

TO: Region F RWPG
CC: File, SAN11472
FROM: Simone Kiel
SUBJECT: Scope of Work for Water Management Strategies
DATE: September 12, 2012
PROJECT: Region F 2016 Water Plan

The TWDB developed a scope of work for Water Management Strategies (Task 4D), which includes the development and evaluation of water management strategies and development of Chapter 5 of the 2016 Region F Water Plan. This scope of work considers all regulatory requirements and TWDB guidance. The scope items that are necessary for regulatory compliance are outlined in the executed contracts. However, specific scopes of work for the evaluations of potentially feasible water management strategies are to be developed by the regions. All funds for this task are contingent upon written notice to proceed. For your information, the existing scope items already included in the executed contracts are attached in Attachment No. 1. These scope items apply to the evaluations of all potentially feasible water management strategies and are not repeated below. The total budget in the executed contract for the Task 4D effort is \$303,293. A preliminary needs analysis was performed to identify water users with needs in Region F. Potential strategies to meet these needs were identified. The draft scopes of work for specific strategy types are outlined below.

SCOPE OF WORK FOR WATER MANAGEMENT STRATEGIES (TASK 4D) FUNDS

To facilitate the development of the scope of work for water management strategies, Region F has conducted a preliminary needs assessment to better identify entities that will require additional water. Based on this assessment, much of this effort will focus on developing and updating the subordination strategy, water conservation strategies and strategies in the 2011 plan that will be retained for the 2016 regional water plan. In addition, there will need to be a several new strategies developed to meet the projected needs. The draft needs analysis shows an increased i need of 11,000 to 22,000 acre-feet per year from the 2012 Region F plan. This in combination with expected reduced surface water supplies from Subordination will result in substantial new needs for Region F.

Subordination is a pivotal strategy in Region F due to the limitations of the WAM Run 3 assumptions and is important in defining the needs that must be met through infrastructure strategies. The subordination strategy will include extending the hydrology for major reservoirs, which will better reflect the current availability and operations of the region's surface water supplies. Strategies that have been previously identified and have been re-affirmed by the water user groups will be considered and evaluated in the 2016 plan. Also, through the municipal survey the RWPG has received information on new strategies that entities are currently pursuing. These strategies are included in this scope of work.

Subordination Strategy

For the 2016 Region F Water Plan, we propose to re-evaluate the Subordination strategy for Region F water users of surface water in the Colorado River Basin. This will include extending the hydrology for the major reservoirs and municipal water rights holders in the Upper Colorado River Basin and determining updated reliable supplies under the assumptions used in the Subordination strategy. Specific tasks associated with this effort include:

Scope of Work:

- Extend the hydrology in the Upper Colorado River Basin for the major reservoirs and municipal water rights through at least 2012. (The analysis may be extended past 2012 depending on the availability of data needed for the analysis).
- Review and update approach used for the subordination model and "Mini-WAM" developed in previous Region F plans. The subordination model covers the same period as the existing Colorado WAM. New capabilities of the WRAP model will be examined and adopted as appropriate for the subordination analysis. The Mini-WAM only models the upper Colorado Basin and is used to extend the period of record. The assumptions used in previous plans will not be changed for the analysis.
- Using the assumptions adopted in the 2011 Region F plan for the Subordination strategy, update the reservoir firm and safe yields. [Assumptions include 1) major reservoir in the upper basin water do not make priority calls on each other with the exception of special considerations in the Pecan Bayou watershed, and 2) only selected water rights in Region K, major reservoirs in Region F and City of Junction water right are included in the Subordination strategy.]
- Re-affirm the assumptions used for the Pecan Bayou watershed with appropriate water rights holders.
- Working together with the water rights holders, assign the amount of supply to water user groups from the Subordination strategy.
- Update the evaluation of the strategy in accordance with the Regional Water Planning Guidelines. This will include the evaluation of reliability, cost, environmental issues, impacts to agricultural and rural areas, natural resources and other issues deemed relevant by the region.
- Develop GIS map showing the reservoirs and water rights considered in the Subordination strategy.
- Develop a draft memorandum summarizing the findings of this strategy update and present it at a RWPG meeting for approval.
- Provide a copy of the updated model to the TWDB.

