Hickory UWCD No. 1

Management Plan: 2014 - 2024

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District Mission

The Hickory Underground Water Conservation District No. 1 strives to conserve, preserve, prevent waste, protect, and recharge the underground waters of all aquifers within the legal boundaries, as far as practicable to minimize the draw-down of the water table and the reduction of artesian pressure within the District Boundaries.

Time Period

This amended plan becomes effective upon approval by the Board of Directors and remains in effect until an amended plan is approved. The plan may be revised at anytime, or after five years when the plan will be reviewed, revised or amended and is approved as administratively complete by the Texas Water Development Board.

History

At the request of area citizens, the Texas Water Development Board entered an order on December 29, 1975, delineating a subdivision of the Hickory Aquifer Underground Water Reservoir in Concho, Kimble, Llano, Mason, McCulloch, Menard and San Saba Counties. In November 1981, a petition was submitted to the Texas Water Commission calling for the creation of the Hickory Underground Water Conservation District No. 1 (District). At a hearing on June 9, 1982, before the Texas Water Commission the petition was granted and the District thus created.

The confirmation election required by state statute was held on August 14, 1982; the District was officially established with a 94% approval of voters in those areas of Concho, Kimble, Mason, McCulloch, Menard and San Saba within the District boundaries.

On August 12, 1999 the petition of creation was amended by the TNRCC (now Texas Commission on Environmental Quality) to include all aquifers within the legal boundaries and management jurisdiction of the District.

On January 11, 2003, landowners of Mason County petitioned the District to annex the remainder of Mason County not currently in the District, and on May 03, 2003, in a special election held at the Mason County Courthouse the remainder of Mason County was annexed into the District with approval of 88% of the voters.

Regional Cooperation and Coordination

Regional Water Planning Groups

In 1998 the District was apportioned into two Regional Water Planning Groups established pursuant to § 16.053 of the Texas Water Code–Concho, Kimble, Mason, McCulloch and Menard are located in Region F and San Saba County is in the Lower Colorado Regional Water Planning Group (Region K). The District's Regional planning responsibilities are within a 46-county area, stretching from Matagorda Bay to the Pecos River.

Groundwater Management Area 7

In 2003 the Texas Water Development Board designated the boundaries of 16 groundwater management areas in Texas. The District lies entirely within Groundwater Management Area 7, which encompasses 34 counties and 21 groundwater conservation districts in an area of more than 42,000 square miles. Though the groundwater management area was designated for the Edwards-Trinity aquifer, it also includes all or portions of the Pecos Valley Alluvium, Ogallala, and Trinity aquifers and portions of the minor Capitan Reef, Dockum, Hickory, Ellenburger-San Saba, Lipan, Marble Falls and Rustler aquifersThe District participates in the joint planning process mandated by Section 36.108 of the Texas Water Code, and actively cooperates with the other 20 GMA- 7 districts and the Texas Water Development Board to develop Desired Future Conditions for the management area aquifers.

West Texas Regional Groundwater Alliance

The District is a member of the West Texas Regional Groundwater Alliance, Includes seventeen (17) locally created and locally funded districts that encompass almost 8.75 million acres or 13,000 square miles of West Texas. There is great diversity both within and among the aquifers in this West Texas region, making it necessary for each member district to develop unique priority management goals and rules to best serve the needs of its constituents.
The Alliance began in 1988 with four (4) groundwater districts; Coke County UWCD, Glasscock GCD, Irion County WCD, and Sterling County UWCD. Since then the number of groundwater conservation districts in the area has more than quadrupled. The current member districts are:

Coke County UWCD	Crockett County GCD	Glasscock GCD
Hickory UWCD	Irion County WCD	Lipan-Kickapoo WCD
Plateau UWC & SD	Santa Rita UWCD	Sterling County UWCD
Sutton County UWCD	Menard County UWD	Lone Wolf GCD
Hill Country UWCD	Jeff Davis County UWCD	Middle Pecos GCD
Permian Basin UWCD	Wes-Tex GCD	

The Alliance was created to implement common objectives of coordinating and facilitating the conservation, preservation, and beneficial use of water and related sources. Local districts monitor the water-related activities of the farming and ranching, oil and gas, industrial entities and municipalities

District Location and Extent

The Hickory Underground Water Conservation District No. 1 is located near the geographical center of Texas and is comprised of approximately 1,683,080 acres, including portions of McCulloch, Menard, Kimble, San Saba, Concho counties and the entirety of Mason County. In 2003 the District gained approximately 433,000 acres with the annexation of the remainder of Mason County that had not been included when the District was initially created.

Principal industries of the District are listed in the table below. The District's economy is based to a large degree on agriculture; 12% of the acreage in the District is cropland. Principal municipalities in or near the district boundaries are Brady, San Saba, Mason and Eden.

Economic Enterprise in the Hickory District[1]

County	Economy
Concho	Livestock production, tourism, hunting, fishing
Kimble	Livestock production, tourism, hunting, fishing
McCulloch	Agribusiness, tourism, manufacturing, silica sand
Mason	Ranching, hunting, tourism
Menard	Agribusiness, hunting and tourism
San Saba	Gov/Services, retail pecan industry, tourism, hunting

Statement of Guiding Principles

The Hickory Underground Water Conservation District No. 1 (District) is created and organized under the terms and provisions of Article XVI, Section 59, of the Constitution of Texas and Chapter 36 (formerly Chapter 52) of the Texas Water Code, Vernon's Texas Civil Statutes, and the District's actions are authorized by, and consistent with this constitutional and statutory provision, including all amendments and additions. The District is created for the purpose of conserving, preserving, recharging, controlling subsidence, protecting and preventing waste and as far as practicable to minimize the drawdown of the water table and the reduction of artesian pressure of all aquifers within the district boundaries. In order to carry out its constitutional and statutory purposes, the District has all the powers authorized by Article XVI, Section 59, of the Texas Constitution, and Chapter 36 of the Texas Water Code, Vernon's Texas Civil Statutes, together with all amendments and additions.

The District's purposes and powers are implemented through promulgation and enforcement of the District's regulations. These regulations are adopted and revised under the authority of Subchapter E, Chapter 36, Texas Water Code, and are incorporated herein as a part of the District's management plan.

Topography

The District is within the Colorado River basin and is bisected by the Llano and San Saba Rivers, as well as numerous tributaries to those two rivers.. Drainage is typically from west to east.
There are two major geologic features within the District. The Llano Uplift (Central Basin) is in the eastern and southern portions of the District. This feature is made up of ancient Cambrian rocks ranging in age from 1.0 to 1.2 billion years old and comprises granite and older metamorphic rocks. The northern and western parts of the District are in the Edwards Plateau region and are made up of Cretaceous Age limestone, dolomite, and marble.
The District elevation ranges from 1,100 to 2,300 feet above sea level.

Groundwater Resources of the Hickory Aquifer[2]

The Hickory Aquifer is the primary source of the District's groundwater, which is used for irrigation, public water supply, industrial, stock, and the domestic needs of the people and entities served.

The Hickory Aquifer occurs in parts of the counties in the Llano uplift region of Central Texas. Discontinuous outcrops of the Hickory Sandstone overlie or flank exposed Precambrian rocks that form the central core of the uplift. The down dip

artesian portion of the aquifer encircles the uplift and extends to maximum depths approaching 4000 ft. Most of the water pumped from the aquifer is used for irrigation. The largest capacity wells, however, have been completed for municipal water supply and industrial purposes in the Mason, Eden and Brady area.

