

TARRANT COUNTY WATER CONTROL AND
IMPROVEMENT DISTRICT NUMBER ONE

TEXAS WATER DEVELOPMENT BOARD

Upper West Fork and Clear Fork
Trinity River Basin
Water Quality and Regional
Facility Planning Study

FINAL REPORT

APPENDIX B
EAGLE MOUNTAIN LAKE
FACILITY PLANNING REGION

August 1988

Alan Plummer and Associates, Inc.

CIVIL/ENVIRONMENTAL ENGINEERS • ARLINGTON-FORT WORTH, TEXAS



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APPENDIX B
EAGLE MOUNTAIN LAKE FACILITY PLANNING REGION
INTRODUCTION

GENERAL

This appendix presents details of Facility Planning efforts conducted for the Eagle Mountain Lake Facility Planning Region. Summary results of these detailed descriptions are also presented in Chapter IV of this report. The specific implementation requirements for the study results for the Eagle Mountain Lake Region are somewhat contingent upon final conclusions developed by the Texas Water Commission as a result of their water quality modeling of Eagle Mountain Lake as well as the outcome of a wastewater discharge permit hearing currently underway for the City of Azle.

The Eagle Mountain Lake planning region is shown on Figures B-1 and B-2. Also shown are the 16 individual facility planning areas (FPA) which were defined for localized facility planning. The individual planning areas in most cases are drainage basins for the creeks which drain into Eagle Mountain Lake. In some instances, however, the boundaries have been modified to account for political boundaries such as city limits. Also included prior to the figures in this appendix is a legend sheet to be used for reference for all subsequent figures.

The FPAs are listed below:

- Azle Facility Planning Area
- Ash Creek Facility Planning Area
- Pelican Bay Facility Planning Area
- Peden Facility Planning Area
- Swift Branch Facility Planning Area
- Reno Facility Planning Area

- Briar Creek Facility Planning Area
- Hog Branch Facility Planning Area
- Boyd Facility Planning Area
- Aurora Facility Planning Area
- Oates Branch Facility Planning Area
- Newark Facility Planning Area
- Avondale Facility Planning Area
- Gilmore Branch Facility Planning Area
- Boat Club Facility Planning Area
- Lake Country Estates Facility Planning Area

For rural areas and some smaller towns; population figures for 1987 were estimated from aerial photographs of the planning area, copies of subdivision plats, and windshield surveys. 1987 Population Estimates for cities were obtained from the North Central Texas Council of Governments (NCTCOG). Year 2005 projections for cities were obtained by linear extrapolation of the growth rates from 1980 through 1987. For rural areas, the 2005 populations were derived by linear extrapolation of the 1980 and 1987 populations using average growth rates from cities in the area. The 1987 population for the EML planning region is estimated at 25,090, and 2005 projection for the region is 43,440, which is a 73 percent increase over 18 years. A density of 2.54 persons per household was used throughout the calculations for the Eagle Mountain Lake regional planning area. As pointed out in Table II-5 of this report approximately 47 percent of the EML Planning Region population did not have sewer service in 1987.

Each of the FPAs is discussed individually in this Appendix. The discussion includes information on soils, boundaries, population, and existing and proposed facilities. Several alternatives for wastewater disposal in the region are examined in this Appendix. These alternatives may generally be classified into one of the following types of systems:

1. Individual organized wastewater systems
2. Subregional wastewater systems
3. Regional wastewater systems

For each alternative, the following factors are considered:

1. Effectiveness toward maintaining water quality and public health.
2. Cost of construction and operation.
3. Geographical, political, and other constraints.

In order to analyze the feasibility of each type of system, maps were prepared showing general collection system layouts, interceptor routes, and pump station and treatment plant locations. Maps showing the individual system layouts used for this study are included herein. The worksheets which were used to generate the cost information for each of the individual planning area systems, the subregional systems, and the regional systems are included at the end of this appendix.

LOCAL WASTEWATER SYSTEMS

Azle Facility Planning Area

The City of Azle is located on the southeast shore of Eagle Mountain Lake in northern Tarrant and Parker Counties. State Highway 199 (SH-199) and Farm to Market 730 (FM 730) are the major roads in the planning area. The topography is gently rolling, ranging in elevation from 650 to 800 feet above sea level. The city is naturally divided by the Ash Creek and Walnut Creek drainage basins, which drain from northwest to southeast into Eagle Mountain Lake.

Soils in the area are classified as clays and clay loams and have the

following distribution of Soil Conservation Service (SCS) ratings of suitability for use as septic tank absorption fields.

- 10 percent has slight limitation for use
- 5 percent has moderate limitations for use
- 65 percent has severe limitations for use due to slow percolation rates
- 20 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The Azle Planning Area includes portions of both the Ash Creek drainage basin and the Walnut Creek drainage basin. The boundaries are similar to those defined in the Sanitary Sewer Master Plan for the City of Azle (July 1982) by Rady and Associates, Inc., but are expanded on the southwest and modified slightly in other areas. The boundaries are shown on Figures B-3 and B-4. Eagle Mountain Lake is the eastern boundary, and the northern and southern boundaries are modified to approximately follow the watershed limits. The planning area under consideration in this study is approximately 2120 acres in the Walnut Creek Basin and 6200 acres in the Ash Creek Basin.

Population. The 1987 North Central Texas Council of Governments (NCTCOG) Population Estimates have a 1987 population figure of 7,750 for the City of Azle, and data from aerial photographs indicate the 1987 population of 930 for the remaining portion of the planning area. The population projection for 2005 for the Azle planning area is 14,250 and for the current city limit area is 10,500. Population growth is occurring inside the city and outside the city limits, in the north, and west-southwest directions. However, the subdivisions outside the city tend to have larger lots, often 2 acres or larger in size. Three subdivisions were identified outside the city limits but in the Azle Facility Planning Area (Ash Creek Acres, Flat Rock, and Silver Creek Estates) with a total of 130 lots.

The Master Plan reports 50 percent of the developed land as residential, 5 percent as commercial/industrial, and the remainder as streets and public lands. Approximately 45 percent of the land area within the city has been developed.

Existing Wastewater Facilities. The City of Azle has a wastewater system which consists of over 217,000 feet of lines, 11 lift stations, and 2 treatment plants. In 1980 approximately 40 percent of the city's population was served by individual systems, and it is estimated by city officials that the level has now decreased to about 20 percent.

The current discharge permits for the treatment plants allow for the following conditions:

	<u>Ash Creek WWTP</u>	<u>Walnut Creek WWTP</u>
Average daily flow	0.45 MGD	0.125 MGD
BOD (30-day average)	10 mg/l	Interim - 20 mg/l; Final-10 mg/l
TSS (30-day average)	15 mg/l	Interim - 20 mg/l; Final-15 mg/l

In 1986 the following average conditions were observed:

	<u>Ash Creek WWTP</u>	<u>Walnut Creek WWTP</u>
Average daily flow	0.44 MGD	0.15 MGD
BOD (30-day average)	5 mg/l	79 mg/l
TSS (30-day average)	25 mg/l	99 mg/l

Proposed Wastewater Facilities. The city is aware of the rapid population growth and has responded by developing a master plan. In addition, the City has applied for amended permits for both WWTPs and is currently expanding

the Walnut Creek WWTP. At the time of this writing the permit application hearings are still in progress and conclusions have not yet been reached. The plant expansion is scheduled to be completed and will provide an additional 0.185 MGD capacity to the existing Walnut Creek WWTP. The request to amend the Ash Creek permit reflects the 0.75 MGD constructed capacity of the Ash Creek WWTP. The discharge permit amendments currently being reviewed by TWC include the following:

	<u>Ash Creek WWTP</u>	<u>Walnut Creek WWTP</u>
Average daily flow	0.75 MGD	0.294 MGD
BOD (30-day average)	10 mg/l	10 mg/l
TSS (d0-day average)	15 mg/l	15 mg/l

The City's master plan report defines future expansions to the collection system, which are repeated on Figures B-3 and B-4. Costs for the improvements were also identified in the city's master plan. The Ash Creek and Walnut Creek WWTPs have projected year 2005 flows of .84 MGD and .21 MGD, respectively based on 100 gpcd. However for purposes of this study, more conservative values of 1.01 MGD and 0.25 MGD were used based on 120 gpcd after reviewing TWC self reporting data. No new areas within the Azle planning area, but outside the City's master planning area, were identified as having sufficient population to support additional facilities.

The Azle planning area was included in a subregional system in the Ash Creek drainage basin, a subregional system in the Walnut Creek drainage basin, and a regional system for the entire west side of Eagle Mountain Lake.

Ash Creek Facility Planning Area

The Ash Creek facility planning area (FPA) is that portion of the Ash Creek natural drainage basin upstream of the Azle planning area. The western boundaries of the FPA are approximately 6 miles from Eagle Mountain Lake in

northeast Parker County. Several small populated areas (unincorporated communities) are included in the FPA, such as Sanctuary and Sabathany next to Highway 199. Also 12 subdivisions were located in the planning area. The populated areas tend to center around the higher hilltops overlooking river valleys. The topography is gently rolling, ranging in elevation from 700 to over 1000 feet above sea level. The Ash Creek river basin drains in an easterly direction into Eagle Mountain Lake.

Soils in the area are mostly clay, however sandy loams are present and many of the higher hills consist of rock. The soils have been rated by the Soil Conservation Service for their suitability for use as septic tank absorption fields. Those soils in the populated areas are categorized as follows:

- 15 percent has moderate limitations for use
- 70 percent has severe limitations for use due to slow percolation rates
- 15 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The boundaries for the Ash Creek facility planning area are shown on Figure B-5. They are defined on the north and south by the natural drainage limits to the Ash Creek basin. The eastern limits coincide with the boundary on the Azle planning area, and the western boundary was defined to include the populated areas within a 5- to 6-mile distance from the lake. The area under consideration in the FPA is approximately 5,550 acres.

Population. Population figures for 1987 for this FPA were estimated by house counts from recent aerial photographs in conjunction with windshield surveys. In addition, maps were obtained from the tax offices where possible, to identify recorded subdivisions. The 1987 population estimate

for the planning area is 1270 and the year 2005 population projection is 2110.

Twelve subdivisions were identified (with a total of 770 lots) in the FPA which are grouped in three areas. The first group is approximately 1 mile west of Sabathany, 2 miles south of Highway 199. Subdivisions include Loma Vista, Allison Cattle Company subdivision, Oak Country, Horseshoe Acres, and Fox Hollow. The 1987 population is estimated to be 310, and 2005 to be 520. The second group includes two Sabathany Acres subdivisions and Whispering Oaks, with a 1987 population of 165 and 2005 population of 280. The third group is Sanctuary and includes Ash Creek Estates, Live Oak Park, Shadow Lane Estates and also Tanglewood Estates. The 1987 population is 647 and 2005 is 1,075.

The areas are all residential with lot sizes ranging from less than one-half acre to over 2 acres. The majority of houses are small or are mobile homes.

Existing Wastewater Systems. All residences within the FPA are currently served by individual on-site systems.

Potential Wastewater Systems. Separate collection and treatment systems were identified for each of the three subareas in the FPA. The systems are shown on Figure B-5. System No. 1 consists of a 0.052 MGD treatment plant and 22,500 feet of line; System No. 2 consists of a 0.028 MGD treatment plant and 15,000 feet of line; and, System No. 3 consists of a 0.11 MGD treatment plant and 20,000 feet of line. Costs for the potential systems are summarized in Tables B-1 and B-2.

Another alternative considered is to combine the three individual subareas into a single subregional system in the facility planning area. Also, the facility planning area system could be combined with the City of Azle's portion in the Ash Creek drainage basin to form another subregional system

for the Ash Creek drainage basin. A regional system was also considered, combining the Ash Creek FPA with all the other FPAs on the west side of Eagle Mountain Lake.

Pelican Bay Facility Planning Area

The Pelican Bay facility planning area includes the City of Pelican Bay and the natural drainage basin to the immediate north of the city and to the east to Eagle Mountain Lake. Seven subdivisions were identified outside of the city limits of Pelican Bay. The topography is gently sloped to the lake from the drainage divide which forms the boundary for the planning area.

Elevations range from 650 at the lake to 770 at the hilltop on the basin boundary. The creek in the planning area is located 2000 feet north of Pelican Bay, and it drains east into Eagle Mountain Lake.

