Exhibit C
Scope of Work

Region F Scope of Work
For Recommended Studies

Administrative and Public Participation Activities

The Texas Water Development Board (TWDB) has allocated $60,540 to the Region F Water Planning Group for administrative and public participation activities. These funds will be used as follows:

1. Administrative – Funds will be used for required newspaper notifications, notifications mailed to the TWDB-specified list of contacts, and other administrative duties and expenses.
2. Scope of Work Development– Funds will be used for reimbursement to the consultants for the development of the scopes of work and planning grant application.
3. Meetings and Public Participation – Funds will be used for planning group member travel, meeting materials, and other expenses associated with public participation.

Study 1 - Refinement of Supplies and Potential Projects to Use Fresh and Brackish Groundwater

Task 1 – Define Potential Projects

Hold a workshop including the Region F groundwater task force and other interested parties to define potential projects based on projected demands and water supply needs. Assess potential groundwater sources (both brackish and fresh), potential for co-development with other projects, disposal options for brackish concentrate and other factors, including distance from demands, economic feasibility, and hydrogeologic limitations.

Task 2 – Select Five Study Areas

Select from three to five groundwater study areas based on existing data, considering the potential for fresh or brackish groundwater development, location of water needs, potential impacts on fresh water sources, and economic feasibility to retrieve and use the water. Existing data include, but are not limited to the TWDB state-wide brackish water evaluation and previous Region F plans. The groundwater study areas can be either fresh water or brackish water sources. Fresh water sources include smaller, localized aquifers currently classified as ‘other aquifer’ by the Texas Water Development Board. Smaller fresh water sources will be evaluated using the same criteria as larger brackish or fresh water sources.

Task 3 – Refine Quantity and Quality

Collect available hydrogeologic data for each site, including geophysical logs, drillers logs, pumping tests, water level and quality information, and other

available data. Refine the estimated volume of retrievable quality groundwater, and the expected range of water quality, yields and the expected production rate of a typical well in the aquifer.

Task 4 – Identify Disposal And Co-Development Options

For brackish groundwater sources, identify potential disposal options for brackish concentrate, including dedicated disposal wells, co-disposal with oil-field brines, evaporation, and other options. Evaluate potential for co-development with other proposed water supply strategies as a mechanism for cost reduction and to meet long term needs.

Task 5 – Identify Data Gaps

Identify gaps in information regarding source of groundwater and disposal options and identify field studies required to advance the projects. Develop a list of tasks required to collect the additional information.

Task 6 – Conceptual Design And Cost Estimates

Develop planning-level conceptual designs and cost estimates for the potential projects, including treatment facilities, well fields, concentrate management options, and transmission and storage facilities. Evaluate potential environmental, agricultural and rural issues, and other natural resource issues associated with implementation of the potential projects. Prepare a draft and final report to include the following sections: executive summary, purpose of study including how the study supports regional water planning, methodology, results, and recommendations, if applicable. Develop a presentation for the Region F Water Planning Group. Draft report will be submitted to the planning group and the TWDB for review and comment. All comments will be addressed in the final report.

The report will be submitted per TWDB requirements and results from this study will be included in the 2011 Region F Regional Water Plan. The development, analysis, and reporting of results will follow methodologies and guidance according to Exhibit B when applicable and agency rules.

Study 2 - Irrigation Survey for Region F in Glasscock, Midland, Reagan, Pecos, Reeves, and Tom Green Counties

Task 1 – Data Collection

Collect existing data on irrigated agriculture in the targeted counties (Glasscock, Midland, Reagan, Pecos, Reeves, and Tom Green counties), focusing on the number of acres irrigated, the type of crops, sources of water, location of use, and the type of irrigation equipment used. Data sources include previous Region F planning efforts, TWDB, irrigation districts, groundwater conservation districts, Extension Service, NRCS, FSA, EQUIP program and other sources. Develop summaries of data and present to the Region F

Irrigation Task Force. Collect and summarize additional data from sources identified by the Irrigation Task Force.

Task 2 – Coordinate With Task Force

Meet with the Region F Irrigation Task Force to identify data needs for irrigated agriculture in the target counties. Assist the Irrigation Task Force with developing methods to collect and summarize additional data needed to fill data gaps, including methods to determine types of irrigation equipment currently in use.

Task 3 – Summarize Data & Plan Developments

Summarize additional data collected by the Irrigation Task Force and others. Identify data that could refine demand locations in the Edwards-Trinity GAM and other GAMs and provide to TWDB. The report will also recommend whether data collected and analyzed warrants pursuing changes to irrigation demand projections or conservation strategies in the future.