The Hickory Sandstone Member of the Cambrian Riley Formation is composed of some of the oldest sedimentary rocks found in Texas. In most of the northern and western portions of the aquifer, the Hickory can be differentiated into lower, middle, and upper units, which reach a maximum thickness of 480 feet in southwestern McCulloch County. In the southern and eastern extent of the aquifer, the Hickory consists of only two units. Extensive block faulting has compartmentalized the Hickory Aquifer, thus restricting hydrologic connection from one area to another.

Edwards-Trinity Aquifer[3]

The Edwards-Trinity Plateau Aquifer underlies the Edwards Plateau east of the Pecos River and the Stockton Plateau west of the Pecos River, supplying water to all or parts of 38 counties.

The aquifer consists of saturated sediments of lower Cretaceous age Trinity Group formations. Natural chemical quality of water ranges from fresh to slightly saline. The water is typically hard and may vary widely in concentrations of dissolved solids and bicarbonate. The salinity of the groundwater tends to increase toward the west.

Well yields are typically low in the eastern portion of the Edwards-Trinity, consequently there is little pumpage from the aquifer within the District. Nevertheless, historical declines in water levels have occurred in the northwestern part of the District as a result of pumpage.

Ellenburger-San Saba Aquifer[4]

The Ellenburger-San Saba Aquifer underlies 4,000 square miles in parts of 15 counties in the Llano Uplift area of Central Texas. Discontinuous outcrops of the aquifer generally encircle older rocks in the core of the Uplift. The remaining down-dip portion contains fresh to slightly saline water to depths of approximately 3,000 feet below land and surface.
Water produced from the aquifer has a range in dissolved solids between 200 and 3,000 mg/l, but usually less than 1,000 mg/l. The quality of water deteriorates rapidly away from the outcrop areas. Approximately, 20 miles of more down-dip from the outcrop, water is typically unsuitable for most uses. Most of the deep municipal wells, which supply the City of Brady, produce an unknown amount of water from the Ellenburger-San Saba sequence of rocks. A

large portion of the water supply for the City of San Saba is believed to be from the Ellenberger-San Saba and Marble Falls Aquifer.

Marble Falls Aquifer[5]

The Marble Falls Aquifer occurs primarily in portions of McCulloch and San Saba counties within the District. Smaller amounts of water are also used for rural domestic supplies, watering of livestock and irrigation. Only small areas of Mason and Kimble counties have production from this aquifer.
The aquifer outcrops, primarily along the northern and eastern flanks of the Llano Uplift Region of Central Texas. Groundwater occurs in fractures, solution cavities, and channels in the limestone of the Marble Falls Formation of the Pennsylvanian Bend Group. Maximum thickness of the formation is 600 feet. Numerous large springs issue from the aquifer and provide a significant part of the base-flow to the San Saba River in McCulloch and San Saba counties and to the Colorado River in San Saba and Lampasas counties.

Existing data for the Marble Falls aquifer show that it contains mostly fresh water in outcrop areas and becomes mineralized a short distance down-dip from the outcrop areas. However, very few data exist to evaluate the brackish water that is present and the aquifer must be considered a very limited source of brackish groundwater. Costs of producing brackish water from this source are expected to be moderate to high.

MODELED AVAILABLE GROUNDWATER IN DISTRICT AQUIFERS 2010-2060

AQUIFER	YEAR					
	2010	2020	2030	2040	2050	2060
Ellenburger-San Saba	22,315	22,315	22,315	22,315	22,315	22,315
Hickory	19,897	19,897	19,897	19,897	19,897	19,897
Marble Falls	6,875	6,875	6,875	6,875	6,875	6,875
Total (excluding non-district areas)	49,087	49,087	49,087	49,087	49,087	49,087

Source: Texas Water Development Board
GTA Aquifer Assessment 1010-MAG Ellenburger-San Saba Aquifer
November 1, 2011
GTA Aquifer Assessment 10-11 MAG Hickory Aquifer
November 1, 2011
GTA Aquifer Assessment 10-12 Marble Falls Aquifer
November 1, 2011

There are no Modeled Available Groundwater numbers for the Edwards-Trinity (Plateau) aquifer in the district. On July 29, 2010 Groundwater Management Area 7 adopted a resolution declaring the aquifer irrelevant for joint planning purpose in the Hickory District because the only production from the aquifer is a limited amount for domestic and livestock use.

Methodology for Calculating Values in Water Data Tables

Where the district covers only a portion of a county the data values for the entire county are modified with an apportioning multiplier to create new values that more accurately represent district conditions. The multiplier used as part of the following formula is a land area ratio: (data value x (land area of district in county / land area of county).The percentage of each of the following counties within the district boundaries is as follows: Concho, 11.43%; Kimble, 2.55%; Mason, 100%; McCulloch 73.03%; Menard, 13.45%; San Saba, 55.71%.

For two of the four State Water Plan tables in Appendix B (Table 2. Projected Surface Water Supplies and Table 3. Projected Water Demands) the county-wide water user group (WUG) data values (county other, manufacturing, steam electric power, irrigation, mining and livestock) are modified using the multiplier. WUG values for municipalities, water supply corporations, and utility districts are not apportioned; instead, their full values are retained when they are located within the district, and eliminated when they are located outside the district. The municipalities of Brady (McCulloch County), Eden (Concho County), Mason (Mason County), and San Saba (San Saba County), and the Millersview-Doole WSC (Concho and McCulloch Counties) and Richland SUD (San Saba and McCulloch Counties) are within District boundaries and are included in the respective data tables. The municipalities of Junction (Kimble County) and Menard (Menard County) are outside of District boundaries and are excluded from the data tables.
The two other State Water Plan tables in Appendix B (Table 4. Projected Water Supply Needs and Table 5. Projected Water Management Strategies) are not apportioned because district-specific values are not statutorily required.

District totals within tables may vary by an acre-foot due to rounding of numbers.

HISTORICAL GROUNDWATER USE WITHIN THE DISTRICT

Historical groundwater use within the District between 1974 and 2010 has varied from a total of 25,745 acre-feet in 1988 to 12,394 acre-feet in 2007[1]. The largest amount of use is for irrigation in Mason and McCulloch Counties.

See Appendix, Table 1.
Estimated Historical Groundwater Use

[1] Source: Appendix, Table 1
TWDB Estimated Historical Groundwater Use
November 13, 2013

ESTIMATES OF RECHARGE FROM PRECIPITATION, DISCHARGES TO SURFACE WATER BODIES, AND FLOWS INTO, OUT OF AND BETWEEN EDWARDS AND TRINITY GROUPS IN THE EDWARDS-TRINITY (PLATEAU) AQUIFER WITHIN DISTRICT BOUNDARIES

(Results in acre-feet)

Management Plan Requirement	Aquifer or Confining Unit	Results (acre-feet)
Estimated annual amount of recharge from precipitation	Edwards-Trinity (Plateau) Aquifer	12,278
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams and rivers	Edwards-Trinity (Plateau) Aquifer	15,070
Estimated annual volume of flow into the District within the Edwards -Trinity aquifer in the District	Edwards-Trinity (Plateau) Aquifer	6,885
Estimated annual volume of flow out of the District within the Edwards_- Trinity aquifer in the District	Edwards-Trinity (Plateau) Aquifer	3,857
Estimated net annual volume of flow between each aquifer in the district	Flow from Edwards-Trinity (Plateau) Aquifer to underlying Llano Uplift Aquifers	288

(Source: GAM Run 13-010, TWDB, August 7, 2013)
(acre-feet/year. All numbers rounded to nearest acre-foot)

ESTIMATES OF RECHARGE FROM PRECIPITATION, DISCHARGES TO SURFACE WATER BODIES, AND FLOWS INTO, OUT OF AND BETWEEN AQUIFERS IN THE HICKORY AQUIFER

Although a Groundwater Availability Model has not yet been developed for the Hickory Aquifer,and therefore estimates of discharges to surface water bodies, and flows into, out of, and between the aquifers are not available, the Texas Water Development Board estimates annual recharge to the Hickory Aquifer to be 10,719 acre-feet/year.

