

May 15, 2003

ATTACHMENT E

AMENDMENT # 2

Llano Estacado Regional Water Plan – January 2001

Insert Section 5.2.11(A) on Page 5-187, as Pages 5-187(1), 5-187(2), 5-154(3), 5-154(4), 5-187(5), and 5-187(6).

5.2.11(A) *Lake Alan Henry Water Supply District Project: Water Treatment Plant at Lake Alan Henry—Lake Alan Henry Source of Water, with Pipelines and Treated Water Storage Facilities to Serve Developing Areas at Lake Alan Henry (Region O) and in Kent County (Region G)*

5.2.11(A).1 *Description of Option*

This water management strategy includes construction of the following list of water supply facilities at Lake Alan Henry (Figure 5-11(A)):

1. Raw water intake on the north side of Lake Alan Henry near the dam on property to be acquired by the project sponsor(s) for that purpose;
2. Raw water pipeline from the water intake to a water treatment plant located on the north side of Lake Alan Henry;
3. Water treatment plant on the north side of Lake Alan Henry in Garza County;
4. Treated water ground storage tank at the water treatment plant;
5. Treated water pipeline from the treated water storage tank to serve the following developments on the north side of Lake Alan Henry;
 - a. Community of Justiceburg,
 - b. Justiceburg Recreation Vehicle Park,
 - c. Grubs Recreation Vehicle Park,
 - d. North Ridge Recreation Vehicle Park, and
 - e. North Ridge Development,
 - f. Other areas within the Lake Alan Henry Water Supply District; and
6. Treated water pipeline from the treated water ground storage tank across the Brazos River downstream of the dam, and extended to supply treated water to the following developments located near Lake Alan Henry in Garza and Kent Counties:
 - a. Rio Brazos Development,
 - b. West Rio Brazos Development
 - c. Rio Brazos Recreation Vehicle Park,
 - d. Community of Polar, and
 - e. Other Areas within the Lake Alan Henry Water Supply District.

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The quantity of water needed and the size of the facilities are based upon information about numbers of connections, people per connection, and daily water use rates shown in Table 5-103a.

Table 5-103a.
Population and Water Demand
Lake Alan Henry Water Supply District System ¹

Name of Development	Maximum Number of Connections	Population with Maximum No. of Connections	GPCD* Use Rate	Water Demand (acft/yr)
North Side of Lake				
Justiceburg Community	50	150	118	19.83
Justiceburg RV Park	100	300	45	15.12
Grubs RV Park	100	300	45	15.12
North Ridge RV Park	120	360	45	18.15
North Ridge Development	100	300	118	39.65
Subtotal	470	1,410		107.87
South Side of Lake				
Rio Brazos Development	200	600	118	79.31
West Rio Brazos Development	120	360	118	47.58
Rio Brazos RV Park	200	600	45	30.24
Polar Community	10	30	118	3.97
Subtotal	530	1,590		161.10
Total		3,000		268.97
Quantity of Water (Million Gallons per Day) Average Usage				0.25
Peaking Factor of 2.0; Peak Day Demand (Million Gallons per Day)				0.50

* GPCD is gallons per person per day.

5.2.11(A).2 Quantity of Water Available

The quantity available for this option is 270 acre-feet per year and would be obtained from Lake Alan Henry that has an estimated firm yield of 18,000 acft/yr, of which the quantity needed to supply this water management strategy is presently available, and will be available for the 50-year planning horizon.

¹ It is intended that other areas within the Lake Alan Henry Water Supply District can be served, as needed.

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5.2.11(A).3 Environmental Issues

The environmental issues associated with this option are for pipeline rights-of-way and sites for the water treatment plant and storage facilities. Since routes and sites can be selected to avoid sensitive wildlife habitat and cultural resources, there would be very little, if any, environmental issues of significant concern.

5.2.11(A).4 Engineering and Costing

Costs for this option include costs of:

1. Land and rights-of-way;
2. Raw water intake facilities (intake, pumps, and pipeline to water treatment plant);
3. Surface water treatment plant;
4. Treated water ground storage tank;
5. Treated water pipelines, pumps and pump stations;
6. Engineering;
7. Environmental and archeological studies,
8. Permitting, and mitigation, if any; and
9. Interest during construction.

