



***GROUNDWATER
MANAGEMENT PLAN***

Re-Adopted October 14, 2008

LONE STAR GROUNDWATER CONSERVATION DISTRICT

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Lone Star Groundwater Conservation District

Groundwater Management Plan

Re-Adopted October 14, 2008

Lone Star Groundwater Conservation District

Groundwater Management Plan

I. District Mission

The Lone Star Groundwater Conservation District (the “District”) is committed to managing and protecting the groundwater resources of Montgomery County and to working with others to ensure a sustainable, adequate, high quality and cost effective supply of water. The District will strive to develop, promote, and implement water conservation, augmentation, and management strategies to protect water resources for the benefit of the citizens, economy, and environment of Montgomery County. The preservation of this most valuable resource can be managed in a prudent and cost-effective manner through conservation, education, management, and permitting. Any action taken by the District shall only be after full consideration and respect has been afforded to the individual property rights of all citizens of Montgomery County.

II. Purpose of Management Plan

The 75th Texas Legislature in 1997 enacted Senate Bill 1 (“SB 1”)¹ to establish a comprehensive statewide water planning process. In particular, SB 1 contained provisions that required groundwater conservation districts to prepare management plans to identify the water supply resources and water demands that will shape the decisions of each district. SB 1 designed the management plans to include management goals for each district to manage and conserve the groundwater resources within their boundaries. The Texas Legislature enacted Senate Bill 2 (“SB 2”)² in 2001 and House Bill 1763 (“HB 1763”)³ in 2005 to build on the planning requirements of SB 1 and to further clarify the actions necessary for districts to manage and conserve the groundwater resources of the state of Texas.

The Lone Star Groundwater Conservation District’s management plan satisfies the requirements of SB 1, SB 2, HB 1763, the statutory requirements of Chapter 36 of the Texas Water Code, and the administrative requirements of the Texas Water Development Board’s (TWDB) rules.

¹ Act of June 2, 1997, 75th Leg., R.S., ch. 1010, 1997 Tex. Gen. Laws 3610.

² Act of May 27, 2001, 77th Leg., R.S., ch. 966, 2001 Tex. Gen. Laws 1991.

³ Act of May 24, 2005, 79th Leg., R.S., ch. 970, 2005 Tex. Gen. Laws 3247.

III. District Information

A. Creation

In 2001, the creation of the District was authorized by the 77th Texas Legislature through House Bill 2362⁴. The creation of the District was confirmed by the voters of Montgomery County on November 6, 2001, with 73.85 percent of the voters casting favorable ballots. As required by 31 TAC § 356.3, the District's original management plan was adopted and submitted to the TWDB within two years of the confirmation election.

B. Location and Extent

The District is located in Montgomery County in southeastern Texas. The boundaries of the District are coterminous with the boundaries of Montgomery County, Texas. The District is bordered by Walker County on the north, San Jacinto and Liberty Counties on the east, Harris County on the south, and Waller and Grimes Counties on the west. Peach Creek is the boundary with San Jacinto County, and Spring Creek forms most of the boundary with Harris County. The District comprises an area of approximately 1,090 square miles.

C. Background

The Board of Directors for the District consists of nine members. The Board of Directors is made up of the following members:

1. two members appointed by the Commissioners Court of Montgomery County;
2. one member appointed by the Board of Directors of the Montgomery County Soil and Water Conservation District;
3. one member appointed by the Board of Directors of the San Jacinto River Authority;
4. one member appointed by the Mayor of the City of Conroe;
5. one member appointed by the mayors of all of the incorporated municipalities, other than the City of Conroe, located in whole or in part in Montgomery County;
6. one member appointed by the Board of Trustees of the Woodlands Joint Powers Agency;
7. one member appointed by the boards of directors of all of the municipal utility districts located in whole or in part in Montgomery County that are not

⁴ Chapter 1321, Acts of the 77th Legislature, Regular Session, 2001.

members of the Woodlands Joint Powers Agency and the district boundaries of which are located primarily to the east of Interstate Highway 45; and

8. One member appointed by the boards of directors of all of the municipal utility districts located in whole or in part in Montgomery County that are not members of the Woodlands Joint Powers Agency and the district boundaries of which are located primarily to the west of Interstate Highway 45.

D. Authority / Regulatory Framework

In its preparation of its management plan, the District has followed all procedures and satisfied all requirements required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code. The District exercises the powers that it was granted and authorized to use by and through the special and general laws that govern it, including Chapter 1321, Acts of the 77th Legislature, Regular Session, 2001, Chapter 994, Acts of the 78th Legislature, Regular Session, 2003, and Chapter 36 of the Texas Water Code.

E. Groundwater Resources of Montgomery County

The principal source of useable groundwater in Montgomery County is the Gulf Coast aquifer. The Gulf Coast aquifer consists of four subdivisions, of which three are water-bearing and recognized as aquifers in their own right: the Chicot aquifer; the Evangeline aquifer; and the Jasper aquifer. The Burkeville confining zone separates the Evangeline and Jasper aquifers.

The water-bearing subdivisions of the Gulf Coast aquifer consist of semi-consolidated or unconsolidated sands with interbedded clays from one or more geologic formations. Clay zones may separate the water-bearing zones in each subdivision of the Gulf Coast aquifer. The Burkeville confining zone is the largest of the clay zones separating water-bearing units in the Gulf Coast aquifer. In some areas, however, this subdivision consists of clay with interbedded sands that allow the passage of water. The Chicot aquifer is the youngest of the Gulf Coast aquifer subdivisions, followed by the Evangeline aquifer and the Burkeville confining zone. The Jasper aquifer is the oldest of the Gulf Coast aquifer subdivisions located in the District. (Fig.1)

Each of these Gulf Coast aquifer subdivisions occurs in outcrop in Montgomery County. The outcrop pattern is a series of belts, which are generally parallel to the coastline. The younger units occur nearest the coast and form a terraced plain. The successively older units crop out progressively further inland at higher elevations and form cuestas or sand hills.

The geologic structure of the Gulf Coast aquifer dips from the inland areas into the subsurface towards the coast at an angle greater than the slope of the land surface. The geologic units composing the Gulf Coast aquifer generally thicken towards the coast in the down-dip direction. The rate of dip in feet per mile increases with depth below land surface. The base of the Chicot aquifer dips at approximately 10 feet per mile while the rate of dip for the Catahoula Sand below the Jasper aquifer is approximately 90 feet per mile. The increased rate of dip with depth is caused by the thickening of geologic units towards the coast. (Popkin, 1971) (Fig. 2)

| System | Series | Geologic Unit | Hydrologic Unit |
|----------------------|---------------|--|---------------------------|
| Quaternary | Holocene | Alluvium | Chicot aquifer |
| Tertiary | Pleistocene | Beaumont Clay Montgomery Formation Bentley Formation | |
| | Pliocene (?) | Willis Sand | |
| | Pliocene | Goliad Sand | Evangeline aquifer |
| | Miocene | Fleming Formation | Burkeville Confining Zone |
| | | | Upper Jasper aquifer |
| Lower Jasper aquifer | | | |

Fig. 1, Geologic and Hydrologic Units of the Gulf Coast aquifer in Montgomery County, Modified from (Popkin, 1971)