Source: GTA Aquifer Assessment 10-11 MAG Hickory Aquifer, November 1, 2011
http://www.twdb.texas.gov/groundwater/docs/AA/AA10-11_MAG.pdf

ESTIMATES OF RECHARGE FROM PRECIPITATION, DISCHARGES TO SURFACE WATER BODIES, AND FLOWS INTO, OUT OF AND BETWEEN AQUIFERS IN THE ELLENBURGER- SAN SABA AQUIFER

Although a Groundwater Availability Model has not yet been developed for the Ellenburger-San Saba Aquifer,and therefore estimates of discharges to surface water bodies, and flows into, out of, and between aquifers are not available, the Texas Water Development Board estimates annual recharge to the Ellenburger – San Saba Aquifer to be 20,854 acre-feet/year.

Source: GTA Aquifer Assessment 10-10 MAG Ellenburger-San Saba Aquifer, November 1, 2011
http://www.twdb.texas.gov/groundwater/docs/AA/AA08-O8.pdf

ESTIMATES OF RECHARGE FROM PRECIPITATION, DISCHARGES TO SURFACE WATER BODIES, AND FLOWS INTO, OUT OF AND BETWEEN AQUIFERS IN THE MARBLE FALLS AQUIFER

Although a Groundwater Availability Model has not yet been developed for the Marble Falls Aquifer,and therefore estimates of discharges to surface water bodies, and flows into, out of, and between aquifers are not available, the Texas Water Development Board estimates annual recharge to the Marble Falls Aquifer to be 5,813 acre-feet/year.

Source: GTA Aquifer Assessment 10-12 MAG Marble Falls Aquifer, November 1, 2011
http://www.twdb.texas.gov/groundwater/docs/AA/AA10-12_MAG.pdf

Surface Water Resources of the Hickory UWCD No. 1

The only surface water impoundment used for purposes other than livestock consumption is Brady Lake. The normal pool capacity is 30,000 acre-feet with a calculated annual firm yield of 2,252[8] acre-feet. Currently the City of Brady is not utilizing this water; however the city plans construct a 3 mgd Reverse Osmosis. Treatment Plant to provide the City of Brady adequate water supplies to blend with the Hickory Aquifer wells in order to maintain a Radium 226/228 level below state and federal standards. Current Brady Lake pumpage is approximately 9 acre-feet annually for domestic purposes.

The San Saba and Llano Rivers bisect the District; however, only a small amount is used for other than livestock and domestic purposes.

PROJECTED SURFACE WATER SUPPLY
2010-2060

Total surface water supply for the district is projected to be 6,209 acre-feet annually for the period 2010-2060. The largest amount of surface water use is for irrigation in San Saba County.

See Appendix, Table 2
Projected Surface Water Supplies

PROJECTED TOTAL DEMAND FOR WATER
2010-2060

Total demand for water within the district is projected to decrease from 23,719 acre-feet in 2010 to 22,857 acre-feet in 2060, mainly due to a decrease in irrigation use in Mason County.

See Appendix, Table 3
Projected Water Demands

The projected demand numbers do not, however account for the 12,000 acre-feet/year of groundwater permitted to the City of San Angelo, which has announced that it will be using at least half of that amount annually by 2015.

The San Angelo wellfield is currently under development, so permitted supplies are not yet being conveyed to and used by the City. Levels of radionuclides exceeding Federal drinking water standards in the San Angelo well field will render the supply unusable for public water supply use without treatment or blending with water from other sources.

PROJECTED WATER SUPPLY NEEDS
2010-2060

Projected water supply needs within the district vary from zero acre-feet in Mason County 2010-2060, to 1,909 acre-feet needed in Kimble County for irrigation and manufacturing by 2060, and 2,393 acre-feet needed in Menard County for irrigation by 2060.

See Appendix, Table 4.
Projected Water Supply Needs

In the year 2060 the total projected groundwater demands of the District are estimated at 22,728 acre-feet. While this number appears to be well within available supplies, Federal Drinking Water Standards relating to the levels of radionuclides in much of the Hickory water supply will significantly diminish the availability of groundwater for public water supply purposes. According to the Texas Commission on Environmental Quality, public water supplies in Mason

County do not exceed the Federal radionuclide standards. However, the cities of Brady and Eden, as well as other municipal systems, may be impacted by the Federal standards.

PROJECTED WATER MANAGEMENT STRATEGIES IN THE 2012 STATE WATER PLAN

See Appendix, Table 5.
Projected Water Management Strategies

MANAGEMENT OF GROUNDWATER SUPPLIES

Implementation of desired future conditions for district aquifers, as well as other district management objectives, are carried out in part through annual monitoring of a network of district wells, maintaining a permanent district database of those well level measurements, and comparing levels with those taken in previous years to discern trends in aquifer gains or depletion. Further, district rules require submission of annual water use reports from owners of groundwater wells. The District achieves close to 100% compliance from permittees. Water use reports are compared with annual water level gains and declines in subdivisions of the district's aquifers.

The district has adopted rules requiring that production permits be reduced or revoked in areas where specific declines in water levels occur over a three-year period and requires owners of high-impact wells to provide monitor wells for tracking of water levels.

ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION

The District will implement the provisions of this plan and will utilize the provisions of this plan as a guidepost for determining the direction or priority for District operations and activities. Operations of the District, all agreements entered into by the District and any additional planning efforts in which the District may participate will be consistent with the provisions of this plan.

The District has adopted rules relating to the permitting of wells and the production of groundwater and continues to review and revise those rules in accordance with the best scientific evidence available and pursuant to changes in state laws and regulations. The rules adopted by the District are consistent with Chapter 36 of the Texas Water Code and the provisions of this plan. Promulgation and enforcement of the rules will be based on the best technical evidence available. The rules are available at http://hickoryuwcd.org/HickoryRules.htm

The District shall treat all citizens indiscriminately. Citizens may apply to the District for discretion in enforcement of the rules on grounds of adverse economic

effect or unique local conditions. In granting of variances to any rule, the Board of Directors shall consider the potential for adverse effect on adjacent landowners. The exercise of said discretion by the District Board shall not be construed as limiting the power of the District Board.

All activities of the District will be undertaken in cooperation and coordinated with the appropriate state, regional or local management entity.

TRACKING METHODOLOGY

The District manager will provide a report of staff activities to the Board of Directors at quarterly board meetings to insure management objectives and goals are being achieved.

MANAGEMENT GOALS, OBJECTIVES AND PERFORMANCE STANDARDS

Goal 1.0 To provide the most efficient use of groundwater

Management Objective
1.1 Annually the district will provide educational materials identifying conservation measures for the efficient use of water. Annually, two (2) District newsletter issues will be published that contain water conservation information. Handout packets with conservation literature will be provided once each year at the annual McCulloch County Soil and Water Conservation 5th Grade Field Day or one other water-related function.

Performance Standard
1.1a Number of newsletters published annually containing water conservation information.
1.1b Number of annual events where conservation material was provided.

Goal 2.0 To control and prevent the waste of groundwater.