Entities Receiving Water from this WMS:

Colorado Municipal Water District (CRMWD) and its customers (22)

San Angelo and its customers (6)

Upper Colorado River Authority and its customers (4)

Brown County WID and its customers (10)

City of Bronte

City of Coleman

City of Junction and its customers (1)

City of Sweetwater (Brazos G)

City of Brady

Steam Electric Power WUGs

Conservation

Region F proposes to develop and/or update conservation strategies for irrigation, develop conservation strategies for all municipal water users in the planning area, and work together with other water use sectors to identify potential conservation and reuse measures that may be appropriate for each sector. Based on survey responses and previously identified strategies, reuse has been identified for 11 water providers and is a potential strategy to help meet the increased mining demands in the region. Specific tasks associated with this effort include:

Scope of Work

- Update irrigation conservation strategies based on updated historical irrigation use, projected demands, adoption rates of irrigation technologies and changing irrigation practices, as necessary. Develop new strategies if appropriate. Evaluate the updated water savings and estimated costs of conversion to the respective identified strategies.
- Identify a package of municipal water conservation strategies that are appropriate for suppliers in Region F. Assess the potential water savings for each municipal entity in Region F and develop estimated costs. Coordinate with municipal water user groups (WUGs) that have implemented conservation programs.
- Identify potential reuse water management strategies. Review existing reuse supplies. Identify potential increases in reuse water supplies and new applications of reuse to meet future water needs. This will include both direct and indirect reuse strategies. Coordinate with representatives of the non-municipal water users and municipalities.
- Evaluate each major conservation and reuse strategy in accordance with the Regional Water Planning Guidelines. This will include the evaluation of reliability, cost, environmental issues, impacts to agricultural and rural areas, natural resources and other issues deemed relevant by the region.
- Develop cost estimates for all conservation and reuse strategies.

Entities Potentially Receiving Water from Conservation WMSs:

All municipal WUGs (83)

Irrigation WUGs

Manufacturing WUGs

Entities Potentially Receiving Water from Reuse WMSs:

CRMWD

San Angelo

City of Brownwood (new strategy)

City of Odessa and Ector County Manufacturing

City of Midland

City of Bangs

Crockett County WCID#1 (new)

City of Menard

City of Winters

City of Ballinger

Bronte Village

Mining WUGs (23, new)

Desalination

With limited surface water and groundwater supplies, entities in Region F are turning to brackish groundwater and/or brackish surface water with desalination for future water sources. The 2011 Region F Water Plan includes desalination strategies for CRMWD, San Angelo and the City of Andrews. These strategies will be retained for the 2016 Region F Water Plan and re-evaluated in light of Modeled Available Groundwater (MAG) values, alternative sources, projected need and other strategies.

Potential **new** desalination strategies include:

1. Desalination of water from CRMWD's brackish diverted water system for potential potable use
2. Desalination of Spence Reservoir and Moss Creek reservoir, and
3. Development of brackish groundwater for the City of Odessa (there are several different variations of this potentially feasible strategy that will be considered, including sales from Fort Stockton and direct development).

Desalination strategies may be used with Aquifer Storage and Recovery (ASR) and/or conjunctively with other water supplies. Specific tasks associated with this effort include:

Scope of Work

- Evaluate the available supplies from brackish groundwater sources, considering MAGs, other demands on the aquifer and the needs of the entity.
- Review and update, as needed, infrastructure requirements for previously developed projects.
- Evaluate the reliable supply form CRMWD's diverted water system. Assess feasibility of desalination and operation with CRMWD's other sources.
- Evaluate the reliable supplies for a desalination strategy for the City of Odessa. Consider up to three different water sources. Develop infrastructure necessary to treat and transport the water to Odessa.
- Evaluate each desalination strategy in accordance with the Regional Water Planning Guidelines. This will include the evaluation of reliability, cost, environmental issues, impacts to agricultural and rural areas, natural resources and other issues deemed relevant by the region.
- Develop cost estimates for all desalination strategies.
- Develop GIS maps for all strategies showing infrastructure improvements and supply sources. (Note: GIS maps are to be provided to the TWDB and any maps included in the Region F plan will be approved by the respective sponsor of the strategy.)
- Distribute supplies to customers of the sponsoring entity.