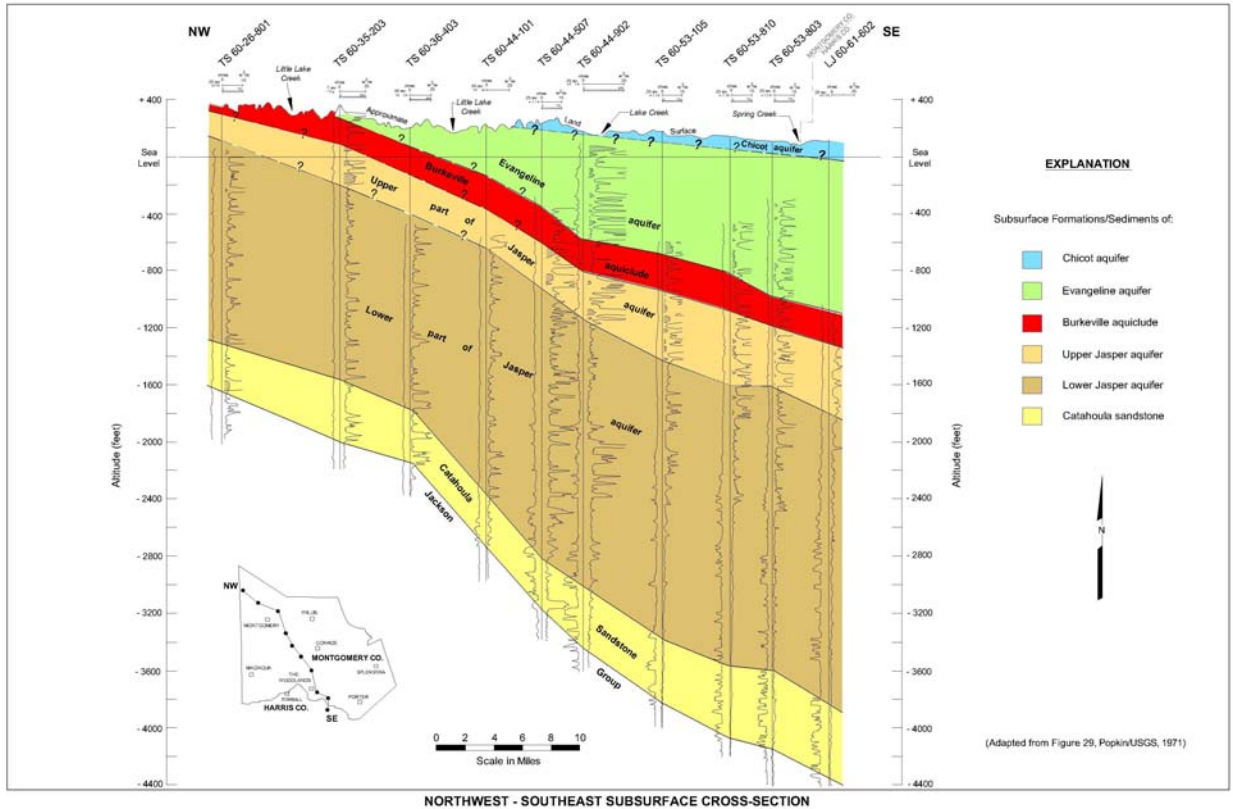


Fig. 2, Northwest to Southeast Cross-section Showing Dip and Thickening of Gulf Coast aquifer Subdivisions (Popkin, 1971)

F. Topography and Drainage

The topographic surfaces vary from almost flat near the larger streams and in the southern part of the county to hilly in the northern part. Altitudes range from about 45 feet above mean sea level in the southeastern corner of the county to about 440 feet in the northwestern corner.

The county is in the San Jacinto River drainage basin in which the primary drainage trends from northwest to southeast. The larger streams are the West Fork San Jacinto River, Peach, Spring, Stewart, and Caney Creeks. Secondary drainage which is roughly west to east is principally by Lake and Spring Creeks. The primary drainage is controlled by the southeasterly slope of the land surface while the secondary drainage is controlled to a large extent by the occurrence of alternating outcrops of sand and clay.

West Fork San Jacinto River has a stream gradient of about 5 feet per mile in the northern part of the county and about 3 feet per mile in the central and southern parts. Caney Creek has a gradient of 8 to 12 feet per mile in the northern part of the county and about 5 feet per mile in the central and southern parts. Spring Creek has a gradient of about 5 feet per mile in the southwestern part of the county and about 3 feet per mile in the southeastern part.” (Popkin at p. 8, 1971)

Although Lake Creek is described as a secondary drainage in TWDB Report 136, it is reported by the San Jacinto River Authority (SJRA) to have experienced flow in excess of 80,000 cubic feet per second (cfs) during storm run-off events on October 18, 1994. SJRA estimated the volume of flow was from data recorded at USGS gauging stations on a reach of the West Fork San Jacinto River where Lake Creek is the major tributary. During storm run-off events this stream could be considered to have flow equal to or exceeding the flow of streams given in TWDB Report 136 as primary drainages. (SJRA, 2003)

IV. Technical District Information Required by Texas Administrative Code

A. Estimate of the Managed Available Groundwater in the District – 31 TAC § 356.5(a)(5)(A)

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 Montgomery County as of the date of this plan.

However, in 2003, the District adopted in its Management Plan an available useable groundwater amount of 64,000 acre-feet per year. This estimate is based on the rate of annual deep recharge to the Gulf Coast aquifer of approximately 1.1 inches per year used in the development of the Northern Gulf Coast aquifer Groundwater Availability Model (GAM). This value was presented during the Stakeholder Advisory Forum meeting for the Northern Gulf Coast aquifer GAM of January 29, 2003. The annual deep recharge value expressed as a fraction of a foot was applied to the area of the District in acres (697,600 acres) to determine the useable amount of groundwater available from the Gulf Coast aquifer in acre-feet per year. In order to manage the groundwater resources of the District as practicably as possible in a sustainable manner, the groundwater availability is designated as the amount of effective annual recharge to the Gulf Coast aquifer in the District. The District has engaged the services of the US Geological Survey in a three-year study program to confirm or update this estimated recharge rate. The study is intended to determine the recharge rates in each of the three primary subdivisions of the Gulf Coast aquifer. The study will be completed in the latter part of 2009, at which time the District may elect to modify its estimate of recharge.

B. Amount of Groundwater Being Used within the District on an Annual Basis - 31 TAC §356.5(a)(5)(B)

The latest available TWDB estimate of the amount of groundwater being used within the District on an annual basis is 55,500 acre-feet per year. This estimate is derived from the TWDB Annual Water Use Survey from the year 2003, which is the most recent data available. (Table 1) The data in Table 1 shows the total groundwater use since 1980. The average annual increase in water use is 4.4 % from 1980 to 2003.

| Year | Aquifer | Municipal | Mfg | Steam Electric | Irrigation | Mining | Livestock | Total |
|------|------------|-----------|-------|----------------|------------|--------|-----------|--------|
| 1980 | Gulf Coast | 18,109 | 1,108 | 810 | 0 | 652 | 139 | 20,818 |
| 1984 | Gulf Coast | 22,599 | 1,239 | 812 | 13 | 2,533 | 201 | 27,397 |
| 1985 | Gulf Coast | 23,425 | 1,014 | 810 | 50 | 348 | 166 | 25,813 |
| 1986 | Gulf Coast | 24,376 | 981 | 810 | 50 | 397 | 151 | 26,765 |
| 1987 | Gulf Coast | 22,476 | 876 | 810 | 50 | 452 | 158 | 24,822 |
| 1988 | Gulf Coast | 26,496 | 979 | 812 | 50 | 435 | 177 | 28,949 |
| 1989 | Gulf Coast | 26,329 | 953 | 808 | 19 | 61 | 155 | 28,325 |
| 1990 | Gulf Coast | 26,595 | 924 | 810 | 20 | 73 | 160 | 28,582 |
| 1991 | Gulf Coast | 25,776 | 1,143 | 810 | 20 | 383 | 163 | 28,295 |
| 1992 | Gulf Coast | 26,751 | 1,152 | 810 | 20 | 204 | 168 | 29,105 |
| 1993 | Gulf Coast | 32,507 | 1,151 | 810 | 0 | 204 | 163 | 34,835 |
| 1994 | Gulf Coast | 34,582 | 692 | 810 | 0 | 319 | 179 | 36,582 |
| 1995 | Gulf Coast | 36,539 | 698 | 810 | 0 | 330 | 192 | 38,569 |
| 1996 | Gulf Coast | 39,732 | 646 | 816 | 0 | 330 | 159 | 41,683 |
| 1997 | Gulf Coast | 39,633 | 806 | 810 | 0 | 313 | 163 | 41,725 |
| 1998 | Gulf Coast | 47,440 | 685 | 810 | 0 | 266 | 206 | 49,407 |
| 1999 | Gulf Coast | 51,559 | 689 | 810 | 0 | 266 | 234 | 53,558 |
| 2000 | Gulf Coast | 53,974 | 599 | 810 | 0 | 403 | 204 | 55,990 |
| 2001 | Gulf Coast | 51,414 | 694 | 810 | 0 | 392 | 197 | 53,507 |
| 2002 | Gulf Coast | 54,322 | 763 | 810 | 0 | 65 | 198 | 56,158 |
| 2003 | Gulf Coast | 53,895 | 579 | 483 | 0 | 67 | 503 | 55,527 |

Table 1, Amount of Groundwater Used in Acre-feet per Year for Each Category of Use in the Annual TWDB Water Use Surveys

C. Annual Amount of Recharge from Precipitation to the Groundwater Resources within the District – 31 TAC § 356.5(a)(5)(C) (Implementing TWC § 36.1071(e)(3)(C))

In 2008, TWDB provided estimates of the annual amount of recharge to the groundwater resources of the District that are based on the GAM simulations conducted to assess the amount of available groundwater in the Northern Gulf Coast Aquifer. The Northern Gulf Coast aquifer GAM application simulated 20 years, 1980 - 1999, extracting the water budgets for each year (simulation 08-36). The results of the simulation averaged the annual water budget values for recharge, surface water outflow, inflow to the District, outflow from the District, net inter-aquifer flow (upper), and net inter-aquifer flow (lower) for the portions of the Gulf Coast Aquifer in located within the District. The amount of annual recharge to these aquifers may vary significantly due to climatic conditions. Annual recharge estimates for each aquifer comprising the Northern Gulf Coast Aquifer are summarized below. **There is a high degree of site-specific variability in the recharge rates of the Gulf Coast Aquifer, and to better define the recharge rate in Montgomery County, the District has engaged the services of the US Geological Survey in a 3 year study program to confirm the estimated recharge rate. Until that study is complete the District acknowledges alternative estimates of recharge, such as that provided by TWDB and reported below.**

- a. Chicot Aquifer Recharge = 36,722 acre-feet per year
- b. Evangeline Aquifer Recharge = 962 acre-feet per year
- c. Burkeville Confining System Recharge = 1 acre-foot per year
- d. Jasper Aquifer Recharge = 498 acre-feet per year

Chicot, Evangeline, Burkeville, and Jasper aquifer estimate source: Taken from the Northern Gulf Coast aquifer GAM Water Budget, Texas Water Development Board GAM Run 08-36; July 23, 2008.

