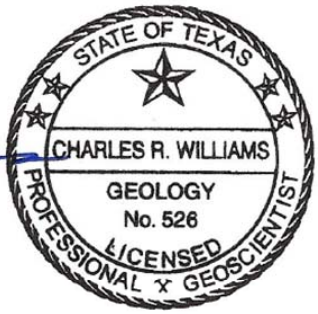
Groundwater Management Plan
Of The
Bluebonnet
Groundwater Conservation
District

TWDB Approval: April 7, 2010
Date of Adoption: January 20, 2010

Groundwater Management Plan

Prepared for:

Bluebonnet Groundwater Conservation District
Austin, Grimes, Waller and Walker Counties, Texas



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January 2010

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District Mission

The BGCD is committed to providing for the conservation, preservation, protection, recharging and prevention of waste of groundwater within the District by developing and implementing an efficient, economical and environmentally sound conservation program with full consideration and respect for the individual citizens of the District.

Purpose of Management Plan

In 1997 the 75th Texas Legislature established a statewide comprehensive regional water planning initiative with the enactment of Senate Bill 1 (SB1). Among the provisions of SB1 were amendments to Chapter 36 of the Texas Water Code requiring groundwater conservation districts to develop a groundwater management plan that shall be submitted to the Texas Water Development Board (TWDB) for approval as administratively complete. The groundwater management plan was specified to contain estimates on the availability of groundwater in the district, details of how the district would manage groundwater and management goals for the District. In 2001 the 77th Texas Legislature further clarified the water planning and management provisions of SB1 with the enactment of Senate Bill 2 (SB2).

The requirements of the Chapter 36 Texas Water Code provisions for groundwater management plan development are specified in 31 Texas Administrative Code Chapter 356 of the TWDB Rules. This plan fulfills all requirements for groundwater management plans in SB1, SB2, Chapter 36 Texas Water Code, and rules of the Texas Water Development Board.

Time Period of Management Plan

This plan shall be in effect for a period of ten years from the date of approval by TWDB, unless a new or amended management plan is adopted by the District Board of Directors and approved by TWDB. The management plan will be readopted with or without changes by the District Board and submitted to TWDB for approval at least every five years.

Bluebonnet Groundwater Conservation District

The District was created in 2001 and consisted of Austin, Grimes, Waller, Washington, and Walker counties. The creation of the District is recorded in Chapter 1361 of the Acts of the 77th Texas Legislature (HB 3655). A local confirmation election for the District was held in November 2002. The District was confirmed in Austin, Grimes, and Walker Counties. The District was not confirmed in Waller and Washington Counties.

In February of 2007 the Commissioners Court of Waller County adopted an Order requesting that the entire county of Waller be annexed into the District. The annexation of Waller County

into the District was approved by the District Board of Directors in July, 2007 and the voters of Waller County confirmed the annexation of the county into the District in November, 2007. With this annexation the District became a four (4) county District with jurisdiction in Austin, Grimes, Walker and Waller Counties.

The District is located in Austin, Grimes, Waller and Walker Counties, Texas. The District boundaries are the same as the area and extent of these four counties. The District is bounded by Colorado, Fayette, Washington, Brazos, Madison, Houston, Trinity, San Jacinto, Montgomery, Harris, Fort Bend, and Wharton Counties. As of the plan date, confirmed groundwater conservation districts (GCD) exist in Fayette, Brazos, Madison, San Jacinto, Montgomery and Wharton counties. As of the plan date, confirmed subsidence districts exist in Harris and Fort Bend counties. The GCDs neighboring the District are: Fayette County GCD, Brazos Valley GCD (Brazos), Mid-East Texas GCD (Madison), Lower Trinity GCD (San Jacinto), Lone Star GCD (Montgomery) and Coastal Bend GCD (Wharton). The subsidence districts neighboring the District are: Harris-Galveston Costal Subsidence District (Harris) and Fort Bend Subsidence District (Fort Bend). (Fig. 1)

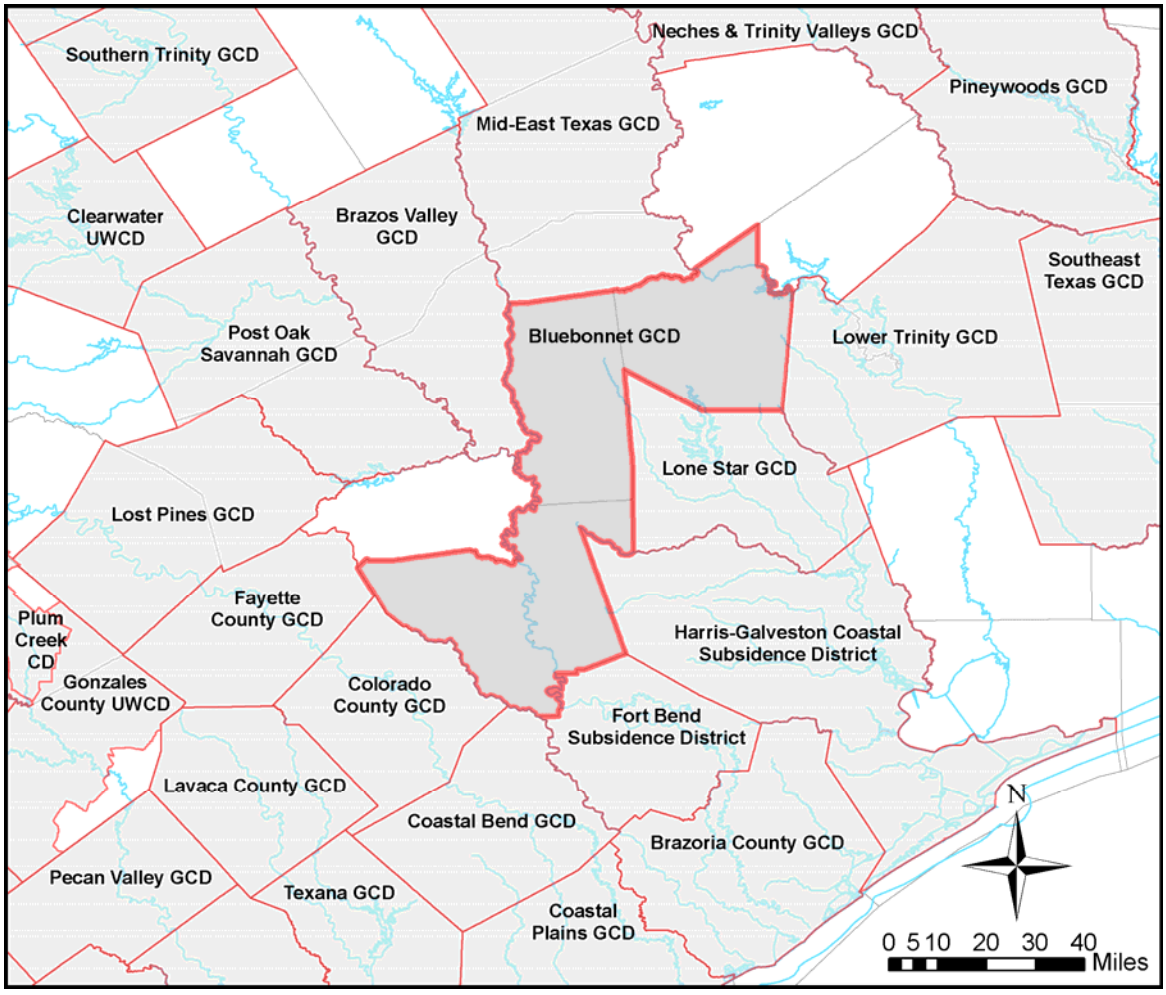

Figure 1, Neighboring Districts to the Bluebonnet Groundwater Conservation District

The District is in Groundwater Management Area (GMA) 14. Chapter 36 of the Texas Water Code authorizes the District to co-ordinate its management of groundwater with other GCDs in

GMA 14. The other Districts that are located in GMA 14 are: Fort Bend SD, Brazoria County GCD, Harris-Galveston Coastal SD (Harris and Galveston), Lone Star GCD (Montgomery), Lower Trinity GCD (San Jacinto and Polk), and Southeast Texas GCD (Tyler, Hardin, Jasper and Newton). (Fig. 2)

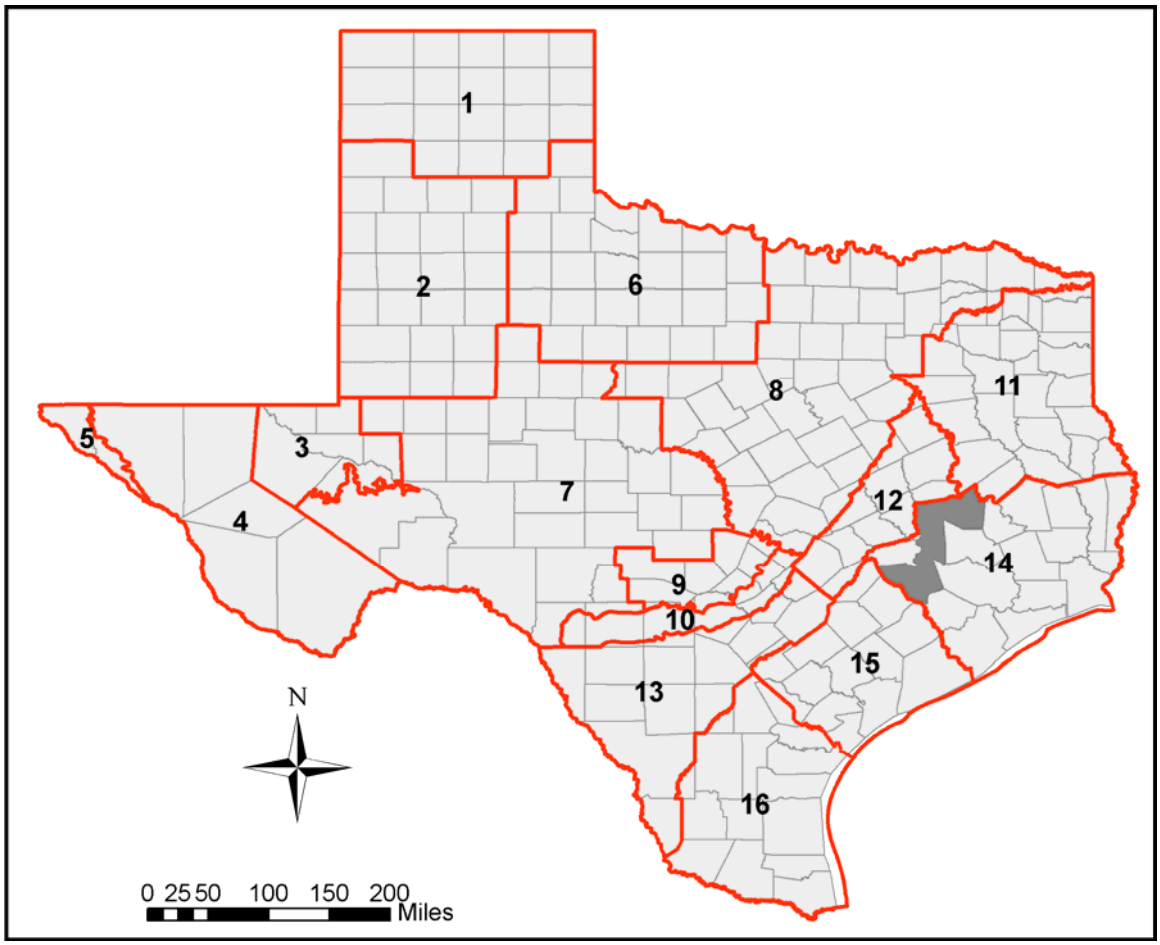

Figure 2, Groundwater Management Areas in Texas, Highlighting the Bluebonnet GCD

The District Board of Directors is composed of sixteen members appointed to staggered four-year terms. The Commissioner's Court for each of the four counties appoints four directors representing municipal, agriculture, industrial and rural water supply interest groups. The Board of Directors holds regular meetings in the City of Navasota in Grimes County, Texas. Meetings of the Board of Directors are public meetings noticed and held in accordance with public meeting requirements. Notices of the Board of Directors meetings are posted IAW Texas Government Code Section 551.053 and are on-line at the Texas Secretary of State, Open Meetings website www.sos.state.tx.us/pls/pub/pubomquery$.startup and at the District website www.bluebonnetgroundwater.org .

Authority of the District

The District derives its authority to manage groundwater use within the District by virtue of the powers granted and authorized in the District enabling act HB 3655 of the 77th Texas Legislature (Appendix A). The District, acting under authority of the enabling legislation, assumes all the

rights and responsibilities of a groundwater conservation district specified in Chapter 36 of the Texas Water Code. The District has developed the rules specifying the bounds of due process governing District actions. The adopted rules of the District are available to the public at the District offices located at 303 E. Washington Street Suite D, Navasota, Texas 77868 and on-line at the District website www.bluebonnetgroundwater.org .

Groundwater Resources of the District

There are 6 sources of groundwater recognized by the TWDB in the District. Two of these sources; the Gulf Coast aquifer and the Carrizo-Wilcox aquifer are classified as major aquifers by the TWDB. (Fig. 3) The other four sources of groundwater: the Queen City aquifer, the Sparta aquifer, the Yegua-Jackson aquifer, and the Brazos River Alluvium aquifer are classified as minor aquifers by the TWDB. (Fig. 4) Additional sources of groundwater in the District that have not yet been classified as major or minor aquifers by TWDB are: the San Bernard River Alluvium, the Trinity River Alluvium, the San Jacinto River Alluvium and the Navasota River Alluvium.

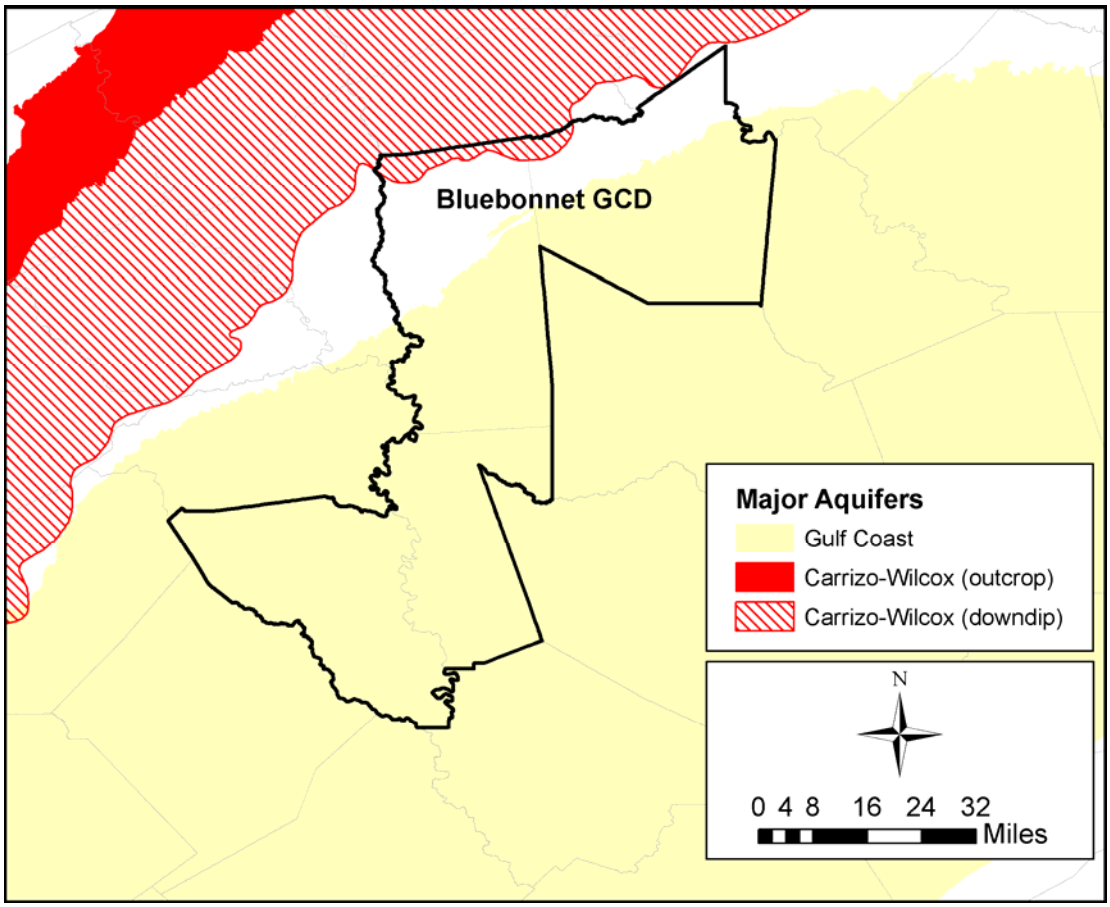

Figure 3, Major Aquifers Recognized by TWDB in the Bluebonnet GCD

A major aquifer is defined by the TWDB as a source of groundwater that is capable of producing large quantities of groundwater or that produces groundwater over a large area. A minor aquifer is defined as an aquifer that produces small quantities of groundwater or produces groundwater in a limited area. The TWDB distinction of a source of groundwater as a major or minor aquifer

or whether a source of groundwater has been classified by TWDB may have no bearing on the importance of a source of groundwater to a particular locality.

The groundwater sources in the District may produce both fresh and moderately saline (brackish) water. The geologic origins of the groundwater sources of the District are relatively young in geologic age and of Tertiary and Quaternary ages. Listed in ascending order by geologic age, these sources are: Carrizo-Wilcox, Queen City, Sparta, Yegua-Jackson, Gulf Coast, Brazos River Alluvium, Trinity River Alluvium, San Jacinto River Alluvium, Navasota River Alluvium and San Bernard River Alluvium aquifers.

Regional Geologic Structure and Aquifer Relationships in the District

The geologic formations of the District occur generally in northeast to southwest trending arcs that are roughly parallel to the Gulf of Mexico coastline. The formations generally dip and thicken towards the coast. Older formations dip more steeply than younger formations. Rates of dip may range from 200 feet per mile for older formations to 10 feet per mile for younger formations. Formations are of progressively more recent origin towards the coast and older formations are found at progressively greater depth. The regional geologic structure may be locally disrupted by faulting and piercement-type salt domes. The recent formations generally form plains near the coast and the older formations form eroded and dissected uplands. (Winslow, 1950; Wilson, 1967 and Baker and others, 1974)

Most of the aquifers in the District are aligned with the regional geologic structure and dip towards the coast. These aquifers are oriented in an inclined stack and may be separated by aquitards that restrict the vertical flow of water from one aquifer to another. Water is recharged by the percolation of rainfall in the outcrop areas. The majority of the groundwater infiltrating the outcrop area of many aquifers is lost to transpiration by plants or may move laterally and be discharged through seeps, springs or bank losses to streams. Groundwater which reaches long term storage in the aquifer generally moves down-dip (or gradient) from the outcrop areas and becomes increasingly mineralized with depth. Several of the aquifers occurring within the District have no outcrop within the District. These aquifers occur only in a buried and confined condition within the District. Springs and flowing wells are not uncommon. In some areas the base flow of streams may supported by springs or bank gains from the aquifer. (Winslow, 1950; Wilson, 1967; Baker and others, 1974 and Scanlon and others, 2002)

The aquifers in the District which do not conform to the regional geologic structure are the Brazos, Trinity, San Jacinto, Navasota and San Bernard River Alluvium aquifers. These aquifers are aligned within the valleys of the rivers and dissect the outcrops of the aquifers that conform to the regional structure. (Fig. 4) The river alluviums aquifers are relatively limited in extent as compared to the other aquifers in the District. (Wilson, 1967; BEG, 1974 and Baker and others, 1974)

Aquifer Descriptions

Carrizo-Wilcox aquifer

The Carrizo-Wilcox aquifer occurs in the northern part of Grimes and Walker Counties but does not outcrop in either County. The aquifer lies approximately 1,700 feet to 2,600 feet below land surface in the District. It consists of the Carrizo Sand, which unconformably overlies the Wilcox Group. The Carrizo Sand is white to light gray in color, is approximately 140 to 220 feet thick and contains brackish to saline water. The Wilcox Group is of variable thickness that may reach 3,300 feet. It consists of clays and sands but may also contain lignite and glauconite. The Wilcox Group has been found to contain highly mineralized water by geophysical log interpretation. (Winslow, 1950 and Baker and others, 1974)

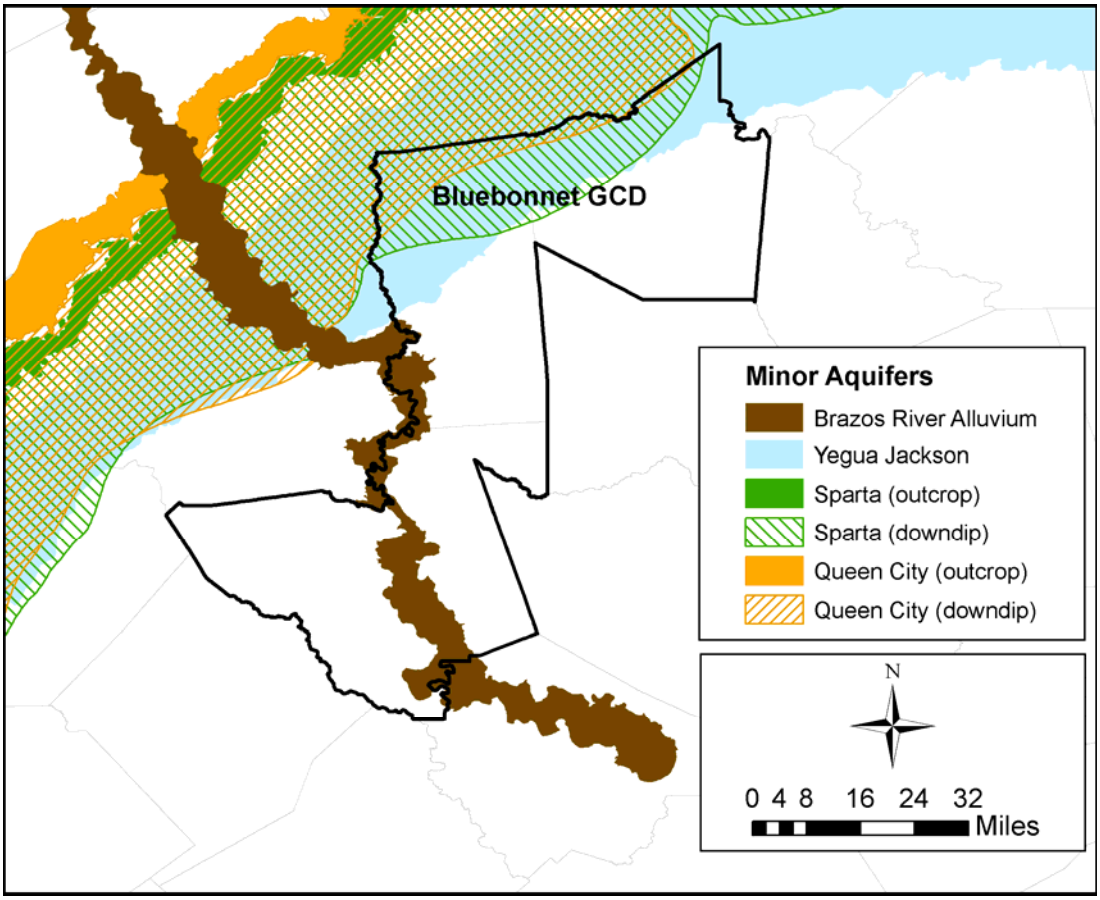

Figure 4, Minor Aquifers Recognized by TWDB in the Bluebonnet GCD

Queen City aquifer

The Queen City Sand occurs in the northern part of Grimes and Walker Counties but does not outcrop in either County. The aquifer lies approximately 1,000 feet to 2,100 feet below land surface in the District. It is approximately 350 to 400 feet maximum thickness. The Queen City Sand consists of gray to yellow orange sand that may be micaceous in Walker County or calcareous in Grimes County. It may contain fresh to brackish water in the lower portion of the aquifer with poorer quality water in the upper portion particularly in Grimes County. (Winslow, 1950 and Baker and others, 1974)

