

APPENDIX 4F

**STRATEGY EVALUATION MATRIX AND QUANTIFIED ENVIRONMENTAL IMPACT
MATRIX**

**Region F Initially Prepared Plan
Strategy Evaluation Matrix**

| Entity | County Used | Basin Used | Strategy | Quantity (Ac-Ft/Yr) | Reliability | Cost (\$/Ac-Ft) | Impacts of Strategy on: | | | | Interbasin Transfer | Third Party Social & Economic Impacts | Implementation Issues | Comments |
|---------------|---------------|------------|---|---------------------|---------------|-----------------|-------------------------|------------------------------------|-------------------------|------------------------------|------------------------------|---|---|--|
| | | | | | | | Environmental Factors | Agricultural Resources/Rural Areas | Other Natural Resources | Key Water Quality Parameters | | | | |
| Andrews | Andrews | Colorado | Water Conservation | 310 | Medium | \$185 | Low | Positive | None identified | Low | n/a | None identified | Site specific data needed. May require financial and technical assistance. | Conservation based on generic assessment. Site-specific data not available. |
| Andrews | Andrews | Colorado | Dockum Desalination | 950 | Medium | \$1,163 | Low | Positive | None identified | Low | n/a | None identified | Co-disposal with oil field brine | |
| Bronte | Coke | Colorado | Reuse | 110 | High | \$2,345 | Medium | Positive | None identified | Medium | n/a | None identified | Public perception, disposal, TCEQ rules | |
| Bronte | Coke | Colorado | Rehabilitation of Oak Creek pipeline | 0 | Medium | n/a | Low | Positive | None identified | Low | n/a | None identified | Funding | |
| Bronte | Coke | Colorado | Water Conservation | 51 | Medium | \$188 | Low | Positive | None identified | Low | n/a | None identified | Site specific data needed. May require financial and technical assistance. | Conservation based on generic assessment. Site-specific data not available. |
| Robert Lee | Coke | Colorado | Infrastructure Improvements | 200 | High | \$1,328 | Low | | 3 | 3 | TBD | n/a | Improved quality and reliability for the city | 0.5 mgd treatment expansion and new storage tank |
| Robert Lee | Coke | Colorado | New groundwater | 150 | Medium to Low | \$1,047 | Medium | Low | None identified | Low | n/a | None identified | Unknown quantity and quality | |
| Robert Lee | Coke | Colorado | Reuse | 110 | High | \$2,345 | Medium | Positive | None identified | Medium | n/a | None identified | Public perception, disposal, TCEQ rules | |
| Robert Lee | Coke | Colorado | Desalination of Spence Reservoir Water | 500 | High | \$1,879 | Medium | Positive | None identified | Medium | n/a | Increased reliability and better water for city | Financing, disposal of brine reject | Strategy assumes that reject can be discharged. Costs may be significantly higher if other methods used. |
| Robert Lee | Coke | Colorado | Floating pump in Mountain Creek Reservoir | 50 | Low | \$1,132 | Low | Positive | None identified | Low | n/a | None identified | Financing | Allows city to take more water when reservoir is low |
| Robert Lee | Coke | Colorado | Water Conservation | 48 | Medium | \$199 | Low | Positive | None identified | Low | n/a | None identified | Site specific data needed. May require financial and technical assistance. | Conservation based on generic assessment. Site-specific data not available. |
| Coleman | Coleman | Colorado | Water Conservation | 107 | Medium | \$101 | Low | Positive | None identified | Low | n/a | None identified | High cost takes away resources | Conservation based on generic assessment. Site-specific data not available. |