Soils in the planning area are mostly clayey with some sandy clay areas along the lake shore. The soils have been rated by the SCS for their suitability for use as septic tank absorption fields, and have the following distribution:

- 5 percent of the soils have moderate limitation for use
- 95 percent of the soils have severe limitations for use due to slow percolation rates

Planning Area Boundaries. The planning area boundaries are shown on Figure B-6. They are defined by the drainage limits on the north and northwest, city limits to the west, and Eagle Mountain Lake to the south and east. The area under consideration in the FPA is approximately 1270 acres.

Population. The NCTCOG estimates the 1987 population of Pelican Bay to be 1300. Population figures for the remainder of the planning area were

estimated by house counts from recent aerial photographs to be 240. The year 2005 population projection for the planning area is 3560.

Seven subdivisions with a total of 180 lots and an RV park were identified outside the limits of Pelican Bay but in the planning area. Five of the subdivisions (Aqua Vista, Dunaway, Eustance-Hill-Stanfield, Tierra Grande, and L. W. Cole) and the RV park (Scotties West Bay Marina) are along the shore of the lake. The other two subdivisions (Executive Acres and Swan Estates) are northwest and north of Pelican Bay. Lot sizes in Pelican Bay and several of the subdivisions are less than one-half acre in size.

Existing Wastewater Facilities. Residences within the planning area are currently served by individual on-site systems.

Potential Wastewater Facilities. A collection and treatment system was identified for the planning area and is shown on Figure B-6. A 0.35 MGD treatment plant, nearly 45,000 feet of line, and one pump station and force main would be necessary under the proposed system. Costs for the potential system are summarized in Table B-3.

Another alternative considered is to combine the Pelican Bay FPA with the Peden and Swift Branch FPAs and form a subregional system. The Pelican Bay FPA was also included in a regional system along with all of the other FPAs on the west side of Eagle Mountain Lake.

Peden Facility Planning Area

The Peden Facility Planning Area (FPA) is located north of the Pelican Bay FPA and includes the natural drainage basin associated with the next small creek north of the Pelican Bay FPA. Eight subdivisions were identified in this planning area. None of this FPA is within city boundaries except for along Highway 730 which is in the Azle city limits. The topography is

gently sloped to the lake from the natural drainage divide which forms the boundary for the planning area. Elevations range from 650 to 800 feet above sea level. The only creek in the FPA is unnamed and drains from the northwest to the southeast into Eagle Mountain Lake.

Soils in the planning area are sandy clays and clay loams. The soils have been rated by the Soil Conservation Service (SCS) for their suitability for use as septic tank absorption fields, and have the following distribution:

- 55 percent has moderate limitations for use
- 35 percent has severe limitations for use due to slow percolation rates
- 10 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The boundaries for the Peden planning area are shown on Figure B-7. They are defined on the east by Eagle Mountain Lake, to the north and south by the natural drainage divide, and the west by the Reno city limits (which nearly follows the drainage divide as well). The area under consideration in the FPA is approximately 1180 acres.

Population. Population figures for 1987 were estimated from recent aerial photographs in conjunction with windshield surveys. Also, plats of subdivisions were obtained from the tax offices and county records. The 1987 population estimate for the planning area is 425, and the year 2005 population projection is 710.

Eight subdivisions were identified in the FPA with an estimated total of 350 lots. Three subdivisions (Lake Forest, W. H. Younger, and L. W. Cole) are along the lake shore, three (the Estates, Schantile, and Wudco Trials) are located from north to south in the center of the area, and the last two (Wood Valley and Pocos Ranchos) are in the northwest corner of the area.

Existing Wastewater Facilities. All residences within the planning area are currently served by individual on-site systems.

Potential Wastewater Facilities. A collection and treatment system was identified for the planning area and is shown on Figure B-7. It is composed of a 0.071 MGD treatment plant, 26,000 feet of line, and the three pump stations and force mains. Costs for the potential system are summarized in Table B-4.

The Peden FPA was also included in a subregional system with the Pelican Bay FPA and the Swift Branch FPA and in a regional system with all of the other FPAs on the west side of Eagle Mountain Lake.

Swift Branch Facility Planning Area

The Swift Branch planning area includes the natural drainage area for Swift Branch from the Reno city limits (or Parker County line) in northwest Tarrant County east to Eagle Mountain Lake. Seven subdivisions were identified in the planning area. There are no areas within city boundaries included in the planning area. The topography is gently sloped from the drainage limits at the planning area boundaries to the lake. Elevations range from 650 to 850 feet above sea level. Swift Branch drains from northwest to southeast across the planning area, into Eagle Mountain Lake about 1300 feet south of the Tarrant-Wise County line.

Soils in the planning area are clays and clay loams with some smaller areas of sandy clays near the lake. The soils have been rated by the SCS for their suitability for use as septic tank absorption fields, and have the following distribution.

- 5 percent has slight limitations for use
- 15 percent has moderate limitations for use
- 75 percent has severe limitations for use due to slow percolation rates
- 5 percent has severe limitation for use due to shallow rock and flooding

Planning Area Boundaries. The planning area boundaries are shown on Figure B-8. They are defined by the drainage limits on the north and south, Reno city limits to the west, and Eagle Mountain Lake on the east. The area under consideration in this facility planning area is approximately 1370 acres.

Population. Population figures for 1987 were estimated from recent aerial photographs, in conjunction with windshield surveys. Copies of subdivision plats were obtained from tax offices and county records. The 1987 population estimate for the planning area is 560 and the year 2005 population projection is 935.

Seven subdivisions were identified in the FPA with an estimated total of 240 lots. Four subdivisions (Perry Miller, Gantt-Stuart-Foster, R. W. Foster, and Lake Forest) are along the lake shore, and the other three (Holly Hills, Ranch Oak Farms, and English Creek) are in the center portion of the planning area.

Existing Wastewater Facilities. All residences within the planning area are currently served by individual on-site systems.

Potential Wastewater Facilities. A collection and treatment system was identified for the planning area and is shown on Figure B-8. The system is composed of a 0.093 MGD treatment plant, 28,500 feet of line and four pump

stations and force mains. Costs for the potential system are summarized in Table B-5.

The Swift Branch FPA was also included in a subregional system with the Peden and Pelican Bay FPAs and in a regional system with all of the other FPAs on the west side of Eagle Mountain Lake.

Reno Facility Planning Area

The City of Reno is located in northeast Parker County less than 2 miles from Eagle Mountain Lake. Nearly the entire city is in the Walnut Creek drainage basin upstream of Azle. State Highway 1542 is the primary road through the city. The area consists mostly of scattered low density subdivisions with large lots. The topography is gently rolling with elevations ranging from 650 to 870. The Walnut Creek basin drains from northwest to southeast to Eagle Mountain Lake.

Soils in the FPA are mostly clays, sandy clays, and clay loams, which have the following distribution of SCS ratings of suitability for use as septic tank absorption fields.

- 5 percent - slight limitations for use
- 25 percent - moderate limitations for use
- 60 percent - severe limitations for use due to slow percolation rates
- 10 percent - severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The Reno planning area includes the entire City of Reno and part of the Walnut Creek drainage basin as illustrated on Figures B-9 and B-10. The eastern and northeastern boundaries are the city limits, the southern and northwestern boundaries are watershed limits and the western boundary is an arbitrary line set to include any population

areas within the 5- to 6-mile distance from the lake. The planning area under consideration in this study is 14,475 acres.

Population. The NCTCOG 1987 population estimate for the City of Reno is 2,200 and data from aerial photographs indicate a 1987 population of 497 for the remainder of the planning area. The population projection for the Reno planning area for year 2005 is 5,675. Growth in the planning area is occurring in the southwest area along Highway 199 (System No. 2) and in the east central area on both sides of Highway 1542 (System No. 1). Nine subdivisions were identified in the planning area (Highlands Additions, H&H Investments Additions, Country Acres, La Junta, Midway, Oak Valley, Reno North, Walnut Creek Ranch, Walnut Creek Estates) with an estimated total of 415 lots. The growth, however, is very low density in most cases because of large lot sizes and open, undeveloped areas between developed areas.

Existing Wastewater Systems. All residents in the Reno planning area are currently served by individual on-site treatment systems.

Potential Wastewater Systems. Potential systems were identified to serve the populated areas in the planning area. Figures B-9 and B-10 have separate collection and treatment systems identified for both of the populated areas. System No. 1 consists of 0.18 MGD treatment plant, 117,000 feet of line, and 2 pump stations and force mains. System No. 2 consists of a 0.121 MGD treatment plant, 40,000 feet of line, and 3 pump stations and force mains. Costs for both individual systems are identified in Table B-6.

The individual Systems Nos. 1 and 2 were combined to form a subregional system (Walnut Creek Subregional System No. 1) and also with the portion of Azle in the Walnut Creek basin to form a second subregional system (Walnut Creek Subregional System No. 2). In addition, the Reno FPA was combined with all the other FPAs on the west side of Eagle Mountain lake to form a regional system.

Briar Creek Facility Planning Area

The Briar Creek Facility Planning Area (FPA) includes all of the natural drainage basin of Briar Creek except for a small portion that is within the city limits of Reno, just west of the Tarrant-Parker County line. The planning area is located near the northern end of Eagle Mountain Lake on the west side of the lake and includes portions of Tarrant, Parker and Wise Counties. Highway 2257 is the main east-west road through the basin, and Highway 730 is the main north-south road. Seven subdivisions and one other populated area were identified in the FPA. There are no areas within city limits in the FPA. The topography is gently rolling with elevations ranging from 650 to 890 feet above sea level. Briar Creek drains from west to east into Eagle Mountain Lake, approximately 2000 feet south of the Tarrant-Wise County line.

Soils in the planning area are generally clays and clay loams; however, the areas along the lake and in the southern half of the planning area have more sand, and the areas in the northern half of the basin, particularly on the ridges and hills have a significant amount of rocky soil. The soils have been rated by the SCS for the suitability for use as septic tank absorption fields, and have the following distribution.

- 5 percent has slight limitations for use
- 15 percent has moderate limitations for use
- 60 percent has severe limitations for use due to slow percolation rates
- 20 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The planning area boundaries are shown in Figure B-11. They are defined by the drainage limits on the north, west, and

south, and by Eagle Mountain Lake on the east. There is a small portion of the natural basin that is within the city limits of Reno which is not included in the Briar Creek FPA. The area under consideration in the Briar Creek FPA is approximately 4850 acres.

Population. Population figures for 1987 were estimated from recent aerial photographs, in conjunction with windshield surveys. Copies of subdivision plats were obtained from tax offices and county records as well. The 1987 population estimate for the planning area is 870, and the year 2005 population projection is 1420.

Seven subdivisions were identified in the FPA with an estimated total of 890 lots. Five of the subdivisions (Cooley, Eagle Mountain Acres, D. L. Marshall, Allyndale and Turpin) are along the lake shore and the subdivisions of Briarwood Estates and Briar Acres are on Portwood Road east of FM 730. Also a smaller populated area was identified along FM 2257 in the center of the FPA approximately 1 mile west of FM 730.

Existing Wastewater Facilities. All residents within the planning area are currently served by individual on-site systems.

Potential Wastewater Facilities. Collection and treatment facilities were identified for the planning area and are shown on Figure B-11. The system is composed of two separate systems, 1) near the lake, and 2) 2.5 miles west along FM 2257. System No. 1 consists of a 0.118 MGD treatment plant, 40,700 feet of line, and three pump stations and force mains. System No. 2 consists of a 0.036 MGD treatment plant, 21,000 feet of line and no pump stations. Costs for the potential individual systems are summarized in Table B-7. The two individual systems in the Briar Creek FPA were combined to form a subregional system. Also, the FPA was combined with all other FPAs on the west side of Eagle Mountain Lake to form a regional system.

✓ Hog Branch Facility Planning Area. The Hog Branch FPA is located northeast of Eagle Mountain Lake in Wise County. It includes the entire natural drainage basin of Hog Branch, in addition to the drainage areas of the Dry Fork and two other small creeks which drain the Fairview area east of the lake. Hog Branch drains from west to east and enters the West Fork of the Trinity River approximately 4 miles upstream of Eagle Mountain Lake. State highways 730 and 2048 are the major roads in the FPA. There are no areas in the FPA which are incorporated. The topography is gently rolling with elevations ranging from 650 to 910 feet above sea level.

Soils in the planning area are mixed sandy clays and clays. The soils have the following distribution of SCS ratings for suitability for use as septic tank absorption fields. The soil ratings are also shown on Figure B-12.