D. For Each Aquifer, Annual Volume of Water that Discharges from the Aquifer to Springs and Any Surface Water Bodies, Including Lakes, Streams, and Rivers – 31 TAC § 356.5(a)(5)(D) (Implementing TWC § 36.1071(e)(3)(D))

In 2008 TWDB provided estimates of the annual amount of water discharged to surface water systems by the groundwater resources of the District that are based on the GAM simulations conducted to assess the amount of available groundwater in the Northern Gulf Coast Aquifer. The Northern Gulf Coast aquifer GAM application simulated 20 years, 1980 - 1999, extracting the water budgets for each year (TWDB simulation 08-36). The results of the simulation averaged the annual water budget values for recharge, surface water outflow, inflow to the District, outflow from the District, net inter-aquifer flow (upper), and net inter-aquifer flow (lower) for the portions of the Gulf Coast Aquifer in located within the District. The amount of annual discharge from the aquifer may vary significantly due to climatic conditions. Discharge estimates for each aquifer are summarized below. The values presented are the sum of the Stream Leakage and Drains values in the GAM Water Budget.

- a. Chicot Aquifer Discharge to Surface Water Systems = 513 acre-feet per year
- b. Evangeline Aquifer Discharge to Surface Water Systems = 380 acre-feet per year
- c. Burkeville Confining System Discharge to Surface Water Systems = 0 acre-feet per year
- d. Jasper Aquifer Discharge to Surface Water Systems = 16 acre-feet per year

Chicot, Evangeline, Burkeville, and Jasper aquifer estimate source: Taken from the Northern Gulf Coast aquifer GAM Water Budget, Texas Water Development Board GAM Run 08-36; July 23, 2008.

E. 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 – 31 TAC § 356.5(a)(5)(E) (Implementing TWC § 36.1071(e)(3)(E))

In 2008 TWDB provided estimates of the amount of water flowing into and out of the District within each aquifer and between aquifers in the District that are based on the GAM simulations conducted to assess the availability of Northern Gulf Coast Aquifer groundwater. The Northern Gulf Coast aquifer GAM application simulated 20 years, 1980 - 1999, extracting the water budgets for each year (simulation 08-36). The results of the simulation averaged the annual water budget values for recharge, surface water outflow, inflow to the District, outflow from the District, net inter-aquifer flow (upper), and net inter-aquifer flow (lower) for the portions of the Gulf Coast Aquifer in located within the District. The amount of annual flow of water into, out of and within these aquifers may vary significantly due to climatic conditions. Discharge estimates for each aquifer are summarized below.

1. Flow into the District within each aquifer:
 - a. Chicot Aquifer – 37,281 acre-feet per year
 - b. Evangeline Aquifer – 12,935 acre-feet per year
 - c. Burkeville Confining System – 34 acre-feet per year
 - d. Jasper Aquifer – 16,464 acre-feet per year

2. Flow out of the District within each aquifer:
 - a. Chicot Aquifer – 72,514 acre-feet per year
 - b. Evangeline Aquifer – 18,052 acre-feet per year
 - c. Burkeville Confining System – 28 acre-feet per year
 - d. Jasper Aquifer – 8,770 acre-feet per year

3. Movement between aquifer subdivisions within the District:
 - a. Chicot Aquifer to the Evangeline Aquifer = 20,008 acre-feet per year
 - b. Burkeville Confining System to the Evangeline Aquifer = 326 acre-feet per year
 - c. Jasper Aquifer to the Burkeville Confining System = 199 acre-feet per year

Chicot, Evangeline, Burkeville, and Jasper aquifer estimate source: Taken from the Northern Gulf Coast aquifer GAM Water Budget, Texas Water Development Board GAM Run 08-36; July 23, 2008.

F. How Natural or Artificial Recharge of Groundwater within the District Might be Increased

Increasing the recharge of groundwater within the District may be difficult. A high percentage of the total amount of recharge is rejected by the aquifer and supports the base flow of streams. The natural or artificial recharge to the groundwater within the District might be feasibly increased by the construction of rainfall runoff retention structures on ephemeral streams.

G. Projected Surface Water Supply within the District – 31 TAC § 356.5(a)(5)(F)

The estimates of projected surface water supplies are taken from the 2007 State Water Plan.

| RWPG | Water User Group | County | River Basin | Source Name | 2000 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|--|----------------------|------------|-------------|--|----------|--------------|--------------|--------------|--------------|--------------|--------------|
| H | Houston | Montgomery | San Jacinto | Livingston-Wallisville Lake/Reservoir System | 0 | 667 | 667 | 667 | 667 | 667 | 667 |
| H | Steam Electric Power | Montgomery | San Jacinto | Conroe Lake/Reservoir | 0 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 |
| H | Irrigation | Montgomery | San Jacinto | Conroe Lake/Reservoir | 0 | 497 | 497 | 497 | 497 | 497 | 497 |
| H | Livestock | Montgomery | San Jacinto | Livestock Local Supply | 0 | 510 | 510 | 510 | 510 | 510 | 510 |
| Total Projected Surface Water Supplies (acre-feet per year) = | | | | | 0 | 6,670 | 6,670 | 6,670 | 6,670 | 6,670 | 6,670 |

Table 2, Estimates of the Projected Surface Water Supplies in the District through 2060

H. Projected Water Demand within the District – 31 TAC § 356.5(a)(5)(G)

Estimates of projected demands are from the 2007 State Water Plan.

| RWPG | Water User Group | County | River Basin | 2000 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|------|-------------------------------|------------|-------------|--------|--------|--------|--------|--------|--------|---------|
| H | Conroe | Montgomery | San Jacinto | 7,175 | 9,668 | 11,190 | 14,167 | 17,627 | 22,192 | 27,493 |
| H | Cut and Shoot | Montgomery | San Jacinto | 169 | 221 | 252 | 314 | 387 | 482 | 592 |
| H | Houston | Montgomery | San Jacinto | 82 | 195 | 265 | 400 | 558 | 766 | 1,008 |
| H | Magnolia | Montgomery | San Jacinto | 233 | 283 | 313 | 373 | 443 | 535 | 641 |
| H | Oak Ridge North | Montgomery | San Jacinto | 563 | 704 | 791 | 960 | 1,156 | 1,415 | 1,716 |
| H | Panorama Village | Montgomery | San Jacinto | 605 | 782 | 890 | 1,100 | 1,205 | 1,205 | 1,205 |
| H | Patton Village | Montgomery | San Jacinto | 76 | 94 | 106 | 127 | 152 | 186 | 224 |
| H | Roman Forest | Montgomery | San Jacinto | 168 | 213 | 240 | 294 | 357 | 439 | 535 |
| H | Shenandoah | Montgomery | San Jacinto | 517 | 517 | 517 | 517 | 517 | 517 | 517 |
| H | Splendor | Montgomery | San Jacinto | 126 | 199 | 243 | 331 | 432 | 566 | 722 |
| H | The Woodlands | Montgomery | San Jacinto | 13,714 | 14,806 | 27,470 | 29,399 | 29,399 | 29,399 | 29,399 |
| H | Willis | Montgomery | San Jacinto | 424 | 606 | 717 | 934 | 1,187 | 1,520 | 1,907 |
| H | Woodbranch | Montgomery | San Jacinto | 156 | 156 | 156 | 156 | 156 | 156 | 156 |
| H | County Other | Montgomery | San Jacinto | 14,307 | 22,498 | 28,514 | 41,244 | 56,110 | 76,829 | 100,893 |
| H | Manufacturing | Montgomery | San Jacinto | 1,587 | 2,045 | 2,332 | 2,608 | 2,883 | 3,126 | 3,392 |
| H | Steam Electric Power | Montgomery | San Jacinto | 2,507 | 5,046 | 8,537 | 9,981 | 11,741 | 13,886 | 16,502 |
| H | Mining | Montgomery | San Jacinto | 414 | 480 | 509 | 526 | 543 | 559 | 573 |
| H | Irrigation | Montgomery | San Jacinto | 66 | 66 | 66 | 66 | 66 | 66 | 66 |
| H | Livestock | Montgomery | San Jacinto | 510 | 510 | 510 | 510 | 510 | 510 | 510 |
| H | Consumers Water Inc. | Montgomery | San Jacinto | 164 | 225 | 263 | 337 | 423 | 536 | 667 |
| H | Crystal Springs Water Company | Montgomery | San Jacinto | 368 | 605 | 750 | 1,033 | 1,362 | 1,795 | 2,299 |
| H | East Plantation UD | Montgomery | San Jacinto | 284 | 454 | 558 | 762 | 998 | 1,310 | 1,672 |
| H | HMW SUD | Montgomery | San Jacinto | 1,268 | 1,649 | 1,882 | 2,336 | 2,865 | 3,562 | 4,372 |
| H | Montgomery County MUD #18 | Montgomery | San Jacinto | 720 | 1,727 | 2,343 | 3,546 | 4,944 | 6,789 | 8,932 |
| H | Montgomery County MUD #19 | Montgomery | San Jacinto | 477 | 477 | 477 | 477 | 477 | 477 | 477 |
| H | Montgomery County MUD #8 | Montgomery | San Jacinto | 651 | 950 | 1,132 | 1,489 | 1,904 | 2,451 | 3,087 |

