

LBG-GUYTON ASSOCIATES
PROFESSIONAL GROUNDWATER AND
ENVIRONMENTAL ENGINEERING

1101 CAPITAL OF TEXAS HIGHWAY, SUITE B-220
AUSTIN, TX 78746
512-327-9640
FAX: 512-327-5573
www.lbgweb.com

To: Freese and Nichols, Inc.

From: Jennifer Herrera and James Beach, PG.

Date: November 8, 2017

Subject: **Region F 2021 Non-Municipal Water Demand Projection Revisions**

Executive Summary

This memo presents the proposed changes to the non-municipal water demand projections for the 2021 Region F Water Plan. It is the desire of the Region F Water Planning Group that the Texas Water Development Board review preliminary data for pre-approval prior to the final adoption and submittal of the revision package due Jan. 12, 2018.

Manufacturing

- Ector County – slight increase due to documented increased demands.
- McCulloch County – 450 af/yr increase based on a new cement plant.
- Pecos County - 161 af/yr increase based on a new refinery.
- Tom Green County – demand decreased 1,313 af/yr due to loss of San Angelo Electric Service Company.

Mining

- Pecos County – demand increased on average 6,698 af/yr based on District pumping data and Fort Stockton’s contract with WaterBridge
- Reeves County – demand increased on average 5,987 af/yr based on Fort Stockton’s contract with WaterBridge and inclusion of county’s estimated brackish water use.
- Ward County – demand increased on average 5,270 af/yr based on Fort Stockton’s contract with WaterBridge and inclusion of county’s estimated brackish water use.
- Midland County – demand increased on average 2,238 af/yr based on Pioneer Resources contracts with the Cities of Midland and Odessa.
- Martin County – demand increased on average 2,139 af/yr based on Pioneer Resources contracts with the Cities of Midland and Odessa.
- Reagan County – demand increased on average 1,986 af/yr based on Pioneer Resources contracts with the Cities of Midland and Odessa.
- Upton County – demand increased on average 2,233 af/yr based on Pioneer Resources contracts with the Cities of Midland and Odessa.
- Ector County – demand increased on average 2,350 af/yr based on City of Odessa’s contract with Gulf Coast Authority, which sells to Concho Resources.
- Irion County – slight increase in 2020 demand based on District data.

Manufacturing

Ector County:

- Thomas Kerr (Utility Director) with the City of Odessa reports that the City is currently providing approximately 450 acre-feet per year of supply to manufacturing. The City also has a contract to provide Rextac, a petrochemical facility that produces adhesives and polymers, with 1,452 acre-feet per year of water supply.
- Historical water use data provided by Texland Great Plains indicates a manufacturing water use for refinery purposes of 250 acre-feet per year.

Based on the historical sales and contracts for Odessa and Texland Great Plains, it is recommended that the manufacturing demands for Ector County be adjusted as shown on the table below. The growth in manufacturing demands for 2030 is estimated at the same rate of growth from the TWDB draft demands (11% increase from 2020).

Ector County	2020	2030	2040	2050	2060	2070
TWDB Draft	1,932	2,138	2,138	2,138	2,138	2,138
Revised	2,152	2,381	2,381	2,381	2,381	2,381

McCulloch County:

- The City of Brady is anticipating the development of a new cement plant called US Cement by 2020. The site is located approximately seven miles north of the City off US 377. At production, the facility is anticipated to use approximately 450 acre-feet per year. Based on this updated information, it is recommended that the manufacturing water demands for McCulloch County be adjusted as shown on the table below.

McCulloch County	2020	2030	2040	2050	2060	2070
TWDB Draft	73	85	85	85	85	85
Revised	523	609	609	609	609	609

Pecos County:

MMEX Resources is currently in the process of building a state-of-the-art refinery in Pecos County located approximately 20 miles northeast of Fort Stockton. They have estimated a water use of 100 gallons/minute, roughly 161 acre-feet per year. This will become the highest county aggregated water use. The recommended changes to include this new growth for manufacturing demands in Pecos County is presented in the table below.