- 45 percent has moderate limitations for use
- 45 percent has severe limitations for use due to slow percolation rates
- 10 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The boundaries for the planning area are shown on Figure B-12. They are defined by the natural drainage limits for Hog Branch, Dry Creek, and two smaller, unnamed creeks at the northeast side of Eagle Mountain Lake. The area under consideration is approximately 10,180 acres.

Population. Population figures for 1987 for the Hog Branch FPA were estimated from recent aerial photographs in conjunction with windshield surveys. Future projections were based on the average county growth rate for the previous 7 years. The FPA 1987 population estimates is 521 and the year 2005 projection is 740. No development activity was identified in this FPA.

Existing Wastewater Facilities. All residences within the planning area are currently served by individual on-site systems.

Potential Wastewater Facilities. There were no areas identified in this FPA which had sufficient development or density to promote additional facility planning.

✓ **Boyd Planning Area**

The City of Boyd is located in Wise County on Highway 114 approximately 4.5 miles north of Eagle Mountain Lake. Boyd lies within Segment 0810 of the West Fork of the Trinity River which is bounded by the Lake Bridgeport Dam upstream and Eagle Mountain Lake downstream.

The City of Boyd was identified and officially designated as the management agency for the Boyd sewerage planning area (SPA) in the initial 208 Plan. This report will serve as a "SPA Update" to summarize facility planning activities conducted or planned by the city in the Boyd facility planning area.

The FPA is characterized by gently sloping terrain with elevations ranging from 800 feet to 680 feet within the basin. Soils in the planning area are mostly clay and loam soils. The soils have been rated by the SCS for their suitability for use as septic tank absorption fields, and have the following distribution:

- 70 percent of the soils have moderate limitations for use
- 20 percent of the soils have severe limitations for use due to slow percolation rates
- 10 percent of the soils have severe limitations for use due to flooding

Facility Planning Area Boundaries. The planning area boundaries are shown on Figure B-13. It includes a portion of the natural drainage basin for the West Fork of the Trinity River and extends to the southwest edge of Aurora, Texas. The FPA consists of approximately 21,700 acres.

Population. The 1980 census showed a population of 889 persons for the City of Boyd. The NCTCOG 1987 estimate for the City of Boyd is 1,150. Population figures for 1987 for the total FPA were estimated to be 1,569 persons based on house counts taken using recent aerial photographs. The design year 2005 population projection for the Boyd FPA is 2,415.

There is potential for new development in the northwest portion of the city where city officials expect 17 to 20 new housing starts and in the southwest portion, where 17 to 35 new homes are expected. The city anticipates a continued moderate growth rate within the FPA.

Existing Wastewater Facilities. The City of Boyd is currently served by one wastewater treatment plant which consists of two Imhoff tanks, an equalization basin and three stabilization ponds with surface areas of 1.86 acres for the primary pond and approximately 0.93 acres each of the remaining two ponds. The Imhoff tanks were installed in 1978. The existing treatment plant location is shown on Figure B-14. The existing sewerage collection system is characterized by small diameter lines and lift stations where required. The current discharge permit for the treatment plant allows for the following conditions:

Average daily flow	70,000 gal/day
BOD (30-day average)	30 mg/l
TSS (30-day average)	90 mg/l

In 1986, the following average conditions were observed:

Average daily flow	64,200 gal/day
BOD (30-day average)	23.0 mg/l
TSS (30-day average)	65.5 mg/l

The city recently completed the installation of approximately 10,000 feet of 6-inch, 8-inch, and 10-inch diameter collection lines and two lift stations. This new collection system expansion services existing homes which were originally on septic tanks.

The city estimates that 30 homes are currently served by septic tank systems within the city limits.

Potential Wastewater Facilities. The City of Boyd has experienced rapid population growth and has taken positive steps to initiate and execute responsible facility planning for the Boyd FPA. City personnel are aware of discharge permit requirements and are consistently meeting these conditions. Boyd has 9 acres available to expand the existing wastewater treatment plant as the need requires. The city is considering the installation of a "race track" type expansion of the treatment plant and expects to initiate facility planning studies in 1988 to meet the projected needs of the Boyd FPA.

The Boyd FPA was included in a regional system with the City of Aurora and the Newark area, on the north end of Eagle Mountain Lake.

Aurora Facility Planning Area

The Aurora planning area is in Wise County approximately 2 miles north of Eagle Mountain Lake. It includes the City of Aurora and the natural drainage basin for Blue Creek. Aurora is located on State Highway 114

between Rhome and Boyd. Several subdivisions were identified along State Highway 718, which is a main road on the south and west areas of the city. The topography is gently rolling with elevations ranging from 650 to 980 across the basin. The area in Aurora that is south of State Highway 114 is gradually sloped down to State Highway 718. The Blue Creek drainage basin drains from northeast to southwest into the West Fork of the Trinity River. However, the majority of the City of Aurora actually drains southwest into a small unnamed creek which enters the West Fork about 2 miles upstream of Eagle Mountain Lake.

Soils in the Aurora area are quite different than in the upper reaches of the Blue Creek basin. The soils in the Aurora area are very sandy with some clays, while the upper basin soils are rocky with some clays. The soils in Aurora have the following distribution of SCS ratings for suitability for use in septic tank absorption fields.

- 60 percent has moderate limitations for use
- 25 percent has several limitations for use due to slow percolation rates
- 15 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The planning area boundaries are shown on Figure B-14. They are defined by the drainage area limits for the Blue Creek basin on the northwest, north and northeast, by the Aurora city limits on the southeast and the drainage limits for the small creek south of Aurora on the south and southwest. The area under consideration is approximately 8315 acres.

Population. Population figures for 1987 were estimated from recent aerial photographs in conjunction with windshield surveys. Subdivisions were located as well, to aid in locating projected future growth. The 1987

population estimate for the planning area is 510 and the year 2005 population projection is 740.

Three subdivisions were identified in the southwest part of Aurora, with an estimated total of 85 lots, most of which are less than 1 acre. The remaining area of town consists of large tracts which are spread out along existing roads.

Existing Wastewater Facilities. All residences within the planning area are currently served by individual on-site systems.

Potential Wastewater Facilities. A potential collection and treatment system was identified for the populated portion of the Aurora planning area and is shown on Figure B-15. The system is composed of a 0.052-MGD treatment plant and 32,000 feet of line. Costs for the potential system are summarized in Table B-8.

The Aurora FPA was also included in a regional system with Boyd and the Newark area at the north end of Eagle Mountain Lake.

✓ Oates Branch Facility Planning Area

The Oates Branch FPA is located northeast of Eagle Mountain Lake in Wise County. It includes the entire natural drainage basin of Oates Branch and a small unnamed creek south of it, with the exception of a portion of the City of Rhome. The drainage divide between the West Fork and Elm Fork of the Trinity passes through Rhome. The city's wastewater is treated and discharged into Elizabeth Creek to the east a tributary to Denton Creek and the Elm Fork. Therefore, the city area was not included in the FPA for Eagle Mountain Lake. No other incorporated areas are in the FPA. The Oates Branch basin lies just south of Aurora and north of Newark, and there is very little development in the FPA. Oates Branch drains from northeast to

southwest into the West Fork of the Trinity River, about 1 mile upstream of Eagle Mountain Lake. State Highway 718, U.S. 287 and State Highway 114, cross the southwest and northeast portions of the basin, respectively. The topography is gently rolling with elevations ranging from 650 to 940 feet above sea level.

Soils in the planning area are sandy clays in the southwest portion and mixed clays with rock in the northeast portion. The soils have the following distribution of SCS ratings for suitability for use as septic tank absorption fields, which are shown on Figure B-15.

- 50 percent moderate limitations for use
- 30 percent has severe limitations for use due to slow percolation rates
- 20 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The boundaries for the planning area are shown on Figure B-15. They are defined by the natural drainage limits for Oates Branch except for the portion in Rhome which is excluded. The area under consideration is approximately 4095 acres.

Population. Population figures for 1987 for the Oates Branch FPA were estimated from recent aerial photographs in conjunction with windshield surveys. Future projections were based on the average county growth rate for the previous 7 years. The FPA 1987 population estimate is 816 and the year 2005 projection is 1155. No development activity was identified in this FPA.

Existing Wastewater Facilities. All residences within the planning area are currently served by individual on-site systems.

Potential Wastewater Facilities. There were no areas identified in this FPA which had sufficient development or density to promote additional facility planning.

Newark Facility Planning Area

The Newark planning area includes the natural drainage basin for Derrett Creek, which runs from northeast to southwest into a bay near the north end of Eagle Mountain Lake. The City of Newark is within the drainage limits of the Derrett Creek basin about 1 mile east of Eagle Mountain Lake in Wise County. State Highway 718 and the Chicago, Rock Island, and Pacific Railroad run through town in a northwest-southeast direction. U.S. Highway 287 and the Burlington Northern Railroad also run parallel, at the northeast or upstream drainage limits of the basin. Only a small portion of the basin is in Tarrant County, the balance is in Wise County. The topography is rolling over most of the basin with elevations ranging from 650 to 920 feet above sea level. The ground is more gently sloped between the city and the lake with elevations changing only 50 feet in over a mile. The City of Newark has a collection system and treatment plant, however there is a significant population outside the city limits (between the city and the lake) that are served by individual on-site systems.

Soils in the area are variable from sands and sandy clays near the lake to clay soils in Newark and west of Newark, to rocky areas mixed with clays in the northern areas. The SCS has rated the various soil types for their suitability for use as septic tank absorption fields. The rating distribution for the soils in the Newark area are as follows:

- 60 percent moderate limitations for use
- 15 percent has severe limitations for use due to slow percolation rates

- 25 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The planning area boundaries are shown on Figure B-16. They are defined by the natural drainage limits for Derrett Creek and by Eagle Mountain Lake. The area under consideration is approximately 5090 acres.

Population. Population figures for the City of Newark and the remaining portion of the FPA were estimated from recent aerial photographs and conversations with city officials. The 1987 population is estimated to be 600 for the City of Newark and 650 for the remainder of the FPA. The year 2005 population is projected to be 1860 for the entire Newark facility planning area.

The population outside of Newark is nearly all south of State Highway 718, between the city and the lake. However, population growth is also occurring to the north and northwest of the city as well.

Existing Wastewater Facilities. The City of Newark has a wastewater collection and treatment system which serves most of the residents within the city limits. The city areas not served are those along the highway extensions and a subdivision about a mile north of the downtown area. The current discharge permit for the Newark treatment plant allows for the following conditions:

Average daily flow	0.15 MGD
BOD (30-day average)	10 mg/l
TSS (30-day average)	15 mg/l

In 1986 the following average conditions were observed:

Average daily flow	0.04 MGD
BOD (30-day average)	2.7 mg/l
TSS (30-day average)	5.2 mg.l

The areas in the city limits not served by the collection system and all other areas outside of the Newark city limits are served by individual on-site systems.

The outfall for the Newark treatment plant is located on Derrett Creek about 500 feet upstream of a small bay of Eagle Mountain Lake. There are also many houses (with individual septic tank systems) located along the shore of the lake in this area. The creek flow is very small and water quality problems have occurred in the bay.

Potential Wastewater Facilities. The primary area for the development of wastewater facilities in the Newark area is the populated area south of State Highway 718, between the lake and Newark. Collection and treatment facilities were identified for this area and are shown on Figure B-16. The system is composed of 64,000 feet of line, a 0.118 MGD treatment plant, and three pump stations and force mains. Costs for the potential systems are summarized in Table B-9.

The Newark area was also included in a regional system with Boyd and Aurora at the north end of the lake.

Avondale Facility Planning Area

The Avondale FPA is located on the east side of Eagle Mountain Lake in northern Tarrant and southern Wise Counties. The FPA includes the Indian Creek drainage basin and the drainage areas of the three small creeks north

of Indian Creek, and south of Newark. There are no incorporated areas in this FPA. The area of interest for facility planning is known as Avondale and is between U.S. Highway 287 and State Highway 718 on the east side of the basin. The topography is rolling with elevations ranging from 650 to 910 feet above sea level. In general, the basin drains from northeast to southwest into a large bay where Indian Creek enters Eagle Mountain Lake, about 2 miles south of the Tarrant-Wise County line.

Approximately half of the soils in the planning area are clay and half are rock, with some sandy areas in the river bottoms closer to the lake. The soils in the Avondale area of the basin have the following distribution of SCS ratings for suitability for use as septic tank absorption fields have the following distribution.

- 60 percent has severe limitations for use due to slow percolation rates
- 40 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The boundaries for the planning area are shown on Figure B-17. They are defined by the drainage limits for Indian Creek, and the drainage limits for the three small creeks north of Indian Creek and south of Newark which drain the area of the old National Guard Base that is currently owned by International Word of Faith Church. The area under consideration in the FPA is approximately 11,465 acres.