Sparta aquifer
The Sparta Sand occurs in the northern part of Grimes and Walker Counties but does not outcrop in either County. The aquifer lies approximately 700 feet to 2,700 feet below land surface in the District. The Sparta Sand consists of gray and buff colored sands with some clay interbeds with a thickness of approximately 120 to 350 feet. The water quality in Walker County may be saline but fresh to brackish in Grimes County. (Winslow, 1950 and Baker and others, 1974)

Yegua-Jackson aquifer
The Yegua-Jackson aquifer consists of the Yegua Formation and the overlying sands of the Jackson Group. The aquifer outcrops in the northern part of Grimes and Walker Counties in an outcrop belt that is approximately 9 miles wide in Walker County but may be up to 20 miles wide in Grimes County. The Yegua Formation consists of light gray calcareous or glauconitic sands interbedded with brown sandy clays and may contain pyrite, lignite or fossil wood. It reaches a maximum thickness of approximately 1,500 feet with water of fresh to moderately saline water. The Jackson Group consists of sands and sandstone, lignitic clay and tuffaceous siltstone that reach a maximum thickness of approximately 1,100 feet in Walker County and 1,600 feet in Grimes County. Some of the sandstones of the Jackson Group form prominent ridges. Water quality in the Yegua-Jackson aquifer ranges from fresh to moderately saline. (Winslow, 1950 and Baker and others, 1974)

Gulf Coast aquifer
The Gulf Coast aquifer is generally sub-divided into the Jasper, Evangeline and Chicot aquifers with the Jasper separated from the overlying Evangeline by an aquitard called the Burkeville Confining Zone. In Grimes and Walker Counties the Catahoula Sandstone could be considered part of the Gulf Coast aquifer. All sub-divisions outcrop in at least some portion of the District. The Catahoula Sandstone consists of sandy and tuffaceous mudstone in the upper portion and coarse quartz sands in the lower portion. The other sub-divisions of the Gulf Coast aquifer consist of geologic units that may differ from county to county. The Jasper aquifer generally has an upper and lower unit. The upper Jasper may have greater sand content and fresher water than the lower Jasper aquifer. The Burkeville Confining Zone consists mostly of clay but may have some sand in places. The Evangeline aquifer consists of alternating beds of sand and shale. The Chicot aquifer differs from the Evangeline mainly in having greater sand content. The Chicot aquifer may occur in the district only in southernmost Austin County. The maximum thickness of the Gulf coast aquifer may range from approximately 2,500 feet in southern Grimes and Walker Counties to approximately 3,800 feet in southern Austin County. The Gulf Coast aquifer is pierced by salt domes in Austin County. The salt domes of Austin County may be responsible for the highly irregular depth of the base of the Evangeline aquifer in that area. The water quality of the Gulf Coast aquifer ranges from fresh to slightly brackish in the District. (Winslow, 1950; Wilson, 1967 and Baker and others, 1974)

Brazos River Alluvium aquifer
The Brazos River Alluvium aquifer consists of the Recent-aged flood plain materials of the Brazos River exposed in a sinuous band in the Brazos River valley. The Brazos River Alluvium aquifer occurs in Grimes and Austin Counties in the District. The aquifer consists of silts and fine to coarse grained sands and gravels in lensatic deposits. Individual lenses of materials may grade horizontally or vertically into different materials. In Austin County the maximum thickness of the Brazos River Alluvium may be approximately 75 feet but may be more than 80 feet in Grimes County. (Wilson, 1967 and Baker and others, 1974)

<table>
<tr><th>System</th><th>Series</th><th colspan="3">Geologic Unit</th><th>Hydrologic Unit</th></tr>
<tr><td rowspan="4">Quaternary</td><td>Recent</td><td colspan="3">Alluvial Fill Material</td><td>Brazos River Alluvium, Navasota River Alluvium, San Bernard River Alluvium, San Jacinto River Alluvium and Trinity River Alluvium</td></tr>
<tr><td rowspan="4">Pleistocene</td><td>Austin</td><td>Grimes</td><td>Walker</td><td rowspan="7">Gulf Coast aquifer</td></tr>
<tr><td>Beaumont Clay</td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>Montgomery Formation</td></tr>
<tr><td>Bentley Formation</td></tr>
<tr><td rowspan="5">Tertiary</td><td rowspan="2">Pliocene (?)</td><td>Willis Sand</td><td rowspan="2">Willis Sand</td><td rowspan="2">Willis Sand</td></tr>
<tr><td>Goliad Sand</td></tr>
<tr><td rowspan="2">Miocene</td><td>Fleming Formation</td><td>Fleming Formation</td><td>Oakville Sand and Lagarto Clay</td></tr>
<tr><td colspan="3">Catahoula Sandstone</td></tr>
<tr><td rowspan="5">Eocene</td><td colspan="3">Jackson Group</td><td rowspan="2">Yegua Jackson aquifer</td></tr>
<tr><td colspan="3">Yegua Formation</td></tr>
<tr><td colspan="3">Sparta Sand</td><td>Sparta aquifer</td></tr>
<tr><td colspan="3">Queen City Sand</td><td>Queen City aquifer</td></tr>
<tr><td colspan="3">Carrizo Sand</td><td rowspan="2">Carrizo-Wilcox aquifer</td></tr>
<tr><td colspan="3">Wilcox Group</td></tr>
</table>

Figure 5, Water-bearing Geologic and Hydrologic Units of Bluebonnet GCD, modified from (Baker and others, 1974), (Wilson 1967) and (Winslow, 1950)

Navasota River Alluvium aquifer
The Navasota River Alluvium aquifer occurs in Grimes County. The Navasota River serves as the western County Line of Grimes County. The aquifer is used as a source of groundwater, but published information has been about this source of water is limited. The aquifer occurs in a sinuous band in the Navasota River valley. The composition and thickness of the aquifer material is likely similar to the Brazos River Alluvium. The Navasota River Alluvium is joined by the alluvium of several tributary creeks. The largest of the tributary creek alluviums which join the Navasota River alluvium in BGCD are: Holland, Rocky and Gibbons Creeks. The Navasota River is itself a tributary of the Brazos River. The extent of the Navasota River Alluvium as mapped on the Geologic Atlas of Texas extends along the length of the river basin. (BEG, 1970, 1974)

San Bernard River Alluvium aquifer
The San Bernard River Alluvium aquifer occurs in Austin County. The aquifer occurs in a sinuous band in the San Bernard River valley, but little or no information has been published about this source of water. The extent of the San Bernard River Alluvium as mapped on the Geologic Atlas of Texas is limited. (BEG, 1974) The composition and thickness of the aquifer material is likely similar to the Brazos River Alluvium.

San Jacinto River Alluvium aquifer
The San Jacinto River Alluvium aquifer occurs in southern Walker County. The aquifer occurs in a band along the San Jacinto River valley. However, little information has been published about the San Jacinto River Alluvium as a source of water. The composition and thickness of the aquifer material is likely similar to the Brazos River Alluvium. The San Jacinto River Alluvium is joined by the alluvium of several tributary creeks. The largest of the tributary creek alluviums which join the San Jacinto River alluvium in BGCD are: East Sandy, Robinson, Mc Gary and Rocky Creeks. The extent of the San Jacinto River Alluvium in BGCD is mapped on the Geologic Atlas of Texas. (BEG, 1968)

Trinity River Alluvium aquifer
The Trinity River Alluvium aquifer occurs in an approximately 4-mile wide and approximately 15-mile long swath across northern Walker County beginning in the west at the Bedias Creek confluence and running east to the confluence of Chalk Creek. At the Chalk Creek confluence the Trinity River becomes the northern County Line of Walker County for approximately 5 miles and only the alluvium of the southern bank occurs in BGCD. Little published information is available about this aquifer. The Trinity River Alluvium is joined by the alluvium of several tributary creeks. The largest of the tributary creek alluviums which join the Trinity River alluvium in BGCD are: Bedias, Whites, Dillard, Chalk, Nelson, Parker and Caney Creeks. The extent of the Trinity River Alluvium is mapped on the Geologic Atlas of Texas. (BEG, 1968) The composition and thickness of the aquifer material is likely similar to the Brazos River Alluvium.

Physiography of the District

Elevation of the District ranges from about 460 feet above mean sea level (amsl) in the northwest to about 120 feet amsl in the southeast. Austin and Walker counties are fairly level to the south with rolling hills to the west and north. Grimes County consists mostly of rolling hills. (TSHA 2003) Southern Austin County is within the Gulf Coast Prairies and Marshes natural region and the northern part of the county is within the Blackland Prairie natural region. Waller County lies in the Fayette Prairie physiographic area. (Brune, 1981) The Fayette Prairie is a narrow belt of more uneven, undulating country, lying next inland and parallel to the Coastal Plain. (Forest Resources of Texas, 1904) Grimes County is within both the Oak Woods and Prairies region and the Blackland Prairies region. Most of Walker County is within the Oak Woods and Prairies region with the southern tip of the county within the Piney Woods natural region (Hatch and others, 1990 and LBJ, 1978). Most of Austin County is drained by the Brazos River with parts of the county drained by the San Bernard and Colorado Rivers (Greenwade, 1984). Grimes County is drained by the Navasota and Bravos Rivers in the west, the Trinity River and Bedias Creek in the northeast and the San Jacinto River in the southeast. (Greenwade, 1996) Walker County is drained by the Trinity River in the north and the San Jacinto River in the south. (TSHA, 2003)

Units of measure for Water Planning Estimates Used in this Plan Document

The District estimates of groundwater availability, annual use, projected water demands, projected water supplies and the water management strategies recommended in the 2007 State Water Plan are expressed in acre-feet per year. An acre-foot is the equivalent volume of water of covering an acre of land to a depth of 1 foot. An acre-foot is equal to 325,851 gallons. Another common unit of measure for large volumes of water is a million (1,000,000) gallons or million gallons per day (Mgd). The relationship of an acre-foot to a million gallons or one Mgd can be expressed as follows; one million gallons equals approximately 3.069 acre-feet, 1 Mgd over one year equals 1,120.14 acre-feet per year.

Managed Available Groundwater in the District

Managed available groundwater is defined in TWC §36.001 as “the amount of water that may be permitted by a district for beneficial use in accordance with the desired future condition of the aquifer.” The desired future condition of the aquifer may only be determined through joint planning with other groundwater conservation districts (GCDs) in the same groundwater management area (GMA) as required by the 79th Legislature with the passage of HB 1763 into law. The District is located in GMA 14. The GCDs of GMA 14 have not completed the joint planning process to determine the desired future condition of the aquifers in the GMA. Therefore, because GMA 14 has not completed the joint planning process, the District is unable to present a final value for the managed available groundwater in the aquifers of Austin, Grimes, Waller and Walker Counties as of the date of this plan. However, the District presents the information that it has developed for use in the GMA-14 process below as the selected management conditions and aquifer availability for each aquifer in the District. TWDB does not allow the District to refer to this information as the “desired future condition" of the aquifer or the “managed available groundwater” of the aquifer.

For the purposes of managing groundwater within the boundaries of the District and pursuant to Chapter 36 of the Texas Water Code, the District identified selected groundwater management conditions as a benchmark to establish groundwater availability in the aquifers of the District. The identification of the selected local groundwater management conditions was accomplished using a process similar to the currently required GMA process. The District identified the local benchmark management conditions for the aquifers in preparation for meeting the requirement of the District's management plan. As required by statute, the District's identified benchmark management conditions were applied to the TWDB groundwater availability models (GAMs) for the Gulf Coast aquifer and the Carrizo Sand, Queen City and Sparta aquifers in BGCD. The District used other calculations for the Yegua-Jackson, Brazos River Alluvium, Navasota River Alluvium, San Bernard River Alluvium, San Jacinto River Alluvium and the Trinity River Alluvium aquifers because a GAM is not available for these aquifers as of the date of this plan. Using the GAM and other calculations the District established groundwater availability values for the aquifers of BGCD, based on maintaining the identified local conditions. The major and minor aquifer groundwater availability values established by the District will be used to coordinate with the other districts for the purpose of joint planning in GMA 14.

Gulf Coast Aquifer

To assess groundwater availability, the District conducted a series of simulations using the TWDB's Groundwater Availability Model (GAM) for the Gulf Coast aquifer. The series of GAM simulations iteratively applied increasing amounts of groundwater pumping from the aquifer over a predictive period. Pumping was increased, until the amount of pumping that could be sustained by the aquifer without exceeding the selected management conditions during the simulated drought of record was identified.

a. Selected Management Conditions

There are three recognized subdivisions in the Gulf Coast aquifer. The District applied the Northern Gulf Coast aquifer GAM to simulate the Gulf Coast aquifer subdivisions as follows: the Chicot aquifer (Layer 1); the Evangeline aquifer (Layer 2); and the Jasper aquifer (Layer 4). The District selected the maintenance of the water levels expressed as an average draw down value for each aquifer (GAM layer) in each County of BGCD over an approximately 50-year horizon (2008-2060) that included maintaining the preferred management condition at or above the levels specified below. *The selected management conditions are intended to define sustainable use by establishing management goals for each aquifer subdivision of the Gulf Coast aquifer.* The District then conducted the GAM simulations during 2009. The average draw-down values are indexed to year 2008 water levels. By maintaining the aquifer water levels the District can provide for the sustainability of the aquifer and minimize the potential for the reductions in the yields of shallow wells due to aquifer use. The following approximately 50-year criteria (rounded to the nearest tenth foot) were applied to the individual GAM layers to assess the amounts of sustainable use:

Chicot Aquifer:

- Austin County – Approximately 16.4 feet average draw down across the area of occurrence of the aquifer
- Grimes County – Approximately 0.3 feet average draw down across the area of occurrence of the aquifer
- Walker County – The Chicot aquifer does not occur in Walker County

- Waller County – Approximately 7.7 feet average draw down across the area of occurrence of the aquifer

Evangeline Aquifer:

- Austin County – Approximately 8.3 feet average draw down across the area of occurrence of the aquifer
- Grimes County – Approximately 3.8 feet average draw down across the area of occurrence of the aquifer
- Walker County – Approximately 4.2 feet average draw down across the area of occurrence of the aquifer
- Waller County – Approximately 6.9 feet average draw down across the area of occurrence of the aquifer

Jasper Aquifer:

- Austin County – approximately 14.3 feet average draw down across the area of occurrence of the aquifer
- Grimes County – approximately 25.6 feet average draw down across the area of occurrence of the aquifer
- Walker County – approximately 30.4 feet average draw down across the area of occurrence of the aquifer
- Waller County – approximately 24.8 feet average draw down across the area of occurrence of the aquifer

The District estimates of the selected management conditions in the Gulf Coast Aquifer are based on AECOM GMA-14 2060 GAM-run June, 2009

b. Groundwater Availability

The estimated total groundwater availability for the Gulf Coast aquifer in BGCD is 95,900 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions in each aquifer subdivision of each County discussed above. In determining the volume of water available for permitting, a total of 36,900 acre-feet per year is allocated for exempt well users. This leaves a total of **59,000 acre-feet per year as the groundwater available for permitting for the Gulf Coast aquifer as given by County and aquifer below**.

Austin County

- Chicot Aquifer – 1,300 acre-feet per year (300 reserved for exempt use)
- Evangeline aquifer – 20,000 acre-feet per year (6,400 reserved for exempt use)
- Jasper Aquifer – 1,000 acre-feet per year (250 reserved for exempt use)

Grimes County

- Chicot Aquifer – 0 acre-feet per year (0 reserved for exempt use)
- Evangeline aquifer – 3,000 acre-feet per year (750 reserved for exempt use)
- Jasper Aquifer – 11,000 acre-feet per year (2,500 reserved for exempt use)

Walker County

- Chicot Aquifer – The Chicot aquifer does not occur in Walker County

- Evangeline aquifer – 2,000 acre-feet per year (500 reserved for exempt use)
- Jasper Aquifer – 16,000 acre-feet per year (2,000 reserved for exempt use)

Waller County

- Chicot Aquifer – 300 acre-feet per year (100 reserved for exempt use)
- Evangeline aquifer – 41,000 acre-feet per year (24,000 reserved for exempt use)
- Jasper Aquifer – 300 acre-feet per year (100 reserved for exempt use)

The District estimates of the groundwater availability in the Gulf Coast Aquifer are based on AECOM GMA-14 2060 GAM-run June, 2009

Carrizo-Wilcox, Queen City and Sparta Aquifers

To assess groundwater availability, the District conducted a series of simulations using the TWDB's Groundwater Availability Model (GAM) for the Carrizo-Wilcox, Queen City and Sparta aquifers. The series of GAM simulations iteratively applied increasing amounts of groundwater pumping from the aquifer over a predictive period that included a repeat of the drought of record. Pumping was increased, until the amount of pumping that could be sustained by the aquifer without exceeding the selected management conditions during the simulated drought of record was identified.

a. Selected Management Conditions

The District applied the Northern Queen City/Sparta aquifer GAM to simulate the Carrizo-Wilcox, Queen City and Sparta aquifers in Grimes and Walker Counties. The District selected the maintenance of the water levels expressed as an average draw down value for each aquifer (GAM layer) in each County where they occur in BGCD over a 50-year horizon (2010-2060) that included maintaining the preferred management condition at or above the levels specified below. *The selected management conditions are intended to define sustainable use by establishing management goals for each aquifer.* The District then conducted the GAM simulations during 2009. The average draw-down values are indexed to year 2010 water levels. By maintaining the aquifer water levels the District can provide for the sustainability of the aquifer and minimize the potential for the reductions in the yields of shallow wells due to aquifer use. The following 50-year criteria (rounded to the nearest tenth foot) were applied to the individual GAM layers to assess the amounts of sustainable use:

Carrizo Sand Aquifer:

- Grimes County – Approximately 52.8 feet average draw down across the area of occurrence of the aquifer
- Walker County – Approximately 45.7 feet average draw down across the area of occurrence of the aquifer

Queen City Aquifer:

- Grimes County – Approximately 16.8 feet average draw down across the area of occurrence of the aquifer
- Walker County – Approximately 21 feet average draw down across the area of occurrence of the aquifer

Sparta Aquifer:

- Grimes County – Approximately 14 feet average draw down across the area of occurrence of the aquifer
- Walker County – Approximately 19.5 feet average draw down across the area of occurrence of the aquifer

The District estimates of the selected management conditions in the Carrizo Sand, Queen City and Sparta Aquifers are based on Bar-W 2060 GAM-run 09-01 September, 2009

b. Groundwater Availability

The estimated total groundwater availability for the Carrizo Sand aquifer in BGCD is 10,000 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions in the aquifer subdivision discussed above. In determining the volume of water available for permitting, 0 acre-feet per year is allocated for exempt well users. This leaves **10,000 acre-feet per year as the groundwater available for permitting for the Carrizo Sand aquifer**. The estimated total groundwater availability for the Queen City aquifer in BGCD is 1,100 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions in the aquifer subdivision discussed above. In determining the volume of water available for permitting, 75 acre-feet per year is allocated for exempt well users. This leaves **1,025 acre-feet per year as the groundwater available for permitting for the Queen City aquifer**. The estimated total groundwater availability for the Sparta aquifer in BGCD is 5,800 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions in the aquifer subdivision discussed above. In determining the volume of water available for permitting, 1,000 acre-feet per year is allocated for exempt well users. This leaves **4,800 acre-feet per year as the groundwater available for permitting for the Sparta aquifer**.

A summary is given by County and aquifer below:

Grimes County

- Carrizo Sand Aquifer – 7,500 acre-feet per year (0 reserved for exempt use)
- Queen City aquifer – 700 acre-feet per year (50 reserved for exempt use)
- Sparta Aquifer – 3,100 acre-feet per year (500 reserved for exempt use)

Walker County

- Carrizo Sand Aquifer – 2,500 acre-feet per year (0 reserved for exempt use)
- Queen City aquifer – 400 acre-feet per year (25 reserved for exempt use)
- Sparta Aquifer – 2,700 acre-feet per year (500 reserved for exempt use)

The District estimates of groundwater availability in the Carrizo Sand, Queen City and Sparta Aquifers are based on Bar-W 2060 GAM-run 09-01 September, 2009

Yegua-Jackson Aquifer

As of the date of this plan a TWDB GAM for the Yegua-Jackson Aquifer has not been released. To assess groundwater availability, a spreadsheet model was developed. The model uses estimates of: the area of the aquifer recharge (unconfined) and the artesian (confined) zones; the annual amount of aquifer use (pumping, where pumping is assumed to be approximately equal to recharge); and the coefficient of storage of the aquifer in the confined and unconfined zones to predict the annual volume of water that could be produced from the aquifer and result in a specified amount of aquifer draw-down after 50 years. Predictions are made for the unconfined and confined zones of the aquifer within each County in which the aquifer occurs in BGCD. Predictions of the estimated annual amount of groundwater that could be produced in the unconfined zone and confined zone of the aquifer in each County are summed for presentation. Aquifer-zone area estimates in Grimes County are from the maps in TWDB Report 186. (Baker and others, 1974) Aquifer-zone area estimates in Walker County are reasonable estimates based on extensions of the aquifer-zone limits given in the maps in TWDB Report 186 using a geographic information system (GIS) following the outcrops given in the Geologic Atlas of Texas. Estimates of the annual aquifer use by County are from the TWDB Annual Water Use Survey data. The coefficients of storage values are reasonable estimates. Pumping was increased, until the amount of pumping that could be sustained by the aquifer without exceeding the selected management conditions during the simulated drought of record was identified. Details of the estimates of groundwater availability for the Yegua-Jackson aquifer are given in Appendix C.

a. Selected Management Conditions

The District selected the maintenance of the water levels expressed as an average draw down value for each aquifer in each County where they occur in BGCD over a 50-year horizon (2010-2060) that included maintaining the preferred management condition at or above the levels specified below. *The selected management conditions are intended to define sustainable use by establishing management goals for each aquifer.* The District then applied the spreadsheet models in 2009. The average draw-down values are indexed to year 2010 water levels. By maintaining the aquifer water levels the District can provide for the sustainability of the aquifer and minimize the potential for the reductions in the yields of shallow wells due to aquifer use. The following 50-year criteria (rounded to the nearest foot) were applied to the individual aquifer zones in each county to assess the amounts of sustainable use:

. **Grimes County**:

- Yegua (unconfined) – Approximately 10 feet average draw down across the area of occurrence of the aquifer
- Yegua (confined) – Approximately 15 feet average draw down across the area of occurrence of the aquifer
- Yegua (brackish confined) – Approximately 20 feet average draw down across the area of occurrence of the aquifer
- Jackson (unconfined) – Approximately 10 feet average draw down across the area of occurrence of the aquifer
- Jackson (confined) – Approximately 15 feet average draw down across the area of occurrence of the aquifer
- Jackson (brackish confined) – Approximately 20 feet average draw down across the area of occurrence of the aquifer

. **Walker County**:

- Yegua (unconfined) – Approximately 10 feet average draw down across the area of occurrence of the aquifer
- Yegua (confined) – Approximately 15 feet average draw down across the area of occurrence of the aquifer
- Yegua (brackish confined) – Approximately 20 feet average draw down across the area of occurrence of the aquifer
- Jackson (unconfined) – Approximately 10 feet average draw down across the area of occurrence of the aquifer
- Jackson (confined) – Approximately 15 feet average draw down across the area of occurrence of the aquifer
- Jackson (brackish confined) – Approximately 20 feet average draw down across the area of occurrence of the aquifer

b. Groundwater Availability

The estimated total groundwater availability for the Yegua-Jackson aquifer in BGCD is 23,605 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the selected management conditions in the aquifer subdivision discussed above. In determining the volume of water available for permitting, 5,100 acre-feet per year is allocated for exempt well users. This leaves **18,505 acre-feet per year as the groundwater available for permitting for the Yegua-Jackson aquifer**.