The following assumptions and conditions were used in the costing of this option.

- The 270 acre-feet of water can be obtained from Lake Alan Henry, which has an adequate yield to meet this demand.
- The cost for raw water from Lake Alan Henry is \$148 per acft.
- Cost of land for water treatment plant, pump stations, and storage tank is \$275 per acre.
- Cost of land for pipeline easements is \$275 per acre.
- The surface water treatment plant would have a capacity of 0.5 MGD, and is sized to meet peak daily demands of the water users at build-out of all areas to be served.
- The pipelines are sized to meet peak daily water demands of the water users at build-out of all areas to be served.
- The costs given are for treated water delivered to the end users' respective locations, but do not include costs of distributing the treated water within the respective communities and subdivisions.
- Engineering, legal costs, and contingencies are calculated as 30 percent of the construction costs for the pipelines and 35 percent for all other facilities.
- Environmental and archeological studies, mitigation, and permitting costs are calculated as 100 percent of the land cost.

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- Interest during construction is calculated at an annual rate of 6 percent with a 4 percent annual rate of return on funds balances during construction, which is estimated to be for a period of 2 (two) years.

The total project construction cost for this option was estimated at \$5,539,000 (Table 5-103b). Financing the project for 30 years at 6 percent annual interest results in an annual expense of \$402,000 for debt service (Table 5-103b). Annual O&M costs total \$271,000 (Table 5-103b). The total annual cost, including debt service, raw water cost, O&M cost, and power cost, is \$716,400 (Table 5-103b). For an annual delivery of 270 acre-feet of treated water at the treated water storage tanks ready for distribution to end users the calculated cost per acre-foot is \$2,653 or \$8.14 per thousand gallons (Table 5-103b).

5.2.11(A).5 Implementation Issues

Implementation of this option will require financing, rights-of-way and sites for facilities, state and federal permits for the raw water intake, stream crossings, environmental and cultural resources studies, and mitigation for any environmental and cultural resources that might be affected.

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**Table 5-103b.
Cost Estimate for
Lake Alan Henry Water Supply District Project (270 acft/yr)
Llano Estacado and Brazos G Regions**

Item	Estimated Cost for Facilities (1st quarter 2003)
Capital Costs	(Dollars)
Intake, Pump, and Pump Station (0.5 MGD)	412,500
Water Treatment Plant (0.5 MGD modular upflow clarifier)	825,000
Transmission Pump, and Pump Station (0.5 MGD)	295,000
Treated Water Storage Tank (1 MGD)	747,000
Transmission Pipelines (6 inch diameter; 7.1 miles)	748,000
Transmission Pipelines (4 inch diameter; 7.3 miles)	620,500
Transmission Pipelines (2 inch diameter; 3.5 miles)	230,500
Highway and Stream Crossings (4 minor, and 1 major stream, and 1 road crossing)	123,500
Total Capital Cost	4,002,000
Engineering, Legal Costs and Contingencies (30% for pipelines & 35% for all other)	1,001,000
Environmental Studies and Permitting (100% Of land costs)	112,000
Land and Surveying for Pipelines (43 acres @ \$275 per acre)	12,900
Land for Treatment Plant, Pump Stations, and Storage Tank (4 acres @ \$275/acre)	1,100
Interest During Construction (2 years @ 4%)	410,000
Total Project Cost	5,539,000
Annual Costs	
Debt Service (6 percent for 30 years)	402,000
Intake, Pipeline, and Pump Station Operation and Maintenance	41,000
Water Treatment Plant Operation and Maintenance	230,000
Cost of Raw Water (270 acft/yr @ \$148 per acft) ¹	40,000
Pumping Energy Costs (56,350 kW-hr @ \$0.06/kW-hr)	3,400
Total Annual Cost¹	716,400
Quantity of Water (acft/yr)	270
Annual Cost of Water (\$ per acft)²	2,653
Annual Cost of Water (\$ per 1,000 gallons)²	8.14
¹ Cost of raw water at Lake Alan Henry is \$148 per acft. ² Annual Cost of Water is for treated water at the treated water storage tanks and does not include costs associated with distribution within municipal systems.	

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Figure 5-11(A): Lake Alan Henry Water Supply District Project

Map of Water Management Option