Population. Population figures for 1987 were estimated from recent aerial photographs in conjunction with windshield surveys. Also plats of subdivisions were obtained from tax offices and county records. The 1987 population estimate for the planning area is 406, and the year 2005 population projection is 655. The Avondale subdivision has about 175 lots of approximately 1 acre in size.

Existing Wastewater Facilities. All residences within the planning area are currently served by individual on-site systems. However the International Word of Faith Church has a small wastewater treatment plant with a 0.01 MGD no discharge permit. The effluent is used for irrigation.

Potential Wastewater Facilities. A collection and treatment system was identified for the Avondale area and is shown on Figure B-17. It is composed of a 0.058 MGD treatment plant and 20,500 feet of line. Costs for the potential system are summarized in Table B-10. The Avondale FPA was not included in any subregional or regional systems.

Gilmore Branch Facility Planning Area

The Gilmore Branch planning area includes the entire area in the natural drainage basin for Gilmore Branch, which drains from east to west into Eagle Mountain Lake just north of Peden Road. The FPA is in Tarrant County and there are no incorporated areas within it. State Highway 1220 and U.S. Highway 287 run north and south on the west and east sides of the basin, respectively. Peden Road runs east and west and is the access for the development along the lake. Five subdivisions and an RV park were identified in the FPA. The topography is gently rolling with elevations ranging from 650 to 890 feet above sea level. The area of development along the lake is nearly flat.

Soils in the planning area are highly varied, from sand and clay areas near the lake to mostly rocky soils over the remainder of the basin. In the developed areas, the soil SCS ratings for suitability for use as septic tank absorption fields have the following distribution.

- 35 percent moderate limitations for use
- 65 percent severe limitations for use due to slow percolation rates

Planning Area Boundaries. The planning area boundaries are shown on Figure B-18. They are defined by the natural drainage limits for Gilmore Branch and by Eagle Mountain Lake. The area under consideration is approximately 5030 acres.

Population. Population figures were estimated from recent aerial photographs and windshield surveys. Also copies of subdivision plats were obtained from tax offices and county records. The 1987 population estimate for the planning area is 450 and the year 2005 population projection is 750.

Five subdivisions with an estimated total of 95 lots and a RV park were identified in the FPA, all of which are along the shore of Eagle Mountain Lake.

Existing Wastewater Facilities. All residents within the planning area are currently served by individual on-site systems. The RV park (permit to Larry Buck, Dido Retirement Center) has a small package treatment plant with a discharge permit of 0.011 MGD, 10 mg/l BOD and 15 mg/l TSS. The 1986 average daily flow was 0.0006 MGD, the average BOD was 8.3 mg/l, and the average TSS was 3.0 mg/l.

Proposed Wastewater Facilities. A collection and treatment system was identified for the planning area and is shown on Figure B-18. The system consists of a 0.058 MGD treatment plant, 12,000 feet of line, and three pump stations and force mains. Costs for the system are summarized in Table B-11. The Gilmore Branch FPA was not included in any subregional or regional systems.

Boat Club Facility Planning Area

The Boat Club FPA is on the east shore of Eagle Mountain Lake, south of the Gilmore Branch FPA and west of the Lake Country FPA in Tarrant County. It includes the natural drainage basins of Little Dosier Creek and the remaining area west to the lake. State Highway 1220 is the major road in the area, with much of the existing development occurring by the lake, adjacent to Boat Club Road. Eight subdivisions were identified in the planning area and no portion of the area is within city limits. The topography is gently rolling along the lake and rolling in the upper reaches of the drainage area. Little Dosier Creek and a small unnamed creek both drain south into Dosier Slough, and two small unnamed creeks drain west into Flemming Slough.

Soils in the planning area are nearly all rocky with some clays and sandy loams in the Little Dosier Creek basin. The soils in the populated areas have the following distribution of SCS ratings for suitability for use as septic tank absorption fields.

- 5 percent has severe limitations for use due to slow percolation rates
- 95 percent has severe limitations for use due to shallow or flooding

Planning Area Boundaries. The boundaries for the Boat Club FPA are shown on Figure B-19. They are defined on the east and north by the drainage limits of Little Dosier Creek and the smaller creeks which drain to Flemming Slough, and on the west and south by Eagle Mountain Lake. The area under considerations in the FPA is approximately 4010 acres.

Population. Population figures for 1987 were estimated by house counts from recent aerial photographs in conjunction with windshield surveys. In addition, copies of subdivision plats were obtained from tax offices and

county records. The 1987 population estimate for the planning area is 500 and the year 2005 population projection is 955.

Nine subdivisions (Ambrose Eagle Nest Estates, The Seville Addition, Burgess Land, Corky Court, Crest Point, Marina Cove, Tranquil Acres, The West Fork Addition, and The Landing) were identified in the planning area with an estimated total of 170 lots (not including The Landing) in addition to the Boat Club facility. The Landing is included in the Tarrant County Municipal Utility District No. 1 (TCMUD No. 1) service area. All of the subdivisions are located south of Boat Club Road along the lakeshore.

Existing Wastewater Facilities. The Fort Worth Boat Club, at the end of Boat Club Road, has a small wastewater treatment plant which serves a portion of the Boat Club facilities. The plant has a discharge permit for an average daily flow of 0.015 MGD, 10 mg/l BOD, and 15 mg/l TSS. The discharge is off the end of the Boat Club point to the lake. The 1986 average daily flow was 0.014 MGD, the average BOD was 9.0 mg/l and the average TSS was 14 mg/l. A few residences in the Boat Club, and all other residences in the planning area are served by individual on-site systems, except for those in The Landing, a subdivision on the northeast side of Dosier Slough which is served by Tarrant County Municipal Utility District No. 1.

Potential Wastewater Facilities. A potential collection and treatment system was identified for the planning area and is shown on Figure B-19. The system consists of a 0.075 MGD treatment plant, 40,200 feet of line and eight small pump stations and force mains. Costs for the system are summarized in Table B-12.

A second alternative for this area is to relift the wastewater into the TCMUD No. 1 service area, or into the City of Fort Worth system.

Lake Country Estates Facility Planning Area

The Lake Country FPA includes the natural drainage basin for Dosier Creek and the area south of Dosier Creek which drains into Carter Slough of Eagle Mountain Lake. The area is in Tarrant County east of Eagle Mountain Lake and extends northeast to U.S. Highway 287. State Highway 1220 is the major access to this portion of the lake. The populated area is nearly all within the TCMUD No. 1 service area, most of which is Lake Country Estates. Several other subdivisions were identified, one of which is not served by TCMUD No. 1. The topography is rolling, with elevations ranging from 650 to 870 feet above sea level. The Dosier Creek Basin drains in a southwesterly direction into Dosier Slough.

Soils in the area are generally rocky with some sandy and clayey areas near the river bottoms. The populated areas have the following distribution of SCS ratings for suitability for use as septic tank absorption fields.

- 10 percent has slight limitations for use
- 90 percent has severe limitations for use due to shallow rock or flooding

Planning Area Boundaries. The boundaries for the Lake Country FPA are shown on Figure B-20. They are defined on the north, south, and east by natural drainage limits and on the west by the lake. The area under consideration in the FPA is approximately 5510 acres.

Population. Population figures for 1987 were estimated by house counts from recent aerial photographs in conjunction with windshield surveys. Also the TCMUD No. 1 provided information on the number of water connections in their service area and average growth rates experienced in the past. Copies of subdivision plats were also obtained. The 1987 population estimate for the

planning area is 2450 and the year 2005 population projection for the FPA is 4680.

Four subdivisions (Lake Country Estates, Eagle Mountain Lake Estates, Secret Harbor, and Meacham Brants) were identified in the planning area with an estimated total of over 4600 lots. The Meacham Brants subdivision (about 40 lots) is located on the south side of Carter Slough and is not included in the TCMUD No. 1 service area.

Existing Wastewater Facilities. The TCMUD No. 1 serves approximately 97 percent of the population in the FPA. Prior to March 1987 TCMUD No. 1 operated a treatment plant north of Dosier Slough. However in March, the plant was abandoned and wastewater pumped into the City of Fort Worth wastewater system. The TCMUD No. 1 currently has nine pump stations in the service area to collect and transfer the wastewater.

The remaining 3 percent of the population in the FPA (mostly in the Meacham Brants subdivision) are served by individual on-site systems.

Potential Wastewater Facilities. A potential collection and treatment system has been identified on Figure B-20 for the portion of the FPA served by individual systems. The potential system consists of a 0.016 MGD treatment plant, 5500 feet of line and one pump station and force main. Costs for the potential system are summarized in Table B-13.

An alternative system is collecting the wastewater at the site of the treatment plant and transferring it to the Fort Worth system, or to the TCMUD No. 1 system.

WATER QUALITY ISSUES

There are two types of pollutant loads that affect water quality. These loads are point source loads and nonpoint source loads. Point source loads are those loads that originate from a specific source such as an industrial facility or a wastewater treatment plant. Point source loads typically enter the river or lake through a discharge pipe. Nonpoint source loads are more diffuse in their generation and entry into a receiving stream. Nonpoint source pollutant loads are typically associated with runoff during rainfall events. For purposes of this study, pollutant loads from septic tanks around the lakes are considered nonpoint source loads.

Almost 50 percent of the population of the EML Facility Planning Region is currently unsewered and served by septic tanks, which can contribute to the amount of nonpoint source pollution in the EML region. Approximately 17 percent of the land area in the region is currently classified as agricultural land which also generates nonpoint source pollutant loadings. There are currently eleven point source dischargers in the EML region which release point source pollutant loads at a current annual flow rate equivalent to about 80 percent of the permitted flow rate. Tables III-10 through III-14 of Chapter III of this report show a comparison of point source and nonpoint source loadings for existing and projected conditions for the EML watershed.

Modeling of the West Fork of the Trinity River and significant tributaries in the EML Planning Region has been performed to establish point source effluent requirements to meet the presently adopted Texas Stream Standards which call for a 5 mg/l DO level on the West Fork and Eagle Mountain Lake and a 3 mg/l DO level in unclassified tributaries including Ash Creek and Walnut Creek which flow into Eagle Mountain Lake. We also investigated the possible need for point source control of nutrients to protect Eagle Mountain Lake. This investigation generally showed that in order to meet

the above stream standards for DO levels, dischargers on the West Fork will be required to attain a minimum level of 20 mg/l BOD, 15 mg/l TSS, and 15 mg/l ammonia and have an effluent level of 5 mg/l. However certain Dischargers may be required to attain a 10 mg/l BOD, 15 mg/l TSS and 2 mg/l ammonia with a DO of 5 mg/l depending on stream geometry and mixing characteristics.

Eagle Mountain Lake modeling studies have also shown that the existing chlorophyll "a" concentration is approximately 17 ug/l and is estimated to increase to approximately 20 ug/l if nutrient removal is not provided in the future. Nutrient removal for existing discharges is estimated to reduce concentrations to between 14 and 15 ug/l. The projected chlorophyll "a" concentrations change approximately ± 3 ug/l. This magnitude of change has been considered to be significant in some situations. It is difficult to quantitatively relate this concentration change to modification in water usage. In addition, the summer chlorophyll "a" data for Eagle Mountain Lake has a standard deviation in excess of 8 ug/l. The projected change of ± 3 ug/l would be difficult if not impossible to measure in the lake during a summer season. The projections indicated a potentially significant trend associated with the increases in discharge to treated sewage without accompanying nutrient controls. As indicated in Chapter III of this report either nitrogen or phosphorous removal could be considered to control Chlorophyll "a" concentrations. Under existing conditions light is the factor that is limiting Chlorophyll "a" concentrations and the influence of nutrients appears to be modest in terms of limiting growth. Control of either nutrient can induce a limitation associated with the nutrient that is controlled. The modeling indicates that phosphorous control is somewhat more effective than nitrogen control and experience indicates that phosphorous control has the additional advantage of being more compatible with many nonpoint source control actions.

The APAI modeling can provide a basis for long term planning, but the more complex Eagle Mountain Lake eutrophication analysis being developed by TWC will be required to ultimately provide the basis for detailed planning and implementation that could consider both point and nonpoint source controls. The TWC is currently utilizing the water quality model WASP (Water Quality Analysis Simulation Program) to analyze the impacts of point and nonpoint sources on reservoir eutrophication process in EML. The modeling could be completed within the next 6 to 9 months.