| Eden | Concho | Colorado | RO treatment | 392 | High | \$819 | Low to Medium | Positive | None identified | Medium | n/a | None identified | Disposal of waste products | |
| Eden | Concho | Colorado | Replacement well | 323 | High | \$1,113 | Low | Positive | None identified | Low | n/a | None identified | | |
| CRMWD | Ector/Midland | Colorado | Odessa/Midland Reuse | 9,799 | High | \$1,354 | Low | Low | None | Low to Medium | n/a | None identified | Public perception, disposal, TCEQ rules | |
| CRMWD | Howard | Colorado | Big Spring Reuse | 1,855 | High | \$824 | Low | Low | None | Low to Medium | n/a | None identified | Public perception, disposal, TCEQ rules | |
| Manufacturing | Kimble | Colorado | Edwards-Trinity aquifer | 1,000 | Medium | \$1,080 | Medium | None | None identified | None | n/a | None identified | Locating areas with sufficient production and acceptable water quality | Manufacturing demands appear to include recirculated water |
| Brady | McCulloch | Colorado | Water Conservation | 239 | Medium | \$132 | Low | Positive | None identified | Low | n/a | None identified | Site specific data needed. May require financial and technical assistance. | Conservation based on generic assessment. Site-specific data not available. |
| Richland SUD | McCulloch | Colorado | Specialty Media Treatment System | 113 | High | \$664 | Low | Positive | None identified | Low | n/a | None identified | Security and worker safety, loss of revenue due to increased costs | Depends on ability to locate injection well. Will require long-term contract and minimum guaranteed payment. |
| Richland SUD | McCulloch | Colorado | Bottled water program | 1 | High | \$28,780 | Low | Positive | None identified | Low | n/a | None identified | Users need to travel to obtain water | Lowest overall cost |
| Richland SUD | McCulloch | Colorado | Replacement well | 113 | High | \$1,982 | Low | Positive | None identified | Low | n/a | None identified | Assumes that an area with low radionuclide concentration can be identified | |
| Menard | Menard | Colorado | Aquifer Storage and Recovery | 240 | High | \$1,271 | Low | Positive | None identified | Low | n/a | None identified | Suitability of Hickory not established, financing | |
| Menard | Menard | Colorado | Water Conservation | 33 | Medium | \$211 | Low | Positive | None identified | Low | n/a | None identified | Site specific data needed. May require financial and technical assistance. | Conservation based on generic assessment. Site-specific data not available. |
| Menard | Menard | Colorado | New Hickory well | 160 | High | \$1,456 | Low | Positive | None identified | Low | n/a | None identified | Water quality unknown. | May be higher impacts if advanced treatment needed. |
| Menard | Menard | Colorado | San Saba Off-Channel Reservoir | 500 | High | \$4,430 | Medium | Positive | None identified | Low | n/a | Property owners at reservoir site | Specific site not selected. Priority date of water significantly affects feasibility. | Assuming that diversion is under existing Menard or LCRA water right. |
| Midland | Midland | Colorado | T-Bar Well Field | 13,600 | High | \$1,422 | Low | Low | Low | Low | Not required for groundwater | | Pipeline route and well field layout not determined | Additional studies underway. Not available for this plan. |
| Midland | Midland | Colorado | Water Conservation | 3,663 | Medium | \$132 | Low | Positive | None identified | Low | n/a | None identified | Site specific data needed. May require financial and technical assistance. | Conservation based on generic assessment. Site-specific data not available. |