A summary is given by County and aquifer sub-division below:

Grimes County

- Yegua – 5,371 acre-feet per year (1,000 reserved for exempt use)
- Jackson – 10,701 acre-feet per year (2,000 reserved for exempt use)

Walker County

- Yegua – 408 acre-feet per year (100 reserved for exempt use)
- Jackson – 7,125 acre-feet per year (2,000 reserved for exempt use)

River Alluvium Aquifers

As of the date of this plan; a TWDB GAM for the Brazos, Navasota, San Bernard, San Jacinto or Trinity River Alluvium aquifers has not been released. To assess groundwater availability, spreadsheet models were developed. The models use estimates of: the area of the aquifer recharge (unconfined) zone; the estimated annual rate of aquifer recharge; the estimated average thickness of the aquifer; and the estimated effective porosity (specific yield) of the aquifer to predict the annual volume of water that could be produced from the aquifer and result in a specified amount of aquifer draw-down after 50 years. Predictions are made for the aquifer in each County where the aquifer occurs in BGCD. Predictions of the estimated annual amount of groundwater that could be produced from the aquifer in each County are summed for presentation. Aquifer-area estimates for the Brazos River Alluviums are taken from TWDB GIS coverages; estimates for all other river alluvium aquifers are taken from the outcrop areas given on the Bureau of Economic Geology (BEG) Austin and Beaumont sheets of the Geologic Atlas of Texas (GAT). (Baker and others, 1974) Details of the estimates of groundwater availability

for the Brazos, Navasota, San Bernard, San Jacinto and Trinity River Alluvium aquifers are given in Appendix C.

a. Selected Management Conditions

The District selected the maintenance of the water levels expressed as an average percentage of saturated thickness value for each aquifer in each County where they occur in BGCD over a 50-year horizon (2010-2060) that included maintaining the preferred management condition at or above the levels specified below. *The selected management conditions are intended to define sustainable use by establishing management goals for each aquifer.* The District then applied the spreadsheet models in 2009. The average draw-down values are indexed to year 2010 water levels. By maintaining the aquifer water levels the District can provide for the sustainability of the aquifer and minimize the potential for the reductions in the yields of shallow wells due to aquifer use. The following 50-year criteria (rounded to the nearest percent) were applied to the individual aquifers to assess the amounts of sustainable use:

Aquifer	Austin	Grimes	Walker	Waller
Brazos River Alluvium	90	90	n/a	90
Navasota River Alluvium	n/a	90	n/a	n/a
San Bernard River Alluvium	90	n/a	n/a	n/a
San Jacinto River Alluvium	n/a	n/a	90	n/a
Trinity River Alluvium	n/a	n/a	90	n/a

Table 1, Selected Management Conditions for the River Alluvium Aquifers in BGCD (in Percent of Saturated Thickness Maintained after 50 years)

b. Groundwater Availability

The estimates of total groundwater availability for the River Alluvium aquifers are given below:

Aquifer	Austin	Grimes	Walker	Waller	Total
Brazos River Alluvium	7,708	5,552	0	11,729	**24,989**
Navasota River Alluvium	0	10,378	0	0	**10,378**
San Bernard River Alluvium	364	0	0	0	**364**
San Jacinto River Alluvium	0	0	2,680	0	**2,680**
Trinity River Alluvium	0	0	8,749	0	**8,749**

Table 2, Estimates of River Alluvium Aquifer Groundwater Availability in Bluebonnet GCD in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

Of the estimates of total groundwater availability for the River Alluvium aquifers the following reservations of water for exempt well use by aquifer and county are given below:

Aquifer	Austin	Grimes	Walker	Waller
Brazos River Alluvium	1,500	1,000	n/a	2,000
Navasota River Alluvium	n/a	2,000	n/a	n/a
San Bernard River Alluvium	100	n/a	n/a	n/a
San Jacinto River Alluvium	n/a	n/a	500	n/a
Trinity River Alluvium	n/a	n/a	1,500	n/a

Table 3, Reservations of Water for Exempt Us in River Alluvium Aquifers Groundwater in Bluebonnet GCD in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

The amounts of water available for permitting from each of the River Alluvium aquifers in BGCD on an annual basis are as follows:

Aquifer	Austin	Grimes	Walker	Waller	Total
Brazos River Alluvium	6,208	4,552	0	9,729	**20,489**
Navasota River Alluvium	0	8,378	0	0	**8,378**
San Bernard River Alluvium	264	0	0	0	**264**
San Jacinto River Alluvium	0	0	2,180	0	**2,180**
Trinity River Alluvium	0	0	7,249	0	**7,249**

Table 4, Estimate of Water Available for Permitting in River Alluvium Aquifers in Bluebonnet GCD in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

Estimate of the Annual Amount of Groundwater Use in the District

To estimate the annual amount of groundwater being used in the District, the District has relied on the TWDB Annual Water use Survey Data. In past years, response to the TWDB survey was voluntary. As a result, the TWDB water use survey data is subject to variations in the completeness or accuracy of the data. The estimate of the amount of groundwater being used in the District on an annual basis is 49,613 acre-feet per year. The estimate is from the TWDB Annual Water Use Survey for the Year 2004, which is the most recent data available. TWDB data on estimated groundwater use is available from 1980 to 2004, excepting 1981 to 1983 when no data was collected. Details of the estimate of the total amount of groundwater use including historic groundwater use data are presented in Appendix D.

The District looks forward to undertaking the process of developing estimates of groundwater use in the District based on site-specific locally generated data. The District has used the TWDB Annual Water Use Survey Data to comply with the statutory requirements for the approval of the District's groundwater management plan by TWDB.

Estimate of the Annual Amount of Natural or Artificial Recharge to the Groundwater Resources within the District

The estimated annual amount of recharge to the groundwater resources of the District is 110,456 acre-feet per year. The Carrizo-Wilcox, Queen City and Sparta aquifers occur within the District but do not outcrop in the District. The District considers that no recharge to these aquifers occurs within the District. The District developed the estimates of annual recharge to all other aquifers.

In the TWDB rules concerning groundwater management plans, recharge is defined as "The addition of water from precipitation or runoff by seepage or infiltration to an aquifer from the land surface, streams, or lakes directly into a formation or indirectly by way of leakage from another formation." This definition does not allow the inclusion of down-gradient movement of water in an aquifer in the estimate of recharge. The estimates of annual recharge for all aquifers in the District were developed in accord with the TWDB definition of recharge.

Aquifer	Annual Recharge
Carrizo-Wilcox	**0**
Queen City	**0**
Sparta	**0**
Yegua-Jackson	**17,200**
Gulf Coast	**54,216**
Brazos River Alluvium	**21,835**
Navasota River Alluvium	**9,157**
San Bernard River Alluvium	**317**
San Jacinto River Alluvium	**2,364**
Trinity River Alluvium	**7,719**
Total Annual Recharge =	**112,808**

Table 5, Annual recharge estimates for the aquifers in Bluebonnet GCD in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

Note: The District estimate of recharge to the Carrizo-Wilcox, Queen City, Sparta and Gulf Coast aquifers are from TWDB GAM-Run 08-87. The estimates for recharge to all other aquifers were developed by the District. The details on the calculations used in developing the estimates of annual recharge to the aquifers of the District are presented in Appendix G.

How the Natural or Artificial Recharge in the District May be Increased

The natural or artificial recharge in the District might be increased by the construction of storm-water runoff infiltration galleries near ephemeral streams.

Estimates of the Annual Volume of Water Discharging from Aquifers to Springs and Other Surface Water in the District

Aquifer	Annual Discharge toSprings or Surface Water
Carrizo-Wilcox	**0**
Queen City	**0**
Sparta	**0**
Yegua-Jackson	**0**
Gulf Coast	**16,557**
Brazos River Alluvium	**0**
Navasota River Alluvium	**0**
San Bernard River Alluvium	**0**
San Jacinto River Alluvium	**0**
Trinity River Alluvium	**0**
Total Annual Discharge =	**16,557**

Table 6, Annual Discharge Estimates to Springs or Surface water for the Aquifers in Bluebonnet GCD in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

USGS Site	State Well No.	Name	Lat (dd)	Long (dd)	Elevation	County	Aquifer	Discharge (gpm)
295131096203101	6614103	Cat Springs	29.8586111	-96.3419444	unk.	Austin		unk.
303737096003200	5924901	Kellum Springs	30.6272222	-96.0091667	261	Grimes	Jackson	25
304544095210501	6014701	YU-60-14-701	30.7622222	-95.3513889	340	Walker	Catahoula	unk.

Table 7, USGS Inventory of Springs Located in BGCD Counties

Note: The District estimate of discharge from the Carrizo-Wilcox, Queen City, Sparta and Gulf Coast aquifers are from TWDB GAM-Run 08-87. The estimate of spring discharge from the Yegua-Jackson aquifer is from the USGS spring inventory database. The previously published estimates of minor aquifer discharges to surface water systems in BGCD are extremely limited. The minor aquifers for which estimates are presented are limited to the aquifers for which previously published information was located by the District. Additional springs that may exist within the District but which have not been identified in the available publications nor have estimates of discharge been published are not included in the estimates given in this plan. Due to the limited time in which the District has been in operation, the District has not been able to develop new information on minor aquifer discharges to surface water systems. Due to the limited information available at the time this plan was prepared, the District does not warrant the completeness of these estimates of minor aquifer discharges to surface water systems in BGCD. The District will in the future undertake studies to identify the quantity of water discharged by springs and to quantify other discharges of water from the aquifers to surface water systems.

Estimates of the Annual Volume of Flow Into and Out of the District Within Each Aquifer and Between Aquifers in the District, if a Groundwater Availability Model is Available

Requirement	Aquifer or Confining Unit	Results
Estimated Annual Flow Into the District within Each Aquifer	Chicot Aquifer	**9,897**
	Evangeline Aquifer	**18,562**
	Burkeville Confining Unit	**33**
	Jasper Aquifer	**14,448**
	Sparta Aquifer	**417**
	Weches Confining Unit	**60**
	Queen City Aquifer	**206**
	Reklaw Confining Unit	**72**
	Carrizo Sand	**1,044**
	Wilcox Aquifer (upper)	**403**
	Wilcox Aquifer (middle)	**1,283**
	Wilcox Aquifer (lower)	**356**
Estimated Annual Flow Out of the District within Each Aquifer	Chicot Aquifer	**20,145**
	Evangeline Aquifer	**24,542**
	Burkeville Confining Unit	**48**
	Jasper Aquifer	**21,450**
	Sparta Aquifer	**633**
	Weches Confining Unit	**75**
	Queen City Aquifer	**126**
	Reklaw Confining Unit	**64**
	Carrizo Sand	**1,026**
	Wilcox Aquifer (upper)	**392**
	Wilcox Aquifer (middle)	**1,391**
	Wilcox Aquifer (lower)	**278**
Estimated Net Annual Flow Between Aquifers in the District	Chicot to Evangeline Aquifer	**44,149**
	Evangeline to Burkeville Confining Unit	**1,158**
	Burkeville to Jasper Aquifer	**1,113**
	Weches Confining to Sparta Aquifer	**201**
	Queen City to Weches Confining Unit	**212**
	Reklaw Confining to Queen City Aquifer	**54**
	Carrizo Sand to Reklaw Confining	**17**
	Carrizo Sand to Upper Wilcox Aquifer	**10**
	Upper Wilcox to Middle Wilcox Aquifer	**24**
	Lower Wilcox to Middle Wilcox Aquifer	**80**

Table 8, Annual Flow Estimates Into and Out of Aquifers and Between the Aquifers in Bluebonnet GCD for Which a TWDB GAM exists in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

Note: The District estimate of flow into, out of and between aquifer of the District for the Carrizo-Wilcox, Queen City, Sparta and Gulf Coast aquifers are from TWDB GAM-Run 08-87.

Estimate of the Projected Total Water Demand within the District

Estimates of projected water demand are based on anticipated patterns of population growth and migration applied to standardized estimated water use rates for the recognized categories of water use. Estimates of projected annual total water demand represent a need for water that may ultimately be met by a supply of surface water or groundwater. The estimation of projected total water demand is the first step in determining the adequacy of a regional system of water supply. The estimate of projected total water demand within the District in the year 2010 is 81,106 acre-feet. The source of this estimate is from Volume 3 of the 2007 State Water Planning Database. Details of the estimate of the projected water demand are presented in Appendix E.

County	2010	2020	2030	2040	2050	2060
Austin	16,411	16,779	17,038	17,156	17,224	17,368
Grimes	14,840	17,658	19,915	22,510	25,649	29,463
Walker	20,376	22,315	23,360	23,468	23,836	24,270
Waller	29,479	30,408	31,489	32,650	34,146	35,898
Total	**81,106**	**87,160**	**91,802**	**95,784**	**100,855**	**106,999**

Table 9, Estimates of Projected Water Demands in Austin, Grimes, Walker and Waller counties in acre-feet per year (one acre-foot = 325,851 gallons or approximately 0.326 Mgd)

Estimate of Projected Surface Water Supplies

Estimates of projected surface water supplies represent the estimated capacity of surface water supply systems to deliver water to meet user needs on an annual basis. The annual water delivery capacity of different water systems in different areas may not be estimated by the same methods. The estimate of projected surface water supplies in the District for the year 2010 is 27,463 acre-feet. This estimate is from Volume 3 of the 2007 State Water Planning Database. Details of the estimate of the projected surface water and groundwater are presented in Appendix F.

County	2010	2020	2030	2040	2050	2060
Austin	52	56	58	59	60	61
Grimes	15,729	15,729	15,729	15,729	15,729	15,729
Walker	11,360	11,384	11,406	11,406	11,412	11,420
Waller	322	322	322	322	344	384
Total	**27,463**	**27,491**	**27,515**	**27,516**	**27,545**	**27,594**

Table 10, Projected Surface Water Supplies in Austin, Grimes, Walker and Waller counties in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

Identified Water Needs of Water User Groups

Estimates of identified water needs for water represent the projected shortages of water for water user groups beyond the existing water supplies of the water user groups. Where water needs are identified for a water user group; a water management strategy must be developed by the Regional Water Planning Group in which the water user group is located that will result in sufficient additional water supplies to meet the identified needs. The estimates of identified water needs are from Volume 3 of the 2007 State Water Planning Database.

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
H	Bellville	Austin	Brazos	-74	-144	-187	-205	-216	-238
H	County Other	Austin	Brazos	-156	-286	-382	-422	-439	-487
H	County Other	Austin	Brazos-Colorado	-32	-58	-77	-85	-89	-98
H	County Other	Austin	Colorado	-3	-6	-8	-8	-9	-10
H	Irrigation	Austin	Brazos	0	0	0	0	0	0
H	Irrigation	Austin	Brazos-Colorado	0	0	0	0	0	0
H	Livestock	Austin	Brazos	0	0	0	0	0	0
H	Livestock	Austin	Brazos-Colorado	0	0	0	0	0	0
H	Livestock	Austin	Colorado	0	0	0	0	0	0
H	Manufacturing	Austin	Brazos	-35	-54	-71	-86	-99	-120
H	Manufacturing	Austin	Brazos-Colorado	-8	-12	-15	-19	-22	-26
H	Mining	Austin	Brazos	-7	-11	-14	-16	-18	-20
H	Mining	Austin	Brazos-Colorado	-1	-1	-1	-1	-2	-2
H	Mining	Austin	Colorado	-1	-2	-2	-3	-3	-3
H	San Felipe	Austin	Brazos	-22	-43	-57	-65	-68	-74
H	Sealy	Austin	Brazos	-79	-153	-207	-224	-235	-261
H	Wallis	Austin	Brazos-Colorado	-17	-33	-41	-46	-48	-53
Total Projected Water Needs (acre-feet per year) =				**-435**	**-803**	**-1,062**	**-1,180**	**-1,248**	**-1,392**

Table 11, Identified Water Needs of Water User Groups in Austin County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
G	County Other	Grimes	Brazos	143	134	119	126	119	101
G	County Other	Grimes	San Jacinto	84	78	69	73	69	59
G	County Other	Grimes	Trinity	50	47	41	44	41	35
G	Irrigation	Grimes	Brazos	953	953	953	953	953	953
G	Irrigation	Grimes	San Jacinto	0	0	0	0	0	0
G	Livestock	Grimes	Brazos	0	0	0	0	0	0
G	Livestock	Grimes	San Jacinto	0	0	0	0	0	0
G	Livestock	Grimes	Trinity	0	0	0	0	0	0
G	Manufacturing	Grimes	Brazos	-1	-41	-80	-119	-154	-189
G	Mining	Grimes	Brazos	17	15	16	15	15	15
G	Mining	Grimes	San Jacinto	0	0	0	1	0	1
G	Mining	Grimes	Trinity	0	0	0	0	0	0
G	Navasota	Grimes	Brazos	1,325	1,287	1,257	1,246	1,225	1,196
G	Steam Electric Power	Grimes	Brazos	3,729	1,263	-727	-3,153	-6,110	-9,715
G	Wickson Creek SUD	Grimes	Brazos	-246	-499	-665	-796	-907	-1,017
Total Projected Water Needs (acre-feet per year) =				**-247**	**-540**	**-1,472**	**-4,068**	**-7,171**	**-10,921**

Table 12, Identified Water Needs of Water User Groups in Grimes County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
H	Consolidated WSC	Walker	Trinity	-1	-2	-2	-1	-1	-1
H	County Other	Walker	San Jacinto	-685	-1,223	-1,282	-1,251	-1,240	-1,217
H	County Other	Walker	Trinity	0	0	-171	-46	-59	-82
H	Huntsville	Walker	San Jacinto	0	323	2,484	1,802	1,978	2,202
H	Huntsville	Walker	Trinity	9,184	8,749	6,367	7,058	6,901	6,629
H	Irrigation	Walker	San Jacinto	0	0	0	0	0	0
H	Irrigation	Walker	Trinity	9	8	8	8	8	8
H	Lake Livingston Water Supply & Sewer Service	Walker	Trinity	-2	-3	-3	-2	-1	-1
H	Livestock	Walker	San Jacinto	0	0	0	0	0	0
H	Livestock	Walker	Trinity	0	0	0	0	0	0
H	Manufacturing	Walker	San Jacinto	-124	-216	-300	-386	-461	-540
H	Manufacturing	Walker	Trinity	-566	-984	-1,370	-1,762	-2,104	-2,459
H	Mining	Walker	San Jacinto	-1	-1	-1	-1	-1	-1
H	Mining	Walker	Trinity	0	0	0	0	0	0
H	New Waverly	Walker	San Jacinto	-23	-40	-48	-41	-40	-40
H	Riverside WSC	Walker	Trinity	-26	-42	-52	-43	-38	-38
H	Trinity Rural WSC	Walker	Trinity	0	0	0	0	0	0
H	Walker County Rural WSC	Walker	Trinity	-108	-186	-227	-227	-239	-254
Total Projected Water Needs (acre-feet per year) =				**-1,536**	**-2,697**	**-3,456**	**-3,760**	**-4,184**	**-4,633**

Table 13, Identified Water Needs of Water User Groups in Walker County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
H	Brookshire	Waller	Brazos	-50	-113	-185	-269	-376	-505
H	County Other	Waller	Brazos	-191	-412	-679	-944	-1,308	-1,726
H	County Other	Waller	San Jacinto	-197	-424	-699	-971	-1,345	-1,776
H	Hempstead	Waller	Brazos	-182	-400	-636	-914	-1,243	-1,633
H	Irrigation	Waller	Brazos	0	0	0	0	0	0
H	Irrigation	Waller	San Jacinto	-400	-874	-399	-13	-316	-1,133
H	Katy	Waller	San Jacinto	-52	-101	-121	-120	-119	-119
H	Livestock	Waller	Brazos	0	0	0	0	0	0
H	Livestock	Waller	San Jacinto	0	0	0	0	0	0
H	Manufacturing	Waller	Brazos	-4	-6	-8	-11	-12	-15
H	Manufacturing	Waller	San Jacinto	-17	-27	-36	-44	-53	-61
H	Mining	Waller	Brazos	0	0	0	0	0	0
H	Mining	Waller	San Jacinto	0	0	0	0	0	0
H	Pine Island	Waller	Brazos	-22	-51	-82	-115	-159	-210
H	Prairie View	Waller	Brazos	-74	-156	-252	-363	-503	-671
H	Prairie View	Waller	San Jacinto	-8	-17	-28	-40	-55	-74
H	Waller	Waller	San Jacinto	-63	-135	-219	-315	-429	-564
Total Projected Water Needs (acre-feet per year) =				**-1,260**	**-2,716**	**-3,344**	**-4,119**	**-5,918**	**-8,487**

Table 14, Identified Water Needs of Water User Groups in Waller County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

Water Management Strategies to Meet Needs of Water User Groups

Water Management Strategies are the projects recommended by Regional Water Planning Groups that are intended to develop the amount of additional water supplies indicated as necessary to meet the identified water needs (projected shortages) of specific water user groups beyond their existing water supplies. The Water Management Strategies recommended by Regional Water Planning Groups may develop additional supplies of surface water or groundwater. The tables presenting the recommended Water Management Strategies for the Counties in BGCD are from Volume 3 of the 2007 State Water Planning Database.