| RWPG | Water User Group | County | River Basin | 2000 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|---|--------------------------------|------------|-------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|
| H | Montgomery County MUD #9 | Montgomery | San Jacinto | 522 | 873 | 1,088 | 1,508 | 1,996 | 2,639 | 3,387 |
| H | Montgomery County UD #2 | Montgomery | San Jacinto | 369 | 546 | 546 | 546 | 546 | 546 | 546 |
| H | Montgomery County UD #3 | Montgomery | San Jacinto | 425 | 489 | 528 | 604 | 693 | 810 | 946 |
| H | Montgomery County UD #4 | Montgomery | San Jacinto | 645 | 955 | 955 | 955 | 955 | 955 | 955 |
| H | Montgomery County WCID #1 | Montgomery | San Jacinto | 435 | 504 | 546 | 628 | 724 | 849 | 996 |
| H | New Caney MUD | Montgomery | San Jacinto | 965 | 1,467 | 1,774 | 2,374 | 3,071 | 3,990 | 5,058 |
| H | Point Aquarius MUD | Montgomery | San Jacinto | 334 | 684 | 897 | 1,314 | 1,799 | 2,439 | 3,182 |
| H | Porter WSC | Montgomery | San Jacinto | 1,391 | 1,927 | 2,254 | 2,894 | 3,638 | 3,638 | 3,638 |
| H | Rayford Road MUD | Montgomery | San Jacinto | 999 | 2,170 | 2,170 | 2,170 | 2,170 | 2,170 | 2,170 |
| H | River Plantation MUD | Montgomery | San Jacinto | 811 | 843 | 843 | 843 | 843 | 843 | 843 |
| H | Southern Montgomery County MUD | Montgomery | San Jacinto | 1,163 | 1,846 | 2,263 | 2,263 | 2,263 | 2,263 | 2,263 |
| H | Southwest Utilities | Montgomery | San Jacinto | 181 | 253 | 296 | 382 | 481 | 612 | 764 |
| H | Spring Creek UD | Montgomery | San Jacinto | 339 | 531 | 648 | 877 | 1,142 | 1,493 | 1,901 |
| H | Stanley Lake MUD | Montgomery | San Jacinto | 367 | 708 | 910 | 910 | 910 | 910 | 910 |
| Total Projected Water Demands (acre-feet per year) = | | | | 56,277 | 78,972 | 106,741 | 132,255 | 159,633 | 195,431 | 237,116 |

Table 3, Estimates of the Projected Water Demand in the District through 2060

I. Projected Water Supply Needs within the District – 31 TAC § 356.5(a)(7)

Estimates of projected needs are from the 2007 State Water Plan.

| RWPG | WUG | County | River Basin | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|---|--------------------------------|------------|-------------|----------------|----------------|----------------|----------------|-----------------|-----------------|
| H | Conroe | Montgomery | San Jacinto | -2,159 | -4,022 | -6,528 | -9,461 | -13,427 | -18,201 |
| H | Cut and Shoot | Montgomery | San Jacinto | -41 | -66 | -116 | -179 | -261 | -360 |
| H | Houston | Montgomery | San Jacinto | 0 | 0 | 0 | 0 | 0 | -177 |
| H | Magnolia | Montgomery | San Jacinto | -42 | -67 | -118 | -179 | -262 | -360 |
| H | Oak Ridge North | Montgomery | San Jacinto | -120 | -284 | -444 | -619 | -854 | -1,133 |
| H | Panorama Village | Montgomery | San Jacinto | -163 | -327 | -522 | -669 | -755 | -827 |
| H | Patton Village | Montgomery | San Jacinto | -11 | -12 | -25 | -39 | -60 | -89 |
| H | Roman Forest | Montgomery | San Jacinto | -34 | -54 | -98 | -149 | -219 | -303 |
| H | Shenandoah | Montgomery | San Jacinto | -86 | -192 | -249 | -288 | -324 | -355 |
| H | Splendor | Montgomery | San Jacinto | -62 | -98 | -171 | -257 | -376 | -514 |
| H | The Woodlands | Montgomery | San Jacinto | -2,459 | -12,882 | -14,616 | -16,360 | -18,464 | -20,204 |
| H | Willis | Montgomery | San Jacinto | -144 | -246 | -403 | -600 | -872 | -1,202 |
| H | Woodbranch | Montgomery | San Jacinto | -1 | -1 | -1 | -1 | -1 | -1 |
| H | County Other | Montgomery | San Jacinto | -6,931 | -12,266 | -23,656 | -37,038 | -56,139 | -78,323 |
| H | Manufacturing | Montgomery | San Jacinto | -458 | -884 | -1,291 | -1,672 | -2,056 | -2,442 |
| H | Steam Electric Power | Montgomery | San Jacinto | 0 | -1,034 | -2,478 | -4,238 | -6,383 | -8,999 |
| H | Mining | Montgomery | San Jacinto | -80 | -193 | -261 | -315 | -368 | -413 |
| H | Irrigation | Montgomery | San Jacinto | 0 | 0 | 0 | 0 | 0 | 0 |
| H | Livestock | Montgomery | San Jacinto | 0 | 0 | 0 | 0 | 0 | 0 |
| H | Consumers Water Inc. | Montgomery | San Jacinto | -46 | -90 | -148 | -212 | -305 | -416 |
| H | Crystal Springs Water Company | Montgomery | San Jacinto | -196 | -313 | -546 | -821 | -1,200 | -1,640 |
| H | East Plantation UD | Montgomery | San Jacinto | -155 | -249 | -435 | -653 | -946 | -1,286 |
| H | HMW SUD | Montgomery | San Jacinto | -357 | -692 | -1,113 | -1,588 | -2,239 | -3,007 |
| H | Montgomery County MUD #18 | Montgomery | San Jacinto | -965 | -1,556 | -2,711 | -4,064 | -5,849 | -7,922 |
| H | Montgomery County MUD #19 | Montgomery | San Jacinto | -77 | -172 | -221 | -257 | -292 | -320 |
| H | Montgomery County MUD #8 | Montgomery | San Jacinto | -269 | -434 | -760 | -1,134 | -1,646 | -2,242 |
| H | Montgomery County MUD #9 | Montgomery | San Jacinto | -334 | -536 | -933 | -1,395 | -2,014 | -2,732 |
| H | Montgomery County UD #2 | Montgomery | San Jacinto | -157 | -197 | -254 | -294 | -334 | -365 |
| H | Montgomery County UD #3 | Montgomery | San Jacinto | -79 | -189 | -274 | -362 | -475 | -607 |
| H | Montgomery County UD #4 | Montgomery | San Jacinto | -279 | -346 | -447 | -517 | -587 | -642 |
| H | Montgomery County WCID #1 | Montgomery | San Jacinto | -81 | -194 | -283 | -375 | -494 | -632 |
| H | New Caney MUD | Montgomery | San Jacinto | -406 | -635 | -1,151 | -1,705 | -2,505 | -3,433 |
| H | Point Aquarius MUD | Montgomery | San Jacinto | -335 | -539 | -938 | -1,398 | -2,014 | -2,729 |
| H | Porter WSC | Montgomery | San Jacinto | -456 | -798 | -1,313 | -1,917 | -2,155 | -2,357 |
| H | Rayford Road MUD | Montgomery | San Jacinto | -1,097 | -1,078 | -1,060 | -1,194 | -1,355 | -1,482 |
| H | River Plantation MUD | Montgomery | San Jacinto | -139 | -310 | -398 | -461 | -521 | -569 |
| H | Southern Montgomery County MUD | Montgomery | San Jacinto | -613 | -986 | -1,049 | -1,222 | -1,386 | -1,517 |
| H | Southwest Utilities | Montgomery | San Jacinto | -60 | -104 | -171 | -247 | -355 | -488 |
| H | Spring Creek UD | Montgomery | San Jacinto | -164 | -254 | -445 | -671 | -981 | -1,342 |
| H | Stanley Lake MUD | Montgomery | San Jacinto | -315 | -504 | -498 | -498 | -565 | -618 |
| Total Projected Water Needs (acre-feet per year) = | | | | -19,371 | -42,804 | -66,125 | -93,049 | -129,039 | -170,249 |

