5A.6 Voluntary Redistribution

5A.6.1 Description of Option

For the purposes of this study, "voluntary redistribution" is defined as an entity in possession of water rights or water purchase contracts freely selling, leasing, giving, or otherwise providing water to another entity. Typically, the entity providing the water has determined that it does not need the water for the duration of the transfer. The transfer of water could be for a set period of years or a permanent transfer.

Voluntary redistribution is nothing new to Texas or to the Brazos G Region. Voluntary redistribution is essentially a water purchase. Typical examples of voluntary redistribution occurring in the region are the sale of water by entities such as the BRA, City of Waco, LCRA, and the City of Abilene. These entities are just a few of those entities already selling water through purchase contracts. The most common water sales occur when cities such as Waco, Austin, or Abilene sell water to their surrounding communities.

Voluntary redistribution has many benefits over other supply options including the facts that it can be much easier than implementing a new reservoir project, it typically cost less than large capital projects, and it avoids implementation issues of new reservoir projects such as environmental and local impacts. Most importantly, redistribution of water makes use of existing resources and provides a more immediate source of water.

5A.6.2 Available Supply

The first step towards voluntary distribution is determining where water supplies are available and are projected to be available for some future period. Water available for the voluntary redistribution option was identified for municipal and industrial uses only.

As potential sources of water for voluntary redistribution are identified, it is important to remember that the redistribution of water is voluntary. No group or individual is required to participate. For this reason, individuals or groups with available water will not be specifically identified, and the quantity of unused water is lumped by county.

The amount of available water reserved for municipal use was determined from the projected demands and supplies. Voluntary redistribution focuses on surface water only, including water rights and water purchase contracts. The major reservoirs of the region and their water users were examined for water that is projected to be in excess of needs. Most municipal

and industrial water originates from reservoirs, and this option considers only water originating from reservoirs. The majority of these reservoirs are BRA reservoirs, and water is supplied through purchase contracts.

5A.6.2.1 Municipal Uses

The municipal surface water supplies in excess of 2030 and 2050 needs are listed in Table 5A.6-1. For the water supplies shown, when an entity owns a water right and also holds a purchase contract, then the entity's demand is first shown as supplied by the water right and then as needed by the contract. Only municipal-use contracts located within the Brazos G Region are listed for each reservoir. For entities such as municipal utility districts, water supply corporations, and cities that provide treated water to other users, the contractual obligations are assumed to be fully met. Only long-term BRA purchase contracts are included in the surface water supplies from BRA. These same contracts are considered available to the contract owner through 2050, regardless of expiration dates.

Table 5A.6-1.
Municipal Demands, Supplies, and Surface Water
in Excess of Needs by Reservoir

County	Reservoir	Year 2030			Year 2050		
		Demand (acft)	Supply (acft)	Excess (acft)	Demand (acft)	Supply (acft)	Excess (acft)
Bell	Belton	91,434	100,050	8,616	92,388	100,050	7,662
Bell	Stillhouse	49,352	67,287	17,935	56,621	67,287	10,666
Hood	Granbury	14,861	19,340	4,479	15,791	19,340	3,549
McLennan	Waco	43,123	80,370	37,247	49,127	79,870	30,743
Palo Pinto	Possum Kingdom	10,941	19,640[1]	8,699	11,035	19,640[1]	8,605
Stephens	Hubbard	23,792	40,369[2]	16,577	23,792	38,349[2]	14,557
Washington	Somerville	2,540	4,619	2,079	2,336	4,619	2,283
Total		236,043	331,675	95,632	251,090	329,155	78,065

[1] The supply is the firm yield of Lake Waco.
[2] The supply is the firm yield of Lake Hubbard.

5A.6.2.2 Steam-Electric Uses

Industrial uses include manufacturing, steam-electric, and mining. No significant quantities of available water were found in manufacturing and mining. Therefore, steam-electric

is the only industrial use considered here. The water supply for stream-electric use was determined to be the contracted amounts from the BRA and run-of-the-river diversions from the Brazos River. The steam-electric reservoirs provide water for cooling and recirculation. Region G reservoirs considered in this study are Lake Alcoa, Lake Creek, Lake Daniel, Lake Bryan, Gibbons Creek Reservoir, Squaw Creek Reservoir, Tradinghouse Reservoir, and Twin Oaks Reservoir. Steam-electric demands, supplies, and supplies in excess of needs are listed in Table 5A.6-2. In 2030, the amount of surface water in excess of demands is estimated to be 120,594 acft.