Prepare a draft and final report to include the following sections: executive summary, purpose of study including how the study supports regional water planning, methodology, results, and recommendations, if applicable. Draft report will be submitted to the planning group and the TWDB for review and comment. All comments will be addressed in the final report. The report will include a description of available data, sources of data, data collected by the Task Force, data needs identified in the study, and a plan to collect any needed data. Finalize report based on comments from Region F and others.

The report will be submitted per TWDB requirements and results from this study will be included in the 2011 Region F Regional Water Plan. The development, analysis, and reporting of results will follow methodologies and guidance according to Exhibit B when applicable and agency rules.

Study 3 - Study of the Economics of Rural Water Distribution and Integrated Water Supply Study

Task 1 – Data Gathering, Survey and Site Visits

Gather basic data on regional water suppliers in Region F from TWDB, TCEQ and other sources. Relevant data include but are not limited to population served, annual median household income, average annual water and wastewater bills, source(s) of water, area served, maps of distribution systems, miles of pipeline, other distribution facilities such as pump stations and storage tanks, water quality and reliability information, and cost of water (purchase, treatment, distribution and maintenance). Identify gaps in data. In conjunction with representatives of rural water supplier on the Region F Water Planning Group and others, develop a survey to gather additional information from water providers. Follow up the survey with telephone calls to gather additional

information. Identify up to six rural water providers for site visits to gather additional information.

Task 2 – Develop Cost Ranges and Scenarios

Based on the above data and data from other sources, develop typical cost ranges for treating and distributing water for rural water systems in Region F. Using these data, develop costs for treatment and distribution over areas of 100, 250, 500, and 1000 square miles for ranges of population densities typically found in the identified counties. Include in the costs water provided for livestock purposes. Evaluate the impact of advanced water treatment costs (i.e. treating naturally occurring elements such as arsenic, radionuclides and fluorides) on the affordability of these systems. Systematically vary individual variables to determine which variables have the most impact on the economics of these systems. Include all costs associated with advanced treatment, including disposal of treatment waste and costs associated with water loss to waste streams. Identify social, political and regulatory issues associated with rural regional water systems.

Task 3 – Information On Alternative Water Paradigms

Gather information on alternatives to traditional water service paradigms from the State of Texas, USDA and others. Identify potential alternative water service paradigms that may be applicable to these portions of Region F. Alternatives include point-of-use treatment, self-construction of water service lines, bottled water programs, point-of-entry treatment, and alternative sources such as rainwater harvesting, etc. Identify technological and regulatory issues associated with alternative water service paradigms.

Task 4 – Information On Distribution Systems

Obtain information on existing potable water distribution facilities in Runnels, Coke, Concho and McCulloch counties, including system maps and any existing distribution models. Identify water supply systems that have existing infrastructure (pump stations, storage and distribution lines) that could be used to interconnect systems. Using existing distribution models where available, develop a model of the identified facilities. Based on information from tasks 1 through 3, identify public water systems and areas that might benefit from regionalization or alternative water supply paradigms.

The primary targets of this project are systems with water quality or reliability problems, but other systems, whether acting as water suppliers or participants in regionalization scenarios, will not necessarily be excluded. Systems will demonstrate a minimal level of interest in participating in a regional system or alternative water supply paradigms. If an insufficient number of public water systems indicate an interest in participating, then the scope of the study and the budget shall be reduced accordingly.

Task 5 – Develop Integration Scenarios

Develop three to five infrastructure improvement scenarios that could be used to interconnect systems. Use the model to size infrastructure and evaluate the feasibility of these interconnections. Evaluate the potential of integrating interconnection with other strategies such as ASR, reuse, advanced treatment (desalination or removal of radionuclides, fluorides or arsenic), or undeveloped water supplies. Identify potential compatibility issues and water quality issues associated with interconnections of different water sources.

Task 6 – Identify Likely Scenarios & Report

Based on the above analyses, identify the most likely scenarios for increasing the reliability of supplies in the central part of Region F, using either regionalization strategies, alternative water supply paradigms, or both. Maps will minimally include appropriate CCN boundaries, supply facilities and transmission lines. Develop planning level cost estimates for each of the most likely scenarios. Compare the unit cost of water for the project to costs for current systems and recommended water management strategies in the 2006 Region F Water Plan. Evaluate potential environmental, agricultural and rural issues, and other natural resource issues associated with implementation of the potential projects. Develop a presentation for the Region F Water Planning Group.

Prepare a draft and final report to include the following sections: executive summary, purpose of study including how the study supports regional water planning, methodology, results, and recommendations, if applicable. Draft report will be submitted to the planning group and the TWDB for review and comment. All comments will be addressed in the final report.