Table 4, Identified Water Supply Needs in the District through 2060

V. Water Management Strategies To Meet Needs of Water User Groups – 31 TAC § 356.5(a)(7)

To meet the needs of water user groups in the District, water management strategies to develop additional supplies are adopted by Region H for inclusion in the State Water Plan. The list of Water Management Strategies is taken from the 2007 State Water Plan.

| WUG | Water Management Strategy | Source Name | Source County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|-------------------------------|-------------------------------------|--|---------------|--------|--------|--------|--------|--------|--------|
| Conroe | Municipal Conservation - Large WUG | Conservation | Montgomery | 644 | 732 | 910 | 1,125 | 1,408 | 1,744 |
| Conroe | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 594 | 0 | 0 | 0 | 0 | 0 |
| Conroe | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 3,290 | 3,290 | 3,290 | 3,290 | 3,290 | 3,290 |
| Conroe | New Contracts from Existing Sources | Trinity River Run-of River | Liberty | 0 | 7,002 | 7,002 | 7,002 | 7,002 | 7,002 |
| Conroe | New Contracts from Existing Sources | Conroe Lake/Reservoir | Reservoir | 6,165 | 6,165 | 6,165 | 6,165 | 6,165 | 6,165 |
| Consumers Water Inc. | Municipal Conservation - Medium WUG | Conservation | Montgomery | 14 | 16 | 21 | 25 | 32 | 40 |
| Consumers Water Inc. | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 11 | 0 | 0 | 0 | 0 | 0 |
| Consumers Water Inc. | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 376 | 376 | 376 | 376 | 376 | 376 |
| Consumers Water Inc. | New Contracts from Existing Sources | Trinity River Run-of River | Liberty | 376 | 376 | 376 | 376 | 376 | 376 |
| County Other | Municipal Conservation - Large WUG | Conservation | Montgomery | 1,200 | 1,496 | 2,129 | 2,872 | 3,932 | 5,164 |
| County Other | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 3,689 | 2,432 | 5,062 | 7,413 | 9,917 | 11,740 |
| County Other | TRA to SJRA Transfer | Livingston-Wallisville Lake/Reservoir System | Reservoir | 0 | 0 | 50,000 | 50,000 | 50,000 | 50,000 |
| County Other | New Contracts from Existing Sources | Trinity River Run-of River | Liberty | 11,419 | 11,419 | 11,419 | 11,419 | 11,419 | 11,419 |
| Crystal Springs Water Company | Municipal Conservation - Large WUG | Conservation | Montgomery | 39 | 47 | 63 | 82 | 108 | 139 |
| Crystal Springs Water Company | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 101 | 54 | 93 | 131 | 168 | 195 |
| Crystal Springs Water Company | New Contracts from Existing Sources | Trinity River Run-of River | Liberty | 1,306 | 1,306 | 1,306 | 1,306 | 1,306 | 1,306 |
| Cut and Shoot | Municipal Conservation - Medium WUG | Conservation | Montgomery | 1 | 1 | 2 | 2 | 3 | 3 |
| Cut and Shoot | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 40 | 65 | 114 | 177 | 258 | 357 |
| East Plantation UD | Municipal Conservation - Medium WUG | Conservation | Montgomery | 26 | 32 | 43 | 56 | 73 | 94 |
| East Plantation UD | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 82 | 47 | 79 | 110 | 136 | 155 |

| WUG | Water Management Strategy | Source Name | Source County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|---------------------------|-------------------------------------|--------------------------------|---------------|-------|-------|-------|-------|-------|-------|
| East Plantation UD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 170 | 170 | 170 | 170 | 170 | 170 |
| East Plantation UD | New Contracts from Existing Sources | Trinity River Run-of-River | Liberty | 0 | 867 | 867 | 867 | 867 | 867 |
| H M W SUD | Municipal Conservation - Large WUG | Conservation | Montgomery | 112 | 126 | 155 | 189 | 235 | 288 |
| H M W SUD | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 85 | 0 | 0 | 0 | 0 | 0 |
| H M W SUD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 566 | 566 | 566 | 566 | 566 | 566 |
| H M W SUD | New Contracts from Existing Sources | Trinity River Run-of-River | Liberty | 0 | 2,153 | 2,153 | 2,153 | 2,153 | 2,153 |
| Houston | Municipal Conservation - Large WUG | Conservation | Montgomery | 13 | 18 | 26 | 36 | 49 | 65 |
| Houston | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 76 | 75 | 108 | 135 | 159 | 177 |
| Magnolia | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 40 | 65 | 116 | 177 | 259 | 356 |
| Magnolia | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 2 | 2 | 2 | 2 | 3 | 4 |
| Manufacturing | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 115 | 0 | 0 | 0 | 0 | 0 |
| Montgomery County MUD #18 | Municipal Conservation - Large WUG | Conservation | Montgomery | 116 | 157 | 237 | 330 | 453 | 596 |
| Montgomery County MUD #18 | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 683 | 694 | 1,013 | 1,289 | 1,527 | 1,701 |
| Montgomery County MUD #18 | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 705 | 705 | 705 | 705 | 705 | 705 |
| Mining | New Contracts from Existing Sources | Indirect Reuse SJRA | Harris | 413 | 413 | 413 | 413 | 413 | 413 |
| Manufacturing | New Contracts from Existing Sources | Indirect Reuse SJRA | Harris | 2,442 | 2,442 | 2,442 | 2,442 | 2,442 | 2,442 |
| Montgomery County MUD #19 | Municipal Conservation - Small WUG | Conservation | Montgomery | 25 | 25 | 25 | 25 | 25 | 25 |
| Montgomery County MUD #19 | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 147 | 147 | 147 | 147 | 147 | 147 |
| Montgomery County MUD #8 | Municipal Conservation - Large WUG | Conservation | Montgomery | 63 | 75 | 97 | 123 | 158 | 200 |
| Montgomery County MUD #8 | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 114 | 23 | 62 | 99 | 134 | 159 |
| Montgomery County MUD #8 | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 336 | 336 | 336 | 336 | 336 | 336 |
| Montgomery County MUD #9 | Municipal Conservation - Medium WUG | Conservation | Montgomery | 59 | 73 | 100 | 132 | 175 | 224 |
| Montgomery County MUD #9 | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 191 | 135 | 213 | 283 | 346 | 390 |
| Montgomery County MUD #9 | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 328 | 328 | 328 | 328 | 328 | 328 |
| Montgomery County UD #2 | Municipal Conservation - Small WUG | Conservation | Montgomery | 29 | 29 | 28 | 28 | 28 | 28 |
| Montgomery County UD #2 | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 68 | 0 | 0 | 0 | 0 | 0 |
| Montgomery County UD #2 | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 168 | 168 | 168 | 168 | 168 | 168 |
| Montgomery County UD #3 | Municipal Conservation - Medium WUG | Conservation | Montgomery | 28 | 30 | 33 | 37 | 43 | 50 |
| Montgomery County UD #3 | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 159 | 159 | 159 | 159 | 159 | 159 |
| Montgomery County UD #4 | Municipal Conservation - Medium WUG | Conservation | Montgomery | 55 | 54 | 54 | 53 | 53 | 53 |
| Montgomery County UD #4 | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 124 | 0 | 0 | 0 | 0 | 0 |
| Montgomery County UD #4 | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 292 | 292 | 292 | 292 | 292 | 292 |
| Montgomery County WCID #1 | Municipal Conservation - Medium WUG | Conservation | Montgomery | 29 | 31 | 34 | 38 | 45 | 52 |
| Montgomery County WCID #1 | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 163 | 163 | 163 | 163 | 163 | 163 |
| New Caney MUD | Municipal Conservation - Large WUG | Conservation | Montgomery | 95 | 110 | 146 | 184 | 239 | 303 |
| New Caney MUD | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 177 | 28 | 104 | 156 | 222 | 267 |
| New Caney MUD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 497 | 497 | 497 | 497 | 497 | 497 |
| Oak Ridge North | Municipal Conservation - Medium WUG | Conservation | Montgomery | 41 | 45 | 53 | 64 | 77 | 94 |
| Oak Ridge North | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 6 | 0 | 0 | 0 | 0 | 0 |
| Oak Ridge North | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 239 | 239 | 239 | 239 | 239 | 239 |
| Panorama Village | Municipal Conservation - Medium WUG | Conservation | Montgomery | 46 | 51 | 63 | 69 | 68 | 68 |
| Panorama Village | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 34 | 0 | 0 | 0 | 0 | 0 |
| Panorama Village | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 276 | 276 | 276 | 276 | 276 | 276 |
| Patton Village | Municipal Conservation - Medium WUG | Conservation | Montgomery | 1 | 1 | 1 | 1 | 1 | 1 |
| Patton Village | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 10 | 11 | 24 | 38 | 59 | 88 |
| Point Aquarius MUD | Municipal Conservation - Large WUG | Conservation | Montgomery | 46 | 60 | 88 | 119 | 162 | 211 |
| Point Aquarius MUD | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 223 | 208 | 308 | 394 | 469 | 524 |
| Point Aquarius MUD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 271 | 271 | 271 | 271 | 271 | 271 |