Pecos County	2020	2030	2040	2050	2060	2070
TWDB Draft	252	264	264	264	264	264
Revised	413	433	433	433	433	433

Tom Green County:

2010-2015 historical water use estimates for manufacturing in Tom Green County presents a manufacturing facility that closed in 2011. TWDB confirmed that San Angelo Electric Service Company in 2010 had a water use estimate of approximately 1,313 acre-feet per year, but the facility and its use does not appear within the data between 2011-2015. It is recommended that the manufacturing water demands for Tom Green County be adjusted as shown below. The 2020 water demand reflects the historical water use estimate recorded in 2011. The growth in manufacturing demands for 2030 is estimated at the same rate of growth from the TWDB draft demands (13% increase from 2020).

Tom Green County	2020	2030	2040	2050	2060	2070
TWDB Draft	1,966	2,224	2,224	2,224	2,224	2,224
Revised	850	962	962	962	962	962

Mining

Pecos County:

- The Middle Pecos GCD (MPGCD) reports the following water demand volumes being produced from within Pecos County:
 - 2014 – 2,622 acre-feet per year
 - 2015 – 1,938 acre-feet per year
 - 2016 – 2,173 acre-feet per year
 - 2017 – 5,924 acre-feet per year (as of Oct. 27, 2017)
- The City of Fort Stockton has recently signed an agreement with WaterBridge which established municipal water service by the City to WaterBridge. The agreement is currently in place and water sales have already occurred. The water purchase sale agreement states that the City will supply WaterBridge with up to 18,000 acre-feet per year. The City completed it's first water sales transaction on August 28, 2017. Water from this agreement will be supplied to the following three counties where the demand exists: Reeves, Pecos and Ward.

Based on the historic pumpage and contracts for MPGCD and the City of Fort Stockton, it is recommended that the mining demands for Pecos County be adjusted as shown on the table below. The water demand projections by the MPGCD shown in the table below is the average of water use between 2014-2017. The WaterBridge agreement amount was decreased between 2040 and 2050 and estimated at the same rate of decline from the TWDB draft demands (20% decrease from 2040). A line for brackish water use was included for the planning groups review. This amount was calculated by taking the average of the historical water use estimates between 2010-2015. In Pecos County, the TWDB brackish water demand is not a separate calculation. The GCD calculation has included this brackish water demand into their estimates.

Pecos County	2020	2030	2040	2050	2060	2070
TWDB Draft	690	1,068	1,072	861	672	524
Mining use estimated by MPGCD	3,164	3,164	3,164	2,541	1,983	1,546
WaterBridge	6,000	6,000	6,000	4,819	3,761	2,933
Revised	9,164	9,164	9,164	7,360	5,744	4,479

Note: TWDB draft volumes in orange are provided only as reference but are not included in the totals.

Reeves County: (see recommendations above)

The WaterBridge agreement amount was decreased between 2040 and 2050 and estimated at the same rate of decline from the TWDB draft demands (18% decrease from 2040).

Reeves County	2020	2030	2040	2050	2060	2070
TWDB Draft	1,531	2,632	2,537	2,068	1,632	1,288
WaterBridge	6,000	6,000	6,000	4,891	3,860	3,046
Brackish Water Use	3,587	3,587	3,587	2,924	2,308	1,822
Revised	9,587	9,587	9,587	7,815	6,168	4,868

Note: TWDB draft volumes in orange are provided only as reference but are not included in the totals.

Ward County: (see recommendations above)

The WaterBridge agreement amount was decreased between 2040 and 2050 and estimated at the same rate of decline from the TWDB draft demands (23% decrease from 2040).

Ward County	2020	2030	2040	2050	2060	2070
TWDB Draft	797	964	840	645	458	329
WaterBridge	6,000	6,000	6,000	4,607	3,271	2,350
Brackish Water Use	940	940	940	722	513	368
Revised	6,940	9,940	6,940	5,329	3,784	2,718

Note: TWDB draft volumes in orange are provided only as reference but are not included in the totals.

