

Section 1

Background, Introduction, Objectives, Methods, and Data

1.1 Background and Introduction

By early 2008, two (2) 110 million gallons per year capacity ethanol production plants had been constructed in Deaf Smith County, one (1) 110 million gallons of ethanol production capacity per year plant had been constructed in Hockley County, and a 40 million gallons per year plant had been located in Hale County of the Llano Estacado Water Planning Region (Region O). In addition, there are regular announcements of new dairies being located in Bailey, Castro, Deaf Smith, Hale, Hockley, Lamb, Lubbock, Parmer, and Terry Counties. These are new industries for the region for which water supplies were not included in previous regional water plans for either of these water using enterprises, the population that will supply the labor, or the input support industries, including irrigation water for the production of grain and forage crops to supply raw materials to either or both of these new and in the case of dairies, expanded sectors.

In view of the fact that some municipal water supplies are obtained from areas of Region A to meet projected municipal needs in Region O, it is essential that the Llano Estacado Regional Water Planning Group (Region O) and Panhandle Regional Water Planning Group (Region A) coordinate and communicate regional water planning activities and work. In order to more efficiently accomplish necessary coordination, it is proposed that interactive video conferencing methods and facilities be evaluated as a means of facilitating coordination meetings of Regions A and O.

The purposes of this Region O 2011 Regional Water Planning Phase I study are related to develop estimates of water demands for the new ethanol and dairy water users, to evaluate potential sources of water supply from the Dockum Aquifer of the six county area, and to evaluate interactive video conferencing as a mean to facilitate interregional coordination.

1.2 Objectives

The specific objectives are as follows:

- a. Estimate additional quantities of water demand (manufacturing and dairy water demand) for operation of the new ethanol plants, dairies, and supporting manufacturing establishments of Bailey, Castro, Deaf Smith, Hale, Hockley,

- Lamb, Lubbock, Parmer, and Terry Counties, with projections by decade from 2010 to 2060, and provide increased total for Region O;¹
- b. Estimate additional population in Bailey, Castro, Deaf Smith, Hale, Hockley, Lamb, Lubbock, Parmer, and Terry Counties, including cities of each county, with projections by decade from 2010 to 2060, and provide increased total for Region O, resulting from new employment opportunities from the ethanol and dairy expansions;
 - c. Estimate additional quantities of municipal water needed to meet the needs of additional population of Bailey, Castro, Deaf Smith, Hale, Hockley, Lamb, Lubbock, Parmer, and Terry Counties, including cities of each county, with projections by decade from 2010 to 2060, and provide increased total for Region O;
 - d. Estimate additional quantities of irrigation water demand for production of crops to supply inputs (grain and forage) to the new ethanol plants and additional dairies in Bailey, Castro, Deaf Smith, Hale, Hockley, Lamb, Lubbock, Parmer, and Terry Counties with projections by decade from 2010 to 2060, and provide increased total for Region O; and
 - e. Compute total of estimates, with projections from 2010 to 2060, of additional municipal, manufacturing, livestock and dairies, irrigation water demand in Bailey, Castro, Deaf Smith, Hale, Hockley, Lamb, Lubbock, Parmer, and Terry Counties, with projections by decade from 2010 to 2060, and provide increased total for Region O.
 - f. Estimate groundwater availability from the Dockum Aquifer in the six county area on the basis of (i) information compiled by the team preparing the Dockum GAM, and (ii) TWDB Report 359, "The Groundwater Resources of the Dockum Aquifer in Texas;"
 - g. Estimate numbers and costs to drill and equip wells in the Dockum Formation to meet projected municipal, manufacturing, livestock, and irrigation needs;
 - h. Estimate salinity of Dockum groundwater and select desalination process;
 - i. Estimate costs to desalt water from the Dockum for
 1. Salinity levels ranging from 1,500 ppm to 5,000 ppm of TDS (Total Dissolved Solids) and dispose of brine concentrate, and
 2. Desalt plant capacities of 0.2 MGD, 1 MGD, 3 MGD, and 10 MGD;
 - j. Estimate environmental effects of Water Management Strategies using Dockum Aquifer Water to meet increased water demand,
 - k. Identify and describe Interactive Video Conferencing Services needed by Regions A and O for coordination of regional water planning:
 1. Identify existing Interactive Video Conferencing Facilities/Services located conveniently to members of the Regions A and O Regional Planning Groups, including costs of such services, if available;
 2. Estimate costs of establishing and operating Interactive Video Conferencing Facilities/Services to meet the needs of Regions A and O; and

¹ During the data collection effort it was found that an ethanol plant had been located in Hockley County, and representatives of the dairy sector included information for Lubbock and Terry Counties, therefore, the study area was expanded to include these counties.

1. Present comparison of costs and services of Interactive Video Conferencing Facilities available from others and via establishment of specialized services for the Regional Planning Groups.

1.3 Methods and Data

The methods of analyses used are as specified in TWDB Water Planning Rules and Guidelines, including quantities of water needed during drought of record conditions, costs of water using prices as specified in the Guidelines (Second Quarter 2007 prices or other price date if specified), and environmental effects of water management strategies to meet projected water needs.

Sources of data regarding population changes will be the Texas State Data Center, information about changes in employment in the counties, and manufacturing and business establishment plant specific information, as available. Per capita water use will be obtained from the TWDB water use reports for municipal water users of the region, and from manufacturing water needs for each new manufacturing plant to be located within the area. The latter to be obtained from representatives of the ethanol industry, where available, and will be estimated from similar types of water using activities, if needed. In the case of dairy water use, parameters of the 2006 Llano Estacado Regional Water Plan will be reviewed, and adjusted, if needed, using data from representatives of dairy water users. Report 359, "The Groundwater Resources of the Dockum Aquifer in Texas," will be a primary source of information for developing water management strategies from the Dockum Aquifer.