**Region F Initially Prepared Plan
Strategy Evaluation Matrix**

| Entity | County Used | Basin Used | Strategy | Quantity (Ac-Ft/Yr) | Reliability | Cost (\$/Ac-Ft) | Impacts of Strategy on: | | | | Interbasin Transfer | Third Party Social & Economic Impacts | Implementation Issues | Comments |
|----------------|----------------|----------------|--|---------------------|----------------|-----------------|-------------------------|---|-------------------------|------------------------------|------------------------------|--|---|--|
| | | | | | | | Environmental Factors | Agricultural Resources/Rural Areas | Other Natural Resources | Key Water Quality Parameters | | | | |
| CRMWD | Multiple | Colorado | Winkler Well Field | 6,000 | High | \$1,444 | Low | Low | Low | Low | Not required for groundwater | | Pipeline route and well field layout not determined | |
| CRMWD | Multiple | Colorado | Water from SW Pecos County | 15,000 | Medium | \$1,485 | Low to Medium | May impact Belding Farms | None identified | Low | Not required for groundwater | May impact other groundwater users in Pecos County | Needs additional studies regarding supplies and impacts | |
| CRMWD | Multiple | Colorado | Water from Roberts County | 25,000 | High | \$3,319 | Low | Low | Low | Low | Not required for groundwater | Other users of Roberts County water | Would be more cost-effective with other participants | |
| Multiple | Multiple | Multiple | Subordination of senior water rights | 80,130 | Medium | TDB | Medium | Positive | None identified | Low | n/a | None identified | Needs further analysis before implementation | Done in conjunction with Region K |
| Ballinger | Runnels | Colorado | Voluntary redistribution - Hords Creek Reservoir | 220 | Low | \$3,361 | Low | Positive | None identified | Low | n/a | None identified | Subordination to downstream water rights | May require modifications to contracts with Corps of Engineers |
| Ballinger | Runnels | Colorado | Voluntary Redistribution - purchase water from CRMWD | 600 | High | \$658 | Low | Positive | None identified | Low | n/a | None identified | Must have agreement with CRMWD and WCTMWD | Uses existing WCTMWD and Ballinger pipelines |
| Ballinger | Runnels | Colorado | Reuse | 220 | High | \$1,473 | Medium | Positive | None identified | Medium | n/a | None identified | Public perception, disposal, TCEQ rules | |
| Ballinger | Runnels | Colorado | Water Conservation | 144 | Medium | \$208 | Low | Positive | None identified | Low | n/a | None identified | Site specific data needed. May require financial and technical assistance. | Conservation based on generic assessment. Site-specific data not available. |
| Winters | Runnels | Colorado | Reuse | 110 | High | \$2,345 | Medium | Positive | None identified | Medium | n/a | None identified | Public perception, disposal, TCEQ rules | |
| Winters | Runnels | Colorado | Water Conservation | 76 | Medium | \$248 | Low | Positive | None identified | Low | n/a | None identified | Site specific data needed. May require financial and technical assistance. | Conservation based on generic assessment. Site-specific data not available. |
| CRMWD | Scurry | Colorado | Snyder Reuse | 726 | High | \$1,521 | Low | Low | None | Low to Medium | n/a | None identified | Public perception, disposal, TCEQ rules | |
| CRMWD | Multiple | Colorado | Capitan Reef Desalination | 9,500 | Medium | \$1,875 | Low | Low | None | Low | n/a | None identified | Reliability of large-scale development not established. | |
| San Angelo | Tom Green | Colorado | Water Conservation | 2,371 | Medium | \$110 | Low | Low | None identified | Low | n/a | None identified | City developing a water conservation program | Actual conservation savings may be greater. |
| San Angelo | Tom Green | Colorado | Edwards-Trinity aquifer - Schleicher Co. | 12,000 | Medium | \$660 | Medium | Potential impact to local users | None identified | Low | n/a | Potential impact to local users | production. Groundwater conservation district rules that discourage large-scale development | |
| San Angelo | Tom Green | Colorado | Water from SW Pecos County | 12,000 | Medium | \$2,643 | Low to Medium | May impact Belding Farms | None identified | Low | Not required for groundwater | May impact other groundwater users in Pecos County | Needs additional studies regarding supplies and impacts | |
| San Angelo | Tom Green | Colorado | McCulloch Well Field | 12,000 | High | \$1,936 | Low | Potential impact to other Hickory users | None identified | Low | n/a | Potential impact to other Hickory users | Pipeline route and well field layout currently being studied | Water may not meet standards for Radium & require advanced treatment, which may increase costs |
| San Angelo | Tom Green | Colorado | Desalination Facility | 11,200 | High | \$1,075 | Low | Low | None identified | Low | n/a | n/a | Lack of data on target aquifer | |
| San Angelo | Tom Green | Colorado | Rehabilitation of Spence Pipeline | 2,300 | High | \$311 | Low | Low | None identified | Low | n/a | n/a | | |
| Steam Electric | Not determined | Not determined | CCGT and ACC Generation | 15,000 | Medium to High | \$1,127 | Low | None | None identified | Low | n/a | | Implementation based on economic decisions by power industry | Technology requires very little water |