RWPG	WUG	River Basin	Water Mgt Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
H	Bellville	Brazos	New Wells	Gulf Coast Aquifer	Austin	74	144	187	205	216	238
H	County Other	Brazos	New Wells	Gulf Coast Aquifer	Austin	156	286	382	422	439	487
H	Manufacturing	Brazos	New Wells	Gulf Coast Aquifer	Austin	35	54	71	86	99	120
H	Mining	Brazos	New Wells	Gulf Coast Aquifer	Austin	7	11	14	16	18	20
H	San Felipe	Brazos	New Wells	Gulf Coast Aquifer	Austin	22	43	57	65	68	74
H	Sealy	Brazos	New Wells	Gulf Coast Aquifer	Austin	79	153	207	224	235	261
H	County Other	Brazos-Colorado	New Wells	Gulf Coast Aquifer	Austin	32	58	77	85	89	98
H	Manufacturing	Brazos-Colorado	New Wells	Gulf Coast Aquifer	Austin	8	12	15	19	22	26
H	Mining	Brazos-Colorado	New Wells	Gulf Coast Aquifer	Austin	1	1	1	1	2	2
H	Wallis	Brazos-Colorado	New Wells	Gulf Coast Aquifer	Austin	17	33	41	46	48	53
H	County Other	Colorado	New Wells	Gulf Coast Aquifer	Austin	3	6	8	8	9	10
H	Mining	Colorado	New Wells	Gulf Coast Aquifer	Austin	1	2	2	3	3	3
Total Projected Water Management Strategies (acre-feet per year) =						**435**	**803**	**1,062**	**1,180**	**1,248**	**1,392**

Table 15, Water Management Strategies Recommended for Austin County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

WPG	WUG	River Basin	Water Mgt Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
G	Wickson Creek SUD	Brazos	Aquifer Development	Carrizo-Wilcox Aquifer	Brazos	246	499	665	796	907	1,017
G	Manufacturing	Brazos	Aquifer Development	Gulf Coast Aquifer	Grimes	250	250	250	250	250	250
G	Steam Electric Power	Brazos	BRA System Op's Permit	BRA System	Reservoir	0	0	0	1,000	1,000	4,500
G	Manufacturing	Brazos	Conservation	Conservation	Grimes	8	15	24	26	29	31
G	Steam Electric Power	Brazos	Raise Level of Gibbons Creek Res.	Gibbons Creek Res.	Reservoir	3,870	3,870	3,870	3,870	3,870	3,870

G	Steam Electric Power	Brazos	Conservation	Conservation	Grimes	279	588	963	1,133	1,340	1,592
Total Projected Water Management Strategies (acre-feet per year) =						**4,653**	**5,222**	**5,772**	**7,075**	**7,396**	**11,260**

Table 16, Water Management Strategies Recommended for Grimes County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

RWPG	WUG	River Basin	Water Management Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
H	County Other	San Jacinto	New Wells	Gulf Coast Aquifer	Walker	685	1,223	1,282	1,251	1,240	1,217
H	Manufacturing	San Jacinto	New Wells	Gulf Coast Aquifer	Walker	124	216	300	386	461	540
H	Mining	San Jacinto	New Wells	Gulf Coast Aquifer	Walker	1	1	1	1	1	1
H	New Waverly	San Jacinto	New Wells	Gulf Coast Aquifer	Walker	23	40	48	41	40	40
H	County Other	Trinity	New Wells	Gulf Coast Aquifer	Walker	0	0	171	46	59	82
H	L. Livingston Water & Sewer	Trinity	New Wells	Gulf Coast Aquifer	Walker	2	3	3	2	1	1
H	Manufacturing	Trinity	New Wells	Gulf Coast Aquifer	Walker	566	357	46	247	287	304
H	Riverside WSC	Trinity	New Wells	Gulf Coast Aquifer	Walker	26	42	52	43	38	38
H	Walker County Rural WSC	Trinity	New Wells	Sparta Aquifer	Walker	108	186	227	227	239	254
H	Consolidated WSC	Trinity	New Wells	Yegua-Jackson Aquifer	Walker	1	2	2	1	1	1
H	Manufacturing	Trinity	New Wells	Yegua-Jackson Aquifer	Walker	0	627	1,324	1,515	1,817	2,155
Total Projected Water Management Strategies (acre-feet per year) =						**1,536**	**2,697**	**3,456**	**3,760**	**4,184**	**4,633**

Table 17, Water Management Strategies Recommended for Walker County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

RWPG	WUG	River Basin	Water Management Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
H	Irrigation	Brazos	Conservation	Conservation	Waller	1,387	1,387	1,387	1,387	1,387	1,387
H	Irrigation	San Jacinto	Conservation	Conservation	Waller	5,219	5,219	5,219	5,219	5,219	5,219
H	Katy	San Jacinto	Additional Yield	Houston Lake/ Reservoir	Reservoir	111	111	111	111	111	111
H	County Other	Brazos	Conservation	Conservation	Waller	0	0	0	0	45	133
H	Hempstead	Brazos	Conservation	Conservation	Waller	0	0	0	0	50	178
H	County Other	San Jacinto	Conservation	Conservation	Waller	0	0	0	0	0	69
H	Katy	San Jacinto	Conservation	Conservation	Waller	10	10	10	10	10	10
H	Brookshire	Brazos	Conservation	Conservation	Waller	0	0	0	0	20	61
H	Prairie View	Brazos	Conservation	Conservation	Waller	0	0	0	0	36	103
H	Prairie View	San Jacinto	Conservation	Conservation	Waller	0	0	0	0	0	5
H	Waller	San Jacinto	Conservation	Conservation	Waller	0	0	0	0	0	26
H	Pine Island	Brazos	Conservation	Conservation	Waller	0	0	0	0	6	17
H	Brookshire	Brazos	New Wells	Gulf Coast Aquifer	Waller	50	113	185	269	356	444
H	County Other	Brazos	New Wells	Gulf Coast Aquifer	Waller	191	412	679	944	1,263	1,593
=H	Hempstead	Brazos	New Wells	Gulf Coast Aquifer	Waller	182	400	636	914	1,193	1,455
H	Irrigation	San Jacinto	New Wells	Gulf Coast Aquifer	Waller	0	0	0	13	124	0
H	Manufacturing	Brazos	New Wells	Gulf Coast Aquifer	Waller	4	6	8	11	12	15
H	Pine Island	Brazos	New Wells	Gulf Coast Aquifer	Waller	22	51	82	115	153	193
H	Prairie View	Brazos	New Wells	Gulf Coast Aquifer	Waller	74	156	252	363	467	568
H	County Other	San Jacinto	New Wells	Gulf Coast Aquifer	Waller	197	424	699	971	1,345	1,707
H	Irrigation	San Jacinto	New Wells	Gulf Coast Aquifer	Waller	400	874	399	0	0	0
H	Manufacturing	San Jacinto	New Wells	Gulf Coast Aquifer	Waller	17	27	36	44	53	61
H	Prairie View	San Jacinto	New Wells	Gulf Coast Aquifer	Waller	8	17	28	40	55	69

H	Waller	San Jacinto	New Wells	Gulf Coast Aquifer	Waller	63	135	219	315	429	564
Total Projected Water Management Strategies (acre-feet per year) =						**7,935**	**9,342**	**9,950**	**10,726**	**12,334**	**13,988**

Table 18, Water Management Strategies Recommended for Waller County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

How the Groundwater Management Plan Considers Water Supply Needs and Water Management Strategies in a Manner Not in Conflict with the State Water Plan

The 2007 State Water Plan identifies 37 groundwater-based Water Management Strategies to meet the identified needs of 37 Water User Groups located within BGCD. Of the 37 groundwater-based Water Management Strategies recommended for Water User Groups located within BGCD: 33 develop additional water supplies from the Gulf Coast aquifer; 2 develop additional water supplies from the Yegua-Jackson aquifer; 1 develops additional water supplies from the Carrizo-Wilcox aquifer and: 1 develops additional water supplies from the Sparta aquifer. In order to address the water supply needs identified in the 2007 State Water Plan for Water User Groups located in BGCD, the District considered: the Water Management Strategies recommended in the 2007 State Water Plan; the annual availability of groundwater based on the District's Selected Management Conditions for the aquifers where a Water Management Strategy is recommended and the available estimates of groundwater use from the aquifers in the District. Based on the available information BGCD Selected Management Conditions for the Gulf Coast, Carrizo-Wilcox, Sparta and Yegua-Jackson aquifers will allow the implementation of all groundwater-based Water Management Strategies recommended in the 2007 State Water Plan. In addition, BGCD developed Selected Management Conditions and Annual Availability values for the Brazos, Navasota, San Bernard, San Jacinto and Trinity River Alluvium aquifers as well as the Queen City aquifer in order to provide additional water supplies and flexibility in meeting the future water supply requirements of the citizens and the economy of the District.

County	Aquifer	Most Recent TWDB Use Estimate	BGCD Annual Availability	Water Mgt Strategies Total
Austin	Gulf Coast	9,946	22,300	1,392
Grimes	Gulf Coast	3,733	14,000	250
	Carrizo-Wilcox	n/a	7,500	1,017
	Yegua-Jackson	n/a	16,072	n/a
Walker	Gulf Coast	5,573	18,000	2,223
	Sparta	n/a	2,700	254
	Yegua-Jackson	n/a	7.533	2,156
Waller	Gulf Coast	29,215	41,600	6,669

Table 19, The Total by Aquifer of the Annual Amount of Water Needed for Water Management Strategies Recommended for BGCD Counties, Estimates of Groundwater Availability for Aquifers in BGCD where Water Management Strategies are Recommended, and the Best Available Estimates of Annual Groundwater Use for each Aquifer and County in acre-feet per year (one acre-foot equals 325,851 gallons or approximately 0.326 Mgd)

Details on How the District Will Manage Groundwater in the District

The District will provide for the conservation, preservation, protection, recharging and prevention of waste of groundwater within the District by developing and implementing an efficient, economical and environmentally sound conservation program with full consideration and respect for the individual citizens of the District. The District seeks to manage the groundwater resources of the District as practicably as possible in a sustainable manner. The Texas Legislature established that groundwater conservation districts are the preferred method of groundwater management in Section 36.0015 of the Texas Water Code. 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 may result in the conservation of groundwater in the District. The District will manage groundwater resources through rules developed and implemented in accordance with Chapter 36 of the Texas Water Code and the provisions of the District Enabling Act recorded in Chapter 1361 of the Acts of the 77th Texas Legislature (HB 3655). (Appendices A and C) The District will require that any well constructed as an exempt well under activities regulated by the Texas Railroad Commission (TRC) and later converted to another use not regulated by the TRC will be required to seek a permit for the use of groundwater in the District.

An observation well network may be established and maintained in order to monitor changing storage conditions of groundwater supplies within the District. When a monitoring well network has been established the District will make a regular assessment of water supply and groundwater storage conditions and will report those conditions to the District Board of Directors and to the public. The District may undertake, as necessary, investigations of the groundwater resources within the District and will make the results of investigations available to the public upon adoption by the District Board of Directors. The District will co-operate with investigations of the groundwater resources of the District undertaken by other local political subdivisions or agencies of the State of Texas.

In order to better manage groundwater resources the District may establish management zones for all sources of groundwater within the District. In each management zone the District may:

a) Establish groundwater availability and authorize the production of groundwater
b) Determine and implement the proportional reductions of the use of groundwater for all classes of groundwater use that are established by the District
c) Allow for the transfer of the permitted right to use groundwater if a process is established in the District rules

Section 36.116 of the Texas Water Code provides that the District may use the management zones to adopt different rules for each:

a) Aquifer
b) Aquifer subdivision
c) Geologic formation
d) Geographic area in which any part of a through c above may occur within the District

For the purpose of managing the use of groundwater within the District, the District may define sustainable use as the use of an amount of groundwater in the District as a whole or any management zone established by the District that does not exceed:

a) The amount of annual recharge of the aquifer or aquifer subdivision in which the use occurs as recognized by the District or
b) Any other criteria established by the District as being a threshold of use beyond which further use of the aquifer or aquifer subdivision may result in a specified undesirable or injurious condition

The District will use the currently available estimates of groundwater recharge, movement and availability within the District in exercising the statutory responsibility of managing the groundwater in the District. As improved information on groundwater conditions in the District becomes available, the District may use that information to refine the specific methodology by which the District will seek to sustainably manage the groundwater in the District.
The annual amount of water used from an aquifer or aquifer subdivision in the District or in a management zone established by the District may be averaged over a period of years specified in the District rules to determine if the sustainable use has been exceeded. If the sustainable use of an aquifer or aquifer subdivision in the District or a management zone is found to have been exceeded the District may implement proportional reductions in the permitted use of groundwater in the District or management zone to reduce the levels of use to the sustainable amount. The District may implement proportional reductions in the permitted use of groundwater only to the extent that is required to maintain sustainable use in an aquifer, aquifer subdivision or a management zone when averaged over time.

The District rules may specify the methodology by which the District will track the usage of groundwater from an aquifer or aquifer subdivision in the District or a management zone to determine whether the sustainable use has been exceeded. The District rules may specify the methodology by which the District will implement any proportional reductions in the permitted use of groundwater in the District. All District actions with regard to proportional reductions of the permitted use of groundwater will be taken in noticed public meetings and in accord with the District rules.

The District may implement rules establishing a process in which the District may allow an existing user of groundwater prior to the effective date of the District Rules to obtain a permit for the use of groundwater, unless the use of groundwater is specifically exempted from permitting under the District Rules. This process is intended to recognize the existing use of groundwater in the District. To obtain a groundwater use permit, a user must indicate the maximum annual amount of groundwater put towards each beneficial use of the groundwater; provide any additional information required by the District as specified in the District Rules and make payment of any outstanding use fees as specified in the District Rules. The opportunity extended to existing users of groundwater to obtain a groundwater use permit does not exempt the permit holder from any more restrictive permit conditions that may be imposed by the District in the future, provided that the restrictions imposed:

a) Apply to all subsequent new applications for the permitted use of groundwater and applications for the increased use of groundwater by holders of groundwater use permits regardless of the type or location of use
b) Bear a reasonable relationship to the District's management plan
c) Are reasonably necessary to protect the groundwater resources of the District

The District may adopt rules to regulate groundwater withdrawals by means of spacing and/or production limits. The District may deny a well construction permit or limit groundwater

withdrawals in accordance with the guidelines stated in the rules of the District. In making a determination to deny a permit or reduce the amount of groundwater withdrawals authorized in an existing permit, the District may weigh the public benefit in managing the aquifer to be derived from the denial of a groundwater withdrawal permit or the reduction of the amount of authorized groundwater withdrawals against the individual hardship imposed by the permit denial or authorization reduction.

The relevant factors to be considered in making a determination to deny a permit or limit groundwater withdrawals may include:

a) The rules of the District
b) The distribution of groundwater resources in the District or any management zones established by the District
c) The economic hardship resulting from grant or denial of a permit or the terms prescribed by the permit

In pursuit of the District's mission of protecting the resource, the District may require reduction of groundwater withdrawals. To achieve this purpose, the District may, at the Boards discretion amend or revoke any permits after notice and hearing. The determination to seek the amendment, reduction or revocation of a permit by the District will be based on aquifer conditions observed by the District. The District may, when necessary, enforce the terms and conditions of permits and the rules of the District by enjoining the permit holder in a court of competent jurisdiction as provided for in Texas Water Code Chapter 36.102.

The District may employ technical resources at its disposal, as needed, to evaluate the resources available within the District and to determine the effectiveness of regulatory or conservation measures. In consideration of particular individual, localized or District-wide conditions the District may allow the production in a management zone to exceed the sustainable amount for a period of time considered necessary by the District. The exercise of this discretion by the District shall not be construed as limiting the authority of the District in any other matter. A public or private user may appeal to the Board for discretion in enforcement of the provisions of a reduction in the permitted use of groundwater on grounds of adverse economic hardship or unique local conditions. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

Actions, Procedures, Performance and Avoidance Necessary to Effectuate the Plan

The District will implement the provisions of this management plan and will utilize the objectives of the plan as a guide for District actions, operations and decision-making. The District will ensure that planning efforts, activities and operations are consistent with the provisions of this plan.

The District will adopt rules in accordance with Chapter 36 of the Texas Water Code and all rules will be followed and enforced. The development of rules will be based on the scientific information and technical evidence available to the District.

The District will encourage cooperation and coordination in the implementation of this plan. All operations and activities will be performed in a manner that encourages the cooperation of the citizens of the District and with the appropriate water management entities at the state, regional and local level.

Methodology for Tracking the District's Progress in Achieving Management Goals

The General Manager of the District will prepare and submit an annual report (Annual Report) to the District Board of Directors. The Annual Report will include an update on the District's performance in achieving the management goals contained in this plan. The general manager will present the Annual Report to the Board of Directors within one hundred eighty (180) days following the completion of the District's Fiscal Year, beginning in the fiscal year starting on October 1, 2004*. A copy of the annual audit of District financial records will be included in the Annual Report. The District will maintain a copy of the Annual Report, after approval by the Board of Directors, on file for public inspection at the District offices.

* **Note:** The regular meetings of the BGCD Board of Directors are scheduled on a quarterly basis. The time period of 180 days from the completion of the BGCD fiscal year for the General Manager to present the Annual Report to the Board of Directors requires that the Annual Report be presented to the Board of Directors by the second regular (quarterly) Board meeting following the completion of the BGCD fiscal year.

Management Goals

1. Providing for the Most Efficient Use of Groundwater in the District

1.1 Objective **–** Each year, the District will require all new exempt or non-exempt wells that are constructed within the boundaries of the District to be registered with the District in accordance with the District rules.

1.1 Performance Standard **–** Each Year the number of exempt and non-exempt wells registered by the District for the year will be incorporated into the Annual Report submitted to the Board of Directors of the District.

2. Controlling and Preventing the Waste of Groundwater in the District

2.1 Objective **–** Each year, the District will make an evaluation of the District Rules to determine whether any amendments are recommended to decrease the amount of waste of groundwater within the District.

2.1 Performance Standard **–** The District will include a discussion of the annual evaluation of the District Rules and the determination of whether any amendments to the rules are recommended to prevent the waste of groundwater in the Annual Report of the District provided to the Board of Directors.

2.2 Objective **–** Each year, the District will provide information to the public on eliminating and reducing wasteful practices in the use of groundwater posting information or a link to information on groundwater waste reduction on the District's website.

2.2 Performance Standard **–** Each year, a copy of the information provided on groundwater waste reduction on the District's website will be included in the District's Annual Report provided to the District Board of Directors.

3. Controlling and Preventing Subsidence

This Management Goal is not Applicable to the District.

4. Conjunctive Surface Water Management Issues

4.1 Objective **–** Each year, the District will participate in the regional planning process by being represented at the Region G and Region H Regional Water Planning Group meetings.

4.1 Performance Standard **–** The attendance of a District representative to at least 50 percent of the Region G and Region H Regional Water Planning Group meetings will be noted in the Annual Report presented to the District Board of Directors.

5. Natural Resource Issues Affecting the Use and Availability of Groundwater or affected by the Use of Groundwater

This Management Goal is not Applicable to the District.

6. Addressing Drought Conditions

6.1 Objective **–** Each month, the District will download available drought information, for the counties in the District, from available websites on the internet.
6.1 Performance Standard **–** Quarterly, the District will make an assessment of the status of drought in the District and prepare a quarterly briefing for the Board of Directors. The downloaded maps, reports and information will be included with copies of the quarterly briefings, in the District Annual Report to the Board of Directors.

7. Addressing

A. Conservation

7A.1 Objective – The District will post an article or a link to an article annually, regarding water conservation on the District website www.bluebonnetgroundwater.org .

7A.1 Performance Standard **–** A copy of the article linked or posted on the District website regarding water conservation will be included in the Annual Report to the Board of Directors.

B. Recharge Enhancement

This management goal is not applicable to the District.

C. Rainwater Harvesting

7C.1 Objective – The District will post an article or a link to an article annually, regarding rainwater harvesting on the District website www.bluebonnetgroundwater.org.

7C.1 Performance Standard – A copy of the article posted on the District website regarding rainwater harvesting will be included in the Annual Report to the Board of Directors.

D. Precipitation Enhancement

This management goal is not applicable to the District.

E. Brush Control

This management goal is not applicable to the District

8. Addressing in a quantitative manner the desired future conditions (DFC) of the groundwater resources in the District

The districts in Groundwater Management Area (GMA) 14, one of which is this District, have not determined the DFC for the GMA and therefore this management goal is not applicable to the District at this time.

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Appendix A

District Enabling Act
HB 3655 of 77th Texas Legislature
Creating the
Bluebonnet Groundwater Conservation District

AN ACT

relating to the creation, administration, powers, duties, operation, and financing of the Bluebonnet Groundwater Conservation District.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

SECTION 1. CREATION. (a) A groundwater conservation district, to be known as the Bluebonnet Groundwater Conservation District, is created in Grimes, Washington, Waller, Austin, and Walker counties, subject to approval at a confirmation election under Section 15 of this Act. The district is a governmental agency and a body politic and corporate.

(b) The district is created under and is essential to accomplish the purposes of Section 59, Article XVI, Texas Constitution.

(c) The purpose of this Act is to create a locally controlled groundwater district in order to protect and recharge groundwater, to prevent pollution or waste of groundwater, to control subsidence caused by withdrawal of water from the groundwater reservoirs in the area, and to regulate the transport of water out of the boundaries of the district.

SECTION 2. DEFINITION. In this Act, "district" means the Bluebonnet Groundwater Conservation District.

SECTION 3. BOUNDARIES. The boundaries of the district are coextensive with the boundaries of Grimes, Washington, Waller, Austin, and Walker counties.

SECTION 4. FINDING OF BENEFIT. All of the land and other property included within the boundaries of the district will be benefited by the works and projects that are to be accomplished by the district under powers conferred by Section 59, Article XVI, Texas Constitution. The district is created to serve a public use and benefit.

SECTION 5. GENERAL POWERS. (a) Except as otherwise provided by this Act, the district has all the rights, powers, privileges, authority, functions, and duties provided by the general law of this state, including Chapter 36, Water Code, applicable to groundwater conservation districts created under Section 59, Article XVI, Texas Constitution. This Act prevails over any provision of general law, including Chapter 36, Water Code, that is in conflict or is inconsistent with this Act.

(b) The district does not have the authority granted by the following provisions of Chapter 36, Water Code:

(1) Section 36.105, relating to eminent domain; and

(2) Sections 36.020 and 36.201-36.204, relating to taxes.

SECTION 6. FEES. (a) The board of directors of the district by rule may impose reasonable fees on each well for which a permit is issued by the district and which is not exempt from regulation by the district. A fee may be based on the size of column pipe used by the well or on the actual, authorized, or anticipated amount of water to be withdrawn from the well.

(b) Fees may not exceed:

(1) $1 per acre-foot payable annually for water used for agricultural use; or

(2) 17 cents per thousand gallons for water used for any other purpose.

(c) In addition to the fee authorized under Subsection (a) of this section, the district may impose a reasonable fee or surcharge for an export fee using one of the following methods:

(1) a fee negotiated between the district and the transporter; or

(2) a combined production and export fee not to exceed 17 cents per thousand gallons for water used.

(d) Fees authorized by this section may be assessed annually and may be used to fund the cost of district operations.

SECTION 7. EXEMPTIONS. (a) The district may exempt wells under Section 36.117, Water Code, from the requirements to obtain a drilling permit, an operating permit, or any other permit required by Chapter 36, Water Code, or the district's rules.