Management Objective
2.1 Once each year the District will loan flow meters to assist at least one irrigating farmer within the District to evaluate irrigation systems and reduce waste.

Performance Standard
2.1 The number of District farmers who receive loans of flow-meters to assist in evaluating their irrigation systems.
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Goal 3.0 Addressing natural resource issues that impact the use and availability of groundwater and are impacted by the use of groundwater

Management Objective

3.1 The District will identify at least twenty (20) wells to be used as water quality monitoring wells that will be sampled annually.

Performance Standard
3.1 Number of monitor wells sampled annually for water quality.

Goal 4.0 Addressing conjunctive surface water management issues.

Management Objective

4.1 Meet at least once annually with City of Brady to discuss and review potential use of surface water resources in the area.

Performance Standard
4.1 Number of meetings with City representatives annually.

Management Objective

4.2 Meet at least once annually with a Lower Colorado River Authority staff member to review potential conjunctive groundwater/surface water resources in the area.

Performance Standard
4.2 Number of meetings with LCRA staff annually.

Goal 5.0 Addressing Drought Conditions

Management Objective

5.1a Monitor the Texas Water Development Board weekly drought report

5.1b Report in the District newsletter when drought conditions reach the "abnormally dry", or more severe drought stages in the TWDB drought report.

Performance Standards

5.1a Report the current drought status of the District to the Board of Directors at quarterly meetings.

5. 1b Annually report to the Board of Directors the number of times area residents are notified of severe drought conditions in the District

newsletter and the number of times that letters are sent to public water suppliers warning of severe drought conditions.

Goal 6.0 Addressing Conservation

Goal 6.1 Addressing Conservation

Management Objectives

6.1 (a). At least once annually the District will provide educational literature promoting water conservation in a public educational presentation.

Performance Standard

6.1 (a) Report to Board of Directors annually number of times water conservation information was distributed to area residents or in public informational or educational meetings.

Goal 6.2 (a) Addressing rainwater harvesting

Management Objective

6.2. (a) The District will display rainwater harvesting manuals publicly at the district office and at least once annually provide notice in the District newsletter that manuals on rainwater harvesting are available to residents in the District office.

Performance Standards

6.2 (a) Report to the Board of Directors annually on the number of times notice was published in the District newsletter about the availability of Rainwater Harvesting manuals in the District office.

Management Objective

6.3 (a) Include information on rainwater harvesting in one public education presentation annually

Performance Standards

6.3 (a) Report to Board of Directors annually the number of educational presentations that included rainwater harvesting information.

Goal 6.4 Addressing brush control

Management Objective

6.4 (a) Meet once annually with NRCS to discuss prioritizing brush control for EQIP funds or other federal conservation funding.

Performance Standards

6.4 (a) Report to Board of Directors annually on the number of meetings held with NRCS officials regarding priority conservation funding for brush control.

Goal 7.0 Addressing in a quantifiable manner the Desired Future Conditions of the district aquifers.

Management Objective
7.1 The District will identify and monitor, over the five-year period of the plan, 50 wells for annual water level changes and will report annually to the Board of Directors on changes in well levels from previous year, comparing the changes to District Desired Future Condition target levels.

Performance Standards
7.1 Annually report to the Board of Directors the number of wells measured and changes in water levels from the previous year, and compare well levels with Desired Future Condition target levels.

36.1071 (a) Management Goals Not Applicable to the District

Goal 1.0 Controlling and Preventing Subsidence
The rigid geologic framework of the region precludes significant subsidence from occurring. This goal is not applicable to the operation of the District.

Goal 2.0 Addressing recharge enhancement
The Texas Water Development Board, at the request of the District, completed a study of an area within the District to evaluate the possibility of beneficial artificial recharge of this area of the Hickory Aquifer. Evaluation of the Hickory Aquifer and Its Relationship to Katemcy Creek and Its Major Tributaries for Beneficial Recharge, McCulloch and Mason Counties, Texas, is available in the District Office. This study, along with subsequent studies, does not support an economically feasible recharge program.

Goal 3.0 Addressing precipitation enhancement

The District has investigated participation in the West Texas Weather Modification program which performs cloud-seeding operations out of San Angelo, Texas, but had determined that it is not economically feasible.

Statement of Commitment by Hickory Underground Water Conservation District No. 1, to Effectuation of the District Groundwater Management Plan

The District will implement the provisions of this plan and/or future amendments and will utilize the provisions of this plan, or amended plan, as guidance for implementation of District goals, in promulgating District Rules and selecting, evaluating, and carrying our district programs, activities and hydrogeologic studies.

Bibliography

1 Texas Almanac 2002-2003, 2000 Census Data, The Dallas Morning News
2 "Hickory Water Data" prepared for Hickory UWCD No. 1 by Harden and Associates, August 1986, and aquifer maps obtained from Water for Texas, 1997, TWDB
3 Edwards-Trinity Aquifer information obtained from TWDB website: http://www.twdb.state.tx.us/publications/reports/GroundWaterReports/GWReports/Brackish%20GW%20Manual/08-Edwards-Trinity(Plateau).pdf Report by LBG-Guyton Associates
4 Aquifer maps obtained from Water for Texas, 1997, TWDB
5 Ellenburger-San Saba Aquifer information obtained from TWDB website: http://www.twdb.state.tx.us/publications/reports/GroundWaterReports/GWReports/Brackish%20GW%20Manual/26-Ellenburger-SanSaba.pdf Report by LBG-Guyton Associates
6 Marble Falls Aquifer information obtained from TWDB website: http://www.twdb.state.tx.us/publications/reports/GroundWaterReports/GWReports/Brackish%20GW%20Manual/27-MarbleFalls.pdf Report by LBG-Guyton Associate

APPENDIX

Texas Water Development Board
Estimated Historical Groundwater Use And
2012 State Water Plan Datasets

Hickory Underground Water Conservation District No. 1

Estimated Historical Groundwater Use And 2012 State Water Plan Datasets:

Hickory Underground Water Conservation District No. 1

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November 13, 2013

GROUNDWATER MANAGEMENT PLAN DATA:

This package of water data reports (part 1 of a 2-part package of information) is being provided to groundwater conservation districts to help them meet the requirements for approval of their five-year groundwater management plan. Each report in the package addresses a specific numbered requirement in the Texas Water Development Board's groundwater management plan checklist. The checklist can be viewed and downloaded from this web address:

http://www.twdb.state.tx.us/groundwater/docs/GCD/GMPChecklist0113.pdf

The five reports included in part 1 are:

1. Estimated Historical Groundwater Use (checklist Item 2)
   from the TWDB Historical Water Use Survey (WUS)
2. Projected Surface Water Supplies (checklist Item 6)
3. Projected Water Demands (checklist Item 7)
4. Projected Water Supply Needs (checklist Item 8)
5. Projected Water Management Strategies (checklist Item 9)
   reports 2-5 are from the 2012 State Water Plan (SWP)

Part 2 of the 2-part package is the groundwater availability model (GAM) report. The District should have received, or will receive, this report from the Groundwater Availability Modeling Section. Questions about the GAM can be directed to Dr. Shirley Wade, shirley.wade@twdb.texas.gov, (512) 936-0883.

DISCLAIMER:

The data presented in this report represents the most updated Historical Groundwater Use and 2012 State Water Planning data available as of 11/13/2013. Although it does not happen frequently, neither of these datasets are static and are subject to change pending the availability of more accurate data (Historical Water Use Survey data) or an amendment to the 2012 State Water Plan (2012 State Water Planning data). District personnel must review these datasets and correct any discrepancies in order to ensure approval of their groundwater management plan.