In addition to this, the TWC hearings for the City of Azle permit application will likely establish what, if any, additional point source effluent requirements should be considered as the basis for subsequent detailed planning.

PROCEDURES AND RESULTS

FACILITY PLANNING METHODOLOGY

The facility planning work associated with this appendix develops data necessary to evaluate the feasibility of specific projects needed to protect water quality in the Eagle Mountain Lake Facility Planning Region of the Upper West Fork and Clear Fork of the Trinity River Basin while providing efficient, cost-effective wastewater treatment. These data will aid in identification of priorities, costs, and locations of necessary pollution abatement facilities. The identification of sound alternatives to maintain water quality and to provide cost-effective wastewater treatment is a primary objective of the study. A detailed description of the methodology used for development of the facility planning regions and treatment alternatives is provided in Appendix D.

ALTERNATIVES EVALUATED IN PHASE I

In addition to the wastewater systems evaluated for each of the sixteen FPAs discussed previously, Subregional Planning Areas which include FPAs within close proximity of each other were also studied. Subregional systems were developed by combining individual facility planning areas, as well as separate areas within a single FPA. Eight potential areas for subregional systems were identified in the EML regional area, as listed below, and shown on Figures B-21 through B-24. The eight subregional areas are:

- Ash Creek Subregional systems 1 and 2
- Walnut Creek Subregional systems 1 and 2
- Swift Branch Subregional system
- Briar Creek Subregional system
- Newark Subregional system
- Boat Club Subregional system

Four of the eight subregional systems involved combining separate systems within a single FPA. The remaining four systems involved combining the individual systems from more than one FPA.

The subregional systems are defined to include the subregional treatment facilities and all facilities necessary to convey the collected wastewater from a single collection point in each area served to the subregional treatment plant. This includes the additional lift stations, force mains, and gravity lines necessary to convey the wastewater from the individual treatment plant sites shown on the individual FPA figures to the subregional treatment plant. Estimated costs for households served by subregional systems can be determined by combining the cost for the subregional system which includes conveyance and treatment facilities only with the cost for the individual planning area collection system.

Ash Creek Subregional Systems

Two subregional systems identified in the Ash Creek Basin are:

1. Combining the three individual systems in the Ash Creek FPA; and
2. Combining the three Ash Creek FPA systems and the portion of the City of Azle that is in the Ash Creek basin.

The first subregional system simply replaces the three individual WWTP's in the Ash Creek FPA with a single larger WWTP. It requires, in addition to the individual collection systems shown on Figure B-5, 18,000 feet of sewer line and a 0.188 MGD WWTP. The regional system is shown on Figure B-22. Costs for the subregional system (No. 1) are summarized in Table B-14. The costs shown are total costs for service and include all the facilities for both local and subregional systems in the Ash Creek FPA.

The Ash Creek subregional system (No. 2) is shown in Figure B-24. The service area for the system includes the entire area served by collection systems within the natural drainage limits for Ash Creek, including the existing system in the City of Azle. Facilities required in addition to those identified in the City of Azle's Master Plan, and the individual collection systems identified in the FPAs, include 22,000 feet of sewer line and an additional 0.327 MGD of treatment capacity. Costs for the subregional system #2 are summarized in Table B-15. The costs reflect only the WWTP expansion costs and the interceptor costs to serve the three subareas in the Ash Creek FPA. The additional cost for the local collection systems in the Ash Creek FPA (\$220 per household per year) are not included in Table B-15 costs. Therefore, the local collection system costs should be added to the subregional conveyance and treatment costs in determining the household costs for those in the Ash Creek FPA, under the subregional system No. 2 scenario.

Walnut Creek Subregional Systems

The two subregional systems identified in the Walnut Creek drainage basin are 1) combining the two individual systems in the Reno FPA and 2) combining both Reno individual systems and the portion of the City of Azle which is in the Walnut Creek drainage basin.

The Walnut Creek subregional system No. 1 essentially serves the City of Reno and a small portion of unincorporated area west of Reno. In addition to the local collection systems shown on Figures B-9 and B-10, the subregional system No. 1 includes 11,000 feet of sewer line (7,500 feet of which is included in Reno system No. 1 but would be 10 inches instead of 8 inches in diameter) and 0.301 MGD of additional WWTP capacity. Costs for the subregional system number 1 are summarized in Table B-16. The costs shown are the total costs for service and include all the facilities for both local and subregional systems in the Reno planning area. The system is shown in Figure B-22.

The Walnut Creek subregional system number 2 is shown on Figure B-24. The service area includes everything served by an organized collection system (in the regional planning area) within the natural drainage limits for Walnut Creek, including the portion served by existing facilities in the City of Azle. System number 2 includes 14,000 feet of sewer line and 0.335 MGD of additional WWTP capacity, in addition to the local collection systems and the existing and proposed City of Azle facilities. Costs for subregional system number 2 are summarized in Table B-17. The costs reflect only the WWTP costs and subregional conveyance line costs. The cost for the individual collection system (\$395 per household per year) should be added to determine the total costs for households in the Reno FPA.

Swift Branch Subregional System

The Swift Branch subregional system was developed by combining three individual planning areas, Pelican Bay, Peden, and Swift Branch into one system. The subregional system consists of two pump stations (0.344 MGD and 0.093 MGD), 9000 feet of force mains, 5000 feet of gravity lines (2000 feet of which is in the individual system but upsized from 6" to 12"), and a 0.508 MGD treatment facility. The system is shown in Figure B-24. Costs for the Swift Branch subregional conveyance and treatment facilities are summarized in Table B-18. These costs are subregional costs only and the annual costs for the individual collection systems (\$105 per household for Pelican Bay, \$335 per household for Peden and \$280 per household for Swift Branch) should be added to determine the total costs for households in each of the individual facility planning areas.

Briar Creek Subregional System

The Briar Creek subregional system is shown on Figure B-21. It combines the two individual service areas within the Briar Creek area to produce a single system for the FPA. In addition to the individual collection systems shown on Figure B-11, the subregional system also includes 7,000 feet of gravity sewer line and a single 0.154 MGD treatment facility. Costs for the subregional system are shown in Table B-19. The costs shown are total cost for service and include all the facilities for both local and subregional systems in the Briar Creek FPA.

Newark Subregional System

The Newark subregional system was identified to combine the area outside the Newark city limits with the city facilities and utilize a single system. The Newark FPA has an individual system identified for the area outside the city service area (on Figure B-16). The subregional system consists of an

additional 1,000 feet of gravity line, a 0.102 MGD pump station, 3,000 feet of force main, and 0.118 MGD of additional treatment capacity. The city's current WWTP has sufficient capacity through the year 2005. The only additional capacity required is for the area outside the city limits. The extra capacity at the Newark WWTP was not considered available for other than city use. The subregional system is shown on Figure B-21. Costs for the subregional conveyance and treatment facilities are summarized in Table B-20. These costs are subregional costs only, and the annual costs for the individual collection system (\$415 per household) should be added to determine the total cost to the household users.

Boat Club Subregional System

The Boat Club subregional system was developed by incorporating the unsewered areas in the southeast region of the lake into the sewer system. Tarrant County MUD No. 1 currently serves the Lake Country area and through a series of pump stations transfers the wastewater into the Fort Worth collection system. The soils in this area are very rocky and are unsuitable for individual sub-surface disposal systems. Individual collection systems were identified for both the Boat Club FPA (on Figure B-19) and for the unsewered areas of the Lake Country FPA (on Figure B-20). A subregional system was identified on Figure B-24 to transfer the collected wastewater to the Fort Worth collection system for treatment. The additional facilities necessary include two pump stations (0.016 MGD and 0.090 MGD) and 23,500 feet of force main. Costs for the subregional conveyance facilities are summarized in Table B-21. These costs are subregional costs only, and the costs for the individual collection systems (\$555 per household per year for Boat Club FPA and \$335 per household per year for Lake County FPA) should be added to determine the total costs for each household user of the individual planning areas. The costs for treatment by the City of Fort Worth are based on present wholesale rates of \$0.3374 per 1000 gallons for volume, plus

\$0.0683 per pound for BOD and \$0.0417 per pound for TSS, plus \$27 per month for billing charges.

Regional Systems

Regional systems include all FPAs in a general geographic location and two such systems have been identified for the EML regional planning area. One is on the north end of the lake (Northside regional system) and serves Boyd, Aurora, and Newark, and one is on the West side of the lake (Westside regional system) and serves all seven of the FPAs from Briar Creek south to Walnut Creek. The regional systems are shown on Figures B-25 and B-26. Facilities for the regional systems are limited to the treatment plant and the pump stations, force mains, and gravity lines necessary to transport the wastewater from the individual planning areas to the regional treatment plant. The regional system facilities do not include any local collection facilities within the individual planning areas. In the cases of the Ash Creek, Reno, and Briar Creek FPAs, the regional system does include the lines within the FPA which were included in the subregional systems. The regional systems are described more completely, including cost information, below. Estimated costs for households served by regional systems are determined by combining the cost for the regional conveyance and treatment facilities, and the cost for the individual planning area collection system.

Westside Regional System

The Westside regional system was developed by combining all of the individual FPAs on the west side of Eagle Mountain Lake. This includes the Azle, Ash Creek, Reno, Pelican Bay, Peden, Swift Branch and Briar Creek FPAs. The regional system includes the subregional systems for Ash Creek System No. 1 (Figure B-22), Walnut Creek System No. 1, (Figure B-22) and Briar Creek, (Figure B-21) but does not include the local collection

facilities identified in any of the individual collection systems. The regional system is shown on Figures B-25 and B-26. It includes 82,500 feet of gravity line, 5 pump stations (0.154 MGD, 0.093 MGD, 0.071 MGD, 0.344 MGD, 1.167 MGD), 49,500 feet of force mains, and 1.496 MGD of additional treatment plant capacity. Costs for the regional system are summarized in Table B-22. These costs reflect only the regional conveyance and treatment facilities costs, and do not include any individual collection system costs. The local collection facility costs associated with each individual area must be combined with the regional cost to obtain the total household user costs.

Northside Regional System

The Northside regional system was developed by combining FPAs on the north end of Eagle Mountain Lake, specifically Boyd, Aurora, and the Newark area. The regional system is shown on Figure B-25. It includes 42,000 feet of gravity line, one 0.094 MGD pump station, 3,000 feet of force main, and a 0.446 MGD treatment plant. Costs for the regional conveyance and treatment facilities are summarized in Table B-23. These costs reflect only the regional system costs and do not include any individual collection facility costs or subregional system costs. The local collection system costs associated with each individual area must be combined with the regional costs to obtain the total household user costs.

ADDITIONAL ALTERNATIVES EVALUATED IN PHASE II

Additional alternatives evaluated during Phase II of this study for wastewater discharges from the City of Azle and/or Pelican Bay and other FPAs on the west side of EML can be divided into three basic groupings with treatment options based on point of treatment as follows:

1. Ash Creek and Walnut Creek WWTPs
10/15/2
10/15/2 with Phosphorous Removal
10/15/2 with Nitrogen Removal
2. Fort Worth Satellite WWTP
2.04 MGD
6.3 MGD
3. Fort Worth Village Creek WWTP

The first group which includes modification of existing plants, considered various treatment requirements as future effluent requirements have not yet been established by TWC. The second group considers a plant location west of Lake Worth as shown in the 1983 201 Facilities Plan for the Village Creek WWTP. Two plant sizes were considered for this group. One plant size was based on the flow requirement of 2.04 MGD to serve the population of the service area (17040) and a per capita flow of 120 gallons per day. The second considered the Fort Worth Facilities Plan plant sized at 6.3 MGD with outfall to Marys Creek. The third group considered discharge into the Fort Worth system with treatment at the Village Creek WWTP in accordance with plans of the City's current wastewater master plan, soon to be completed.