**Region F Initially Prepared Plan
Environmental Quantification Matrix**

| Entity | County | Basin | Strategy | Environmental Factors | | | | | | | | | | Comments |
|---------------|---------------|----------|--|-----------------------|---------------|-------------------|---------|-----------------------------|--------------------|------------------|---------------------|-------|-------------------------------|--|
| | | | | Acres Impacted | Wetland Acres | Envir Water Needs | Habitat | Threat and Endanger Species | Cultural Resources | Bays & Estuaries | Envir Water Quality | Other | Overall Environmental Impacts | |
| Andrews | Andrews | Colorado | Dockum Desalination | 15 | | Low | Low | 6 | Low | None | Low | | Low | Disposal through existing deep well injection |
| County Other | Brown | Colorado | Voluntary redistribution | 53 | | Low | Low | 10 | Low | None | Low | | Low | Not a significant draw on reservoir |
| Bronte | Coke | Colorado | Reuse | 10 | | Medium | Medium | 8 | Low | None | Medium | | Medium | Assuming that waste stream from treatment process would be discharged or use land application. |
| Bronte | Coke | Colorado | Rehabilitation of Oak Creek pipeline | 32 | | Low | Low | 8 | Low | None | Low | | Low | |
| Bronte | Coke | Colorado | Water Conservation | 0 | | Low | Low | 8 | Low | None | Low | | Low | |
| Robert Lee | Coke | Colorado | Infrastructure Improvements | 4 | | Low | Low | 8 | Low | None | Low | | Low | 0.5 mgd treatment plant and new storage tank |
| Robert Lee | Coke | Colorado | Reuse | 10 | | Medium | Medium | 8 | Low | None | Medium | | Medium | Assuming that waste stream from treatment process would be discharged or use land application. |
| Robert Lee | Coke | Colorado | Desalination of Spence Reservoir Water | 5 | | Medium | Medium | 8 | Low | None | Medium | | Medium | |
| Robert Lee | Coke | Colorado | Floating pump in Mountain Creek Reservoir | 1 | | Low | Low | 8 | Low | None | Low | | Low | Allows city to take more water when reservoir is low |
| Robert Lee | Coke | Colorado | Water Conservation | 0 | | Low | Low | 8 | Low | None | Low | | Low | |
| Eden | Concho | Colorado | RO treatment | <1 | | Low to Medium | Medium | 8 | Low | None | Medium | | Low to Medium | Long-term impacts of land application of naturally occurring radionuclides unknown |
| Eden | Concho | Colorado | Replacement well | <1 | | Low | Low | 8 | Low | None | Low | | Low | Small amount of water treated |
| CRMWD | Ector/Midland | Colorado | Odessa/Midland Reuse | 152 | | Low | Medium | 6 | Low | None | Low | | Low | Impacts due to decreased flow in Monahans Draw. |
| CRMWD | Howard | Colorado | Big Spring Reuse | 6 | | Low | Low | 6 | Low | None | Medium | | Low | No impact below Beals Creek diversion |
| Manufacturing | Kimble | Colorado | Edwards-Trinity aquifer | <1 | | Medium | Medium | 9 | Low | None | Medium | | Medium | Potential impact on surface water flows |
| Richland SUD | McCulloch | Colorado | Specialty Media Treatment System | <1 | | Low | Low | 9 | Low | None | Low | | Low | Spent media disposed using deep-well injection. |
| Richland SUD | McCulloch | Colorado | Bottled water program | <1 | | Low | Low | 9 | Low | None | Low | | Low | Small amount of water treated |
| Richland SUD | McCulloch | Colorado | Replacement well | 1 | | Low | Low | 9 | Low | None | Low | | Low | Replaces existing well |
| Menard | Menard | Colorado | Aquifer Storage and Recovery | 2 | | Low to Medium | Low | 12 | Low | None | Low | | Low | In conjunction with Hickory well |
| Menard | Menard | Colorado | Water Conservation | 0 | | Low | Low | 12 | Low | None | Low | | Low | |
| Menard | Menard | Colorado | New Hickory well | 2 | | Low | Low | 12 | Low | None | Low | | Low | Impacts may be higher if advanced treatment required because of brine disposal |
| Menard | Menard | Colorado | San Saba Off-Channel Reservoir | 80 | | Medium | Medium | 12 | Low to Medium | None | Low | | Medium | Specific site not selected |
| Midland | Midland | Colorado | T-Bar Well Field | 212 | | Low | Low | 7 | Low | None | Low | | Low | Estimated impacts. Precise route unknown pending routing study. |
| Midland | Midland | Colorado | Water Conservation | 0 | | Low | Low | 6 | Low | None | Low | | Low | |
| CRMWD | Multiple | Colorado | Winkler Well Field | 112 | | Low | Low | 7 | Low | None | Low | | Low | Estimated impacts. Precise route unknown pending routing study. |
| CRMWD | Multiple | Colorado | Water from SW Pecos County | 265 | | Low to Medium | Low | 23 | Low | None | Low to Medium | | Low to Medium | |
| CRMWD | Multiple | Colorado | Water from Roberts County | 1125 | | Low to Medium | Low | | Low | None | Low | | Low | Possible impact on Canadian River flows |
| Multiple | Multiple | Multiple | Subordination of senior water rights | 0 | | Medium | Low | varies | Low | Medium to Low | Medium to Low | | Medium | |
| Ballinger | Runnels | Colorado | Voluntary redistribution - Hords Creek Reservoir | 51 | | Low | Low | 10 | Low | None | Low | | Low | |