The Historical Water Use dataset can be verified at this web address:

http://www.twdb.texas.gov/waterplanning/waterusesurvey/estimates/

The 2012 State Water Planning dataset can be verified by contacting Sabrina Anderson (sabrina.anderson@twdb.texas.gov or 512-936-0886).

The values presented in the data tables of this report are county-based. In cases where groundwater conservation districts cover only a portion of one or more counties the data values are modified with an apportioning multiplier to create new values that more accurately represent district conditions. The multiplier used as part of the following formula is a land area ratio: (data value * (land area of district in county / land area of county)). For two of the four State Water Plan tables (Projected Surface Water Supplies and Projected Water Demands) only the county-wide water user group (WUG) data values (county other, manufacturing, steam electric power, irrigation, mining and livestock) are modified using the multiplier. WUG values for municipalities, water supply corporations, and utility districts are not apportioned; instead, their full values are retained when they are located within the district, and eliminated when they are located outside (we ask each district to identify these locations).

The two other SWP tables (Projected Water Supply Needs and Projected Water Management Strategies) are not apportioned because district-specific values are not statutorily required. Each district needs only "consider" the county values in those tables.

In the Historical Groundwater Use table every category of water use (including municipal) is apportioned. Staff determined that breaking down the annual municipal values into individual WUGs was too complex.

TWDB recognizes that the apportioning formula used is not perfect but it is the best available process with respect to time and staffing constraints. If a district believes it has data that is more accurate it has the option of including those data in the plan with an explanation of how the data were derived. Apportioning percentages are listed above each applicable table.

For additional questions regarding this data, please contact Stephen Allen (stephen.allen@twdb.texas.gov or 512-463-7317) or Rima Petrossian (rima.petrossian@twdb.texas.gov or 512-936-2420).

Table 1.
Estimated Historical Groundwater Use
TWDB Historical Water Use Survey (WUS) Data

Groundwater historical use estimates are currently unavailable for calendar years 2005, 2011 and 2012. TWDB staff anticipates the calculation and posting of these estimates at a later date.

CONCHO COUNTY

11.44 % (multiplier)

All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	42	0	0	30	0	132	204
1980	GW	54	0	0	46	0	82	182
1984	GW	50	0	0	209	0	53	312
1985	GW	48	0	0	353	0	51	452
1986	GW	47	0	0	282	0	52	381
1987	GW	48	0	0	358	0	59	465
1988	GW	53	0	0	305	0	48	406
1989	GW	54	0	0	344	0	46	444
1990	GW	75	0	0	251	0	50	376
1991	GW	64	0	0	320	0	52	436
1992	GW	83	0	0	317	0	73	473
1993	GW	78	0	0	665	0	78	821
1994	GW	84	0	0	419	0	59	562
1995	GW	74	0	0	576	0	62	712
1996	GW	73	0	0	430	0	54	557
1997	GW	78	0	0	155	0	61	294
1998	GW	79	0	0	384	0	58	521
1999	GW	85	0	0	538	0	58	681
2000	GW	72	0	0	275	0	50	397
2001	GW	66	0	0	225	0	49	340
2002	GW	70	0	0	397	0	50	517
2003	GW	70	0	0	171	0	40	281
2004	GW	69	0	0	208	0	41	318
2006	GW	66	0	0	873	0	33	972
2007	GW	51	0	0	585	0	40	676
2008	GW	50	0	0	1,106	0	28	1,184
2009	GW	51	0	0	138	9	28	226
2010	GW	45	0	0	738	12	26	821

Table 1.
Estimated Historical Groundwater Use
TWDB Historical Water Use Survey (WUS) Data

Groundwater historical use estimates are currently unavailable for calendar years 2005, 2011 and 2012. TWDB staff anticipates the calculation and posting of these estimates at a later date.

KIMBLE COUNTY *2.55 % (multiplier)* All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	21	28	0	34	0	25	108
1980	GW	4	1	0	8	0	15	28
1984	GW	5	2	0	7	2	9	25
1985	GW	5	2	0	8	2	7	24
1986	GW	5	2	0	10	2	8	27
1987	GW	5	2	0	10	2	8	27
1988	GW	5	2	0	9	2	9	27
1989	GW	5	1	0	6	2	9	23
1990	GW	5	1	0	6	2	9	23
1991	GW	5	1	0	6	2	9	23
1992	GW	5	1	0	6	2	10	24
1993	GW	5	0	0	7	2	8	22
1994	GW	5	0	0	6	2	10	23
1995	GW	5	0	0	8	2	10	25
1996	GW	5	0	0	8	2	9	24
1997	GW	5	0	0	6	2	9	22
1998	GW	5	0	0	6	2	9	22
1999	GW	5	0	0	6	2	10	23
2000	GW	5	0	0	1	2	10	18
2001	GW	5	0	0	1	2	9	17
2002	GW	5	0	0	1	2	8	16
2003	GW	5	0	0	1	2	7	15
2004	GW	4	0	0	2	2	8	16
2006	GW	5	0	0	1	0	7	13
2007	GW	5	0	0	12	0	7	24
2008	GW	6	0	0	5	0	6	17
2009	GW	6	0	0	20	0	6	32
2010	GW	6	0	0	14	0	8	28

Table 1.
Estimated Historical Groundwater Use
TWDB Historical Water Use Survey (WUS) Data

Groundwater historical use estimates are currently unavailable for calendar years 2005, 2011 and 2012. TWDB staff anticipates the calculation and posting of these estimates at a later date.

MASON COUNTY *100.00 % (multiplier)* All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	612	4	0	6,304	1	1,239	8,160
1980	GW	728	0	0	15,500	0	633	16,861
1984	GW	755	0	0	13,376	0	547	14,678
1985	GW	741	0	0	16,179	0	503	17,423
1986	GW	574	0	0	16,006	0	564	17,144
1987	GW	787	0	0	14,482	0	530	15,799
1988	GW	657	0	0	18,148	0	492	19,297
1989	GW	649	0	0	17,788	0	485	18,922
1990	GW	723	0	0	16,860	0	494	18,077
1991	GW	712	0	0	17,266	6	513	18,497
1992	GW	754	0	0	12,173	6	628	13,561
1993	GW	856	0	0	13,237	6	560	14,659
1994	GW	842	0	0	12,447	6	471	13,766
1995	GW	824	0	0	11,440	6	484	12,754
1996	GW	951	0	0	10,358	6	476	11,791
1997	GW	817	0	0	9,154	6	471	10,448
1998	GW	880	0	0	8,898	6	466	10,250
1999	GW	919	0	0	8,856	6	493	10,274
2000	GW	889	0	0	10,223	140	350	11,602
2001	GW	825	0	0	9,499	6	396	10,726
2002	GW	915	0	0	9,866	0	327	11,108
2003	GW	752	0	0	9,276	0	515	10,543
2004	GW	595	0	0	9,562	0	524	10,681
2006	GW	854	0	0	6,775	0	936	8,565
2007	GW	626	0	0	3,311	0	742	4,679
2008	GW	748	0	0	5,445	0	738	6,931
2009	GW	812	0	0	6,725	275	650	8,462
2010	GW	814	0	0	3,853	275	426	5,368

Table 1.
Estimated Historical Groundwater Use
TWDB Historical Water Use Survey (WUS) Data

Groundwater historical use estimates are currently unavailable for calendar years 2005, 2011 and 2012. TWDB staff anticipates the calculation and posting of these estimates at a later date.