The report will be submitted per TWDB requirements and results from this study will be included in the 2011 Region F Regional Water Plan. The development, analysis, and reporting of results will follow methodologies and guidance according to Exhibit B when applicable and agency rules.

Study 4 - Evaluation of Water Supplies in the Pecan Bayou Watershed

Task 1 – Determine Flow Methodology

Obtain historical records for reservoirs in the Pecan Bayou watershed. Develop historical inflows into the reservoirs. Compare these flows to naturalized flows used in the Colorado WAM. Evaluate historical long-term channel losses in the watershed. Make a determination of the most appropriate flows for use in this project (historical or WAM-based flows).

Task 2 – Coordination With Region G & K

Contact representatives of Region G for coordination on water supply impacts for Lake Clyde. Contact representatives of Region K about the assumptions and

results of this study. It is not anticipated that this study will have any impact on water supplies outside of the Pecan Bayou watershed.

Task 3 – Develop Four Yield Scenarios

In conjunction with Brown County Water Improvement District, the City of Coleman, and the City of Clyde, develop up to four scenarios under which Lake Brownwood would make calls on water from upstream reservoirs. Determine the impact on yield of the reservoirs for each scenario. Select the most likely scenario as the basis for possible revision of water supplies for the 2011 Region F plan. The selection process will receive prior approval from the TWDB Executive Administrator. Evaluate potential environmental, agricultural and rural issues, and other natural resource issues associated with implementation of these scenarios.

Task 4 – Report

Develop a draft report describing water rights issues in the Pecan Bayou watershed, the methodology used in the study and the results of the study. Provide memorandum to Regions G, F and K, as well as other stakeholders in the Pecan Bayou watershed. Prepare a draft and final report to include the following sections: executive summary, purpose of study including how the study supports regional water planning, methodology, results, and recommendations, if applicable. Draft report will be submitted to the planning group and the TWDB for review and comment. All comments will be addressed in the final report. Finalize report based on comments from Regions G, F and K, TWDB and other interested parties.

The report will be submitted per TWDB requirements and results from this study will be included in the 2011 Region F Regional Water Plan. The development, analysis, and reporting of results will follow methodologies and guidance according to Exhibit B when applicable and agency rules.

Study 5 - Municipal Water Conservation

Task 1 – Survey Of Practices

Survey up to 10 Region F cities on current conservation practices. A list of conservation practices identified by the Water Conservation Task Force will be provided for reference. Document current practices and the costs of implementing those practices.

Task 2 – Identify and Meet With Three Cities

Identify up to 3 cities that are actively employing conservation measures. Collect data on historical water use and assess potential savings associated with conservation practices. Via conference call, meet with each city to discuss current conservation programs, issues, and challenges to implementation, including the costs and financing water conservation activities.

Task 3 – Compare BMPs To Region F Experience

Review best management practices (BMPs) for municipal users identified by the Conservation Task Force. Compare water savings estimates and costs listed in the best management practices to savings and costs for the cities in Region F. Identify municipal conservation practices that may be appropriate for Region F with an estimated range of potential water savings for each applicable practice.

Task 4 - Report

Prepare a draft and final report to include the following sections: executive summary, purpose of study including how the study supports regional water planning, methodology, results, and recommendations, if applicable. Draft report will be submitted to the planning group and the TWDB for review and comment. All comments will be addressed in the final report. Finalize report based on comments by Region F and others.

The report will be submitted per TWDB requirements and results from this study will be included in the 2011 Region F Regional Water Plan. The development, analysis, and reporting of results will follow methodologies and guidance according to Exhibit B when applicable and agency rules.

Study 6 - Inter-Regional Coordination on the Refinement of Colorado Basin Water Availability

Task 1 – Determine Coordination Process

Contact Region K representatives and consultants to determine details of coordination and review process in regards to the Region K study, "Surface Water Availability Modeling" ($151,100).

Task 2 – Attend Region K Meetings

Attend up to three (3) meetings with Region K to review efforts by Region K as needed. Assist with providing existing water supply agreements in Region F that are not included in the WAM model.

Task 3 – Review Findings

Review findings of the Region K Surface Water Availability Modeling study. Develop a draft report/technical memorandum describing coordination efforts and potential impacts of the Region K study on Region F. Present the results to the Region F Water Planning Group and TWDB. As directed by Region F, provide comments to Region K regarding their modeling study. Based on comments by Region F and others, finalize the report. Written meeting reports and/or technical memoranda will be substituted for a fully study report. The fully study report will be developed and submitted by Region K.