Various service area options were considered for each of the groupings and treatment categories which resulted in the following list of eleven alternatives:

<u>Alternative No.</u>	<u>Treatment Facility</u>	<u>Service Area</u>	<u>2005 Population</u>
1	Ash Crk/Walnut Crk 10/15/2	Azle	10500
2	Ash Crk/Walnut Crk 10/15/2	Azle, Pelican Bay	13935
3	Ash Crk/Walnut Crk 10/15/2 with Phosphorous Removal	Azle	10500
4	Ash Crk/Walnut Crk 10/15/2 with Phosphorous Removal	Azle, Pelican Bay	13935
5	Ash Crk/Walnut Crk 10/15/2 with Nitrogen Removal	Azle	10500
6	Ash Crk/Walnut Crk 10/15/2 with Nitrogen Removal	Azle, Pelican Bay	13935
7	Satellite WWTP 2.04 MGD	Azle, Downstream Intervening	17040
8	Satellite WWTP - 6.3 MGD	Azle, Downstream Intervening Fort Worth Silver Crk/ Live Oak	19377
9	Fort Worth Village Creek WWTP	Azle	10500
10	Fort Worth Village Creek WWTP	Azle, Pelican Bay	13935
11	Fort Worth Village Creek WWTP	Azle, West Side EML	21995

Cost summary tables for these additional alternatives evaluated during Phase II are included on Tables B-24, B-25, and B-26. System layouts for Alternatives 1, 3, and 5 modification of Azle WWTP for dischargers from Azle only would be the same as shown on Figure B-3 for the existing Walnut Creek section of the system and Figure B-4 for the Ash Creek section of the system. Alternates 2, 4 and 6 which include Pelican Bay with the Azle service area and treatment at the modified existing Azle WWTP are shown on Figure B-26 for the Walnut Creek drainage area and Figure B-4 for the Ash Creek drainage area. Figure B-27 shows the location of the satellite

treatment plant used in Alternates 7 and 8. Figure B-27 also shows the service area for Alternate 7 including the downstream intervening area from Azle to Lakeside as well as the Alternate 8 service area which also includes the Silver Creek and Live Oak Creek sewersheds on the west side of Lake Worth. Figures B-28 and B-29 show local collection system in Azle modified to close existing treatment plants and provide lift stations at the existing Walnut Creek and Ash Creek plant sites. Figure B-30 shows the proposed Fort Worth wastewater system expansion in EML region per Fort Worth Master Plan as well as conveyance route to the proposed Fort Worth system expansion along Highway 199 including the proposed lift station near Lakeside for transfer to the existing Fort Worth Jenkins Heights lift station at Lake Worth and then downstream transfer to the Marine Creek sewershed and finally to Village Creek WWTP as identified for Alternates 9, 10, and 11. Local collection system in Azle for Alternates 7, 8, and 9 is shown on Figures B-28 and B-29 and Alternate 10 Figure B-31 shows Pelican Bay/Azle layout per Alternate 10 for North Area. Layout for the south area is as shown on as Figure B-29. Figure B-32 shows layout of Westside facilities for Alternate 11.

WASTEWATER FACILITY CONCLUSIONS AND RECOMMENDATIONS FOR VARIOUS FACILITY PLANNING AREAS

The following summary conclusions are presented as a result of water quality and wastewater facility planning studies performed for the EML Region based on presently defined planning criteria and feasibility analysis utilized in these studies:

- Organized wastewater systems are probably not cost effective in the immediate future for any areas which are presently unsewered. However, increased development and/or problems with on-site systems could alter this.

- Increasingly stringent effluent requirements which are necessary to protect our water supply resources may require communities such as Azle with existing organized systems to seriously consider the diversion of sewage flows out at the EML watershed.
- Expansion of the existing Azle wastewater treatment plants should be in a manner which facilitates ultimate inclusion of phosphorous removal and nitrification at all facilities
- Gradual extension of sewerage service into outlying areas, could be achieved by requiring new housing or commercial developments to provide sewage collection systems with cluster on-site treatment facilities with either surface or subsurface land disposal of effluent. Surface land disposal systems must be permitted by the TWC whereas subsurface disposal systems are licensed by either the District or County depending on proximity to the lake.
- An operations agency should be identified which can guide local interests in properly operating and maintaining existing on-site systems and/or new cluster-type systems. Such an agency could possibly provide O&M services such as the pump out of holding tanks and could possibly operate septage treatment plants until a public sewer system becomes available.

Table B-27 summarizes determinations made during our current studies and lists the most desirable alternatives on the basis of general feasibility based on current parameters, as opposed to a definite conclusion or recommendation for each. It can be seen from Table B-27 that the identified system costs for 1990 vary from about \$280 to over \$1600 per household per year. The economic screening parameters utilized in costing studies for this current study have included the EPA affordability guidelines which for Tarrant County are \$325 per household per year based on 1.75 percent of the

1979 medium household income of \$18,642 (recent Census Bureau publication). Most of these costs are excessive since the EML region is sparsely populated. Over 30 percent of the population of the EML region is considered to be rural and in unincorporated areas and as such is not currently amenable to the development of organized systems. Developed urban land areas cover only about 3 percent of the EML watershed. The largest incorporated city in the EML watershed is Azle which had a 1987 population 7750. There are five other incorporated cities in the region and their 1987 population varies from 500 to 2200 and the total of the five is only about 6000. All of these facts illustrate that most areas of the EML region are still rural in nature. However, even though the evaluated wastewater facilities for most of the FPAs in the EML planning region are uneconomical at this time based on evaluation parameters used for the planning criteria of the current study, the systems identified should be reevaluated in the future as population density increases and other water quality management requirements become more acute.

The problems associated with the proper installation and maintenance of adequately designed on-site disposal systems are becoming more critical. Required compliance with the updated Construction Standards for On-Site Sewerage Facilities adopted by the Texas Department of Health in June 1987 which became effective January 1, 1988 will be imperative for new development if organized wastewater systems are not available as well as for existing development served by on-site systems requiring major repair or modification. Use of the updated standards will be required to provide for facilities that will reduce potential contamination of potable water supplies and/or reduce the potential threat to the health and welfare of the public. As population increases in the rural areas of the EML planning region which do not have organized systems, the requirements for proper on-site systems will become substantially more costly and this should provide additional incentive for the development of organized systems.

The importance of developing organized systems as soon as feasible cannot be overstated. The continued use of on-site disposal, particularly in areas of poor soil capabilities, which covers much of the EML region, adversely impacts nonpoint source loadings to EML. The estimated current NPS loadings to EML expressed as a percentage of the total loading for Phosphorous, Nitrogen and BOD are 70.9, 88.8 and 94.8 percent, respectively, as shown in Table III-14 of this report.

Contingent upon the outcome of the City of Azle discharge permit application hearings currently being conducted by the TWC and completion of TWC modeling of EML to establish effluent limitations, discussion should probably be initiated with the City of Fort Worth to evaluate requirements to ultimately divert all City of Azle sewage to the City of Fort Worth wastewater system as proposed in the Fort Worth Water and Wastewater System Master Plan currently being developed by the City and its consultants. Also the inclusion of Pelican Bay should be carefully considered as it is one of the most densely populated areas located near the shoreline of EML but still using on-site disposal systems. A plan such as this would meet the definition of a regional system as discussed by the Advisory Committee for this study in October 1987 in that it would convey the wastewater out of the watershed of EML to the Fort Worth Wastewater System.

TABLES

TABLE B-1
COST SUMMARY FOR THE ASH CREEK FPA

Degree of Treatment	System 1		System 2	
	10/15	10/15/2	10/15	10/15/2
2005 population served	520	520	280	280
Total collection system capital cost	\$ 563,000	\$ 563,000	\$ 384,000	\$ 384,000
Treatment plant capital cost	500,000	550,000	360,000	380,000
Total capital cost	1,063,000	1,113,000	744,000	764,000
Annualized capital cost	82,000	86,000	57,000	59,000
Annual O&M Cost	25,000	29,000	21,000	25,000
Total annual cost	107,000	115,000	78,000	84,000
Annual cost per household	\$ 520	\$ 560	\$ 710	\$ 760

TABLE B-2
COST SUMMARY FOR THE ASH CREEK FPA

Degree Treatment	System 3	
	10/15	10/15/2
2005 population served	1,075	1,075
Total collection system capital cost	\$ 500,000	\$ 500,000
Treatment plant capital cost	780,000	900,000
Total capital cost	1,280,000	1,400,000
Annualized capital cost	98,000	108,000
Annual O&M Cost	25,000	29,000
Total annual cost	123,000	137,000
Annual cost per household	\$ 290	\$ 325

TABLE B-3
COST SUMMARY FOR THE PELICAN BAY FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	3,435	3,435
Total collection system capital cost	\$1,213,000	\$1,213,000
Treatment plant capital cost	1,800,000	2,100,000
Total capital cost	3,013,000	3,313,000
Annualized capital cost	232,000	255,000
Annual O&M Cost	84,000	100,000
Total annual cost	316,000	355,000
Annual cost per household	\$ 235	\$ 260

TABLE B-4
COST SUMMARY FOR THE PEDEN FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	710	710
Total collection system capital cost	\$ 796,000	\$ 796,000
Treatment plant capital cost	620,000	680,000
Total capital cost	1,416,000	1,476,000
Annualized capital cost	109,000	114,000
Annual O&M Cost	61,000	65,000
Total annual cost	170,000	179,000
Annual cost per household	\$ 610	\$ 640

TABLE B-5
COST SUMMARY FOR THE SWIFT BRANCH FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	930	930
Total collection system capital cost	\$ 878,000	\$ 878,000
Treatment plant capital cost	730,000	820,000
Total capital cost	1,608,000	1,698,000
Annualized capital cost	124,000	131,000
Annual O&M Cost	74,000	78,000
Total annual cost	198,000	209,000
Annual cost per household	\$ 540	\$ 570

TABLE B-6
COST SUMMARY FOR THE RENO FPA

Degree of Treatment	System 1		System 2	
	10/15	10/15/2	10/15	10/15/2
2005 population served	1,800	1,800	1,210	1,210
Total collection system capital cost	\$2,865,000	\$2,865,000	\$1,104,000	\$1,104,000
Treatment plant capital cost	1,200,000	1,400,000	800,000	910,000
Total capital cost	4,065,000	4,265,000	1,940,000	2,014,000
Annualized capital cost	313,000	328,000	146,000	155,000
Annual O&M Cost	111,000	120,000	71,000	75,000
Total annual cost	429,000	449,000	217,000	230,000
Annual cost per household	\$ 605	\$ 635	\$ 455	\$ 485

TABLE B-7
COST SUMMARY FOR THE BRIAR CREEK FPA

Degree of Treatment	System 1		System 2	
	10/15	10/15/2	10/15	10/15/2
2005 population served	1,180	1,180	355	355
Total collection system capital cost	\$1,127,000	\$1,127,000	\$ 533,000	\$ 533,000
Treatment plant capital cost	800,000	910,000	400,000	450,000
Total capital cost	1,927,000	2,037,000	933,000	983,000
Annualized capital cost	148,000	157,000	72,000	76,000
Annual O&M Cost	70,000	74,000	24,000	28,000
Total annual cost	218,000	231,000	96,000	104,000
Annual cost per household	\$ 470	\$ 500	\$ 685	\$ 745

TABLE B-8
COST SUMMARY FOR THE AURORA FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	520	520
Total collection system capital cost	\$ 787,000	\$ 787,000
Treatment plant capital cost	500,000	540,000
Total capital cost	1,287,000	1,327,000
Annualized capital cost	99,000	101,000
Annual O&M Cost	31,000	35,000
Total annual cost	130,000	136,000
Annual cost per household	\$ 635	\$ 665

TABLE B-9
COST SUMMARY FOR THE NEWARK FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	1,175	1,175
Total collection system capital cost	\$1,683,000	\$1,683,000
Treatment plant capital cost	800,000	900,000
Total capital cost	2,483,000	2,583,000
Annualized capital cost	191,000	199,000
Annual O&M Cost	87,000	90,000
Total annual cost	278,000	289,000
Annual cost per household	\$ 600	\$ 625

TABLE B-10
COST SUMMARY FOR THE AVONDALE FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	575	575
Total collection system capital cost	\$ 517,000	\$ 517,000
Treatment plant capital cost	550,000	610,000
Total capital cost	1,067,000	1,127,000
Annualized capital cost	82,000	87,000
Annual O&M Cost	24,000	28,000
Total annual cost	106,000	115,000
Annual cost per household	\$ 470	\$ 510

TABLE B-11
COST SUMMARY FOR THE GILMORE BRANCH FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	575	575
Total collection system capital cost	\$ 435,000	\$ 435,000
Treatment plant capital cost	550,000	610,000
Total capital cost	985,000	1,045,000
Annualized capital cost	76,000	78,000
Annual O&M Cost	58,000	55,000
Total annual cost	127,000	123,000
Annual cost per household	\$ 560	\$ 585

TABLE B-12
COST SUMMARY FOR THE BOAT CLUB FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	750	750
Total collection system capital cost	\$1,385,000	\$1,385,000
Treatment plant capital cost	640,000	700,000
Total capital cost	2,025,000	2,085,000
Annualized capital cost	156,000	160,000
Annual O&M Cost	125,000	129,000
Total annual cost	281,000	289,000
Annual cost per household	\$ 950	\$ 980