MCCULLOCH COUNTY

72.92 % (multiplier)

All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	1,445	176	0	1,224	123	995	3,963
1980	GW	1,905	1,272	0	1,677	0	626	5,480
1984	GW	1,913	1,854	0	2,395	93	432	6,687
1985	GW	1,738	666	0	2,551	93	456	5,504
1986	GW	1,566	801	0	2,256	98	399	5,120
1987	GW	1,877	299	0	2,476	82	330	5,064
1988	GW	1,937	524	0	1,886	86	357	4,790
1989	GW	2,169	561	0	1,842	86	351	5,009
1990	GW	1,905	570	0	1,510	86	349	4,420
1991	GW	1,830	416	0	1,510	102	360	4,218
1992	GW	1,767	577	0	1,127	102	597	4,170
1993	GW	2,018	255	0	2,083	102	572	5,030
1994	GW	2,065	416	0	1,895	102	531	5,009
1995	GW	1,850	488	0	1,841	102	537	4,818
1996	GW	1,975	606	0	1,094	102	437	4,214
1997	GW	1,967	575	0	1,151	102	494	4,289
1998	GW	1,905	518	0	1,465	102	462	4,452
1999	GW	2,105	31	0	1,465	102	454	4,157
2000	GW	2,112	496	0	2,034	17	545	5,204
2001	GW	1,280	550	0	1,487	102	395	3,814
2002	GW	1,278	389	0	1,516	102	478	3,763
2003	GW	1,372	542	0	2,527	102	363	4,906
2004	GW	1,361	564	0	2,297	102	363	4,687
2006	GW	1,862	1,805	0	2,146	0	359	6,172
2007	GW	1,769	1,674	0	1,308	0	376	5,127
2008	GW	906	1,655	0	560	0	384	3,505
2009	GW	770	1	0	2,451	2,510	416	6,148
2010	GW	745	1	0	1,770	3,709	686	6,911

Table 1.
Estimated Historical Groundwater Use
TWDB Historical Water Use Survey (WUS) Data

Groundwater historical use estimates are currently unavailable for calendar years 2005, 2011 and 2012. TWDB staff anticipates the calculation and posting of these estimates at a later date.

MENARD COUNTY

13.51 % (multiplier)

All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	14	0	0	43	0	110	167
1980	GW	10	0	0	14	0	72	96
1984	GW	10	0	0	22	0	39	71
1985	GW	9	0	0	16	0	42	67
1986	GW	10	0	0	81	0	38	129
1987	GW	11	0	0	64	0	38	113
1988	GW	10	0	0	54	0	40	104
1989	GW	9	0	0	40	0	39	88
1990	GW	9	0	0	54	0	40	103
1991	GW	8	0	0	69	0	42	119
1992	GW	10	0	0	92	0	53	155
1993	GW	11	0	0	81	0	52	144
1994	GW	11	0	0	73	0	61	145
1995	GW	11	0	0	73	0	54	138
1996	GW	10	0	0	62	0	51	123
1997	GW	10	0	0	61	0	50	121
1998	GW	10	0	0	59	0	44	113
1999	GW	11	0	0	85	0	43	139
2000	GW	47	0	0	50	0	45	142
2001	GW	44	0	0	57	0	45	146
2002	GW	43	0	0	57	0	40	140
2003	GW	41	0	0	25	0	43	109
2004	GW	33	0	0	19	0	43	95
2006	GW	45	0	0	211	0	46	302
2007	GW	41	0	0	143	0	47	231
2008	GW	41	0	0	0	0	40	81
2009	GW	47	0	0	110	14	45	216
2010	GW	12	0	0	115	28	37	192

Table 1.
Estimated Historical Groundwater Use
TWDB Historical Water Use Survey (WUS) Data

Groundwater historical use estimates are currently unavailable for calendar years 2005, 2011 and 2012. TWDB staff anticipates the calculation and posting of these estimates at a later date.

SAN SABA COUNTY

55.88 % (multiplier)

All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	427	25	0	913	12	996	2,373
1980	GW	609	137	0	699	0	626	2,071
1984	GW	254	137	0	517	54	500	1,462
1985	GW	207	137	0	1,037	54	457	1,892
1986	GW	215	137	0	346	56	556	1,310
1987	GW	171	0	0	404	47	491	1,113
1988	GW	223	9	0	323	51	515	1,121
1989	GW	220	0	0	497	48	506	1,271
1990	GW	203	0	0	320	48	501	1,072
1991	GW	192	0	0	320	91	515	1,118
1992	GW	526	0	0	0	91	536	1,153
1993	GW	170	5	0	348	91	526	1,140
1994	GW	605	6	0	299	91	535	1,536
1995	GW	615	6	0	351	91	541	1,604
1996	GW	566	6	0	399	91	779	1,841
1997	GW	624	6	0	616	91	553	1,890
1998	GW	599	9	0	0	91	510	1,209
1999	GW	581	13	0	0	91	483	1,168
2000	GW	650	13	0	257	91	533	1,544
2001	GW	580	13	0	198	91	490	1,372
2002	GW	592	13	0	206	91	490	1,392
2003	GW	747	4	0	420	91	484	1,746
2004	GW	722	4	0	607	91	496	1,920
2006	GW	643	1	0	500	0	205	1,349
2007	GW	575	1	0	801	0	284	1,661
2008	GW	734	5	0	139	0	205	1,083
2009	GW	741	1	0	1,748	221	205	2,916
2010	GW	748	1	0	800	226	193	1,968

Table 2.
Projected Surface Water Supplies
TWDB 2012 State Water Plan Data

CONCHO COUNTY

11.44 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	CONCHO RIVER RUN -OF-RIVER CITY OF PAINT ROCK	4	4	4	4	4	4
F	IRRIGATION	COLORADO	CONCHO RIVER COMBINED RUN-OF-RIVER IRRIGATION	26	26	26	26	26	26
F	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	14	14	14	14	14	14
F	MILLERSVIEW-DOOLE WSC	COLORADO	COLORADO RIVER MWD LAKE/RESERVOIR SYSTEM						
	Sum of Projected Surface Water Supplies (acre-feet/year)			**44**	**44**	**44**	**44**	**44**	**44**

KIMBLE COUNTY

2.55 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	LLANO RIVER RUN-OF-RIVER CITY OF JUNCTION	0	0	0	0	0	0
F	IRRIGATION	COLORADO	LLANO RIVER COMBINED RUN-OF-RIVER IRRIGATION	38	38	38	38	38	38
F	JUNCTION	COLORADO	LLANO RIVER RUN-OF-RIVER CITY OF JUNCTION						
F	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	2	2	2	2	2	2
F	MANUFACTURING	COLORADO	LLANO RIVER COMBINED RUN-OF-RIVER MANUFACTURING	0	0	0	0	0	0
F	MINING	COLORADO	LLANO RIVER COMBINED RUN-OF-RIVER MINING	0	0	0	0	0	0
	Sum of Projected Surface Water Supplies (acre-feet/year)			**40**	**40**	**40**	**40**	**40**	**40**

Table 2.
Projected Surface Water Supplies
TWDB 2012 State Water Plan Data

MASON COUNTY

100.00 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
F	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	451	451	451	451	451	451
	Sum of Projected Surface Water Supplies (acre-feet/year)			**451**	**451**	**451**	**451**	**451**	**451**