Mining Demand met with City of Odessa and City of Midland Effluent

The City of Midland has a contract to sell their effluent to Pioneer Resources for mining purposes. The contract is for up to 15 MGD but will be limited by actual wastewater flow, which is expected to be less than the contract amount based on conversations with Pioneer personnel and the City of Midland. Supplies from Midland’s improved treatment plant are expected to be available in 2020. In addition, the City of Odessa currently has a contract to sell up to 6 MGD to Pioneer Resources, but this is also limited to actual wastewater flows, which are somewhat less. The total expected average annual supply from the two cities to Pioneer by 2020 is about 12,320 acre-feet per year. Conversations with Pioneer indicate that the pipeline network can currently move water to meet mining demands in four counties: Martin, Midland, Reagan and Upton. Based on the City’s contract with Pioneer Resources, it is recommended that the mining demands for these four counties be adjusted as shown on the tables below. Revisions include an equal split of the full 12,320 af/yr between the four counties.

Midland County:

- The contract amount was decreased between 2040 and 2050 and estimated at the same rate of decline from the TWDB draft demands (33% decrease from 2040).

Midland County	2020	2030	2040	2050	2060	2070
TWDB Draft	3,893	3,418	2,630	1,774	1,056	743
Pioneer Resources	3,080	3,080	3,080	2,078	1,237	870
Revised	6,973	6,498	5,710	3,852	2,293	1,613

Martin County: (see recommendations above)

The contract amount was decreased between 2040 and 2050 and estimated at the same rate of decline from the TWDB draft demands (36% decrease from 2040).

Martin County	2020	2030	2040	2050	2060	2070
TWDB Draft	3,527	2,998	2,251	1,441	771	413
Pioneer Resources	3,080	3,080	3,080	1,972	1,055	565
Revised	6,607	6,078	5,331	3,413	1,829	978

Reagan County: (see recommendations above)

The contract amount was decreased between 2040 and 2050 and estimated at the same rate of decline from the TWDB draft demands (43% decrease from 2040).

Reagan County	2020	2030	2040	2050	2060	2070
TWDB Draft	4,211	3,395	2,457	1,406	529	199
Pioneer Resources	3,080	3,080	3,080	1,762	663	249
Revised	7,291	6,475	5,537	3,168	1,192	448

Upton County: (see recommendations above)

The contract amount was decreased between 2040 and 2050 and estimated at the same rate of decline from the TWDB draft demands (33% decrease from 2040).

Upton County	2020	2030	2040	2050	2060	2070
TWDB Draft	4,237	3,634	2,873	1,926	1,150	803
Pioneer Resources	3,080	3,080	3,080	2,065	1,233	861
Revised	7,317	6,714	5,953	3,991	2,383	1,664

Ector County:

The City of Odessa produces approximately 8.5 MGD of wastewater effluent. 2.5 MGD (2,800 acre-feet per year) is diverted to the Gulf Coast Authority who then treats it and sells it to the Concho Oil Company. Based on this contract, it is recommended that the mining demands for Ector County be adjusted as shown on the table below. The contract amount was decreased between 2040 and 2050 and estimated at the same rate of decline from the TWDB draft demands (18% decrease from 2040).

Ector County	2020	2030	2040	2050	2060	2070
TWDB Draft	1,977	2,164	1,926	1,574	1,272	1,076
Concho Oil Company	2,800	2,800	2,800	2,288	1,849	1,564
Revised	4,777	4,964	4,726	3,862	3,121	2,640

Irion County:

- Scott Holland with Irion County GCD compiled volumes reported in FRAC Focus between 2013-2016. Based on the average use reported in Frac Focus during that period, we request a slight revision to the 2020 mining water demand projection as shown in the table below.

Irion County	2020	2030	2040	2050	2060	2070
TWDB Draft	3,192	3,357	2,423	1,487	713	342
FRAC Focus Average	3,275	-	-	-	-	-
Revised	3,275	3,357	2,423	1,487	713	342