Entities Potentially Receiving Water from these WMSs:

City of Andrews

City of Odessa

City of San Angelo

CRMWD and its customers

Infrastructure Improvements

There are several strategies in the 2011 Region F Water Plan that require infrastructure improvements to utilize available water supplies. These include the rehabilitation of Spence pipeline, advanced water treatment of poor quality water, new technologies for power cooling and other system improvements necessary to utilize available water supplies. Some previously recommended projects are in the process

of being implemented (such as Eden's RO plant) and will not be listed as a strategy. One change that will be considered for the 2016 plan is that the sponsor of the Spence pipeline rehabilitation is now UCRA, rather than San Angelo. The project has also expanded to serve rural communities in Tom Green County. Also, the City of Junction is considering possible dredging of its intake area to restore the storage capacity behind the diversion structure. Specific tasks associated with this effort include:

Potential **new** Infrastructure Improvement strategies include:

1. Dredging at Junction's river diversion

Scope of Work

- Evaluate the available supplies and appropriate sizing required for the infrastructure improvements.
- Evaluate each strategy in accordance with the Regional Water Planning Guidelines. This will include the evaluation of reliability, cost, environmental issues, impacts to agricultural and rural areas, natural resources and other issues deemed relevant by the region.
- Develop cost estimates for all infrastructure strategies.
- Develop GIS maps for all strategies showing infrastructure improvements and supply sources. (Note: GIS maps are to be provided to the TWDB and any maps included in the Region F plan will be approved by the respective sponsor of the strategy.)
- Distribute supplies to customers of the sponsoring entity.

Entities Potentially Receiving Water from these WMSs:

Tom Green County-Other

UCRA

Bronte Village

City of Robert Lee

City of Junction

Richland SUD

Steam Electric Power WUGs (5)

New Groundwater Development

New groundwater development has been and will continue to be a major water supply strategy for Region F. The current content of most of the reservoirs in Region F are at all-time lows with storage less than 25 percent of the conservation storage, and some reservoirs are near empty. The current conditions of the surface water supplies in Region F have prompted several water providers to look towards groundwater for future supplies. Several major groundwater supply projects have just been completed or are on-going. However, there are plans to continue to develop groundwater for these entities as well as others. This may include new groundwater development both in Region F and outside of Region F. The 2011 Region F Water Plan identifies "New groundwater development" for CRMWD, San Angelo, Midland and Colorado City. The City of Menard is also planning to develop groundwater with ASR. Each of these entities is planning to develop new and/or additional groundwater supplies. Pecos County WCID#1, Brownwood, City of Andrews, and Odessa also have indicated that they are pursuing groundwater for future supplies.

In addition, with the current oil and gas activities in Region F, the mining demands have increased

significantly. Much of the water needed for this increased demand is anticipated to come from new groundwater development. Some groundwater development has already occurred, but more is expected. To meet the future mining demands in Region F, the RWPG will be evaluating new groundwater supplies.

New groundwater strategies may be used with ASR and/or conjunctively with other water supplies. Specific tasks associated with this effort include:

Scope of Work

- Evaluate the available supplies and appropriate sizing required for the infrastructure improvements for new groundwater development. Available supply will consider MAGs, other demands on the aquifer and needs of the entity. As appropriate, consider potential phasing of new groundwater projects to economically meet projected needs.
- Consider potential regionalization, as appropriate.
- Coordinate with other regions for strategies that propose to use water from outside of Region F.
- Evaluate the water quality of the potential source(s) for the end use purpose.
- Evaluate each strategy in accordance with the Regional Water Planning Guidelines. This will include the evaluation of reliability, cost, environmental issues, impacts to agricultural and rural areas, natural resources and other issues deemed relevant by the region.
- Develop cost estimates for all new and/or expanded groundwater strategies.
- Develop GIS maps for all strategies showing infrastructure improvements and supply sources. (Note: GIS maps are to be provided to the TWDB and any maps included in the Region F plan will be approved by the respective sponsor of the strategy.)
- Distribute supplies to customers of the sponsoring entity.

Entities Potentially Receiving Water from these WMSs:

Colorado Municipal Water District (CRMWD) and its customers (22)

San Angelo and its customers (6)

Midland

Odessa

City of Andrews

Colorado City

Junction

Menard

Pecos County WCID#1

Brownwood

Mining WUGs (23)

Manufacturing (Kimble)

Steam Electric Power WUGs (5)

County Other (9)

Voluntary Re-Distribution

The Voluntary Re-Distribution strategy is a general strategy that includes sales of water from one entity to another, new or extended contracts or other types of transfers of water. In Region F most of these strategies involve new sales or increased sales of water from a provider, and may include new infrastructure as needed to transport the water. New strategies will be considered for entities with

needs. Also, we will consider change of use type strategies, such as using surface water permitted for steam electric use for municipal, industrial and/or mining use.

Potential **new** Voluntary Re-Distribution strategies include:

1. Use of water from Lake Colorado City and Champion Creek Reservoirs for additional municipal, industrial and mining purposes.