| WUG | Water Management Strategy | Source Name | Source County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|--------------------------------|-------------------------------------|--------------------------------|---------------|-------|-------|-------|-------|-------|-------|
| Porter WSC | Municipal Conservation - Large WUG | Conservation | Montgomery | 127 | 145 | 183 | 228 | 226 | 226 |
| Porter WSC | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 147 | 0 | 0 | 0 | 0 | 0 |
| Porter WSC | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 653 | 653 | 653 | 653 | 653 | 653 |
| Rayford Road MUD | Municipal Conservation - Large WUG | Conservation | Montgomery | 145 | 143 | 142 | 142 | 142 | 142 |
| Rayford Road MUD | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 747 | 290 | 41 | 0 | 0 | 0 |
| Rayford Road MUD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 645 | 645 | 645 | 645 | 645 | 645 |
| River Plantation MUD | Municipal Conservation - Small WUG | Conservation | Montgomery | 46 | 45 | 45 | 44 | 44 | 44 |
| River Plantation MUD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 525 | 525 | 525 | 525 | 525 | 525 |
| Roman Forest | Municipal Conservation - Medium WUG | Conservation | Montgomery | 1 | 1 | 2 | 2 | 2 | 3 |
| Roman Forest | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 33 | 53 | 96 | 147 | 217 | 300 |
| Shenandoah | Municipal Conservation - Small WUG | Conservation | Montgomery | 28 | 28 | 28 | 28 | 27 | 27 |
| Shenandoah | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 328 | 328 | 328 | 328 | 328 | 328 |
| Southern Montgomery County MUD | Municipal Conservation - Large WUG | Conservation | Montgomery | 123 | 148 | 146 | 145 | 145 | 145 |
| Southern Montgomery County MUD | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 315 | 171 | 0 | 0 | 0 | 0 |
| Southern Montgomery County MUD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 667 | 667 | 667 | 667 | 667 | 667 |
| Southwest Utilities | Municipal Conservation - Medium WUG | Conservation | Montgomery | 17 | 19 | 24 | 29 | 37 | 46 |
| Southwest Utilities | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 20 | 0 | 0 | 0 | 2 | 6 |
| Southwest Utilities | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 436 | 436 | 436 | 436 | 436 | 436 |
| Splendor | Municipal Conservation - Medium WUG | Conservation | Montgomery | 1 | 1 | 2 | 2 | 3 | 4 |
| Splendor | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 61 | 97 | 169 | 255 | 373 | 510 |
| Spring Creek UD | Municipal Conservation - Large WUG | Conservation | Montgomery | 35 | 41 | 54 | 70 | 91 | 116 |
| Spring Creek UD | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 79 | 29 | 57 | 85 | 112 | 132 |
| Spring Creek UD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 184 | 184 | 184 | 184 | 184 | 184 |
| Stanley Lake MUD | Municipal Conservation - Medium WUG | Conservation | Montgomery | 41 | 52 | 52 | 51 | 51 | 51 |
| Stanley Lake MUD | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 201 | 174 | 70 | 0 | 0 | 0 |
| Stanley Lake MUD | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 567 | 567 | 567 | 567 | 567 | 567 |
| Steam Electric Power | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 1,694 | 2,795 | 2,535 | 2,423 | 2,243 | 2,114 |
| The Woodlands | Municipal Conservation - Large WUG | Conservation | Montgomery | 1,012 | 1,835 | 1,954 | 1,945 | 1,936 | 1,936 |
| The Woodlands | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 0 | 2,801 | 594 | 0 | 0 | 0 |
| The Woodlands | New Contracts from Existing Sources | Indirect Reuse SJRA | Harris | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| The Woodlands | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 8,246 | 8,246 | 8,246 | 8,246 | 8,246 | 8,246 |
| Willis | Municipal Conservation - Large WUG | Conservation | Montgomery | 39 | 45 | 56 | 71 | 89 | 112 |
| Willis | New Groundwater Wells | Gulf Coast Aquifer | Montgomery | 49 | 0 | 0 | 6 | 19 | 31 |
| Willis | New Contracts from Existing Sources | San Jacinto River Run-of-River | Harris | 201 | 201 | 201 | 201 | 201 | 201 |
| Woodbranch | Municipal Conservation - Small WUG | Conservation | Montgomery | 1 | 1 | 1 | 1 | 1 | 1 |
| Montgomery County UD #3 | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 398 | 398 | 398 | 398 | 398 |
| The Woodlands | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 5,022 | 5,022 | 5,022 | 5,022 | 5,022 |
| Willis | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 858 | 858 | 858 | 858 | 858 |
| New Caney MUD | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 2,366 | 2,366 | 2,366 | 2,366 | 2,366 |
| Montgomery County MUD #18 | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 4,920 | 4,920 | 4,920 | 4,920 | 4,920 |
| Montgomery County MUD #19 | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 148 | 148 | 148 | 148 | 148 |
| Point Aquarius MUD | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 1,723 | 1,723 | 1,723 | 1,723 | 1,723 |
| Montgomery County MUD #8 | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 1,547 | 1,547 | 1,547 | 1,547 | 1,547 |
| Montgomery County MUD #9 | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 1,790 | 1,790 | 1,790 | 1,790 | 1,790 |
| Panorama Village | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 483 | 483 | 483 | 483 | 483 |
| Porter WSC | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 1,478 | 1,478 | 1,478 | 1,478 | 1,478 |
| Montgomery County UD #2 | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 169 | 169 | 169 | 169 | 169 |

| WUG | Water Management Strategy | Source Name | Source County | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
|---|-------------------------------------|----------------------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|
| Rayford Road MUD | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 695 | 695 | 695 | 695 | 695 |
| Spring Creek UD | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 910 | 910 | 910 | 910 | 910 |
| Montgomery County UD #4 | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 297 | 297 | 297 | 297 | 297 |
| Montgomery County WCID #1 | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 417 | 417 | 417 | 417 | 417 |
| Oak Ridge North | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 800 | 800 | 800 | 800 | 800 |
| Southern Montgomery County MUD | New Contracts from Existing Sources | Trinity River Run-of-River | Chambers | 0 | 705 | 705 | 705 | 705 | 705 |
| Steam Electric Power | New Contracts from Existing Sources | Indirect Reuse SJRA | Harris | 0 | 0 | 0 | 6,885 | 6,885 | 6,885 |
| Total Projected Water Management Strategies (acre-feet per year) = | | | | 61,665 | 98,266 | 150,161 | 160,857 | 165,973 | 170,690 |

Table 5, Water Management Strategies to Meet Needs in the District through 2060

The water management strategies adopted by Region H for inclusion in the State Water Plan include only one strategy to supply groundwater to a water user group in the District. This strategy supplies the City of Willis with groundwater from the Gulf Coast aquifer from a well field to be developed in Walker County. Table 4 indicates that none of the water management strategies recommended by Region H for inclusion in the State Water Plan would be affected by the District’s use of a value of 64,000 acre-feet per year for the availability of groundwater from the Gulf Coast aquifer.

VI. Management of Groundwater Supplies

The Texas Legislature has established that groundwater conservation districts (‘districts’), such as the Lone Star Groundwater Conservation District (“District”), are the state’s preferred method of groundwater management. The Texas Legislature codified its policy decision in Section 36.0015 of the Texas Water Code, which establishes that districts will manage groundwater resources through rules developed and implemented in accordance with Chapter 36 of the Texas Water Code (“Chapter 36”). Chapter 36 gives directives to districts and the statutory authority to carry out such directives, so that districts are given the proper tools to protect and manage the groundwater resources within their boundaries.