(b) The district may not require a permit for:

(1) a well used solely for domestic use or for providing water for livestock or poultry on a tract of land larger than 10 acres that is either drilled, completed, or equipped so that it is incapable of producing more than 25,000 gallons of groundwater a day;

(2) the drilling of a water well used solely to supply water for a rig that is actively engaged in drilling or exploration operations for an oil or gas well permitted by the Railroad Commission of Texas, provided that the person holding the permit is responsible for drilling and operating the water well and the well is located on the same lease or field associated with the drilling rig; or

(3) the drilling of a water well authorized under a permit issued by the Railroad Commission of Texas under Chapter 134, Natural Resources Code, or for production from any such well to the extent the withdrawals are required for mining activities regardless of any subsequent use of the water.

(c) The district may not deny the owner of a tract of land, or the owner's lessee, who does not have a well equipped to produce more than 25,000 gallons a day on the tract, either a permit to drill a well on the owner's land or the privilege to produce groundwater from the owner's land, subject to the rules of the district.

(d) The district may not restrict the production of any well that is exempt from permitting under Subsection (b)(1) of this section.

(e) Notwithstanding Subsection (b) of this section, the district may require a well to be permitted by the district and to comply with all district rules if:

(1) the purpose of a well exempted under Subsection (b)(2) of this section is no longer solely to supply water for a rig that is actively engaged in drilling or exploration operations for an oil or gas well permitted by the Railroad Commission of Texas; or

(2) the withdrawals from a well exempted under Subsection (b)(3) of this section are no longer necessary for mining activities or are greater than the amount necessary for mining activities specified in the permit issued by the Railroad Commission of Texas under Chapter 134, Natural Resources Code.

(f) An entity holding a permit issued by the Railroad Commission of Texas under Chapter 134, Natural Resources Code, that authorizes the drilling of a water well shall report monthly to the district:

(1) the total amount of water withdrawn during the month;

(2) the quantity of water necessary for mining activities; and

(3) the quantity of water withdrawn for other purposes.

(g) Notwithstanding Subsection (e) of this section, the district may not require a well exempted under Subsection (b)(3) of this section to comply with the spacing requirements of the district.

(h) The district may not deny an application for a permit to drill and produce water for hydrocarbon production activities if the application meets the spacing, density, and production rules applicable to all permitted water wells in the district.

(i) A water well exempted under Subsection (a) or (b) of this section may:

(1) be registered in accordance with rules adopted by the district; and

(2) be equipped and maintained so as to conform to the district's rules requiring installation of casing, pipe, and fittings to prevent the escape of groundwater from a groundwater reservoir to any reservoir not containing groundwater and to prevent the pollution or harmful alteration of the character of the water in any groundwater reservoir.

(j) The district may require the driller of a well exempted under Subsection (a) or (b) of this section to file the drilling log with the district.

(k) A well to supply water for a subdivision of land for which a plat approval is required by Chapter 232, Local Government Code, is not exempted under Subsection (b) of this section.

(l) Groundwater withdrawn from a well exempt from permitting or regulation under this section and subsequently transported outside the boundaries of the district is subject to any applicable production and export fees under Section 6 of this Act.

(m) This section applies to water wells, including water wells used to supply water for activities related to the exploration or production of hydrocarbons or minerals. This section does not apply to production or injection wells drilled for oil, gas, sulphur, uranium, or brine, for core tests, or for injection of gas, saltwater, or other fluids, under permits issued by the Railroad Commission of Texas.

SECTION 8. MITIGATION ASSISTANCE. In addition to the authority granted under Chapter 36, Water Code, the district may assist in the mediation between landowners regarding the mitigation of the loss of existing groundwater supply of exempt domestic and livestock users due to the groundwater pumping of others.

SECTION 9. MANAGEMENT PLAN. The district shall develop or contract to develop its own management plan under Section 36.1071, Water Code.

SECTION 10. PERMITTING. The district shall issue permits for wells based on the consideration of whether:

(1) the application conforms to the requirements prescribed by Chapter 36, Water Code, and is accompanied by the prescribed fees;

(2) the proposed use of water unreasonably affects existing groundwater and surface water resources or existing permit holders;

(3) the proposed use of water is dedicated to any beneficial use;

(4) the proposed use of water is consistent with the district's certified water management plan;

(5) the applicant has agreed to avoid waste and

achieve water conservation; and

(6) the applicant has agreed that reasonable diligence will be used to protect groundwater quality and that the applicant will follow well plugging guidelines at the time of well closure.

SECTION 11. COORDINATION OF ACTIVITIES WITH OTHER ENTITIES. (a) The district may coordinate activities with the Central Carrizo-Wilcox Coordinating Council and may appoint a nonvoting representative to the Central Carrizo-Wilcox Coordinating Council.

(b) The district may coordinate activities with the Harris-Galveston Coastal Subsidence District or with other groundwater conservation districts to manage portions of the Gulf Coast Aquifer.

SECTION 12. BOARD OF DIRECTORS. (a) The district is governed by a board of directors of not fewer than 8 or more than 20 directors, appointed as provided by Section 13 of this Act.

(b) Initial directors serve until permanent directors are appointed under Section 13 of this Act and qualified as required by Subsection (d) of this section.

(c) Permanent directors serve four-year staggered terms.

(d) Each director must qualify to serve as a director in the manner provided by Section 36.055, Water Code.

(e) A director serves until the director's successor has qualified.

(f) A director may serve consecutive terms.

(g) If there is a vacancy on the board, the governing body of the entity that appointed the director who vacated the office shall appoint a director to serve the remainder of the term. In making this appointment, the governing body shall appoint a director to represent the interest of the director who has vacated the office.

(h) Directors are not entitled to receive compensation for serving as a director but may be reimbursed for actual, reasonable expenses incurred in the discharge of official duties.

(i) A majority vote of a quorum is required for board action. If there is a tie vote, the proposed action fails.

SECTION 13. APPOINTMENT OF DIRECTORS. (a) The commissioners courts of the counties within the district, if the district has two to five counties, shall each appoint four directors, of whom:

(1) one must represent municipal interests;

(2) one must represent agricultural interests;

(3) one must represent industrial interests; and

(4) one must represent rural water suppliers' interests.

(b) If the district consists of one county, the commissioners court of that county shall appoint eight directors, of whom:

(1) two must represent municipal interests;

(2) two must represent agricultural interests;

(3) two must represent industrial interests; and

(4) two must represent rural water suppliers' interests.

(c) The commissioners courts of the counties within the district shall each appoint the appropriate number of initial directors as soon as practicable following the effective date of this Act, but not later than the 90th day after the effective date of this Act.

(d) The initial directors shall draw lots to determine their terms. Half of the initial directors serve terms that expire on

the second anniversary of the date on which all initial directors have qualified as required by Section 12 of this Act, and half of the initial directors serve terms that expire on the fourth anniversary of the date on which all initial directors have qualified as required by Section 12 of this Act. On the second anniversary of the date on which all initial directors have qualified as required by Section 12 of this Act and every two years after that date, the appropriate commissioners courts shall appoint the appropriate number of permanent directors.

SECTION 14. ORGANIZATIONAL MEETING. As soon as practicable after all the initial directors have been appointed and have qualified as provided in this Act, a majority of the directors shall convene the organizational meeting of the district at a location within the district agreeable to a majority of the directors. If no location can be agreed on, the organizational meeting of the directors shall be at the Washington County Courthouse.

SECTION 15. CONFIRMATION ELECTION. (a) The initial board of directors shall call and hold, on the same date in each county to be included in the district, an election to confirm the creation of the district.

(b) Except as provided by this section, a confirmation election must be conducted as provided by Sections 36.017, 36.018, and 36.019, Water Code, and Section 41.001, Election Code.

(c) If the majority of qualified voters in a county who vote in the election vote to confirm the creation of the district, that county is included in the district. If the majority of qualified voters in a county who vote in the election vote not to confirm the creation of the district, that county is excluded from the district.

(d) If the creation of the district is not confirmed by an election held under this section before the second anniversary of the effective date of this Act, the district is dissolved and this Act expires on that date.

SECTION 16. FINDINGS RELATED TO PROCEDURAL REQUIREMENTS. (a) The proper and legal notice of the intention to introduce this Act, setting forth the general substance of this Act, has been published as provided by law, and the notice and a copy of this Act have been furnished to all persons, agencies, officials, or entities to which they are required to be furnished by the constitution and other laws of this state, including the governor, who has submitted the notice and Act to the Texas Natural Resource Conservation Commission.

(b) The Texas Natural Resource Conservation Commission has filed its recommendations relating to this Act with the governor, the lieutenant governor, and the speaker of the house of representatives within the required time.

(c) All requirements of the constitution and laws of this state and the rules and procedures of the legislature with respect to the notice, introduction, and passage of this Act are fulfilled and accomplished.

SECTION 17. EFFECTIVE DATE. This Act takes effect September 1, 2001.

_____ _____

President of the Senate Speaker of the House

I certify that H.B. No. 3655 was passed by the House on April 27, 2001, by a non-record vote; and that the House concurred in Senate amendments to H.B. No. 3655 on May 25, 2001, by a

non-record vote.

_____
Chief Clerk of the House

I certify that H.B. No. 3655 was passed by the Senate, with amendments, on May 22, 2001, by a viva-voce vote.

_____
Secretary of the Senate

APPROVED: _____
Date

_____
Governor

Appendix B

Evidence of the Administrative Processes Required For the Approval of the Groundwater Management Plan as Administratively Complete

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

Board of Directors
Called Meeting

Wednesday, September 16, 2009
6:00 PM

Bluebonnet Groundwater Conservation District
Board Room, Suite B & C
303 East Washington Avenue
Navasota, Texas

AGENDA

1. Call to order

2. Public Hearing – Consideration of request from Spring Preserve Water Company for and the July 15, 2009 protest by Rick Welch of an application filed by Spring Preserve Water Company LLC, whose address is c/o New Waverly Sound Investments, LLC; PO Box 502, Hockley, TX 77447, for an operating permit for a non-exempt public water supply well BWLL-048, located generally six miles northeast of Waller, Texas on Kickapoo Road and Hegar Parkway in the Shubal Marsh Survey, abstract no. 217. The volume of water proposed to be produced from this well is 44,712,500 gallons annually to be used to serve the Kickapoo Preserve Subdivision.

3. Discussion and possible action on the Spring Preserve Water Company LLC request for Well Operating Permit for Well BWLL-048 in the amount of 44,712,500 gallons annually, and the protest by Rick Welch.

4. Public Hearing - Proposed revisions to the District Management Plan that establishes: the District Mission; the purpose and time period of the Plan; reviews the composition of the District and the authority of the District; established the groundwater resource of the District; reviews the regional geologic structure and aquifer relationships in the District; sets forth aquifer descriptions; describes the physiography of the District; defines units of measure for the water planning estimates in the Plan; estimates the Total usable amount of groundwater in the District, the amount of groundwater used annually in the District and the amount of natural or artificial annual recharge of the groundwater resources within the District; describes how recharge may be increased; states estimates of projected total water demand within the District and of projected surface and groundwater supplies; discusses water management strategies to meet the needs of water user groups; discusses how the District Plan addresses water supply needs in a manner not in conflict with the Region G and H water plans; provides details of District plans to manage groundwater in the District; provides actions, procedures performance and avoidance necessary to effectuate the Plan; describes methodology for tracking the District's progress in achieving management goals; and describes management goals for the District.

5. Discussion and possible action on the revised Management Plan, including but not limited to approval of Resolution 2009-03 Revising and Readopting the District Management Plan or setting a date for future Board consideration of the Management Plan Revision and Readoption.

6. Discussion and possible action to approve Amended FY 2009 District Budget.

7. Discussion and possible action to approve FY 2009 - 2010 District Budget.

8. Date for next Board meeting – October 21, 2009.

9. Adjourn

Agenda items may be considered, discussed and/or acted upon in a different order than the order set forth above.

Executive Session

The Board of Directors of the Bluebonnet Groundwater Conservation District reserves the right to adjourn into Executive (Closed) Session at any time during the course of this meeting to discuss any of the items listed on this agenda, as authorized by the Texas Government Code, Sections 551.071 (Consultations with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), and 551.087 (Economic Development). No final action will be taken in Executive Session.

Posted 9-4-9 at 10:15 am
By: Sally Williams
(Title) Adm. Asst.

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

Board of Directors Meeting

Wednesday, October 21, 2009
6:00 PM

Bluebonnet Groundwater Conservation District
Board Room, Suite B & C
303 East Washington Avenue
Navasota, Texas

AGENDA

1. Call to order
2. Public Comment
   (Public comment is limited to a maximum of 5 minutes per speaker and/or 30 minutes total time for all speakers)
3. Introduction of new District Permitting Assistant
4. Discussion and possible action to accept resignation of Director Gerald E Hord representing rural water suppliers interests from Grimes County.
5. Introduction of Grimes County Director Appointee Bobby Brown.
6. Discussion and possible action to approve bond for Director Bobby Brown representing rural water suppliers interests from Grimes County for the remainder of an unexpired term ending in January, 2012.
7. Administer Oath of Office to Director Bobby Brown.
8. Discussion and possible action to approve minutes of July 15, 2009 and September 16, 2009 Board Meetings.
9. Discussion and possible action to approve quarterly Financial Report.

10. Discussion and possible action to approve quarterly Investment Report.

11. Discussion and possible action to accept quarterly Drought Status Assessment.

12. Discussion and review of proposed District Management Plan.

13. Discussion and possible action to approve Resolution 2009-03 Revising and Readopting the District Management Plan.

14. Discussion and possible action to appoint alternate Presiding Officer for Spring Preserve hearings.

15. Discussion of current and future District Fee Schedule.

16. General Manager's Report

    a. Well Registration/Permitting
    b. GMA 14 Joint Planning
    c. Trinity and San Jacinto Rivers and Galveston Bay Basin and Bay Area Stakeholder Committee meetings and action.
    d. Region G & H Regional Water Planning Group meetings and actions.
    e. Texas Alliance of Groundwater Districts meetings and actions.
    f. Planning meeting at Harris Galveston Subsidence District.

17. Date for next Board meeting –

    Spring Preserve Hearing, Hempstead, 10AM, 11/18/09.
    Regular meeting January 20, 2010.

18. Adjourn

Agenda items may be considered, discussed and/or acted upon in a different order than the order set forth above.

Executive Session

The Board of Directors of the Bluebonnet Groundwater Conservation District reserves the right to adjourn into Executive (Closed) Session at any time during the course of this meeting to discuss any of the items listed on this agenda, as authorized by the Texas Government Code, Sections 551.071 (Consultations with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), and 551.086 (Economic Development). No final action will be taken in Executive Session.

Posted 10-15- at 9:55am

By Kelly Williams

(Title) Asst. Asst

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT
Resolution No. 2009-03

A RESOLUTION OF THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT REVISING AND READOPTING THE DISTRICT MANAGEMENT PLAN.

WHEREAS, the Bluebonnet Groundwater Conservation District ("District") was created by H.B. 3655, an Act of the 77th Texas Legislature, effective September 1, 2001, and by subsequent confirmation by the voters in Austin, Grimes and Walker Counties of the District. In 2007, Waller County was annexed into the District. The District has operated under the rights, powers, privileges, authority, functions, duties, and requirements of HB 3655, Chapter 36 of the Texas Water Code, provisions of the general law of Texas and the Texas Constitution and under sections of the Texas Administrative Code since its creation; and

WHEREAS, under the direction of the Board of Directors, and in accordance with Section 9 of H.B. 3655, Section 36.1071, Texas Water Code, and Chapter 356, Title 31, Texas Administrative Code, the District adopted a Management Plan in 2004, which was later certified by the Texas Water Development Board; and

WHEREAS, § 36.1072(e) of the Texas Water Code requires the District to review and readopt the plan, with or without revisions, at least once every five years; and

WHEREAS, the District engaged Randy Williams, P.G. a hydrogeologist with Bar-W Groundwater Exploration of Sunset Valley, Texas, to provide technical assistance to review the technical information, estimates, and other information that are required by the Texas Water Development Board, the Texas Administrative Code, and Chapter 36, Texas Water Code, to be included in the Management Plan; and

WHEREAS, the District held a public hearing on September 16, 2009, which was properly noticed as required by law, to receive comments on the Management Plan for the District; and

WHEREAS, the Board of Directors finds that the Management Plan meets all of the requirements of H.B. 3655, Chapter 36, Texas Water Code, and Chapter 356, Title 31, Texas Administrative Code.

NOW, THEREFORE, BE IT RESOLVED, that:

(1) The Bluebonnet Groundwater Conservation District Management Plan is hereby revised and as revised, readopted and approved as the Management Plan for the District.
(2) The General Manager of the District is hereby directed to take any and all necessary action to file the adopted plan with the Texas Water Development Board for approval.

(3) The General Manager of the District is authorized to coordinate with the Texas Water Development Board as may be required in furtherance of approval pursuant to the provisions of Section 36.1072 of the Texas Water Code.

(4) The General Manager of the District is authorized and directed to take all necessary action during the approval process and after approval of the Management Plan is received to effect coordination of the Plan, as required by statute, code and regulation, with regional water planning groups, other groundwater conservation districts, river authorities, and other entities and political subdivisions.

AND IT IS SO ORDERED, PASSED AND ADOPTED ON THIS THE 21st DAY OF OCTOBER, 2009.

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

J. Jared Patout, President

ATTEST:

Lloyd A. Behm, Deputy Secretary

RESOLUTION NO. 2007-06

RESOLUTION CANVASSING THE RETURNS AND DECLARING THE RESULTS OF THE NOVEMBER 6, 2007, SPECIAL ELECTION FOR THE ANNEXATION OF WALLER COUNTY INTO THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT; AND OTHER MATTERS IN CONNECTION THEREWITH

WHEREAS, the Board of Directors ("Board") of the Bluebonnet Groundwater Conservation District ("District" or "Bluebonnet") called a special election to be held on November 6, 2007, (the "Election") to authorize the annexation of Waller County which is contiguous to the District and to include such territory within the boundary of the District; and,

WHEREAS, the Board has reviewed and investigated all matters pertaining to the Election, including the calling, notices, election officers, holding, and returns thereof; and,

WHEREAS, the Board hereby canvasses the returns of the Election, at which there was submitted to all resident, qualified voters of the Territory for their action thereupon, the following proposition:

"THE INCLUSION OF WALLER COUNTY IN THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT?"; and,

WHEREAS, the Board has diligently inquired into the poll lists and the official election returns, which were duly and lawfully made to the Board by the appropriate election official as set out in the joint election agreement between the District and Waller County, and which separately show the votes cast in the Election; and

WHEREAS, from these returns, the Board hereby finds that the following votes were cast in the Election by voters who were resident, qualified voters of the Territory:

PROPOSITION

"THE INCLUSION OF WALLER COUNTY IN THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT?"

	For	Against
Election Day Votes	936	528
Early Votes	227	124
TOTAL VOTES CAST	1163	652

IT IS, THEREFORE, ORDERED BY THE BOARD OF DIRECTORS OF THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT THAT:

Section 1. **Election; Returns; Canvass.** The Board officially finds, determines, and declares that the Election was duly and properly conducted; that proper legal notice of such Election was duly given in the English language and the Spanish language, to the extent required by law; that proper election officers were duly appointed prior to the Election; that the Election was duly and legally held; that all resident, qualified voters of Waller County were permitted to vote at the Election; that due returns of the results of the Election have been made and delivered; and, that the Board has duly canvassed such returns, all in accordance with the laws of the State of Texas and of the United States of America, and the Order calling the Election.

Section 2. **Election Results.** A MAJORITY of the resident, qualified voters of the Territory located within Waller County voting in the Election have voted FOR authorizing the annexation and inclusion of the County into the District as provided in the Proposition. The Board hereby finds and determines that the Proposition did carry at the Election in that portion of the Territory located in Waller County. The Territory is included in the District.

Section 3. **Preamble Incorporation.** The recitals contained in the preamble hereof are hereby found to be true, and such recitals are hereby made a part of this Resolution for all purposes and are adopted as a part of the judgment and findings of the Board.

Section 4. **Notice of Meeting.** It is officially found, determined, and declared that the meeting at which this Resolution is adopted was open to the public and public notice of the time, place and subject matter of the public business to be considered at such meeting, including this Resolution, was given, all as required by Chapter 551, as amended, Texas Government Code.

Section 5. **Authorization to Execute.** The President of the Board is authorized to execute and the Secretary of the Board is authorized to attest this Resolution on behalf of the Board; and the President of the Board is authorized to do all other things legal and necessary in connection with the consummation of the Election.

Section 6. **Effective Date.** This Resolution is effective immediately upon its passage and approval.

PASSED AND APPROVED, this the 14th day of November, 2007.

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

J Jared Patout, President, Board of Directors

ATTEST:

Lloyd A. Stehm, Deputy Secretary, Board of Directors

ORDER RATIFYING CANVASSING RESOLUTION FOR THE NOVEMBER 6, 2007 SPECIAL ELECTION

WHEREAS, the Board of Directors (the "Board") of the Bluebonnet Groundwater Conservation District (the "District") called a special election for November 6, 2007 (the "Election") to authorize annexation of Waller County; and,

WHEREAS, the following proposition was submitted to all resident, qualified voters of Waller County for their action thereupon: "The Inclusion of Waller County in the Bluebonnet Groundwater Conservation District?"; and,

WHEREAS, the Texas Election Code authorizes as few as two members of the Board to canvass the Election; and,

WHEREAS, on November 14, 2007, three members of the Board canvassed the returns of the Election (the "Canvass"), which, pursuant to the Texas Election Code, constituted a quorum of the Board; and,

WHEREAS, at the Canvass the required number of Board members reviewed and investigated all matters pertaining to the Election, including the calling, notices, election officers, holding, and returns thereof; and,

WHEREAS, at the Canvass the required number of Board members diligently inquired into the poll lists and the official election returns, which were duly and lawfully made to the Board by the appropriate election official as set out in the agreements to perform election services between the District and Waller County; the poll lists and the official election returns showing separately the votes cast in the Election; and,

WHEREAS, from the returns, the required number of Board members found that the following votes were cast in the Election by voters who were resident, qualified voters of Waller County:

PROPOSITION

"THE INCLUSION OF WALLER COUNTY IN THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT?"

	For	Against
Election Day Votes	936	528
Early Votes	227	124
TOTAL VOTES CAST	1163	652

IT IS, THEREFORE, ORDERED BY THE BOARD OF DIRECTORS OF THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT THAT:

Section 1. Canvassing Resolution. The required number of Board members in the Resolution Canvassing the Returns and Declaring the Results of the Election and Other Matters in Connection Therewith ("Resolution"), officially found, determined, and declared that the Election was duly and properly conducted; that proper legal notice of such Election was duly given in the English language and the Spanish language, to the extent required by law; that proper election officers were duly appointed prior to the Election; that the Election was duly and legally held; that all resident, qualified voters of Waller County were permitted to vote at the Election; that due returns of the results of the Election were made and delivered; and, that the Board duly canvassed such returns, all in accordance with the laws of the State of Texas and of the United States of America, and the Orders calling the Election. The Resolution is hereby ratified.