Specific tasks associated with this effort include:

Scope of Work

- Coordinate with entities that have expiring contracts to confirm whether the contracts will be extended and at what level of supply.
- Evaluate whether an entity has supply available for re-distribution. Confirm with the water provider that it is willing to provide water to the respective WUG(s). Confirm with the receiving WUG(s), as appropriate, that it is willing to purchase water.
- Develop or update the appropriate sizing required for the infrastructure improvements for transfers of water. As appropriate, consider potential phasing of new re-distribution projects to economically meet projected needs.
- Consider potential regionalization, as appropriate.
- Evaluate the water quality of the potential source(s) for the end use purpose.
- Evaluate each strategy in accordance with the Regional Water Planning Guidelines. This will include the evaluation of reliability, cost, environmental issues, impacts to agricultural and rural areas, natural resources and other issues deemed relevant by the region.
- Develop cost estimates for all new and/or expanded voluntary re-distribution strategies.
- Develop GIS maps for all strategies showing infrastructure improvements and supply sources. (Note: GIS maps are to be provided to the TWDB and any maps included in the Region F plan will be approved by the respective sponsor of the strategy.)
- Distribute supplies to customers of the sponsoring entity.

Entities Potentially Receiving or Supplying Water from these WMSs:

Colorado Municipal Water District (CRMWD)

San Angelo

UCRA

Mining WUGs (31)

University Lands

City of Andrews

Stanton

Millersview-Doole

Ballinger

Manufacturing WUGs (8)

County-Other WUGs (9)

New Surface Water

While there is little to no available surface water in the Colorado River Basin, there is interest in using developed storm water to supplement existing surface water supplies. The UCRA is considering a project that would use developed storm water and a possible upstream diversion of an existing water right to

provide additional supplies. The water would be stored in the Red Arroyo near San Angelo for users in Tom Green County. Region F would work with the UCRA to develop the project and evaluate it in accordance with RWPG guidelines.

Other Projects Currently Being Considered:

There are several other projects that are currently being considered by water providers in the region but we do not have specific information on the projects. These include the West Texas Water Partnership water supply project (Midland and San Angelo) and other projects that may be identified during the planning process. These projects will be developed and evaluated for the 2016 Region F Water Plan as more information becomes available.

Data Base Entry

As required by the TWDB rules, all water management strategies that are recommended or adopted as alternate strategies must be entered into the TWDB database for the 2017 State Water Plan. Also, specific reports must be included in the 2016 Region F Water Plan. The effort to enter this data and coordinate with the TWDB has historically taken considerable effort. With the redesign of the database, it may become more efficient but all data will need to be re-entered. Specific tasks associated with the database entry include:

Scope of Work

- Define each water management strategy (WMS) in accordance with the specific requirements of the database.
- Assign WUGs and WWP to a specific WMSs. Enter the amount of supply received for each decade. Enter other data required for the WMS source, user and seller, as appropriate.
- Enter capital costs and annual costs for each WUG/WWP as appropriate.
- Coordinate with shared regions as appropriate.
- Perform appropriate QC checks on data entry.
- Coordinate with TWDB database staff.
- Prepare required reports and include in the Region F Water Plan.

Entities

All WUGs and WWPs receiving water from a WMS.

Report Preparation and Coordination

Chapter 5 of the 2016 Region F Water Plan is one of the most important chapters in the plan. This chapter is the compilation of the future direction for water supply in the region. The 2011 Region F Water Plan has over 200 pages dedicated to this section of the report along with several appendices that document the data evaluation. The basics of the strategy development and technical evaluations are included in the scopes of work for the specific strategy types. This task is for the effort to compile all of the information developed into Chapter 5 of the 2016 Region F report. It also includes coordination with the RWPG on the draft chapter and the incorporation of comments for the final chapters in the Initially Prepared Plan and Final Plan.

Fee Summary

The total budget for developing the water management strategies for the 2016 region F Water Plan (Task 4D) is \$303,293. Below is a breakdown of the fee by major strategy category.

TASK 4D	BUDGET
Subordination	\$73,000
Conservation strategies	\$45,700
Desalination	\$44,700
Infrastructure Improvements	\$20,693
New Groundwater	\$40,500
New Surface Water	\$6,200
Voluntary Redistribution	\$17,200
Other New Projects	\$13,300
Database Entry	\$21,000
Report Preparation	\$21,000
TOTAL	\$303,293

ATTACHMENT NO. 1

**TASK 4D SCOPE OF WORK
REGION F CURRENT CONTRACTS**

Task 4D - Evaluation and Recommendation of Water Management Strategies (WMSs)

The objective of this task is to evaluate and recommend water management strategies (WMS) including preparing a separate chapter¹ and subchapter (on conservation recommendations see - Task 5) to be included in the 2016 Regional Water Plan (RWP) that describes the work completed, presents the potentially feasible WMSs, recommended and alternative WMSs, including all the technical evaluations, and presents which water user entities will rely on the recommended WMSs.