In addition to the statutory authority provided to districts in Chapter 36, the District has the powers expressly granted to the District by Chapter 1321, Acts of the 77th Legislature, Regular Session, 2001, and Chapter 994, Acts of the 78th Legislature, Regular Session, 2003 (collectively “the District Act”). In accordance with Chapter 36 and the District Act, the District implemented a claims process in which the District required existing or historic users of groundwater to obtain a historic use permit, wherein an existing or historic user was required to prove the maximum annual amount of groundwater that the user put towards a beneficial use during the period from January 1, 1992, to the date of first adoption of the District Rules, August 26, 2002. Pursuant to Section 36.116(b) and 36.113(e) of the Texas Water Code, the District Act, the District Rules, the claims process and the existing and historic use period preserve existing and historic use to the maximum extent practicable consistent with the District’s management plan.

Another significant management tool that the District is authorized to utilize by the District Act and Chapter 36 is the use of management zones. The District may establish management zones within the boundaries of the District in order to better manage and regulate the groundwater resources of Montgomery County. The District may use the management zones to adopt

different rules under Section 36.116 of the Texas Water Code for each aquifer, subdivision of an aquifer, or geologic stratum located in whole or in part within the boundaries of the District, or different geographic areas of an aquifer or subdivision of an aquifer located in whole or in part within the boundaries of the District. Management zones shall serve as areas for which the District shall determine total water availability, authorize total production, implement proportional reduction of production among classes of users, and within which the District shall allow the transfer of the right to produce groundwater, as set forth in the District's rules.

As set forth in the District Rules and this Management Plan, the District shall seek to limit production of groundwater from the resources within its boundaries to a sustainable level, so that the groundwater resources of Montgomery County are not depleted for future generations. For purposes of this plan, the word "sustainable" means limiting total groundwater production in the District or in a management zone designated by the District to an amount that does not exceed the amount of effective deep aquifer recharge available in the District or the management zone, as applicable, when averaged over a term of years to be determined by the District. To the extent that groundwater use in a particular management zone exceeds groundwater availability in that zone, the District shall implement proportional adjustment regulations to reduce overall production in that zone to a level that does not exceed availability when averaged over time. The regulatory scheme for proportional adjustment is set forth in the District Rules. The District Rules also expressly recognize that, in establishing or implementing any proportional adjustment regulations that contemplate the reduction of authorized production or a prohibition on authorization for new or increased production, the District shall consider the time necessary for water users to secure alternate sources of water, including surface water, by economically feasible means. This consideration may necessitate that the District authorize total production to exceed availability, either within a particular management zone or in the District as a whole, for a period of time to be determined by the District until economically feasible alternative water sources may reasonably be expected to be available to such groundwater users, and nothing in this plan shall be construed to limit the ability of the District to utilize that regulatory flexibility.

An important part of the District Rules is the registration and permitting process instituted by the District. The District Rules created a process by which users of groundwater are required to register their groundwater wells with the District. If the groundwater users and their wells met certain criteria, then the user is required to obtain either a Historic Use Permit ("HUP") or an Operating Permit ("OP"). Non-exempt groundwater users who used water for a beneficial purpose during the Existing and Historic Use Period established in the District Rules (January 1, 1992, through August 26, 2002) were eligible to file an application for an HUP. All non-exempt groundwater users who commenced beneficially using groundwater after the Existing and Historic Use Period were and continue to be required to obtain an OP. Some wells, such as some small wells used for domestic and livestock purposes, are exempt from the permitting process altogether.

In 2004, the District commenced joint planning activities with the San Jacinto River Authority ("SJRA") under a grant provided by the TWDB through its State Regional Facilities Planning Grant Program. After completion of the joint planning activities, the District and the SJRA generated the *Regulatory Study and Facilities Implementation Plan for Lone Star Groundwater Conservation District and San Jacinto River Authority* (June 2006) ("TWDB Study"). The

TWDB Study, which is incorporated herein by reference, provides substantial regulatory, hydrogeological and technical information, including regulatory options available to the District and the technical and scientific basis for the establishment of management zones by the District.

After extensive analysis of the technical and scientific data available for Montgomery County, the District decided to manage the groundwater resources within its jurisdiction on a sustainable basis. The District believes it is important to protect and preserve the groundwater resources of Montgomery County for future generations by preventing the long-term depletion of the aquifers located within Montgomery County and working towards the continued sustainability and viability of such aquifers. Based on this decision, the District Management Plan designated the total amount of groundwater to be available for production and use in the District as the amount of effective annual recharge to the Gulf Coast Aquifer located within Montgomery County. In other words, the District decided that the amount of groundwater which the District would authorize for withdrawal through its permitting process, after taking into account an estimate of groundwater produced by exempt users, would equal the sustainable recharge rate, which the District has determined to be 64,000 acre-feet per year based upon the best available science.

Upon completion of the District's HUP permitting process, the District determined the total volume that could be authorized for withdrawal under HUPs is in excess of 56,483 acre-feet. Further, the total amount of volume authorized by the District for use under the OPs the District had granted as of September 2008 was approximately 23,500 acre-feet per year. It is important to note that the total amount of volume of use authorized under OPs will continue to increase as the District issues new OPs each month, and that, thus far, the holders of OPs have enjoyed the same rights of production and other protections as the holders of HUPs. While the total amount of permitted groundwater use under OPs and HUPs is approximately 80,000 acre-feet per year as of September 2008 as indicated by District records, the District must also take the groundwater used by exempt domestic and livestock wells into consideration to determine the total amount of groundwater authorized to be produced within the county. The TWDB Study estimated domestic use accounts for approximately 3,000 acre-feet per year. Therefore, the total amount of groundwater authorized for use in Montgomery County as of September 2008 is estimated at around 83,000 acre-feet per year when adding together the total amount of permitted groundwater use and the total amount of exempt groundwater use. The total volume of groundwater produced and used within Montgomery County, therefore, already exceeds the amount of groundwater use the District determined would achieve the sustainability of the Gulf Coast Aquifer within its jurisdiction by approximately 19,000 acre-feet per year and the amount of groundwater use permitted by the District under OPs and pending HUP applications by close to 16,000 acre-feet per year.

Based on the volumes of groundwater use set forth above and the water demand realities facing the District, the District began its phased adoption of its District Regulatory Plan (DRP) with the adoption of Phase 1 on December 12, 2006, in order to begin the process of facilitating the conversion from groundwater use to surface water and other alternative water supplies. The DRP, along with the District Rules, is the vehicle through which the District will create a regulatory framework to responsibly regulate and conserve the use of groundwater in Montgomery County and to meet the goals set forth in the District Management Plan.

In Phase I of the DRP, after considering the time reasonably necessary for water users in the District to secure alternative sources of water by economically feasible means, as set forth in the TWDB Study, the District established a benchmark for the reduction of groundwater production within Montgomery County by requiring the total annual groundwater production to be reduced to a level equal to or less than 64,000 acre-feet by January 1, 2015, which has been determined to be the sustainable recharge rate for the groundwater resources within Montgomery County. All past, current, and future users of groundwater in Montgomery County were put on notice by Phase 1 of the DRP that the District will curtail both new and historic use of groundwater as necessary by January 1, 2015, to reduce total production and use of groundwater in the District to an amount equal to or less than 64,000 acre-feet per year.

The District recognizes the need for long-term water planning based upon the significant periods of time it takes to bring alternative water supplies on-line on a retail basis. The process of obtaining new alternative water supplies and constructing the necessary infrastructure to deliver such supplies to the intended water users takes years to complete.

Because of these time considerations and the impending groundwater reduction deadline of January 1, 2015, established under Phase 1 of the DRP, the District adopted Phase II (A) of the DRP on February 12, 2008, which requires certain specified large volume groundwater users to demonstrate incremental progress towards conversion to alternative water supplies by preparation off a Water Resources Assessment Plan ("WRAP") to be submitted to the District. The WRAPs will identify each large volume groundwater user's current and future water demands and supplies to meet those demands, including detailed supporting information. The District will use the planning and technical information gathered through the WRAP process to determine the most appropriate regulatory approach for groundwater reductions by new and historic users when it adopts Phase II (B) of the DRP.

VII. Methodology to Track District Progress in Achieving Management Goals

The general manager of the District will prepare and submit an annual report ("Annual Report") to the Board of Directors of the District. The Annual Report will include an update on the District's performance in regards to achieving management goals and objectives. The general manager of the District will present the Annual Report following its completion each year. The District will maintain a copy of the Annual Report on file for public inspection at the District's offices upon adoption.

VIII. Actions, Procedures, Performance, and Avoidance for District Implementation of Management Plan – 31 TAC § 356.5 (a)(4)

The District will implement the goals and provisions of this management plan and will utilize the objectives of this management plan as a guideline in its decision-making. The District will ensure that its planning efforts, operations, and activities will be 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 District may amend the District rules as necessary to

comply with changes to Chapter 36 of the Texas Water Code and to insure the best management of the groundwater within the District. The development and enforcement of the rules of the District will be based on the best scientific and technical evidence available to the District.