Section 2. Election Results. The Board hereby ratifies the Resolution in that a MAJORITY of the resident, qualified voters of Waller County voting in the Election voted FOR inclusion of Waller County in the District as provided in the Proposition and thus, Waller County is included in the District.

Section 3. Preamble Incorporation. The recitals contained in the preamble hereof are hereby found to be true, and such recitals are hereby made a part of this Order for all purposes and are adopted as a part of the judgment and findings of the Board.

Section 4. Inconsistent Provisions. All orders and resolutions, or parts thereof, which are in conflict or inconsistent with any provision of this Order are hereby repealed to the extent of such conflict, and the provisions of this Order shall be and remain controlling as to the matters ordered herein.

Section 5. Governing Law. This Order shall be construed and enforced in accordance with the laws of the State of Texas and the United States of America.

Section 6. Severability. If any provision of this Order or the application thereof to any person or circumstance shall be held to be invalid, the remainder of this Order and the application of such provision to other persons and circumstances shall nevertheless be valid, and the Board hereby declares that this Order would have been enacted without such invalid provision.

Section 7. Notice of Meeting. The Board officially finds, determines, recites and declares that written notice of the date, hour, place and subject of the meeting at which this Order is adopted was posted for at least 72 hours preceding the scheduled time of the meeting and at the location required by the Open Meetings Law, Chapter 551, Texas Government Code, as amended; and that such meeting was open to the public as required by law at all times during which this Order and the subject matter thereof was discussed, considered and formally acted upon.

Section 8. Authorization to Execute. The President of the Board is authorized to execute and the Secretary of the Board is authorized to attest this Order on behalf of the Board; and the President of the Board is authorized to do all other things legal and necessary in connection with the holding and consummation of the Election.

Section 9. Effective Date. This Order is effective immediately upon its passage and approval.

PASSED AND APPROVED this 16th day of January, 2008.

J. Jared Patout, President, Board of Directors

ATTEST:

Joe B. Sandel, Secretary, Board of Directors

ORDER NO. _____

THE STATE OF TEXAS §
§
THE COUNTY OF WALLER §

ORDER OF WALLER COUNTY COMMISSIONER'S COURT PETITIONING FOR INCLUSION OF WALLER COUNTY WITHIN THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

WHEREAS, § 36.325(a) of the Texas Water Code provides that landowners of a defined area of territory not already in a groundwater conservation district may file with the district a petition requesting inclusion in the district; and

WHEREAS, § 36.325(b) (3) of the Texas Water Code provides that the commissioners court of the county in which the area is located must sign the petition if the area contains the entire county; and

WHEREAS, a petition must describe the land by legal description, by metes and bounds, or by lot and block number if there is a recorded plat of the area to be included in the district; and

WHEREAS, the Bluebonnet Groundwater Conservation District ("District") was created in 2001 by adoption of H.B. 3655 by the 77th Texas Legislature. The District was created in Austin, Grimes, Walker, Waller, and Washington counties subject to a confirmation of the District by the electorate in each county. In November 2002, the District was confirmed only in Austin, Grimes, and Walker Counties; and

WHEREAS, Waller County is contiguous to the District; and

WHEREAS, Waller County owns land within the County; and

WHEREAS, groundwater is an important resource in Waller County; and

RECEIVED
FEB 19 2007
BY:

WHEREAS, it is to the benefit of Waller County that the groundwater within the County will be subject to the District's authority to conserve, preserve, protect, recharge, and prevent waste of groundwater; and

WHEREAS, it is to the District's benefit to include the County within the District because it enables the District to apply its regulations in a consistent manner to the groundwater within Waller County that would otherwise be outside the District and not directly subject to District regulations; and

WHEREAS, the District has no bonds, notes, or other obligations outstanding or payable in whole or part from taxation; and

WHEREAS, the District does not impose ad valorem taxes; and

WHEREAS, the Waller County Commissioners Court will appoint four directors to the Board of Directors of the District.

NOW THEREFORE BE IT ORDERED:

1. The Commissioners Court of Waller County requests that the Board of Directors of the District accept this petition and set hearings to decide whether Waller County should be included within the District; and

2. The Commissioners Court of Waller County requests that after hearings the Board of Directors of the District find that addition of Waller County would benefit the County and the District, and that the Board adopt a resolution adding Waller County, as described in Exhibit A, into the District.

BE IT SO ORDERED.

Adopted on this 26th day of February, 2007.

WALLER COUNTY, TEXAS

Owen Ralston
, County Judge

, Commissioner, Precinct 1

, Commissioner, Precinct 2

, Commissioner, Precinct 3

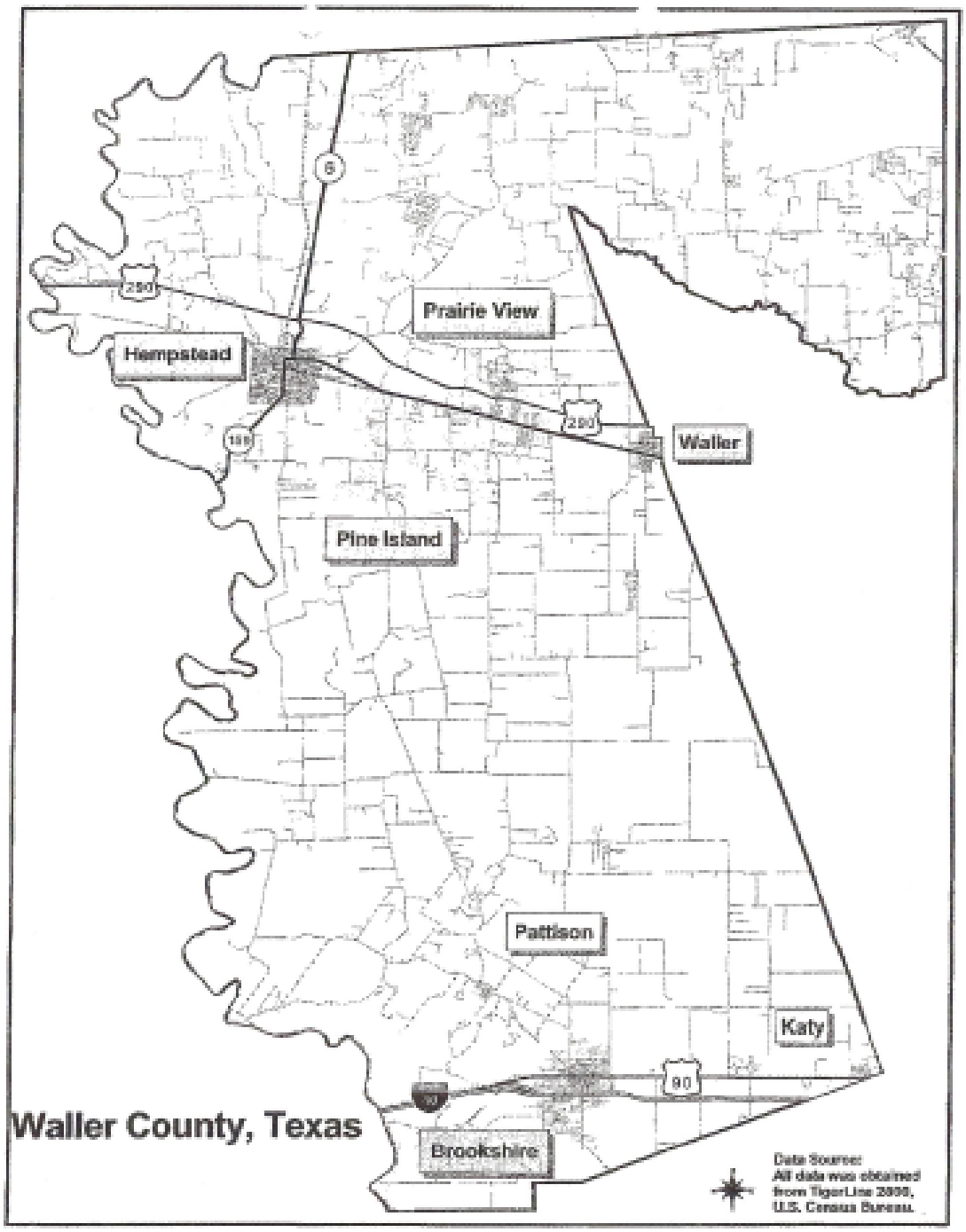
, Commissioner, Precinct 4

ATTEST:

Cheryl Peters
Walker, County Clerk

EXHIBIT A

WALLER COUNTY MAP


Prairie View
Hempstead
Waller
Pine Island
Pattison
Katy
Brookshire
Waller County, Texas
Data Source:
All data was obtained
from TigerLine 2000,
U.S. Census Bureau.

THE STATE OF TEXAS §
§
THE COUNTY OF GRIMES §

RESOLUTION NO. 2007-03

ORDER ADDING WALLER COUNTY TO THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

WHEREAS, House Bill 3655, 77th Texas Legislature, effective September 1, 2001 ("Enabling Legislation"), created the Bluebonnet Groundwater Conservation District ("District"); and

WHEREAS, on or about February 28, 2007, the Waller County Commissioners Court filed a petition ("Petition") with the Board of Directors ("Board") of the District, requesting that Waller County be added to the District; and

WHEREAS, § 36.325(a) of the Texas Water Code provides that landowners of a defined area of territory not already in a groundwater conservation district may file with the district a petition requesting inclusion in the district; and

WHEREAS, § 36.325(b) (3) of the Texas Water Code provides that the commissioners court of the county in which the area is located must sign the petition if the area contains the entire county; and

WHEREAS, a petition must describe the land by legal description, by metes and bounds, or by lot and block number, if there is a recorded plat of the area to be included in the district; and

WHEREAS, § 36.326 of the Texas Water Code provides the board shall set the time and place of separate hearings on the petition to include the territory in the district and at least one hearing shall be held in the existing district and one hearing shall be held in the territory to be added; and

WHEREAS, the Board conducted a hearing on May 16, 2007 in Hempstead, Texas, which is within the territory to be added, and a hearing on July 18, 2007 in Navasota, Texas, which is within the District's existing boundaries; and

WHEREAS, § 36.327 of the Texas Water Code provides that, if the board finds after the hearings on the petition that the addition of the land would benefit the district and the territory added, the Board may add the territory to the district by resolution; and

WHEREAS, on July 18, 2007, the Board considered the Petition in a called meeting of the Board that was posted and conducted in accordance with the Texas Open Meetings Act; and

WHEREAS, the Petition of Waller County was signed by members of the Waller County Commissioners Court and the Waller County Judge and was accompanied by a map based on TigerLine 2000 U.S. Census bureau data depicting a legal description of Waller County Texas; and

WHEREAS, Waller County is contiguous to the District; and

WHEREAS, Waller County owns land within the county; and

WHEREAS, groundwater is an important resource in Waller County; and

WHEREAS, it is to the benefit of Waller County to be annexed into a locally controlled groundwater district in order that the groundwater within Waller County will be subject to the District's authority to conserve, preserve, protect, recharge, and prevent waste of groundwater and to regulate the transport of water out of the boundaries of the District; and

WHEREAS, it is to the District's benefit to include Waller County within the District because it enables the District to apply its regulations in a consistent manner to the groundwater within Waller County that would otherwise be outside the District and not directly subject to District regulations; and

WHEREAS, the District has no bonds, notes, or other obligations outstanding or payable in whole or part from taxation; and

WHEREAS, the District does not impose ad valorem taxes; and

WHEREAS, the Waller County Commissioners Court will appoint four directors to the Board of Directors of the District in accordance with the Enabling Legislation.

NOW THEREFORE BE IT ORDERED:

1. Waller County is added to the District;
2. The annexation of Waller County is not final until ratified by a majority vote of the voters in Waller County;
3. If the annexation is ratified by the voters of Waller County, the four additional directors will be appointed to the Board by the Waller County Commissioners Court, as provided under Section 13 of the Enabling Legislation.

BE IT SO ORDERED.

Adopted on the 18th day of July, 2007.

Bluebonnet Groundwater Conservation District

By: _____
J. Jared Patout, President
President, Board of Directors

ATTEST:

_____
Lloyd A. Behm
Deputy Secretary

3

Bluebonnet Groundwater Conservation District
303 East Washington, Suite D, PO Box 269
Navasota, Texas 77868-0269
Phone: 936 825-7303 Fax: 936 825-7331
E-mail: LBehm@bluebonnetgroundwater.org
www.bluebonnetgroundwater.org

December 3, 2009

Certified 7002 3150 0004 6805 3664

Mr. J. Kevin Ward, Executive Administrator
Texas Water Development Board
Stephen F. Austin Building
P.O. Box 13231
Austin, Texas 78711-3231

Dear Mr. Ward:

Enclosed you will find a copy of the Groundwater Management Plan for the Bluebonnet Groundwater Conservation District. After a Public Hearing at a District Board Meeting on September 16, 2009, this Management Plan was adopted by Resolution 2009-03 of the Bluebonnet Groundwater Conservation District Board of Directors on Wednesday, October 21, 2009.

The Bluebonnet Groundwater Conservation District Groundwater Management Plan is submitted for approval by the Texas Water Development Board as required by Texas Water Code, Chapter 36, Section 36.1072(e).

Also enclosed you will find the following additional information submitted to assist with your completeness review:

1) Certified copy of Resolution 2009-03 adopting the revised District Management Plan.
2) Copy of the September 16, 2009 Bluebonnet GCD Board of Directors meeting agenda and copies of the filing of this agenda with the County Clerks of Austin, Grimes, Walker and Waller Counties, the Texas Secretary of State and posting at the District Office.
3) Copy of the October 21, 2009 Bluebonnet GCD Board of Directors meeting agenda and copies of the filing of this agenda with the Grimes County Clerk, the Texas Secretary of State and posting at the District office.
4) Copies of the transmittal letters showing transmittal of the adopted revised Bluebonnet GCD Management Plan to Region G and Region H Regional Water Planning Groups for use in their planning process as required by Texas Water Code, Section 36.7071(b).

5) Copies of the transmittal letters showing transmittal of copies of the revised Bluebonnet GCD Management Plan to the River Authorities in the Bluebonnet GCD service area as required by Texas Water Code, Section 36.1071(a).
6) Copy of existing Bluebonnet Groundwater Conservation District Rules. Our Board has appointed a Board Committee to begin a review of these rules in 2010 and directed this committee to submit any suggested revisions they deem necessary to the full Board for consideration and possible adoption.
7) An electronic copy of the above referenced District Management Plan has been transmitted to Rima Petrossian at her e-mail address.

If you have any questions or need additional information, please contact me.

Sincerely,

Lloyd A Behm
General Manager

Enclosures as referenced and listed above

Lloyd Behm

From: Rima Petrossian [Rima.Petrossian@twdb.state.tx.us]
Sent: Friday, December 11, 2009 10:37 AM
To: LBehm@bluebonnetgroundwater.org
Cc: Lance Christian
Subject: management plan review
Attachments: Bluebonnet GCD MP Official Review 1 Recommendation Report.doc

Hi Lloyd, We reviewed your management plan for administrative completeness. We cannot pass it as adopted because of a numerical error, enclosed is an explanation. Please consider withdrawing your plan, revising and readopting in an new public hearing, and resubmitting it for approval. The change is simple so we should not need to see it if you keep everything else as is, but we are willing to pre-review it if you wish.
Please let me know what you wish to do.
thanks,
Rima

Bluebonnet Groundwater Conservation District

Official Review 1 - Management Plan Recommendations - 12/9/09

Required Changes for Approval

Disclaimer: The numbered items listed under the "Required Changes" section are provided by the Texas Water Development Board (TWDB) to groundwater conservation district (District) personnel in order to address deficiencies in the *required* groundwater management plan elements as listed in TWC §36.1071 and/or TAC §356.2-§356.6. These items will need to be corrected and/or addressed in order for the TWDB to approve the district's groundwater management plan as administratively complete. Example language is often provided by the TWDB simply to illustrate how a given checklist item in the groundwater management plan is not compliant and how the item may be corrected. It is not the TWDB's intention to suggest the content of the District's groundwater management plan or to influence the District in any way with the exception of pointing out the items that are included in *or* excluded from the District's groundwater management plan that are not in compliance according to state law. Please contact either Rima Petrossian (512) 936-2420 or Lance Christian (512) 463-9804 if you have any questions regarding the content of this recommendation report or the groundwater management plan approval process.

Note: For all preliminary reviews, the TWDB strongly encourages districts to submit their management plans for subsequent preliminary reviews following the corrections/amendments from the list below. This helps to ensure that no items were missed during the correction/amendment process and that the final official review runs as smoothly as possible, thereby requiring no management plan withdrawals, which can significantly delay the approval process.

1. **Checklist Item 5b**:
   a. The management plan includes an incorrect estimate in the 'The Flow *Out* of the District within each Aquifer' section. It appears that a simple character transposition occurred during the construction of the table on page 21.The management plan includes an estimate of groundwater flow *out* of the District within the Evangeline Aquifer of "24,524" acre-feet; however, the GAM 08-87 report states that the flow out of the District within the Evangeline Aquifer is "24,542" acre-feet. Please review this and include a corrected estimate within the management plan if you concur with the TWDB's finding. Please do not hesitate to contact us if you have any questions.
   b. The citation below the GAM estimates table on page 21 appears to be copied from the previous recharge section (p.19) and still includes relict language that refers to 'District estimate of *recharge*' where it should refer to groundwater flow into, out of, and between aquifers within the District. The citation technically is sufficient for administrative completeness purposes, but since the estimate discussed in item a above requires attention, staff suggests making this correction as well.

2. **Checklist Item 38**: **Addressing Drought Conditions** (p.35)
   Recommend changing the reference to the "Texas Water Information Network website www.txwin.net" to the federal government website because the TxWIN program on the "TWDB website" has been discontinued. Again this goal is approvable as it is written, but since other changes are needed, staff recommends removing the language referring to the now defunct TxWIN website. Other alternative websites are provided below.

The link to the federal PDSI maps on the National Weather Service – Climate Prediction Center website is:

http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/drought.shtml

The information should be included under the link titled:

"Current Palmer Drought Severity Index Map by Climate Divisions"

Also, the raw data are available at the link below:

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/palmer_drought/wpdsouth.txt

The Texas Drought Preparedness Council Situation Report is available on the Texas Department of Public Safety website:

http://www.txdps.state.tx.us/dem/sitrepindex.htm

Additional information:

http://www.txdps.state.tx.us/dem/pages/drought.htm

The recently launched Agricultural Drought Task Force hosted by the Texas Agrilife Extension is available at:

http://agrilife.tamu.edu/drought/

Suggested Changes

Disclaimer: The numbered items listed under the "Suggested Changes" section are provided by the Texas Water Development Board to groundwater conservation district personnel for the sole purpose to improve the district's groundwater management plan. The items outlined in this section are *not* directly required by Chapter 36 of the Texas Water Code or Chapter 356 of the Texas Administrative Code; they will *not* prevent the district's groundwater management plan from being approved for administrative completeness. Addressing items outlined in the "Suggested Changes" section and incorporation of any example language or suggested corrections located within said listed items is solely at the discretion of the respective groundwater conservation district staff and board members. The Texas Water Development Board accepts no liability for any actions derived from the incorporation of example language or corrections listed within the "Suggested Changes" section.

1. Consider changing all instances of management plan TWDB "*certification*" and/or "*certified*" language (e.g. "Time Period of Man. Plan" section) to *approval* and *approved* due to a change in statute several years ago [Ch. 970, §6, 79th Leg., 2005] (p.1).

2. Consider adding language to the section titled "Time Period of Management Plan" that states the management plan will be readopted with or without changes by the District Board and submitted to the TWDB for approval *at least every five years* [TWC §36.1072(e)]. This will provide more accurate information on the future timeline of the management plan (p.1).

Lloyd Behm

From: Lloyd Behm [LBehm@bluebonnetgroundwater.org]
Sent: Tuesday, December 15, 2009 4:06 PM
To: 'Rima Petrossian'
Subject: RE: management plan review

Rima

Please withdraw the Management Plan submitted from consideration for approval. We will make the corrections noted by your staff and submit the revised plan for approval.

Lloyd A Behm, General Manager
Bluebonnet Groundwater Conservation District
303 East Washington Avenue, Suite D
PO Box 269
Navasota, Texas 77868
Phone: (936) 825-7303
Fax: (936) 825-7331
E-mail: LBehm@bluebonnetgroundwater.org

From: Rima Petrossian [mailto:Rima.Petrossian@twdb.state.tx.us]
Sent: Friday, December 11, 2009 10:37 AM
To: LBehm@bluebonnetgroundwater.org
Cc: Lance Christian
Subject: management plan review

Hi Lloyd, We reviewed your management plan for administrative completeness. We cannot pass it as adopted because of a numerical error, enclosed is an explanation. Please consider withdrawing your plan, revising and readopting in an new public hearing, and resubmitting it for approval. The change is simple so we should not need to see it if you keep everything else as is, but we are willing to pre-review it if you wish.
Please let me know what you wish to do.
thanks,
Rima

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

Board of Directors Meeting

Wednesday, January 20, 2010
6:00 PM

Bluebonnet Groundwater Conservation District
Board Room, Suite B & C
303 East Washington Avenue
Navasota, Texas

AGENDA

1. Call to order

2. Public Comment
   (Public comment is limited to a maximum of 5 minutes per speaker and/or 30 minutes total time for all speakers)

3. Discussion and possible action to approve Resolution 2010-01 (1) ratifying and adopting the Presiding Officers January 6, 2010 Order which adopts Findings of Fact and Conclusions of Law and (2) adopting Findings of Fact and Conclusions of Law.

4. Presentation by Thomas Wallis and discussion of FY 2009 audit performed by Ingram Wallis & Company.

5. Discussion and possible action to accept FY 2009 Audit prepared by Ingram Wallis & Company.

6. Public Hearing - Proposed revisions to the Revised District Management Plan adopted by the District on October 21, 2009 (Resolution 2009-03) recommended by the Texas Water Development Board after their initial review of the Revised Management Plan submitted on December 3, 2009 that establishes: the District Mission; the purpose and time period of the Plan; reviews the composition of the District and the authority of the District; established the groundwater resource of the District; reviews

the regional geologic structure and aquifer relationships in the District; sets forth aquifer descriptions; describes the physiography of the District; defines units of measure for the water planning estimates in the Plan; estimates the Total usable amount of groundwater in the District, the amount of groundwater used annually in the District and the amount of natural or artificial annual recharge of the groundwater resources within the District; describes how recharge may be increased; states estimates of projected total water demand within the District and of projected surface and groundwater supplies; discusses water management strategies to meet the needs of water user groups; discusses how the District Plan addresses water supply needs in a manner not in conflict with the Region G and H water plans; provides details of District plans to manage groundwater in the District; provides actions, procedures performance and avoidance necessary to effectuate the Plan; describes methodology for tracking the District's progress in achieving management goals; and describes management goals for the District.

7. Discussion and possible action to approve Resolution 2010-02 Revising and Readopting the District Management Plan following comments from the Texas Water Development Board.