Work shall be contingent upon a written notice-to-proceed and shall include but not be limited to the following:

- a) In addition to generally meeting all applicable rules and statute requirements governing regional and state water planning under 31 TAC Chapters 357 and 358, this portion of work shall, in particular, include all work necessary to meet all the requirements of 31 TAC §357.34 and §357.35 that is not already included under Task 4B or Task 5.²
- b) Plans to be considered in developing water management strategies include those referenced under 31 TAC §357.22.
- c) Inclusion of a list of the potentially feasible water management strategies that were identified by the RWPG. Information to include what past evaluations have been performed for each potentially feasible water management strategy listed.
- d) Technical evaluations of all categories of potentially feasible WMSs including previously identified or recommended WMSs and newly identified WMSs including drought management and conservation WMSs; WMS documentation shall include a strategy description, discussion of associated facilities, project map, and technical evaluation addressing all considerations and factors required under 31 TAC §357.34(d)(e)(f) and §357.35.
- e) Process of selecting all recommended WMSs including development of WMS evaluations matrices and other tools required to assist the RWPG in comparing and selecting recommended WMSs.
- f) Consideration of water conservation and drought contingency plans from each WUG, as necessary, to inform WMS evaluations and recommendations.
- g) Communication, coordination, and facilitation required within the RWPA and with other RWPGs to develop recommendations.
- h) Updates to descriptions and associated technical analyses and documentation of any WMSs that are carried forward from the previous RWP to address:
 - Changed conditions or project configuration
 - Changes to sponsor of WMS
 - Updated costs (based on use of required costing tool³)
 - Other changes that must be addressed to meet requirements of 31 TAC §357.34 and §357.35.

¹ This shall be a separate chapter as required by 31 TAC §357.22(b).

² Requirements are further explained in the guidance document *First Amended General Guidelines for Regional Water Plan Development*.

³ See section 5.1.2.1 under 'Financial Costs' in *First Amended General Guidelines for Regional Water Plan Development*

- i) Assignment of all recommended strategy water supplies to meet projected needs of specific WUGs.
- j) Documentation of the evaluation and selection of all recommended water management strategies.
- k) Coordination with sponsoring water user groups, wholesale water providers, and/or other resource agencies regarding any changed conditions in terms of projected needs, strategy modifications, planned facilities, market costs of water supply, endangered or threatened species, etc.
- l) If applicable, determination of the “highest practicable level” of water conservation and efficiency achievable (as existing conservation or proposed within a water management strategy) for each WUG that relies on a WMS involving and interbasin transfer to which TWC 11.085 applies. Recommended conservation WMSs associated with this analysis shall be presented by WUG.
- m) Presentation of the water supply plans in the RWP for each WUG and WWP relying on the recommended WMSs.
- n) Consideration of alternative WMSs for inclusion in the plan. Alternative water management strategies must be fully evaluated in accordance with 31 TAC §357.34(d)(e)(f).
- o) Incorporation of all required DB17 reports into document.
- p) Submission of data through the Regional Water Planning Application (DB17) to include the following work:
 - review of the data,
 - confirmation that data is accurate,
 - incorporation of the required DB17 reports into the draft and final regional water planning chapter document
- q) Review of the chapter document and related information by RWPG members,
- r) Modifications to the chapter document based on RWPG, public, and or agency comments.
- s) Submittal of chapter document to TWDB for review and approval; and
- t) All effort required to obtain final approval of the regional water plan chapter and associated DB17 data by TWDB.
- u) *[SCOPE OF WORK TO BE DETERMINED]*

Scope of Work to be amended based on specific Task 4D scope of work to be developed and negotiated with TWDB. Work under this Task to be performed only after approval and incorporation of Task 4D scope of work and written notice-to-proceed. NOTE: Work effort associated with preparing and submitting a proposed Task 4D scope of work for the purpose of obtaining a written ‘notice-to-proceed’ from TWDB is not included in Task 4D and shall not be reimbursed under the Contract.

Deliverables: A completed Chapter 5 shall be delivered in the 2016 RWP as a work product to include technical analyses of all evaluated WMSs. Data shall be submitted and finalized through DB17 in accordance with the Guidelines for Regional Water Planning Data Deliverables.