The District will encourage cooperation and coordination in the implementation of this plan. All operations and activities of the District will be performed in a manner that best encourages cooperation with the appropriate state, regional or local water entity.

IX. Management Goals

A. Providing the Most Efficient Use of Groundwater – 31 TAC § 356.5(a)(1)(A)

- A. 1. **Objective** – Each year, the District will require all new exempt or permitted wells that are constructed within the boundaries of the District to be registered or permitted with the District in accordance with the District Rules.
- A. 1. **Performance Standard** – The number of exempt and permitted wells registered or permitted by the District for the year will be incorporated into the Annual Report submitted to the Board of Directors of the District.
- A. 2. **Objective** – Each year, the District will regulate the production of groundwater by maintaining a system of permitting the use and production of groundwater within the boundaries of the District in accordance with the District Rules.
- A. 2. **Performance Standard** – Each year the District will accept and process applications for the permitted use of groundwater in the District in accordance with the permitting process established by the District Rules. The number and type of applications made for the permitted use of groundwater in the District, and the number and type of permits issued by the District, will be included in the Annual Report given to the Board of Directors.

B. Controlling and Preventing Waste of Groundwater – 31 TAC § 356.5(a)(1)(B)

- B. 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.

- B. 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.
- B. 2. **Objective** – Each year, the District will apply a water use fee structure to the permitted use of groundwater in the District to encourage the elimination and reduction of waste of groundwater.
- B. 2. **Performance Standard** – Each year, with the exception of wells exempt from permitting, the District will apply a water use fee to the permitted use of groundwater in the District pursuant to District rules. The amount of fees generated by the water use fee structure and the amount of water used for each type of permitted use of groundwater will be included in a section of the Annual Report given to the Board of Directors of the District.
- B. 3. **Objective** – Each year, the District will provide information to the public on eliminating and reducing wasteful practices in the use of groundwater by including information on groundwater waste reduction on the District’s website.
- B. 3. **Performance Standard** – Each year, a copy of the information provided on the groundwater waste reduction page of District’s website will be included in the District’s Annual Report to be given to the District’s Board of Directors.

C. Controlling and Preventing Subsidence – 31 TAC § 356.5(a)(1)(C)

- C.1. **Objective** – Each year, the District will hold a joint conference with the Harris-Galveston Coastal Subsidence District and the Fort Bend Subsidence District focused on sharing information regarding subsidence and the control and prevention of subsidence through the regulation of groundwater.
- C.1. **Performance Standard** – Each year, a summary of the joint conference on subsidence issues will be included in the Annual Report submitted to the Board of Directors of the District.
- C. 2. **Objective** – Each year, the District will provide one article annually on the District’s website to educate the public on the subject of subsidence.
- C. 2. **Performance Standard** – The Annual Report submitted to the Board of Directors will include a copy of the article posted on the District’s website.

D. Conjunctive Surface Water Management Issues – 31 TAC § 356.5(a)(1)(D)

D. 1. Objective – Each year, the District will participate in the regional planning process by attending at least 75 percent of the Region H – Regional Water Planning Group meetings to encourage the development of surface water supplies to meet the needs of water user groups in the District.

D. 1. Performance Standard – The attendance of a District representative at each Region H Regional Water Planning Group will be noted in the Annual Report presented to the District Board of Directors.

E. Drought Conditions – 31 TAC § 356.5(a)(1)(F)

E. 1. Objective – Each month, the District will download the updated Palmer Drought Severity Index (PDSI) map and check for the periodic updates to the Drought Preparedness Council Situation Report (Situation Report) posted on the Texas Water Information Network website www.txwin.net.

E. 1. Performance Standard – Quarterly, the District will make an assessment of the status of drought in the District and prepare a quarterly briefing to the Board of Directors. The downloaded PDSI maps and Situation Reports will be included with copies of the quarterly briefing in the District Annual Report to the Board of Directors.

F. Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, or Brush Control Where Appropriate and Cost Effective – 31 TAC § 356.5(a)(1)(G)(Implementing TWC § 36.1071(a)(7))

Precipitation enhancement is not an appropriate or cost-effective program for the District at this time because there is not an existing precipitation enhancement program operating in nearby counties in which the District could participate and share costs. The cost of operating a single-county precipitation enhancement program is prohibitive and would require the District to increase taxes in Montgomery County. The District has determined that addressing precipitation enhancement is not applicable to the District at this time.

Recharge enhancement is not an appropriate or cost-effective program for the District at this time. The District has determined that addressing recharge enhancement is not applicable to the District at this time.

Brush Control is not an appropriate or cost-effective program for the District at this time. The District has determined that addressing brush control is not applicable to the District at this time.

- F.1. Objective** – The District will annually submit an article regarding water conservation for publication to at least one newspaper of general circulation in Montgomery County.
- F.1. Performance Standard** – A copy of the article submitted by the District for publication to a newspaper of general circulation in Montgomery County regarding water conservation will be included in the Annual Report to the Board of Directors.
- F.2. Objective** – The District will develop or implement a pre-existing educational program for use in public or private schools in Montgomery County to educate students on the importance of water conservation by January 1, 2005.
- F.2. Performance Standard** - A description of the educational program developed or implemented by the District for use in Montgomery County public or private schools will be included in the Annual Report to the Board of Directors for the year 2005.
- F.3. Objective** – Each year, the District will include an informative flier on water conservation within at least one mail out to groundwater use permit holders distributed in the normal course of business for the District.
- F.3. Performance Standard** - The District's Annual Report will include a copy of the informative flier distributed to groundwater use permit holders regarding water conservation and the number of fliers distributed.
- F.4. Objective** – Each year, the District will promote rainwater harvesting by posting at least one informative article on rainwater harvesting on the District web site. The District will also consider sponsoring rainwater harvesting activities when the project offers opportunities to advertise and promote the technology.
- F.4. Performance Standard** - Each year, the annual report will include a copy of the article that has been provided on the District web site on rainwater harvesting.

X. Management Goals Not-Applicable to District

A. Natural Resource Issues – 31 TAC § 356.5(a)(1)(E) – The District has not been advised as to any threatened or endangered species that exist within the boundaries of the District and are significantly impacted by groundwater usage.

B. Addressing in a Quantitative Manner the Desired Future Conditions of the Groundwater Resources – 31 TAC § 356.5(a)(1)(H)(Implementing TWC § 36.1071(a)(8)) – This category of management goal is not applicable to the District because the desired future condition of the groundwater resources in GMA 14 has not been defined. The District intends to coordinate with other groundwater conservation districts in GMA 14 to define the desired future conditions of the aquifers, as required by TWC 36.108. The District also intends to review and evaluate the GAM simulation results from the northern part of the Gulf Coast aquifer GAM and other available data by September 1, 2010 to determine if revisions are needed regarding total aquifer storage and groundwater availability. The District is also funding a multi-year study with the US Geological Survey to verify the recharge rate to each of the producing strata. The study will be completed in the latter portion of 2009.

XI. Action Required for Plan Approval – 31 TAC § 356.6

A. Planning Period – 31 TAC § 356.5(a)

The Board of Directors of the District adopted the original management plan for the District by resolution on October 14, 2003. The management plan will remain in effect from the date of approval by the Texas Water Development Board until the plan is readopted, unless the District adopts an amended management plan that is approved by the Texas Water Development Board. The amended management plan will take effect as of the date of approval. In accordance with the provisions of Chapter 36 of the Texas Water Code, the District's management plan shall be reviewed annually and readopted with or without revisions at least every five years.

B. Certified Copy of District's Resolution Adopting Management Plan – 31 TAC § 356.6(a)(2)

A certified copy of the District's resolution adopting the plan is located in Appendix A – District Resolution.

C. Evidence of Management Plan Adoption After Notice and Hearing – 31 TAC § 356.6(a)(3)

Evidence, such as public notices, that the management plan was adopted following applicable public meetings and hearings is located in Appendix B - Notice of Meetings.

**D. Coordination with Surface Water Management Entities –
31 TAC § 356.6(a)(4)**

Evidence, such as correspondence or agendas from regional water planning group planning meetings that the District coordinated with surface water management entities in regards to the District’s management plan is located in Appendix C.

References

Popkin, Barney P., 1971. Texas Water Development Board Report 136, “Ground-Water Resources of Montgomery County, Texas”, prepared by the United States Geological Survey in cooperation with the Texas Water Development Board, Montgomery County Commissioners Court, the San Jacinto River Authority and the City of Conroe.

Regional Water Management Plan, Region H – Regional Water Planning Group

Rules of the Lone Star Groundwater Conservation District, as amended

San Jacinto River Authority - Jim Adams, General Manager personal communication August 2003 based on USGS Stream Gage Data for October 18, 1994, from Site No.s 08067650 and 08068000 located near the confluence of Lake Creek and the West Fork of the San Jacinto River.