Table 5A.6-2.
Steam-Electric Demands, Supplies, and Surface Water in Excess of Needs by County

County	Year 2030			Year 2050		
	Demand (acft)	Supply (acft)	Excess (acft)	Demand (acft)	Supply (acft)	Excess (acft)
Bell	11,200	0	0	11,200	0	0
Bosque	5,600	0	0	5,600	0	0
Brazos[1]	5,000	5,756	756	5,000	5,756	756
Grimes	20,000	20,000	0	20,000	20,000	0
Haskell	3,000	1,291	0	3,000	1,175	0
Hood	6,700	40,000	33,300	6,700	39,905	33,205
Jones	10,324	6,500	0	10,324	6,500	0
Limestone[1]	20,000	27,458	7,458	20,000	27,458	7,458
McLennan	25,000	25,000	0	35,000	35,000	0
Milam	12,500	9,002	0	16,000	9,002	0
Palo Pinto	3,000	69,034	66,034	3,000	49,034	46,034
Robertson[1]	30,000	40,727	10,727	40,000	50,727	10,727
Somervell	23,200	23,200	0	23,200	23,200	0
Taylor	300	2,619	2,319	300	2,619	2,319
Young	3,500	0	0	3,500	0	0
Total	179,324	270,587	120,594	202,824	270,376	100,499

[1] Includes groundwater supplies

Available water in the Brazos G Region was identified within existing water rights and contracts of major reservoirs. The reservoirs identified with unused water include Lake Belton,

Lake Stillhouse Hollow, Lake Granbury, Lake Somerville, Lake Waco, and Possum Kingdom. Table 5A.6-3 summarizes the volumes of surface water for municipal and industrial uses in excess of needs in the years 2030 and 2050. The region has an estimated 215,470 acft projected in excess of needs in 2030 and 177,808 acft in 2050.

Table 5A.6-3.
Summary of Municipal and Industrial Surface Water in Excess of 2030 and 2050 Needs by County

County	Surface Water in Excess of Needs	
	Year 2030 (acft)	Year 2050 (acft)
Bell	26,551	18,328
Hood	37,779	36,754
Limestone	7,458	7,458
McLennan	37,247	30,743
Palo Pinto	74,733	54,639
Robertson	10,727	10,727
Stephens	16,577	14,557
Taylor	2,319	2,319
Washington	2,079	2,283
Total Excess Water	215,470	177,808

5A.6.2.3 Water Shortages in Brazos G Region

The second step toward voluntary redistribution is knowing which areas in the region will have water shortages in the future. Shortages in the years 2030 and 2050 are shown in Tables 5A-19 and 5A-20. Five counties in the region are projected to have overall shortages in 2050, as listed in Table 5A.6-4. The counties are Coryell, Knox, Johnson, Somervell, and Williamson. Overall shortages are defined as the grand total of each county's supply and demand.

Individual shortages for a municipal or industrial use occur more often than overall shortages. Although a county may not have an overall shortage, the individual use types of municipal or industrial may have shortages. These individual shortages are listed in Table 5A.6-5. Bell, Bosque, Jones, McLennan, Milam, and Young Counties will have the

Table 5A.6-4.
Municipal and Industrial Supply Shortages
for Counties with Overall Shortages

County	Shortage Amount	
	Year 2030 (acft)	Year 2050 (acft)
Coryell	2,482	6,925
Knox	486	490
Johnson	0	7,716
Somervell	1,034	1,714
Williamson	8,748	32,135
Total County Shortages	12,758	48,980

largest individual shortages in the region for the year 2030 with shortages greater than 2,000 acft. Counties that will have shortages greater than 2,000 acft in 2050 are Bell, Bosque, Johnson, Jones, McLennan, Milam, Taylor, and Young.

The total shortage in the region is the sum of the county shortage and individual shortages. The total shortages in 2030 and 2050 are 59,699 acft and 109,183 acft, respectively. The total excess water in 2030 and 2050 is estimated at 215,470 acft and 177,808 acft, respectively.

The voluntary redistribution option could potentially solve the municipal and industrial water supply problems in Region G. The surface water supply in excess of water needs is more than twice the shortages. However, this is no guarantee that voluntary redistribution will supply the shortages in the region.

5A.6.3 Environmental Issues

No substantial environmental impacts are anticipated, as available water resources identified for this option are supplied through existing reservoirs. A summary of the few environmental issues that might arise for this alternative are presented in Table 5A.6-6.