MCCULLOCH COUNTY

72.92 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
F	BRADY	COLORADO	BRADY CREEK LAKE/RESERVOIR	0	0	0	0	0	0
F	IRRIGATION	COLORADO	COLORADO RIVER COMBINED RUN-OF-RIVER IRRIGATION	93	93	93	93	93	93
F	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	120	120	120	120	120	120
F	MANUFACTURING	COLORADO	BRADY CREEK LAKE/RESERVOIR	0	0	0	0	0	0
F	MILLERSVIEW-DOOLE WSC	COLORADO	COLORADO RIVER MWD LAKE/RESERVOIR SYSTEM						
	Sum of Projected Surface Water Supplies (acre-feet/year)			**213**	**213**	**213**	**213**	**213**	**213**

MENARD COUNTY

13.51 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	SAN SABA RIVER RUN-OF-RIVER CITY OF MENARD	0	0	0	0	0	0
F	IRRIGATION	COLORADO	SAN SABA RIVER COMBINED RUN-OF-RIVER IRRIGATION	396	396	396	396	396	396
F	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	12	12	12	12	12	12
F	MENARD	COLORADO	SAN SABA RIVER RUN-OF-RIVER CITY OF MENARD						
	Sum of Projected Surface Water Supplies (acre-feet/year)			**408**	**408**	**408**	**408**	**408**	**408**

Table 2.
Projected Surface Water Supplies
TWDB 2012 State Water Plan Data

SAN SABA COUNTY

55.88 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
K	COUNTY-OTHER	COLORADO	HIGHLAND LAKES LAKE/RESERVOIR SYSTEM	11	11	11	11	11	11
K	IRRIGATION	COLORADO	COLORADO RIVER COMBINED RUN-OF-RIVER IRRIGATION	4,917	4,917	4,917	4,917	4,917	4,917
K	LIVESTOCK	COLORADO	LIVESTOCK LOCAL SUPPLY	125	125	125	125	125	125
	Sum of Projected Surface Water Supplies (acre-feet/year)			**5,053**	**5,053**	**5,053**	**5,053**	**5,053**	**5,053**

Table 3.
Projected Water Demands
TWDB 2012 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

CONCHO COUNTY

11.44 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	22	22	22	22	22	22
F	EDEN	COLORADO	559	572	569	562	559	559
F	IRRIGATION	COLORADO	492	490	488	486	484	482
F	LIVESTOCK	COLORADO	89	89	89	89	89	89
F	MILLERSVIEW-DOOLE WSC	COLORADO						
	Sum of Projected Water Demands (acre-feet/year)		**1,162**	**1,173**	**1,168**	**1,159**	**1,154**	**1,152**

KIMBLE COUNTY

2.55 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	LIVESTOCK	COLORADO	17	17	17	17	17	17
F	IRRIGATION	COLORADO	25	24	23	22	21	21
F	MINING	COLORADO	2	2	2	2	2	2
F	JUNCTION	COLORADO						
F	MANUFACTURING	COLORADO	18	20	21	22	24	26
F	COUNTY-OTHER	COLORADO	5	5	5	5	5	5
	Sum of Projected Water Demands (acre-feet/year)		**67**	**68**	**68**	**68**	**69**	**71**

MASON COUNTY

100.00 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	MASON	COLORADO	742	739	733	727	722	723
F	IRRIGATION	COLORADO	10,079	9,936	9,792	9,648	9,505	9,363
F	LIVESTOCK	COLORADO	1,036	1,036	1,036	1,036	1,036	1,036
F	COUNTY-OTHER	COLORADO	190	187	183	178	176	177
F	MINING	COLORADO	6	6	6	6	6	6
	Sum of Projected Water Demands (acre-feet/year)		**12,053**	**11,904**	**11,750**	**11,595**	**11,445**	**11,305**

Table 3.
Projected Water Demands
TWDB 2012 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

MCCULLOCH COUNTY

72.92 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	MILLERSVIEW-DOOLE WSC	COLORADO	248	245	239	230	228	228
F	RICHLAND SUD	COLORADO	113	113	111	109	108	108
F	BRADY	COLORADO	1,879	1,893	1,874	1,854	1,842	1,842
F	LIVESTOCK	COLORADO	749	749	749	749	749	749
F	MINING	COLORADO	112	116	118	120	123	125
F	IRRIGATION	COLORADO	2,059	2,034	2,008	1,982	1,956	1,932
F	MANUFACTURING	COLORADO	615	677	732	784	829	899
F	COUNTY-OTHER	COLORADO	9	9	9	9	9	9
	Sum of Projected Water Demands (acre-feet/year)		**5,784**	**5,836**	**5,840**	**5,837**	**5,844**	**5,892**

MENARD COUNTY

13.51 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	14	14	13	13	13	13
F	IRRIGATION	COLORADO	819	816	814	811	808	805
F	MENARD	COLORADO						
F	LIVESTOCK	COLORADO	87	87	87	87	87	87
	Sum of Projected Water Demands (acre-feet/year)		**920**	**917**	**914**	**911**	**908**	**905**

SAN SABA COUNTY

55.88 % (multiplier)

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	SAN SABA	COLORADO	884	877	869	862	856	856
K	COUNTY-OTHER	COLORADO	127	134	141	148	146	148
K	MINING	COLORADO	91	91	91	91	91	91
K	IRRIGATION	COLORADO	1,811	1,752	1,696	1,641	1,588	1,536
K	LIVESTOCK	COLORADO	666	666	666	666	666	666
K	MANUFACTURING	COLORADO	16	17	17	18	18	20
K	RICHLAND SUD	COLORADO	188	199	207	213	213	215
	Sum of Projected Water Demands (acre-feet/year)		**3,783**	**3,736**	**3,687**	**3,639**	**3,578**	**3,532**

Table 4.
Projected Water Supply Needs
TWDB 2012 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

CONCHO COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	31	28	30	32	33	33
F	EDEN	COLORADO	95	224	227	234	237	237
F	IRRIGATION	COLORADO	968	985	1,003	1,020	1,036	1,052
F	LIVESTOCK	COLORADO	0	0	0	0	0	0
F	MILLERSVIEW-DOOLE WSC	COLORADO	-4	-8	14	13	-42	-42
	Sum of Projected Water Supply Needs (acre-feet/year)		**-4**	**-8**	**0**	**0**	**-42**	**-42**

KIMBLE COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	-9	-7	-3	4	6	6
F	IRRIGATION	COLORADO	786	823	858	894	930	964
F	JUNCTION	COLORADO	-936	-935	-926	-917	-910	-910
F	LIVESTOCK	COLORADO	0	0	0	0	0	0
F	MANUFACTURING	COLORADO	-699	-764	-820	-877	-929	-999
F	MINING	COLORADO	33	37	39	41	43	44
	Sum of Projected Water Supply Needs (acre-feet/year)		**-1,644**	**-1,706**	**-1,749**	**-1,794**	**-1,839**	**-1,909**

MASON COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	0	3	7	12	14	13
F	IRRIGATION	COLORADO	6,020	6,163	6,307	6,451	6,594	6,736
F	LIVESTOCK	COLORADO	0	0	0	0	0	0
F	MASON	COLORADO	24	26	33	39	44	43
F	MINING	COLORADO	0	0	0	0	0	0
	Sum of Projected Water Supply Needs (acre-feet/year)		**0**	**0**	**0**	**0**	**0**	**0**

Table 4.
Projected Water Supply Needs
TWDB 2012 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