8. Discussion and possible action to approve minutes of October 21, 2009 and November 18, 2009 Board meetings.

9. Discussion and possible action to approve quarterly Financial Report.

10. Discussion and possible action to approve quarterly Investment Report.

11. Discussion and possible action to accept quarterly Drought Status Assessment.

12. Approve Bonds for Directors.

13. Administer Oath of Office to new Walker County Director Jack Olsta representing Industrial interests and to reappointed Directors (Austin County Blezinger & Huebner; Grimes County Patout & Thomas; Waller County Copeland & Minze; Walker County Morrison).

14. Discussion and possible action to elect Board Officers (President, 2 Vice-presidents & Secretary).

15. Committee appointments by President.

    a) Executive Committee [oversight of District Administration, Financial matters (including signatories on District Bank Accounts) & Investments]

b) Legislative Committee (advise General Manager on legislative matters and positions to be advocated by the District)

c) Rules Committee (annual review of District Rules and recommend and prepare revisions for consideration by the Board)

d) Management Plan Committee (conduct annual review, recommend revisions for consideration by the Board and prepare revised plan for consideration by Board and approval by Texas Water Development Board)

e) District Fee Schedule Committee (conduct review of District Fee Schedule, recommend changes or revisions for consideration by the Board and prepare revised schedule for consideration by Board)

16. Public Hearing – A hearing will be conducted to consider an operating permit amendment application and a transportation permit application submitted by DWP Interest LLC for production of spring water from a well at 153-A Davidson Road, Huntsville, Texas (well BWLK-0036). The applications are to modify an existing operating permit for production of 7 million gallons annually to an amended operating permit authorizing the production of 33 million gallons annually for use as bottled water and to grant a transportation permit to transport 33 million gallons annually out of the District for bottling or as bottled water.

17. Discussion and possible action on:

    a) Amended Operating Permit for DWP Interest LLC for well BWLK-0036 to authorize production from this well of 33,000,000 gallons annually for use as bottled water.

    b) Transportation Permit for DWP Interest LLC to authorize transport out of the District for bottling or as bottled water of 33,000,000 gallons annually.

18. Discussion and possible action to approve Resolution 2010-03 approving a monitoring well agreement with New Waverly Sound Investments LLC for District access and use of well BWLL-0048TW as a District monitoring well.

19. Discussion and possible action to approve Resolution 2010-04 designating certain positions and persons as signatories for BGCD bank accounts.

20. General Managers Report

a. Well Registration/Permitting
b. GMA 14 Joint planning
c. Trinity & San Jacinto River Basins & Galveston Bay Basin & Bay Stakeholder Committee meetings
d. Region G & H RWPG

21. Date for next Board meeting – April 21, 2010[1].

22. Adjourn

Agenda items may be considered, discussed and/or acted upon in a different order than the order set forth above.

Executive Session

The Board of Directors of the Bluebonnet Groundwater Conservation District reserves the right to adjourn into Executive (Closed) Session at any time during the course of this meeting to discuss any of the items listed on this agenda, as authorized by the Texas Government Code, Sections 551.071 (Consultations with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), and 551.086 (Economic Development). No final action will be taken in Executive Session.

Posted 1-7-10 at 11:00 am
By Sally Williams
(Title) Admin. Asst.

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT
Resolution No. 2010-02

A RESOLUTION OF THE BLUEBONNET GROUNDWATER CONSERVATION DISTRICT REVISING AND READOPTING THE DISTRICT MANAGEMENT PLAN FOLLOWING COMMENTS FROM THE TEXAS WATER DEVELOPMENT BOARD.

WHEREAS, following notice and hearing, the Bluebonnet Groundwater Conservation District ("District") approved Resolution No. 2009-003 dated October 21, 2009, which revised and readopted its 2004 certified Management Plan as required under H.B. 3655, Chapter 36, Texas Water Code, and Chapter 356, Title 31, Texas Administrative Code; and

WHEREAS, on December 3, 2009 The District General Manager (GM) submitted the revised Management Plan to the Texas Water Development Board (TWDB) for review and approval; and

WHEREAS, the TWDB informed the GM via e-mail that the revised Management Plan was not administratively complete because of a typographical error in the estimate of groundwater flow out of the District. The TWDB also recommended updating an obsolete web page reference and using current language from the Water Code in the Management Plan; and

WHEREAS, the GM withdrew submission of the Management Pan to address the TWDB comments; and

WHEREAS, the GM and District-engaged hydrogeologist Randy Williams, P.G. have addressed the matters raised by the TWDB and modified the revised Management Plan accordingly; and

WHEREAS, the District held a public hearing on January 20, 2010, which was properly noticed as required by law, to receive comments on the modified revised Management Plan for the District; and

WHEREAS, the Board of Directors finds that the Management Plan meets all of the requirements of H.B. 3655, Chapter 36, Texas Water Code, and Chapter 356, Title 31, Texas Administrative Code.

NOW, THEREFORE, BE IT RESOLVED, that:

(1) The Bluebonnet Groundwater Conservation District Management Plan is hereby revised and as revised, readopted and approved as the Management Plan for the District.
(2) The General Manager of the District is hereby directed to take any and all necessary action to file the adopted plan with the Texas Water Development Board for approval.

(3) The General Manager of the District is authorized to coordinate with the Texas Water Development Board as may be required in furtherance of approval pursuant to the provisions of Section 36.1072 of the Texas Water Code.

(4) The General Manager of the District is authorized and directed to take all necessary action during the approval process and after approval of the Management Plan is received to effect coordination of the Plan, as required by statute, code and regulation, with regional water planning groups, other groundwater conservation districts, river authorities, and other entities and political subdivisions.

AND IT IS SO ORDERED, PASSED AND ADOPTED ON THIS THE 20th DAY OF JANUARY, 2010.

BLUEBONNET GROUNDWATER CONSERVATION DISTRICT

David Minze, Vice President

ATTEST:

Joe B Sandel, Secretary

Appendix C

Groundwater Availability Estimates For Non-GAM Aquifers in Austin, Grimes, Walker and Waller Counties

Austin, Grimes, Walker and Waller Counties
Minor Aquifer Groundwater Availability
(Acre-feet per Year)

Calculation Methodology for River Alluvium Aquifers

Assumptions: unconfined aquifer

Groundwater Availability = Groundwater Availability $_{\text{Storage}}$ + Groundwater Availability $_{\text{Recharge}}$

GWA = GWAS + GWAR

GWA = Groundwater availability (ac-ft/yr)
GWAS = Groundwater availability from storage (ac-ft/yr)
GWAR = Groundwater availability from recharge (ac-ft/yr)

GWAS = (1-DD)*B*A*N/Y/43560

DD = average percentage of drawdown maintained (%)
B = average saturated thickness of aquifer (ft)
A = area of aquifer (ft^2)
N = effective porosity
Y = time duration (yrs)

GWAR = P*A*R/43560

P = average yearly precipitation (ft/yr)
R = % precipitation that infiltrates into groundwater system

Equation: GWA = GWAS + GWAR = (1-DD)*B*A*N/Y/43560 + P*A*R/43560

Aquifer Details

Brazos River Alluvium
Recharge Rate = 5 Percent of Annual Rainfall*
*(Conservatively reduced from approximately 10 percent value reported in TWDB Report 186)
Recharge Area
- Austin County = 41,329 acres (GIS calculation from TWDB Aquifer Coverage)
- Grimes County = 27,217 acres (GIS calculation from TWDB Aquifer Coverage)
- Waller County = 62,891 acres (GIS calculation from TWDB Aquifer Coverage)

Annual Rainfall
- Austin County = 39 inches (NOAA)
- Grimes County = 43 inches (NOAA)
- Waller County = 39 inches (NOAA)

Saturated Thickness = 60 feet*
*(Approximate 60-foot saturated thickness value given in TWDB Report 186 for Grimes County used in all Counties)
Effective Porosity (Coefficient of Storage) = 0.2 (dimensionless)

Navasota River Alluvium
Recharge Rate = 5 Percent of Annual Rainfall*
*(Adapted from assumptions used for Brazos River Alluvium)
Recharge Area
Grimes County = 50,874 acres
(GIS calculation from Geologic Atlas of Texas – Austin Sheet)
Annual Rainfall
Grimes County = 43 inches (NOAA)
Saturated Thickness = 60 feet*
*(Adapted from assumptions used for Brazos River Alluvium)
Effective Porosity (Coefficient of Storage) = 0.2 (dimensionless)

San Bernard River Alluvium
Recharge Rate = 5 Percent of Annual Rainfall*
*(Adapted from assumptions used for Brazos River Alluvium)
Recharge Area
Austin County = 1,948 acres
(GIS calculation from Geologic Atlas of Texas – Austin Sheet)
Annual Rainfall
Austin County = 39 inches (NOAA)
Saturated Thickness = 60 feet*
*(Adapted from assumptions used for Brazos River Alluvium)
Effective Porosity (Coefficient of Storage) = 0.2 (dimensionless)

San Jacinto River Alluvium
Recharge Rate = 5 Percent of Annual Rainfall*
*(Adapted from assumptions used for Brazos River Alluvium)
Recharge Area
Walker County = 13,136 acres
(GIS calculation from Geologic Atlas of Texas – Beaumont Sheet)
Annual Rainfall
Walker County = 43 inches (NOAA)
Saturated Thickness = 60 feet*
*(Adapted from assumptions used for Brazos River Alluvium)
Effective Porosity (Coefficient of Storage) = 0.2 (dimensionless)

Trinity River Alluvium
Recharge Rate = 5 Percent of Annual Rainfall*
*(Adapted from assumptions used for Brazos River Alluvium)
Recharge Area
Walker County = 42,886 acres
(GIS calculation from Geologic Atlas of Texas – Beaumont Sheet)
Annual Rainfall
Walker County = 43 inches (NOAA)
Saturated Thickness = 60 feet*
*(Adapted from assumptions used for Brazos River Alluvium)
Effective Porosity (Coefficient of Storage) = 0.2 (dimensionless)

Calculation Methodology for Yegua-Jackson Aquifer

Assumptions: aquifer has both unconfined and confined zones

Q(t) = R(t) – D(t) + dS/dt

Where:
Q(t) = the total rate of groundwater withdrawal (ac-ft/yr)
R(t) = the total rate of groundwater recharge to the basin (aquifer) (ac-ft/yr)
D(t) = the total rate of groundwater discharge from the basin (aquifer) (ac-ft/yr)
dS/dt = change in aquifer storage of groundwater over time (draw down in feet)
(Freeze and Cherry, 1979)

If annual pumping is approximately equal to annual recharge; the factors for recharge and discharge in the aquifer will cancel each other and the relationship may be simplified to:

Q(t) = dS/dt

If it is assumed that the annual amount of recharge to the aquifer is approximately equal to groundwater use from the aquifer in each County where it occurs in BGCD; the step-by-step description of the process to project the effects of use in each county is as follows:

1. The total area occupied by the aquifer in each county is subdivided by aquifer zone (unconfined, fresh confined and brackish confined).
2. Within each County; the area of each aquifer zone is divided by the total area occupied by the aquifer in the County to give the percentage of the total aquifer area in the County represented by each zone.
3. The estimate of annual recharge (assumed to be equal to the estimate annual aquifer pumping) for each County is divided by the percentage value of the total aquifer area in the County represented by each aquifer sub-zone in the County to give an estimate of recharge to each aquifer sub-zone (in acre-feet per year).
4. The area (in acres) of each aquifer sub-zone in each County is multiplied by an estimated amount of aquifer draw-down (in feet) [1] and then multiplied by the storage coefficient of the aquifer zone (expressed as a decimal fraction) [2] to give an estimate of the amount of water (in acre-feet) that could be removed from the aquifer if the estimated amount of aquifer draw-down occurred.
5. The estimated volume of water that could be produced from each aquifer zone with the specified estimate of aquifer draw-down is divided by 50 (years) to estimate the amount of water that could be produced each year from the aquifer zone over a 50-year period to result in the estimated amount of aquifer draw-down at the end to the 50-year time period.
6. The estimated annual amount of water that could be produced from each aquifer zone in each County (in acre-feet per year) is added to the estimate of annual recharge for the zone (in acre-feet per year) to give the estimated availability value for the aquifer zone (in acre-feet per year).
7. The estimated availability values (in acre-feet per year) of the several aquifer zones in each County are summed to give a total estimated availability value for the aquifer in each County.

Notes:

1. The estimated average aquifer draw-down values were kept constant for the two sub-zones of the confined zone and for the unconfined zone of the aquifer within each County.
2. The storage coefficient values for the confined and unconfined zones were kept constant in the aquifer zone in all Counties.

County	Aquifer	Aquifer zone	Sub-divsion Area (acres)	Total Aquifer Area in County (acres)	Sub-division Percent of Total Area	Estimated Total County Pumping (ac-ft per year)	Assigned Annual Recharge Volume (ac-ft)	Estimated Average Aquifer Draw-down (ft)	Storage Co-efficient (dimen-sionless)	Total With-drawal Volume (ac-ft)	Annual With-drawal Volume (ac-ft)	MAG Estimate (ac-ft)
Grimes	Yegua	Recharge un-confined	71,425	257,518	28%	3,900	1092	10	0.1	71425	1429	2521
Grimes	Yegua	Fresh Confined	32,609	257,518	13%	3,900	507	15	0.00005	24	0	507
Grimes	Yegua	Brackish Confined	153,483	257,518	60%	3,900	2340	20	0.00005	153	3	2343
Grimes	Jackson	Recharge un-confined	144,836	352,223	41%	7,800	3198	10	0.1	144836	2897	6095
Grimes	Jackson	Fresh Confined	108,709	352,223	31%	7,800	2418	15	0.00005	82	2	2420
Grimes	Jackson	Brackish Confined	98,678	352,223	28%	7,800	2184	20	0.00005	99	2	2186
Walker	Yegua	Recharge un-confined	5,232	160,496	3%	300	9	10	0.1	5232	105	114
Walker	Yegua	Fresh Confined	12,274	160,496	8%	300	24	15	0.00005	9	0	24
Walker	Yegua	Brackish Confined	142,990	160,496	89%	300	267	20	0.00005	143	3	270
Walker	Jackson	Recharge un-confined	96,012	400,160	24%	5,200	1248	10	0.1	96012	1920	3168
Walker	Jackson	Fresh Confined	217,727	400,160	54%	5,200	2808	15	0.00005	163	3	2811
Walker	Jackson	Brackish Confined	86,422	400,160	22%	5,200	1144	20	0.00005	86	2	1146
Totals			**1,170,397**				**17,239**			**318,264**	**6,366**	**23,605**

Estimated Availability from the Unconfined, Fresh Confined and Brackish Confined Zones of the Yegua and Jackson Subdivisions of the Yegua-Jackson aquifer in Grimes and Walker Counties*

*The area of the unconfined, fresh confined and brackish confined zones of the Yegua and Jackson subdivisions of the Yegua-Jackson aquifer in Grimes County are GIS calculations from the zones described in Figures 21 and 22 of TWDB Report 186. The area of the unconfined, fresh confined and brackish confined zones of the Yegua and Jackson subdivisions of the Yegua-Jackson aquifer in Walker County are GIS calculations from extrapolation of the zones described in Figures 21 and 22 of TWDB Report 186 into Walker County.

Appendix D

TWDB Groundwater Use Estimates
for
Austin, Grimes, Walker and Waller Counties

Austin County

Year	Aquifer	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1980	GULF COAST	2,694	2	0	9,998	0	254	12,948
1984	GULF COAST	3,256	33	0	8,754	24	192	12,259
1985	GULF COAST	3,308	29	0	7,291	24	210	10,862
1986	GULF COAST	3,078	23	0	7,900	25	180	11,206
1987	GULF COAST	3,114	44	0	6,717	20	170	10,065
1988	GULF COAST	3,190	27	0	8,783	21	164	12,185
1989	GULF COAST	3,009	33	0	9,172	20	162	12,396
1990	GULF COAST	3,181	46	0	9,642	20	163	13,052
1991	GULF COAST	2,921	41	0	9,042	58	168	12,230
1992	GULF COAST	2,939	75	0	10,851	58	199	14,122
1993	GULF COAST	3,101	77	0	7,252	58	212	10,700
1994	GULF COAST	3,182	66	0	8,492	58	186	11,984
1995	GULF COAST	3,446	62	0	7,877	58	207	11,650
1996	GULF COAST	3,562	61	0	9,627	58	192	13,500
1997	GULF COAST	3,219	65	0	7,877	58	190	11,409
1998	GULF COAST	3,485	34	0	9,504	58	161	13,242
1999	GULF COAST	3,675	43	0	9,504	58	161	13,441
2000	GULF COAST	3,647	30	0	9,070	42	161	12,950
2001	GULF COAST	3,391	71	0	8,191	42	158	11,853
2002	GULF COAST	3,419	58	0	4,255	42	162	7,936
2003	GULF COAST	3,451	54	0	5,808	42	591	9,946

NOTE: All Pumpage reported in acre-feet 3/5/2009

Source: TWDB Water Use Survey Database (http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=2)

Grimes County

Year	Aquifer	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1980	BRAZOS RIVER ALLUVIUM	0	0	0	140	0	0	140
	GULF COAST	1,167	2	0	110	0	398	1,677
	OTHER	393	111	0	0	0	341	845
	SPARTA	2	0	0	0	0	0	2
	Total	**1,562**	**113**	**0**	**250**	**0**	**739**	**2,664**
1984	BRAZOS RIVER ALLUVIUM	0	0	0	268	0	0	268
	GULF COAST	1,723	9	0	211	0	431	2,374
	OTHER	324	66	0	0	26	369	785
	SPARTA	2	0	0	0	0	0	2
	Total	**2,049**	**75**	**0**	**479**	**26**	**800**	**3,429**
1985	BRAZOS RIVER ALLUVIUM	0	0	0	112	0	0	112
	GULF COAST	2,851	9	0	88	0	366	3,314
	OTHER	378	83	0	0	24	314	799
	SPARTA	2	0	0	0	0	0	2
	Total	**3,231**	**92**	**0**	**200**	**24**	**680**	**4,227**
1986	BRAZOS RIVER ALLUVIUM	0	0	0	112	0	0	112
	GULF COAST	2,040	5	0	88	0	369	2,502
	OTHER	349	95	0	0	27	317	788
	SPARTA	2	0	0	0	0	0	2
	Total	**2,391**	**100**	**0**	**200**	**27**	**686**	**3,404**
1987	BRAZOS RIVER ALLUVIUM	0	0	0	112	0	0	112
	GULF COAST	1,916	6	0	88	0	380	2,390
	OTHER	382	206	0	0	22	324	934
	SPARTA	2	0	0	0	0	0	2
	Total	**2,300**	**212**	**0**	**200**	**22**	**704**	**3,438**
1988	BRAZOS RIVER ALLUVIUM	0	0	0	84	0	0	84
	GULF COAST	1,745	5	0	66	0	371	2,187
	OTHER	374	219	0	0	23	319	935
	SPARTA	3	0	0	0	0	0	3
	Total	**2,122**	**224**	**0**	**150**	**23**	**690**	**3,209**
1989	BRAZOS RIVER ALLUVIUM	0	0	0	22	0	0	22
	GULF COAST	1,663	5	0	18	0	329	2,015
	OTHER	330	173	0	0	0	281	784
	SPARTA	5	0	0	0	0	0	5
	Total	**1,998**	**178**	**0**	**40**	**0**	**610**	**2,826**

1990	BRAZOS RIVER ALLUVIUM	0	0	0	19	0	0	19
	GULF COAST	2,208	9	0	16	0	373	2,606
	OTHER	458	174	0	0	0	320	952
	SPARTA	4	0	0	0	0	0	4
	Total	**2,670**	**183**	**0**	**35**	**0**	**693**	**3,581**
1991	BRAZOS RIVER ALLUVIUM	0	0	0	19	0	0	19
	GULF COAST	1,945	11	0	16	29	375	2,376
	OTHER	430	82	0	0	2	322	836
	SPARTA	4	0	0	0	0	0	4
	Total	**2,379**	**93**	**0**	**35**	**31**	**697**	**3,235**
1992	BRAZOS RIVER ALLUVIUM	0	0	0	19	0	0	19
	GULF COAST	2,033	4	0	16	29	416	2,498
	OTHER	587	70	0	0	2	358	1,017
	SPARTA	6	0	0	0	0	0	6
	Total	**2,626**	**74**	**0**	**35**	**31**	**774**	**3,540**
1993	BRAZOS RIVER ALLUVIUM	0	0	0	99	0	0	99
	GULF COAST	2,271	13	0	139	29	397	2,849
	OTHER	649	85	0	0	2	342	1,078
	SPARTA	6	0	0	0	0	0	6
	Total	**2,926**	**98**	**0**	**238**	**31**	**739**	**4,032**
1994	BRAZOS RIVER ALLUVIUM	0	0	0	0	0	0	0
	GULF COAST	2,659	13	0	244	29	357	3,302
	OTHER	641	132	0	0	2	307	1,082
	SPARTA	6	0	0	0	0	0	6
	Total	**3,306**	**145**	**0**	**244**	**31**	**664**	**4,390**
1995	GULF COAST	2,345	3	0	271	29	435	3,083
	OTHER	448	122	0	0	2	374	946
	SPARTA	6	0	0	0	0	0	6
	Total	**2,799**	**125**	**0**	**271**	**31**	**809**	**4,035**
1996	GULF COAST	2,931	137	0	261	29	395	3,753
	OTHER	788	0	0	0	2	339	1,129
	SPARTA	6	0	0	0	0	0	6
	Total	**3,725**	**137**	**0**	**261**	**31**	**734**	**4,888**
1997	GULF COAST	2,722	168	0	261	29	353	3,533
	OTHER	770	0	0	0	2	301	1,073
	SPARTA	6	0	0	0	0	0	6
	Total	**3,498**	**168**	**0**	**261**	**31**	**654**	**4,612**
1998	GULF COAST	2,817	117	0	373	29	382	3,718
	OTHER	797	0	0	0	2	327	1,126
	SPARTA	6	0	0	0	0	0	6
	Total	**3,620**	**117**	**0**	**373**	**31**	**709**	**4,850**
1999	GULF COAST	2,803	83	0	373	29	333	3,621
	OTHER	793	0	0	0	2	283	1,078

	SPARTA	6	0	0	0	0	0	6
	Total	**3,602**	**83**	**0**	**373**	**31**	**616**	**4,705**
2000	GULF COAST	2,851	126	0	185	29	336	3,527
	OTHER	807	0	0	0	2	286	1,095
	SPARTA	6	0	0	0	0	0	6
	Total	**3,664**	**126**	**0**	**185**	**31**	**622**	**4,628**
2001	GULF COAST	3,161	235	0	252	29	325	4,002
	OTHER	2,368	0	0	0	2	277	2,647
	SPARTA	6	0	0	0	0	0	6
	Total	**5,535**	**235**	**0**	**252**	**31**	**602**	**6,655**
2002	GULF COAST	3,311	210	0	176	29	336	4,062
	OTHER	2,551	0	0	0	2	286	2,839
	SPARTA	6	0	0	0	0	0	6
	Total	**5,868**	**210**	**0**	**176**	**31**	**622**	**6,907**
2003	GULF COAST	3,236	207	0	53	0	237	3,733
	OTHER	2,731	0	0	0	0	202	2,933
	SPARTA	6	0	0	0	0	0	6
	Total	**5,973**	**207**	**0**	**53**	**0**	**439**	**6,672**