**Region F Initially Prepared Plan
Environmental Quantification Matrix**

| Entity | County | Basin | Strategy | Environmental Factors | | | | | | | | | | Comments |
|----------------|----------------|----------------|--|-----------------------|---------------|-------------------|---------|-----------------------------|--------------------|------------------|---------------------|-------|-------------------------------|---|
| | | | | Acres Impacted | Wetland Acres | Envir Water Needs | Habitat | Threat and Endanger Species | Cultural Resources | Bays & Estuaries | Envir Water Quality | Other | Overall Environmental Impacts | |
| Ballinger | Runnels | Colorado | Voluntary Redistribution - purchase water from CRMWD | 0 | | Low | Low | 10 | Low | None | Low | | Low | Pipeline already in place |
| Ballinger | Runnels | Colorado | Reuse | 10 | | Medium | Medium | 10 | Low | None | Medium | | Medium | Assuming that waste stream from treatment process would be discharged or use land application. |
| Ballinger | Runnels | Colorado | Water Conservation | 0 | | Low | Low | 10 | Low | None | Low | | Low | |
| Winters | Runnels | Colorado | Reuse | 10 | | Medium | Medium | 10 | Low | None | Medium | | Medium | Assuming that waste stream from treatment process would be discharged or use land application. |
| Winters | Runnels | Colorado | Water Conservation | 0 | | Low | Low | 10 | Low | None | Low | | Low | |
| CRMWD | Scurry | Colorado | Snyder Reuse | 9 | | Low | Low | 6 | Low | None | Medium | | Low | No impact below Colorado City |
| CRMWD | Multiple | Colorado | Capitan Reef Desalination | 164 | | Low | Low | 7 | Low | None | Low | | Low | Estimated impacts. Precise route unknown pending routing study. |
| San Angelo | Tom Green | Colorado | Water Conservation | 0 | | Low | Low | 10 | Low | None | Low | | Low | Conserved water expected to remain in reservoirs for later use, use by others, or lost due to evaporation. Not expected to have a significant positive impact on environmental flows. |
| San Angelo | Tom Green | Colorado | Edwards-Trinity aquifer - Schleicher Co. | 83 | | Medium to high | Medium | 10 | Low | None | Medium to Low | | Medium | |
| San Angelo | Tom Green | Colorado | Water from SW Pecos County | 448 | | Low to Medium | Low | 23 | Low | None | Low to Medium | | Low to Medium | |
| San Angelo | Tom Green | Colorado | McCulloch Well Field | 476 | | Low | Low | 12 | Low | None | Low | | Low | Estimated impacts. Precise route unknown pending routing study. |
| San Angelo | Tom Green | Colorado | Desalination Facility | 100 | | Low | Low | 10 | Low | None | Low | | Low | Using deep well injection for brine disposal |
| San Angelo | Tom Green | Colorado | Rehabilitation of Spence Pipeline | 0 | | Low | Low | 10 | Low | None | Low | | Low | Existing pipeline |
| Steam Electric | Not determined | Not determined | CCGT and ACC Generation | 0 | | Low | Low | unknown | Low | None | Low | | Low | Location of new generation not determined |