MCCULLOCH COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	BRADY	COLORADO	-995	-1,009	-990	-970	-958	-958
F	COUNTY-OTHER	COLORADO	0	0	0	0	0	0
F	IRRIGATION	COLORADO	3,279	3,314	3,349	3,385	3,420	3,454
F	LIVESTOCK	COLORADO	0	0	0	0	0	0
F	MANUFACTURING	COLORADO	0	0	0	0	0	0
F	MILLERSVIEW-DOOLE WSC	COLORADO	-9	-15	28	26	-80	-80
F	MINING	COLORADO	0	0	0	0	0	0
F	RICHLAND SUD	COLORADO	73	73	75	77	78	78
	Sum of Projected Water Supply Needs (acre-feet/year)		**-1,004**	**-1,024**	**-990**	**-970**	**-1,038**	**-1,038**

MENARD COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
F	COUNTY-OTHER	COLORADO	-20	-21	-19	-17	-16	-16
F	IRRIGATION	COLORADO	-2,441	-2,421	-2,402	-2,383	-2,361	-2,342
F	LIVESTOCK	COLORADO	0	0	0	0	0	0
F	MENARD	COLORADO	-50	-49	-43	-37	-35	-35
	Sum of Projected Water Supply Needs (acre-feet/year)		**-2,511**	**-2,491**	**-2,464**	**-2,437**	**-2,412**	**-2,393**

SAN SABA COUNTY

All values are in acre-feet/year

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
K	COUNTY-OTHER	COLORADO	7,837	7,824	7,812	7,800	7,802	7,799
K	IRRIGATION	COLORADO	14,918	15,022	15,123	15,221	15,317	15,409
K	LIVESTOCK	COLORADO	2,639	2,639	2,639	2,639	2,639	2,639
K	MANUFACTURING	COLORADO	2,728	2,726	2,725	2,724	2,723	2,721
K	MINING	COLORADO	1,376	1,376	1,376	1,376	1,376	1,376
K	RICHLAND SUD	COLORADO	22	11	3	-3	-3	-5
K	SAN SABA	COLORADO	1,356	1,363	1,371	1,378	1,384	1,384
	Sum of Projected Water Supply Needs (acre-feet/year)		**0**	**0**	**0**	**-3**	**-3**	**-5**

Table 5.
Projected Water Management Strategies
TWDB 2012 State Water Plan Data

CONCHO COUNTY

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
COUNTY-OTHER, COLORADO (F)							
SUBORDINATION	OC FISHER LAKE/RESERVOIR SAN ANGELO SYSTEM [RESERVOIR]	25	25	25	25	25	25
EDEN, COLORADO (F)							
ADVANCED TREATMENT	HICKORY AQUIFER [CONCHO]	0	0	0	0	0	0
REPLACEMENT WELL	HICKORY AQUIFER [CONCHO]	0	0	0	0	0	0
IRRIGATION, COLORADO (F)							
IRRIGATION CONSERVATION	CONSERVATION [CONCHO]	0	748	1,496	1,496	1,496	1,496
MILLERSVIEW-DOOLE WSC, COLORADO (F)							
NEW/RENEW WATER SUPPLY	COLORADO RIVER MWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	0	0	0	74	74
SUBORDINATION	COLORADO RIVER MWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	34	42	1	7	0	0
Sum of Projected Water Management Strategies (acre-feet/year)		**59**	**815**	**1,522**	**1,528**	**1,595**	**1,595**

KIMBLE COUNTY

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
COUNTY-OTHER, COLORADO (F)							
SUBORDINATION	LLANO RIVER RUN-OF-RIVER CITY OF JUNCTION [KIMBLE]	9	9	9	9	9	9
IRRIGATION, COLORADO (F)							
IRRIGATION CONSERVATION	CONSERVATION [KIMBLE]	0	74	147	147	147	147

Table 5.
Projected Water Management Strategies
TWDB 2012 State Water Plan Data

WUG, Basin (RWPG) / Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
JUNCTION, COLORADO (F)							
SUBORDINATION	LLANO RIVER RUN-OF-RIVER CITY OF JUNCTION [KIMBLE]	991	991	991	991	991	991
MANUFACTURING, COLORADO (F)							
SUBORDINATION	LLANO RIVER COMBINED RUN-OF-RIVER MANUFACTURING [KIMBLE]	1,000	1,000	1,000	1,000	1,000	1,000
Sum of Projected Water Management Strategies (acre-feet/year)		**2,000**	**2,074**	**2,147**	**2,147**	**2,147**	**2,147**

MASON COUNTY

All values are in acre-feet/year

WUG, Basin (RWPG) / Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
IRRIGATION, COLORADO (F)							
IRRIGATION CONSERVATION	CONSERVATION [MASON]	0	746	1,491	1,491	1,491	1,491
Sum of Projected Water Management Strategies (acre-feet/year)		**0**	**746**	**1,491**	**1,491**	**1,491**	**1,491**

MCCULLOCH COUNTY

All values are in acre-feet/year

WUG, Basin (RWPG) / Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
BRADY, COLORADO (F)							
MUNICIPAL CONSERVATION	CONSERVATION [MCCULLOCH]	77	192	214	222	230	239
SUBORDINATION	BRADY CREEK LAKE/RESERVOIR [RESERVOIR]	2,170	2,170	2,170	2,170	2,170	2,170
COUNTY-OTHER, COLORADO (F)							
BOTTLED WATER PROGRAM	HICKORY AQUIFER [MCCULLOCH]	0	0	0	0	0	0
IRRIGATION, COLORADO (F)							
IRRIGATION CONSERVATION	CONSERVATION [MCCULLOCH]	0	197	394	394	394	394

Table 5.
Projected Water Management Strategies
TWDB 2012 State Water Plan Data

WUG, Basin (RWPG)

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
MILLERSVIEW-DOOLE WSC, COLORADO (F)							
NEW/RENEW WATER SUPPLY	COLORADO RIVER MWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	0	0	0	143	143
SUBORDINATION	COLORADO RIVER MWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	67	81	1	14	0	0
RICHLAND SUD, COLORADO (F)							
BOTTLED WATER PROGRAM	HICKORY AQUIFER [MCCULLOCH]	1	1	1	1	1	1
DEVELOP ELLENBURGER AQUIFER SUPPLIES	ELLENBURGER-SAN SABA AQUIFER [SAN SABA]	0	200	200	200	200	200
REPLACEMENT WELL	HICKORY AQUIFER [MCCULLOCH]	0	0	0	0	0	0
Sum of Projected Water Management Strategies (acre-feet/year)		**2,315**	**2,841**	**2,980**	**3,001**	**3,138**	**3,147**

MENARD COUNTY

WUG, Basin (RWPG)

All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
COUNTY-OTHER, COLORADO (F)							
DEVELOP HICKORY AQUIFER SUPPLIES	HICKORY AQUIFER [MENARD]	20	21	20	20	19	19
IRRIGATION, COLORADO (F)							
IRRIGATION CONSERVATION	CONSERVATION [MENARD]	0	23	46	46	46	46
MENARD, COLORADO (F)							
DEVELOP HICKORY AQUIFER SUPPLIES	HICKORY AQUIFER [MENARD]	140	139	140	140	141	141
MUNICIPAL CONSERVATION	CONSERVATION [MENARD]	10	24	28	30	32	33
Sum of Projected Water Management Strategies (acre-feet/year)		**170**	**207**	**234**	**236**	**238**	**239**

Table 5.
Projected Water Management Strategies
TWDB 2012 State Water Plan Data

SAN SABA COUNTY

WUG, Basin (RWPG) All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
RICHLAND SUD, COLORADO (K)							
MUNICIPAL CONSERVATION	CONSERVATION [SAN SABA]	13	22	19	15	14	15
Sum of Projected Water Management Strategies (acre-feet/year)		**13**	**22**	**19**	**15**	**14**	**15**