NOTE: All Pumpage reported in acre-feet 3/5/2009

Source: TWDB Water Use Survey Database (http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=2)

Walker County

Year	Aquifer	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1980	GULF COAST	9,769	182	0	0	0	231	10,182
	OTHER	142	0	0	0	0	79	221
	Total	**9,911**	**182**	**0**	**0**	**0**	**310**	**10,403**
1984	GULF COAST	3,542	220	0	75	6	261	4,104
	OTHER	299	0	0	0	0	91	390
	Total	**3,841**	**220**	**0**	**75**	**6**	**352**	**4,494**
1985	GULF COAST	3,302	230	0	54	6	233	3,825
	OTHER	546	0	0	0	0	81	627
	Total	**3,848**	**230**	**0**	**54**	**6**	**314**	**4,452**
1986	GULF COAST	3,383	224	0	36	6	268	3,917
	OTHER	595	0	0	0	0	93	688
	Total	**3,978**	**224**	**0**	**36**	**6**	**361**	**4,605**
1987	GULF COAST	4,127	184	0	36	5	228	4,580
	OTHER	1,098	7	0	0	0	79	1,184
	Total	**5,225**	**191**	**0**	**36**	**5**	**307**	**5,764**
1988	GULF COAST	3,829	184	0	36	6	248	4,303
	OTHER	1,124	6	0	0	0	86	1,216

	Total	**4,953**	**190**	**0**	**36**	**6**	**334**	**5,519**
1989	GULF COAST	4,025	183	0	326	5	220	4,759
	OTHER	1,113	7	0	0	0	76	1,196
	Total	**5,138**	**190**	**0**	**326**	**5**	**296**	**5,955**
1990	GULF COAST	4,066	185	0	324	5	217	4,797
	OTHER	1,153	5	0	0	0	75	1,233
	Total	**5,219**	**190**	**0**	**324**	**5**	**292**	**6,030**
1991	GULF COAST	3,684	124	0	324	12	222	4,366
	OTHER	1,114	5	0	0	0	77	1,196
	Total	**4,798**	**129**	**0**	**324**	**12**	**299**	**5,562**
1992	GULF COAST	3,565	182	0	324	12	168	4,251
	OTHER	1,212	6	0	0	0	58	1,276
	Total	**4,777**	**188**	**0**	**324**	**12**	**226**	**5,527**
1993	GULF COAST	4,208	184	0	11	12	148	4,563
	OTHER	1,316	8	0	0	0	51	1,375
	Total	**5,524**	**192**	**0**	**11**	**12**	**199**	**5,938**
1994	GULF COAST	3,752	184	0	11	12	175	4,134
	OTHER	1,240	0	0	0	0	61	1,301
	Total	**4,992**	**184**	**0**	**11**	**12**	**236**	**5,435**
1995	GULF COAST	4,919	210	0	11	12	188	5,340
	OTHER	1,327	0	0	0	0	65	1,392
	Total	**6,246**	**210**	**0**	**11**	**12**	**253**	**6,732**
1996	GULF COAST	5,386	212	0	11	12	185	5,806
	OTHER	1,305	0	0	0	0	64	1,369
	Total	**6,691**	**212**	**0**	**11**	**12**	**249**	**7,175**
1997	GULF COAST	5,492	183	0	11	12	220	5,918
	OTHER	670	0	0	0	0	76	746
	Total	**6,162**	**183**	**0**	**11**	**12**	**296**	**6,664**
1998	GULF COAST	5,343	434	0	11	12	185	5,985
	OTHER	652	0	0	0	0	64	716
	Total	**5,995**	**434**	**0**	**11**	**12**	**249**	**6,701**
1999	GULF COAST	5,547	586	0	11	12	211	6,367
	OTHER	2,039	0	0	0	0	73	2,112
	Total	**7,586**	**586**	**0**	**11**	**12**	**284**	**8,479**
2000	GULF COAST	4,184	395	0	0	12	188	4,779
	OTHER	507	0	0	0	0	65	572
	Total	**4,691**	**395**	**0**	**0**	**12**	**253**	**5,351**
2001	GULF COAST	4,473	263	0	0	12	193	4,941
	OTHER	641	0	0	0	0	67	708
	Total	**5,114**	**263**	**0**	**0**	**12**	**260**	**5,649**
2002	GULF COAST	4,682	254	0	0	12	185	5,133
	OTHER	930	0	0	0	0	64	994
	Total	**5,612**	**254**	**0**	**0**	**12**	**249**	**6,127**
2003	GULF COAST	5,217	202	0	0	12	142	5,573
	OTHER	927	0	0	0	0	49	976
	Total	**6,144**	**202**	**0**	**0**	**12**	**191**	**6,549**

NOTE: All Pumpage reported in acre-feet 3/5/2009

Source: TWDB Water Use Survey Database (http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=2)

Waller County

Year	Aquifer	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1980	GULF COAST	3,088	15	0	25,999	916	602	30,620
1984	GULF COAST	3,979	24	0	28,076	1,325	814	34,218
1985	GULF COAST	4,148	18	0	32,135	1,326	752	38,379
1986	GULF COAST	3,866	27	0	23,651	1,327	937	29,808
1987	GULF COAST	3,983	33	0	25,333	964	794	31,107
1988	GULF COAST	4,335	43	0	33,593	906	834	39,711
1989	GULF COAST	4,154	38	0	20,417	904	730	26,243
1990	GULF COAST	4,513	29	0	26,370	905	731	32,548
1991	GULF COAST	3,903	22	0	24,620	1,029	746	30,320
1992	GULF COAST	3,715	81	0	22,830	1,028	743	28,397
1993	GULF COAST	3,947	47	0	16,672	1,028	751	22,445
1994	GULF COAST	4,197	41	0	20,689	1,031	664	26,622
1995	GULF COAST	4,725	45	0	18,736	1,031	753	25,290
1996	GULF COAST	4,581	53	0	22,460	1,031	1,072	29,197
1997	GULF COAST	4,421	46	0	21,371	1,031	648	27,517
1998	GULF COAST	3,754	47	0	24,295	80	546	28,722
1999	GULF COAST	4,402	12	0	20,396	80	581	25,471
2000	GULF COAST	4,404	42	0	22,201	80	564	27,291
2001	GULF COAST	4,953	40	0	25,896	80	533	31,502
2002	GULF COAST	4,839	38	0	26,551	80	511	32,019
2003	GULF COAST	4,757	45	0	23,111	757	545	29,215

NOTE: All Pumpage reported in acre-feet 3/5/2009

Source: TWDB Water Use Survey Database (http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=2)

Appendix E

TWDB Projected Water Demands
for
Austin, Grimes, Walker and Waller Counties

Austin County

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
H	Bellville	Austin	Brazos	958	1,028	1,071	1,089	1,100	1,122
H	County Other	Austin	Brazos	1,396	1,526	1,622	1,662	1,679	1,727
H	County Other	Austin	Brazos-Colorado	281	307	326	334	338	347
H	County Other	Austin	Colorado	26	29	31	31	32	33
H	Irrigation	Austin	Brazos	743	743	743	743	743	743
H	Irrigation	Austin	Brazos-Colorado	9,874	9,874	9,874	9,874	9,874	9,874
H	Livestock	Austin	Brazos	1,211	1,211	1,211	1,211	1,211	1,211
H	Livestock	Austin	Brazos-Colorado	339	339	339	339	339	339
H	Livestock	Austin	Colorado	65	65	65	65	65	65
H	Manufacturing	Austin	Brazos	172	191	208	223	236	257
H	Manufacturing	Austin	Brazos-Colorado	38	42	45	49	52	56
H	Mining	Austin	Brazos	40	44	47	49	51	53
H	Mining	Austin	Brazos-Colorado	4	4	4	4	5	5
H	Mining	Austin	Colorado	7	8	8	9	9	9
H	San Felipe	Austin	Brazos	124	145	159	167	170	176
H	Sealy	Austin	Brazos	955	1,029	1,083	1,100	1,111	1,137
H	Wallis	Austin	Brazos-Colorado	178	194	202	207	209	214
	Total Projected Water Demands (acre-feet per year) =			**16,411**	**16,779**	**17,038**	**17,156**	**17,224**	**17,368**

Source: Volume 3, 2007 State Water Planning Database 3/5/2009
(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Grimes County

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
G	County Other	Grimes	Brazos	658	667	682	675	682	700
G	County Other	Grimes	San Jacinto	385	391	400	396	400	410
G	County Other	Grimes	Trinity	226	229	235	232	235	241
G	Irrigation	Grimes	Brazos	190	190	190	190	190	190
G	Irrigation	Grimes	San Jacinto	51	51	51	51	51	51
G	Livestock	Grimes	Brazos	901	901	901	901	901	901
G	Livestock	Grimes	San Jacinto	373	373	373	373	373	373
G	Livestock	Grimes	Trinity	280	280	280	280	280	280
G	Manufacturing	Grimes	Brazos	257	297	336	375	410	445
G	Mining	Grimes	Brazos	128	130	132	134	134	135
G	Mining	Grimes	San Jacinto	37	38	38	38	39	39
G	Mining	Grimes	Trinity	1	1	1	1	1	1
G	Navasota	Grimes	Brazos	1,426	1,464	1,494	1,505	1,526	1,555
G	Steam Electric Power	Grimes	Brazos	9,302	11,768	13,758	16,184	19,141	22,746
G	Wickson Creek SUD	Grimes	Brazos	625	878	1,044	1,175	1,286	1,396
	Total Projected Water Demands (acre-feet per year) =			**14,840**	**17,658**	**19,915**	**22,510**	**25,649**	**29,463**

Source: Volume 3, 2007 State Water Planning Database 3/5/2009
(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Walker County

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
H	Consolidated WSC	Walker	Trinity	8	9	9	8	8	8
H	County Other	Walker	San Jacinto	5,752	6,303	6,558	6,463	6,465	6,465
H	County Other	Walker	Trinity	3,714	4,070	4,235	4,174	4,174	4,174
H	Huntsville	Walker	San Jacinto	4,597	4,946	5,041	4,904	4,874	4,874
H	Huntsville	Walker	Trinity	1,024	1,101	1,122	1,092	1,085	1,085
H	Irrigation	Walker	San Jacinto	5	5	5	5	5	5
H	Irrigation	Walker	Trinity	6	6	6	6	6	6
H	Lake Livingston Water Supply & Sewer Service Company	Walker	Trinity	29	30	30	29	28	28
H	Livestock	Walker	San Jacinto	310	310	310	310	310	310
H	Livestock	Walker	Trinity	322	322	322	322	322	322
H	Manufacturing	Walker	San Jacinto	577	669	753	839	914	993
H	Manufacturing	Walker	Trinity	2,631	3,049	3,435	3,827	4,169	4,524
H	Mining	Walker	San Jacinto	7	7	7	7	7	7
H	Mining	Walker	Trinity	6	6	6	6	6	6
H	New Waverly	Walker	San Jacinto	218	235	243	236	235	235
H	Riverside WSC	Walker	Trinity	309	325	335	326	321	321
H	Trinity Rural WSC	Walker	Trinity	22	24	24	23	23	23
H	Walker County Rural WSC	Walker	Trinity	839	898	919	891	884	884
	Total Projected Water Demands (acre-feet per year) =			**20,376**	**22,315**	**23,360**	**23,468**	**23,836**	**24,270**

Source: Volume 3, 2007 State Water Planning Database 3/5/2009
(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Waller County

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
H	Brookshire	Waller	Brazos	572	635	707	791	898	1,027
H	County Other	Waller	Brazos	866	1,087	1,354	1,619	1,983	2,401
H	County Other	Waller	San Jacinto	892	1,119	1,394	1,666	2,040	2,471
H	Hempstead	Waller	Brazos	1,128	1,346	1,582	1,860	2,189	2,579
H	Irrigation	Waller	Brazos	4,825	4,825	4,825	4,825	4,825	4,825
H	Irrigation	Waller	San Jacinto	18,153	18,153	18,153	18,153	18,153	18,153
H	Katy	Waller	San Jacinto	149	145	143	142	141	141
H	Livestock	Waller	Brazos	676	676	676	676	676	676
H	Livestock	Waller	San Jacinto	263	263	263	263	263	263
H	Manufacturing	Waller	Brazos	17	19	21	24	25	28
H	Manufacturing	Waller	San Jacinto	72	82	91	99	108	116
H	Mining	Waller	Brazos	9	9	9	9	9	9
H	Mining	Waller	San Jacinto	71	71	71	71	71	71
H	Pine Island	Waller	Brazos	117	146	177	210	254	305
H	Prairie View	Waller	Brazos	1,129	1,211	1,307	1,418	1,558	1,726
H	Prairie View	Waller	San Jacinto	124	133	144	156	171	190
H	Waller	Waller	San Jacinto	416	488	572	668	782	917
	Total Projected Water Demands (acre-feet per year) =			**29,479**	**30,408**	**31,489**	**32,650**	**34,146**	**35,898**

Source: Volume 3, 2007 State Water Planning Database 3/5/2009

(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Appendix F

TWDB Projected Surface Water Supply for Austin, Grimes, Walker and Waller Counties

Austin County

RWPG	Water User Group	County	River Basin	Source Name	2010	2020	2030	2040	2050	2060
H	Livestock	Austin	Colorado	Livestock Local Supply	52	56	58	59	60	61
Total Projected Surface Water Supplies (acre-feet per year) =					**52**	**56**	**58**	**59**	**60**	**61**

Source: Volume 3, 2007 State Water Planning Database 3/5/2009

(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Grimes County

RWPG	Water User Group	County	River Basin	Source Name	2010	2020	2030	2040	2050	2060
G	Irrigation	Grimes	Brazos	Brazos River Combined Run-of-River Irrigation	1,082	1,082	1,082	1,082	1,082	1,082
G	Livestock	Grimes	Brazos	Livestock Local Supply	901	901	901	901	901	901
G	Livestock	Grimes	San Jacinto	Livestock Local Supply	373	373	373	373	373	373
G	Livestock	Grimes	Trinity	Livestock Local Supply	280	280	280	280	280	280
G	Mining	Grimes	Brazos	Brazos River Combined Run-of-River Mining	62	62	62	62	62	62
G	Steam Electric Power	Grimes	Brazos	Gibbons Creek Lake/ Reservoir	6,310	6,310	6,310	6,310	6,310	6,310
G	Steam Electric Power	Grimes	Brazos	Livingston-Wallisville Lake/Reservoir System	6,721	6,721	6,721	6,721	6,721	6,721
Total Projected Surface Water Supplies (acre-feet per year) =					**15,729**	**15,729**	**15,729**	**15,729**	**15,729**	**15,729**

Source: Volume 3, 2007 State Water Planning Database 3/5/2009

(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Walker County

RWPG	Water User Group	County	River Basin	Source Name	2010	2020	2030	2040	2050	2060
H	County Other	Walker	San Jacinto	Livingston-Wallisville Lake/Reservoir System	0	13	209	145	158	181
H	County Other	Walker	Trinity	Livingston-Wallisville Lake/Reservoir System	1,681	1,668	1,472	1,536	1,523	1,500
H	Huntsville	Walker	San Jacinto	Livingston-Wallisville Lake/Reservoir System	0	339	2,672	1,979	2,121	2,374
H	Huntsville	Walker	Trinity	Livingston-Wallisville Lake/Reservoir System	9,521	9,182	6,849	7,542	7,400	7,147
H	Irrigation	Walker	Trinity	Livingston-Wallisville Lake/Reservoir System	10	10	10	10	10	10
H	Livestock	Walker	San Jacinto	Livestock Local Supply	0	1	12	8	9	11
H	Livestock	Walker	Trinity	Livestock Local Supply	106	127	138	143	148	154
H	Riverside WSC	Walker	Trinity	Livingston-Wallisville Lake/Reservoir System	20	20	20	20	20	20
H	Trinity Rural WSC	Walker	Trinity	Livingston-Wallisville Lake/Reservoir System	22	24	24	23	23	23
Total Projected Surface Water Supplies (acre-feet per year) =					**11,360**	**11,384**	**11,406**	**11,406**	**11,412**	**11,420**

Source: Volume 3, 2007 State Water Planning Database 3/5/2009
(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Waller County

RWPG	Water User Group	County	River Basin	Source Name	2010	2020	2030	2040	2050	2060
H	Livestock	Waller	Brazos	Livestock Local Supply	232	232	232	232	242	277
H	Livestock	Waller	San Jacinto	Livestock Local Supply	90	90	90	90	102	107
Total Projected Surface Water Supplies (acre-feet per year) =					**322**	**322**	**322**	**322**	**344**	**384**

Source: Volume 3, 2007 State Water Planning Database 3/5/2009
(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Appendix G

Details on the Development of the Estimates of Annual Recharge

At the time of the development of the management plan document a Groundwater Availability Model (GAM) has not been released for the Yegua-Jackson aquifer. Under the methodology used to project the potential effects of use of the Yegua-Jackson aquifer, the annual recharge is considered to be approximately equal to the projected use of the aquifer. The District assumes that the rate of annual recharge for the Yegua-Jackson aquifer is approximately equal to 1.5% of annual rainfall. The District identified a published recharge rate for the Brazos River Alluvium aquifer in Grimes County of approximately 10 % of annual rainfall. (TWDB Report 186) However, the District was concerned that this rate may be too high and conservatively reduced the assumptive rate used in the recharge estimate for the Brazos River Alluvium aquifer to approximately 5 % of annual rainfall. The estimates of annual recharge for the Brazos River Alluvium aquifer all use the assumptive rate of 5 % of annual rainfall. The District was not able to identify a published estimate of the annual recharge or the estimated rate of annual recharge for the Navasota, San Bernard, San Jacinto and Trinity River Alluvium aquifers. The estimates of annual recharge for the Navasota, San Bernard, San Jacinto and Trinity River Alluvium aquifers all use the assumptive rate of 5 % of annual rainfall. In order to comply with the statutory requirement of including an estimate of the annual amount of recharge to the groundwater resources of the District, the District applied the assumptive rate of annual recharge to the River Alluvium aquifers to estimates of the area (in acres) of these aquifers within the District. The estimated area of the Navasota, San Bernard, San Jacinto and Trinity River Alluvium aquifers are based on GIS coverage of the outcrop of alluvial sediments within the river basin developed from the Geologic Atlas of Texas. The area of the Brazos River Alluvium aquifer in the District was estimated from the TWDB GIS coverage of the aquifer. The District used the reasonable methods described above to fulfill statutory requirements for the management plan document to give estimates of annual recharge. The details for specific Counties and aquifers are as follows:

Austin County

- River Alluvium Recharge Rate = 5% of annual rainfall
- Annual Rainfall = 39 inches (3.25 feet) per year
- **Brazos River Alluvium**
    - Area of the **Brazos River Alluvium** aquifer outcrop in Austin County = 41,329 acres (GIS calculation from TWDB minor aquifer map)
    - **Brazos River Alluvium** aquifer recharge in Austin County = (3.25 feet x 0.05) x 41,329 acres = **6,716** acre-feet per year
- **San Bernard River Alluvium**
    - Area of the **San Bernard River Alluvium** aquifer outcrop in Austin County = 1,948 acres (GIS calculation from Geologic Atlas of Texas; Seguin Sheet, 1974; Bureau of Economic Geology)
    - **San Bernard River Alluvium** aquifer recharge in Austin County = (3.25 feet x 0.05) x 1,948 acres = **317** acre-feet per year

Grimes County

- Yegua-Jackson Recharge Rate = 1.5% of annual rainfall (assumed)
- River Alluvium Recharge Rate = 5% of annual rainfall (assumed)
- Annual Rainfall = 43 inches (3.6 feet) per year
- **Brazos River Alluvium**
    - Area of the **Brazos River Alluvium** aquifer outcrop in Grimes County = 27,217 acres (GIS calculation from TWDB minor aquifer map)

    - **Brazos River Alluvium** aquifer recharge in Austin County = (3.6 feet x 0.05) x 27,217 acres = **4,899** acre-feet per year
- **Navasota River Alluvium**
    - Area of the **Navasota River Alluvium** aquifer outcrop in Grimes County = 50,874 acres (GIS calculation from Geologic Atlas of Texas; Austin Sheet, 1974; Bureau of Economic Geology)
    - **Navasota River Alluvium** aquifer recharge in Grimes County = 50,874 acres (3.6 feet x 0.05) x 50,874 acres = **9,157** acre-feet per year
- **Yegua-Jackson aquifer**
    - Yegua Recharge Area = 71,425 acres (GIS calculation from TWDB Report 186)
        - Recharge = (3.6 feet x 0.015) x 71,425 acres = 3,857 rounded to **3,900** acre-feet per year
    - Jackson Recharge Area = 144,836 acres (GIS calculation from TWDB Report 186)
        - Recharge = (3.6 feet x 0.015) x 144,836 acres = 7,821 rounded to **7,800** acre-feet per year

Walker County

- Yegua-Jackson Recharge Rate = 1.5% of annual rainfall (assumed)
- River Alluvium Recharge Rate = 5% of annual rainfall (assumed)
- Annual Rainfall = 43 inches (3.6 feet) per year
- **San Jacinto River Alluvium**
    - Area of the **San Jacinto River Alluvium** aquifer outcrop in Grimes County = 13,136 acres (GIS calculation from Geologic Atlas of Texas; Beaumont Sheet, 1968; Bureau of Economic Geology)
    - **San Jacinto River Alluvium** aquifer recharge in Austin County = (3.6 feet x 0.05) x 13,136 acres = **2,364** acre-feet per year
- **Trinity River Alluvium**
    - Area of the **Trinity River Alluvium** aquifer outcrop in Grimes County = 42,886 acres (GIS calculation from Geologic Atlas of Texas; Beaumont Sheet, 1968; Bureau of Economic Geology)
    - **Trinity River Alluvium** aquifer recharge in Grimes County = (3.6 feet x 0.05) x 42,886 acres = **7,719** acre-feet per year
- **Yegua-Jackson aquifer**
    - Yegua Recharge Area = 5,232 acres (GIS calculation from Geologic Atlas of Texas; Beaumont Sheet, 1968; Bureau of Economic Geology)
        - Recharge = (3.6 feet x 0.015) x 5,232 acres = 283 rounded to **300** acre-feet per year
    - Jackson Recharge Area = 96,012 acres (GIS calculation from Geologic Atlas of Texas; Beaumont Sheet, 1968; Bureau of Economic Geology)
        - Recharge = (3.6 feet x 0.015) x 96,012 acres = 5,185 rounded to **5,200** acre-feet per year

Waller County

- River Alluvium Recharge Rate = 5% of annual rainfall
- Annual Rainfall = 39 inches (3.25 feet) per year
- **Brazos River Alluvium**

- Area of the **Brazos River Alluvium** aquifer outcrop in Waller County = 62,891 acres (GIS calculation from TWDB minor aquifer map)
- **Brazos River Alluvium** aquifer recharge in Austin County = (3.25 feet x 0.05) x 62,891 acres = **10,220** acre-feet per year