TABLE B-13
COST SUMMARY FOR THE LAKE COUNTRY FPA

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	160	160
Total collection system capital cost	\$ 186,000	\$ 186,000
Treatment plant capital cost	260,000	270,000
Total capital cost	446,000	456,000
Annualized capital cost	34,000	35,000
Annual O&M Cost	25,000	29,000
Total annual cost	59,000	64,000
Annual cost per household	\$ 935	\$ 1,015

TABLE B-14

COST SUMMARY FOR THE ASH CREEK SUBREGIONAL SYSTEM NO. 1¹

Degree of Treatment	Subregional System No. 1	
	10/15	10/15/2
2005 population served	1,875	1,875
Total collection system capital cost	\$1,827,000	\$1,827,000
Treatment plant capital cost	1,150,000	1,350,000
Total capital cost	2,977,000	3,277,000
Annualized capital cost	229,000	252,000
Annual O&M Cost	70,000	75,000
Total annual cost	299,000	377,000
Annual cost per household	\$ 405	\$ 445

1. Costs in this table include both local collection and subregional conveyance and treatment facilities.

TABLE B-15

COST SUMMARY FOR THE ASH CREEK SUBREGIONAL SYSTEM NO. 2¹

Degree of Treatment	Subregional System No. 2	
	10/15	10/15/2
2005 population served	3,270	3,270
Total collection system capital cost	\$ 648,000	\$ 648,000
Treatment plant capital cost	1,600,000	2,000,000
Total capital cost	2,248,000	2,648,000
Annualized capital cost	173,000	204,000
Annual O&M Cost	56,000	69,000
Total annual cost	229,000	273,000
Annual cost per household	\$ 180	\$ 210

1. Costs in this table include only subregional conveyance and treatment facilities. Additional costs associated with local collection systems are not included. The cost for the Ash Creek local collection system is about \$240 per household per year and should be included to get total household user cost.

TABLE B-16

COST SUMMARY FOR THE WALNUT CREEK SUBREGIONAL SYSTEM NO. 1¹

Degree of Treatment	Subregional System No. 1	
	10/15	10/15/2
2005 population served	3,010	3,010
Total collection system capital cost	\$4,247,000	\$4,247,000
Treatment plant capital cost	1,500,000	1,800,000
Total capital cost	5,847,000	6,147,000
Annualized capital cost	450,000	473,000
Annual O&M Cost	194,000	206,000
Total annual cost	644,000	679,000
Annual cost per household	\$ 545	\$ 575

1. Costs in this table include both local collection and subregional conveyance and treatment facilities.

TABLE B-17

COST SUMMARY FOR THE WALNUT CREEK SUBREGIONAL SYSTEM NO. 2¹

Degree of Treatment	Subregional System No. 2	
	10/15	10/15/2
2005 population served	3,350	3,350
Total collection system capital cost	\$ 518,000	\$ 518,000
Treatment plant capital cost	1,650,000	1,950,000
Total capital cost	2,168,000	2,468,000
Annualized capital cost	167,000	190,000
Annual O&M Cost	50,000	66,000
Total annual cost	217,000	256,000
Annual cost per household	\$ 165	\$ 195

1. Costs in this table include only subregional conveyance and treatment facilities. Additional costs associated with local collection systems are not included. The cost for the Reno FPA local collection system is \$415 per household per year and should be included to get total household user cost.

TABLE B-18

COST SUMMARY FOR THE SWIFT BRANCH SUBREGIONAL SYSTEM¹

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	5,075	5,075
Total collection system capital cost	\$ 470,000	\$ 470,000
Treatment plant capital cost	2,100,000	2,600,000
Total capital cost	2,670,000	3,170,000
Annualized capital cost	245,000	244,000
Annual O&M Cost	101,000	124,000
Total annual cost	306,000	368,000
Annual cost per household	\$ 155	\$ 185

1. Costs in this table are for subregional conveyance and treatment facilities only. Additional costs associated with local collection systems are not included. The annual cost for the Pelican Bay local collection system is \$125 per household, for the Peden local system is \$355 and for the Swift Branch local system is \$300 per household per year and should be included to get total household user cost for respective area.

TABLE B-19
COST SUMMARY FOR THE BRIAR CREEK SUBREGIONAL SYSTEM¹

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	1,535	1,535
Total collection system capital cost	\$1,766,000	\$1,766,000
Treatment plant capital cost	900,000	1,100,000
Total capital cost	2,766,000	2,966,000
Annualized capital cost	213,000	228,000
Annual O&M Cost	91,000	97,000
Total annual cost	304,000	325,000
Annual cost per household	\$ 505	\$ 540

1. Costs in this table include both local collection and subregional conveyance and treatment facilities.

TABLE B-20
COST SUMMARY FOR THE NEWARK SUBREGIONAL SYSTEM¹

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	1,175	1,175
Total collection system capital cost	\$ 129,000	\$ 129,000
Treatment plant capital cost	700,000	800,000
Total capital cost	829,000	929,000
Annualized capital cost	64,000	71,000
Annual O&M Cost	27,000	32,000
Total annual cost	91,000	103,000
Annual cost per household	\$ 195	\$ 225

1. Costs in this table include only subregional conveyance and treatment facilities. Additional costs associated with local collection systems are not included. The annual costs for local collection system is about \$435 per household and should be included to get total household user costs.

TABLE B-21
COST SUMMARY FOR THE BOAT CLUB SUBREGIONAL SYSTEM

Description	<u>Degree of Treatment</u> ¹ 1
2005 population served	910
Total collection system capital cost	\$ 428,000
Treatment plant capital cost	1
Total capital cost	428,000
Annualized capital cost	33,000
Annual O&M Cost	34,000
Total annual cost	86,000 ²
Annual cost per household ³	\$ 225 ²

1. Assumes treatment by the Fort Worth system.
2. Cost includes treatment rates of \$0.3374 per 1000 gallons volume, \$0.0683 per pound BOD and \$0.0417 per pound SS plus \$27 per month billing fee which are current City of Fort Worth Wholesale rates.
3. Costs does not include local collection facilities. Annual cost of local collection system is about %575 per household for Boat Club FPA and about \$355 per hosuehold for Lake Country FPA and should be included to get total household user cost for respective area.

TABLE B-22
COST SUMMARY FOR THE WESTSIDE REGIONAL SYSTEM¹

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	14,955	14,955
Total collection system capital cost	⁴ \$1,406,000	\$4,406,000
Treatment plant capital cost	5,786,000	6,019,000
Total capital cost	10,192,000	10,425,000
Annualized capital cost	784,000	802,000
Annual O&M Cost	375,000	378,000
Total annual cost	1,159,000	1,327,000
Annual cost per household	\$ 195	\$ 210

1. Costs in this table include only regional conveyance and treatment facilities. Additional costs associated with local collection systems for each respective area should be included to get total household user cost for respective area.

TABLE B-23
COST SUMMARY FOR THE NORTHSIDE SUBREGIONAL SYSTEM¹

Description	Degree of Treatment	
	10/15	10/15/2
2005 population served	4,455	4,455
Total collection system capital cost	\$1,590,000	\$1,590,000
Treatment plant capital cost	2,000,000	2,500,000
Total capital cost	3,690,000	4,190,000
Annualized capital cost	284,000	322,000
Annual O&M Cost	100,000	121,000
Total annual cost	384,000	443,000
Annual cost per household	\$ 220	\$ 250

1. Costs in this table include only regional conveyance and treatment facilities. Additional costs associated with local collection systems for each respective area should be included to get total household user cost for respective area.

TABLE B-24

COST SUMMARY FOR ALTERNATES 1-6
MODIFICATION OF AZLE WWTPS

Description	<u>10/15/2 Plants</u>		<u>10/15/2 with P Removal</u>		<u>10/15/2 with N Removal</u>	
	Azle Only	Azle and Pelican Bay	Azle Only	Azle and Pelican Bay	Azle Only	Azle and Pelican Bay
2005 Population served	10500	13935	10500	13935	10500	13935
Total collection system capital cost	1	2	1	2	1	2
Treatment plants modification capital cost	\$1,700,000	\$1,700,000	\$2,005,000	\$2,005,000	\$2,553,000	\$2,553,000
Total capital cost	1,700,000	1,700,000	2,005,000	2,005,000	2,553,000	2,553,000
Annualized capital cost	131,000	131,000	154,000	154,000	196,000	196,000
Annual L&M cost	280,000	280,000	369,000	369,000	369,000	369,000
Total annual cost	411,000	411,000	523,000	523,000	565,000	565,000
Annual cost per household ^{1,2} \$	100	\$ 90	\$ 125	\$ 110	135	120

- Existing system current costs to users are about \$130 per year per household. Projected costs for existing system could decrease to \$95 per year based on 2005 population. Cost for existing system should be added to annual cost shown to get total household user cost,
- Local costs for proposed Pelican Bay collection system are about \$120 per household per year based on 2005 population and should be added to annual cost shown to get total household user cost.

TABLE B-25

COST SUMMARY FOR ALTERNATES 7-8
DISCHARGE TO SATELLITE WWTP

Description	<u>2.04 MGD Satellite Plant¹</u>		<u>6.3 MGD Satellite Plant²</u>
	Azle and Downstream Intervening to Lakeside 10/15	10/15/2	Azle and Downstream Intervening + Ft. Worth Silver/Live Oak Crk 10/15
2005 Population served	17040	17040	19377
Total collection system capital cost	\$1,836,000 ³	\$1,836,000 ³	\$1,836,000 ³
Treatment plants modification capital cost	7,225,000	7,517,000	20,900,000 ⁴
Total capital cost	9,661,000	9,953,000	23,336,000
Annualized capital cost	743,000	765,000	1,795,000
Annual L&M cost	454,000	554,000	1,244,000
Total annual cost	1,197,000	1,319,000	3,039,000
Annual cost per household ⁵	\$ 180	\$ 195	\$ 400

1. Plant sized for population served
2. Plant size from Fort Worth 201 Facilities Plan
3. Main conveyance facilities to WWTP
4. Cost includes effluent outfall line to Marys Creek for 10/15 plant only per facilities plan.
5. Cost for existing collection facilities in Azle of about \$130 per year should be added to get total household user cost for these users.

TABLE B-26

**COST SUMMARY FOR ALTERNATES 9-11
DISCHARGE TO FORT WORTH VILLAGE CREEK WWTP**

Description	<u>Discharge to Fort Worth System & Village Creek WWTP</u>		
	Azle Only	Azle and Pelican Bay	Azle and West Side EML
2005 Population served	10500	13935	21995
Total collection system capital cost	\$1,391,000 ¹	\$1,955,000 ¹	\$5,523,000 ¹
Total capital cost	1,711,000	2,275,000	5,643,000
Annualized capital cost	132,000	175,000	434,000
Annual treatment cost ²	248,000	315,000	437,000
Annual O&M cost	44,000	45,000	153,000
Total annual cost	424,000	535,000	1,024,000
Annual cost per household	\$ 105	\$ 95	\$ 125

1. Main conveyance facilities to lift station near Lakeside per Fort Worth Wastewater Master Plan. Local collection system costs not included. Additional local costs include \$95 for Azle and \$120 per household per year for Pelican Bay. For local collection system costs for other individual FPAs on west side of EML see cost table for respective FPA.
2. Annual treatment costs based on current City of Fort Worth wholesale rates. Volume - \$0.3375 per 1000 gal; BOD - \$0.0683/lb.; SS - \$0.0417/lb.; Billing \$27 per month and estimated flows for 2005 population at average levels of BOD and SS for domestic sewage.