Table 5A.6-5.
Counties with Individual
Municipal and Industrial Supply Shortages

County	Shortage Amount	
	Year 2030 (acft)	Year 2050 (acft)
Bell	18,515	19,595
Bosque	6,765	7,460
Haskell	1,709	1,825
Hill	56	84
Johnson	1,342	7,716
Jones	4,204	4,260
Lampasas	108	128
Limestone	777	1,059
McLennan	3,174	4,658
Milam	3,498	6,998
Nolan	697	835
Palo Pinto	86	118
Shackelford	333	340
Stephens	1	1
Taylor	1,953	2,327
Young	3,723	2,799
Total Individual Shortages	46,941	60,203

5A.6.4 Engineering and Costing

A cost estimate to this option cannot be fully assessed at this time. Many unknowns exist including the price of the water, potential costs of new pipelines or water treatment facilities, and the proximity of the water needs to the water supply.

Potential costs of purchasing and using water available from voluntary redistribution are listed below:

- Cost of raw water;
- Potential treatment costs;
- Conveyance costs;
- Engineering costs of designing and constructing treatment and conveyance systems; and
- Additional costs required by water supplier. Many times when the water supplier is a city, water will be sold for 1.5 times the price of water sold within the city limits.

Table 5A.6-6.
Environmental Issues: Voluntary Redistribution

Water Management Option	*Voluntary Redistribution*
Implementation Measures	Voluntary Redistribution or water purchase from an entity with available water supply to entities in need of water. Terms of the contract would be drawn up on the case by case basis.
Environmental Water Needs / Instream Flows	Possible low impacts. The primary source of water identified as available to this option is stored in existing reservoirs.
Bays and Estuaries	No substantial impact identified.
Fish and Wildlife Habitat	Potential impacts include constructing and maintaining easements for new pipelines or pump stations. Extent of impacts dependent on location and size of projects.
Cultural Resources	Possible low impact.
Threatened and Endangered Species	Potential impacts include impacts of constructing and maintaining easements for new pipelines or pump stations. Extent of impacts dependent on location and size of projects.
Comments	Assumes infrastructure is needed to distribute purchased water to the entity in need.

Table 5A.6-7 lists estimates of costs of voluntary redistribution. The raw water purchase price is estimated to be between $23 and $105 per acft. The price of raw water from the BRA and LCRA is $23 and $105, respectively. The total potential cost of water from voluntary redistribution is $348 to $1,205 per acft, or $1.07 to $3.70 per 1,000 gallons.

Table 5A.6-7.
Potential Costs of Water from Voluntary Redistribution (i.e. Water Purchase)

Raw Water Purchase[1] *($/acft)*	*Treatment ($/acft)*	*Conveyance ($/acft)*	*Potential Total Cost ($/acft)*
$23 to $105	$325 to $800	$0 to $300	$348 to $1,205

[1] Raw water costs from BRA and LCRA is $23 and $105 per acft, respectively.

5A.6.5 Implementation Issues

This water supply option has been compared to the plan development criteria, as shown in Table 5A.6-8, and the option meets each criterion.

An issue facing redistribution is proper compensation for the entity or individual that owns the water right or contract for water. If an entity has arranged through contracts to have

more water than they currently need or may need in the study period, they should be compensated for the expense and upkeep of any facilities already in place.

Table 5A.6-8.
Comparison of Voluntary Redistribution Option to Plan Development Criteria

Impact Category	*Comment(s)*
A. Water Supply:	
1. Quantity	1. Significant quantities available in parts of the region
2. Reliability	2. High reliability
3. Cost	3. Low to moderate
B. Environmental factors	
1. Environmental Water Needs	1. Possible low impact
2. Habitat	2. Low impact possible where new pipelines are constructed
3. Cultural Resources	3. Possible low impact
4. Bays and Estuaries	4. No substantial impact
C. Impact on Other State Water Resources	• No apparent negative impacts on state water resources; no effect on navigation
D. Threats to Agriculture and Natural Resources	• Could affect agriculture if supplies converted to M&I; beneficial effect on natural resources by avoiding need for new projects
E. Equitable Comparison of Strategies Deemed Feasible	• Option is considered to meet municipal and industrial shortages
F. Requirements for Interbasin Transfers	• Not applicable
G. Third Party Social and Economic Impacts from Voluntary Redistribution	• Supplies considered are excess to 30-year needs; no anticipated third party effects

The following issues should be considered when negotiating a voluntary redistribution agreement:

- Quantity of water to be redistributed;
- Location of excess water supply;
- Location of buyer with water need;
- Necessary water treatment and distribution facilities;
- Determination of fair market value;
- Consideration of how existing contracts will effect the sale or lease;
- Length of agreement;
- Expiration dates of agreement;
- Drought contingencies;
- Protections needed by entity providing water;
- Protections needed by entity needing water;
- Enforcement of protections; how do you enforce termination for interim water sales?; and
- Other conditions specific to buyer and seller.