TABLE B-27

EAGLE MOUNTAIN LAKE REGION WASTEWATER FACILITY SYSTEMS
IDENTIFIED FOR VARIOUS FPAs¹

Facility Planning Area	Identified System		Local Management Agency	On-Site Waste Disposal	Existing System
	Annual Cost Per Household	Type of System			
Azle	\$150 ³	Ind. ³	City of Azle	2	Yes
Ash Creek	\$485-\$1160	Ind.	None	2	No
Pelican Bay	\$485 ⁴	Ind.	City of Pelican Bay	2	No
Peden	955	Ind.	None	2	No
Swift Branch	855	Ind.	None	2	No
Reno	\$885-\$1165	Ind.	City of Reno	2	No
Briar Creek	750-1110	Ind.	None	2	No
Hog Branch	5	5	None	2	No
Boyd	6	6	City of Boyd	2	Yes
Aurora	895	Ind.	City of Aurora	2	No
Oates Branch	5	5	None	2	No
Newark	830	Ind.	City of Newark	2	Yes
Avondale	760	Ind.	None	2	No
Gilmore Branch	880	Ind.	None	2	No
Boat Club	1645	Ind.	None	2	No
Lake Country	1665 ⁷	Ind.	7	2	Yes

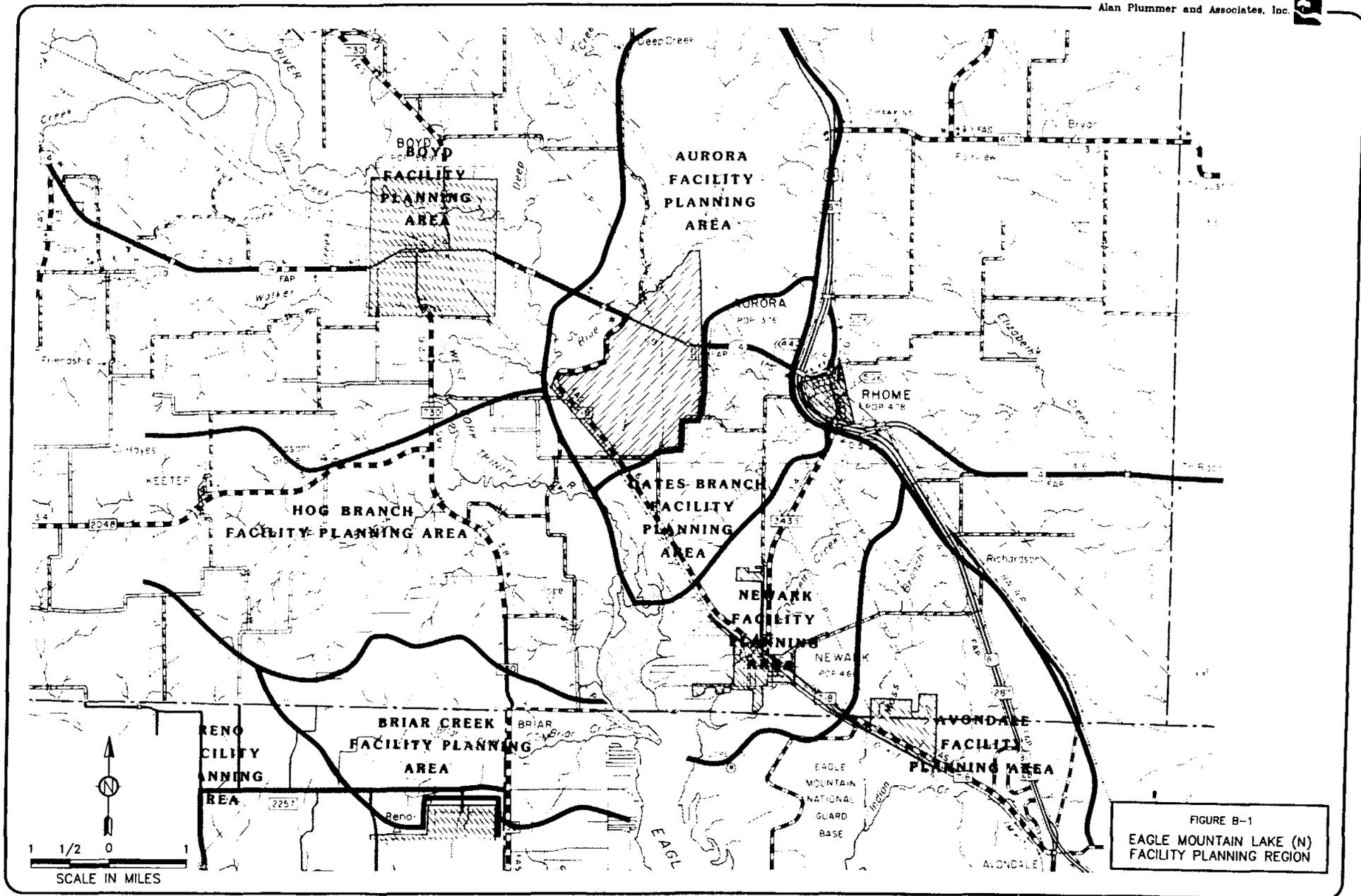
1. 1990 cost based on 10/15/2 plant for individual area. Cost requirements subject to change based on treatment requirements/Eagle Mountain Lake effluent guidelines to be established by TWC.
2. Generally on-site waste disposal regulations enforced by TWCID if household within 2000 feet of normal pool level (elevation 649.1) of EML and/or municipality if located within incorporated area. Otherwise regulations enforced by Parker County Health Department, Tarrant County Health Department or Wise County Health Department according to location.

3. Modification to 10/15/2 existing plant only. Does not include current cost of existing organized system. Present billing for users is about \$130 per year. Regional system also evaluated to convey wastewater to City of Fort Worth sewer system per Fort Worth's Wastewater Master Plan now being updated.
4. Also included in regional system with City of Azle to convey wastewater to City of Fort Worth wastewater system per Master Plan.
5. FPAs very sparsely populated and currently not adequate to warrant evaluation of organized system.
6. City of Boyd to initiate facility planning studies in 1988 to expand existing system and therefore individual FPA system not evaluated for this study. Only about 400 persons located outside of current city limits but in FPA and these areas may be subject to possible annexation.
7. Population in FPA nearly all within Tarrant County Municipal Utility District No. 1 (Lake County Estates) and sewage conveyed to City of Fort Worth sewer system for treatment. Costs shown for small part of FPA outside of TCMUD #1 service area.

FIGURES

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<u>FIGURE</u>	<u>DESCRIPTION</u>	<u>FIGURE</u>	<u>DESCRIPTION</u>
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B-2	EAGLE MOUNTAIN LAKE (S) FACILITY PLANNING REGION	B-21	EAGLE MOUNTAIN LAKE (N) SUB-REGIONAL FACILITIES "A"
B-3	AZLE (NORTH) FACILITY PLANNING AREA	B-22	EAGLE MOUNTAIN LAKE (S) SUB-REGIONAL FACILITIES "A"
B-4	AZLE (SOUTH) FACILITY PLANNING AREA	B-23	EAGLE MOUNTAIN LAKE (N) SUB-REGIONAL FACILITIES "B"
B-5	ASH CREEK FACILITY PLANNING AREA	B-24	EAGLE MOUNTAIN LAKE (S) SUB-REGIONAL FACILITIES "B"
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B-7	PEDEN FACILITY PLANNING AREA	B-26	EAGLE MOUNTAIN LAKE (S) REGIONAL FACILITIES
B-8	SWIFT BRANCH FACILITY PLANNING AREA	B-27	ALTERNATES 2, 4 AND 6 - AZLE / PELICAN BAY SERVICE AREA ON MODIFIED AZLE WWTP - WALNUT CREEK
B-9	RENO (NORTH) FACILITY PLANNING AREA	B-28	ALTERNATES 7 AND 8 - LOCATION OF PROPOSED SATELLITE WWTP AND DOWNSTREAM SERVICE AREAS
B-10	RENO (SOUTH) FACILITY PLANNING AREA	B-29	ALTERNATES 7 AND 9 - AZLE COLLECTION SYSTEM WITH CONVEYANCE TO SATELLITE WWTP - NORTH
B-11	BRIAR CREEK FACILITY PLANNING AREA	B-30	ALTERNATES 7 AND 9 - AZLE COLLECTION SYSTEM WITH CONVEYANCE TO SATELLITE WWTP - SOUTH
B-12	HOG BRANCH FACILITY PLANNING AREA	B-31	ALTERNATES 9, 10 AND 11 - PROPOSED FORT WORTH SYSTEM EXPANSION IN EML WATERSHED
B-13	BOYD FACILITY PLANNING AREA	B-32	ALTERNATE 10 SERVICE AREA - AZLE / PELICAN BAY TO FORT WORTH VILLAGE CREEK WWTP - NORTH
B-14	AURORA FACILITY PLANNING AREA	B-33	ALTERNATE 11 SERVICE AREA - EML WEST SIDE TO FORT WORTH VILLAGE CREEK WWTP
B-15	OATES BRANCH FACILITY PLANNING AREA		
B-16	NEWARK FACILITY PLANNING AREA		
B-17	AVONDALE FACILITY PLANNING AREA		
B-18	GILMORE BRANCH FACILITY PLANNING AREA		
B-19	BOAT CLUB FACILITY PLANNING AREA		



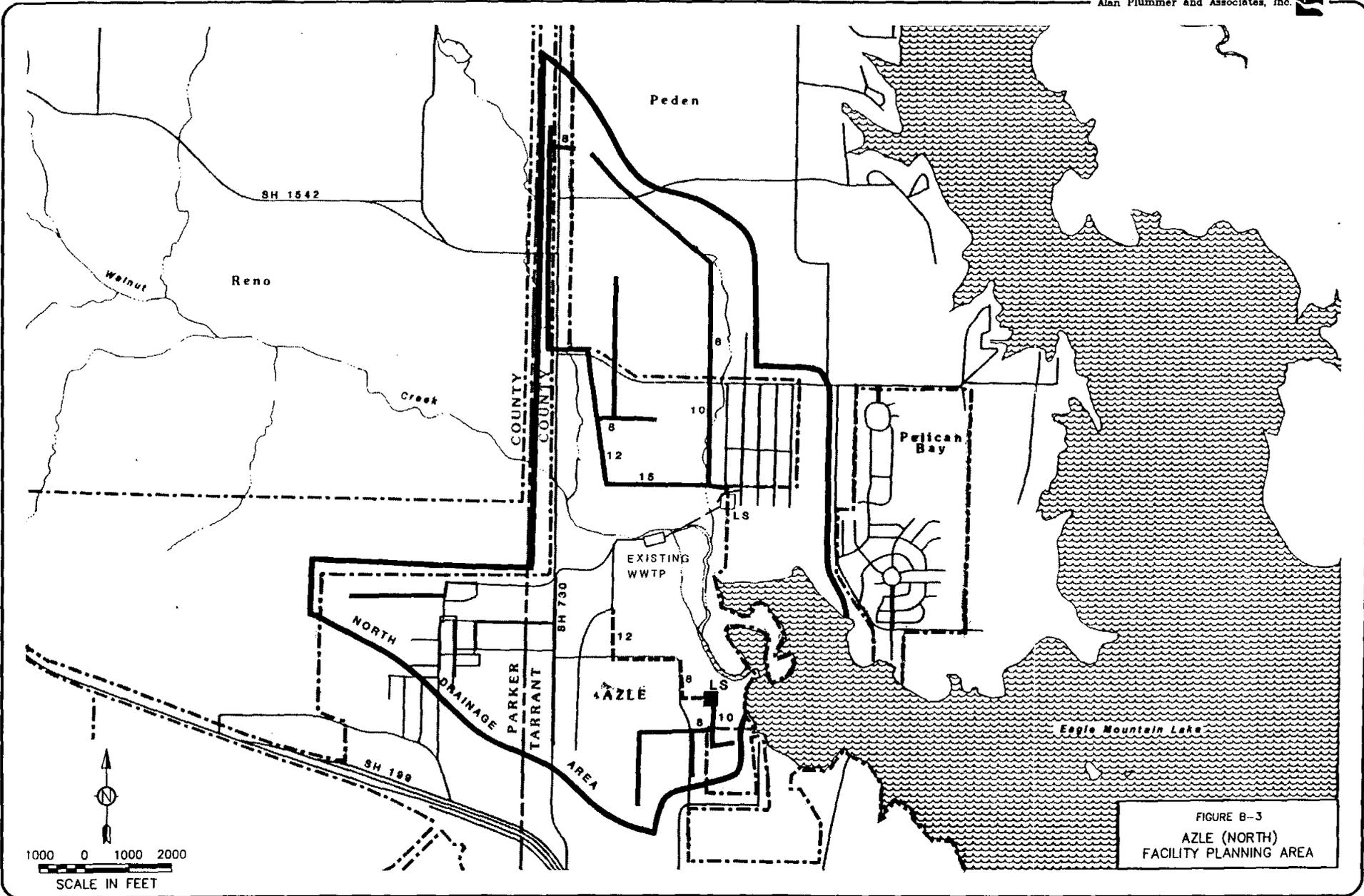


FIGURE B-3
AZLE (NORTH)
FACILITY PLANNING AREA

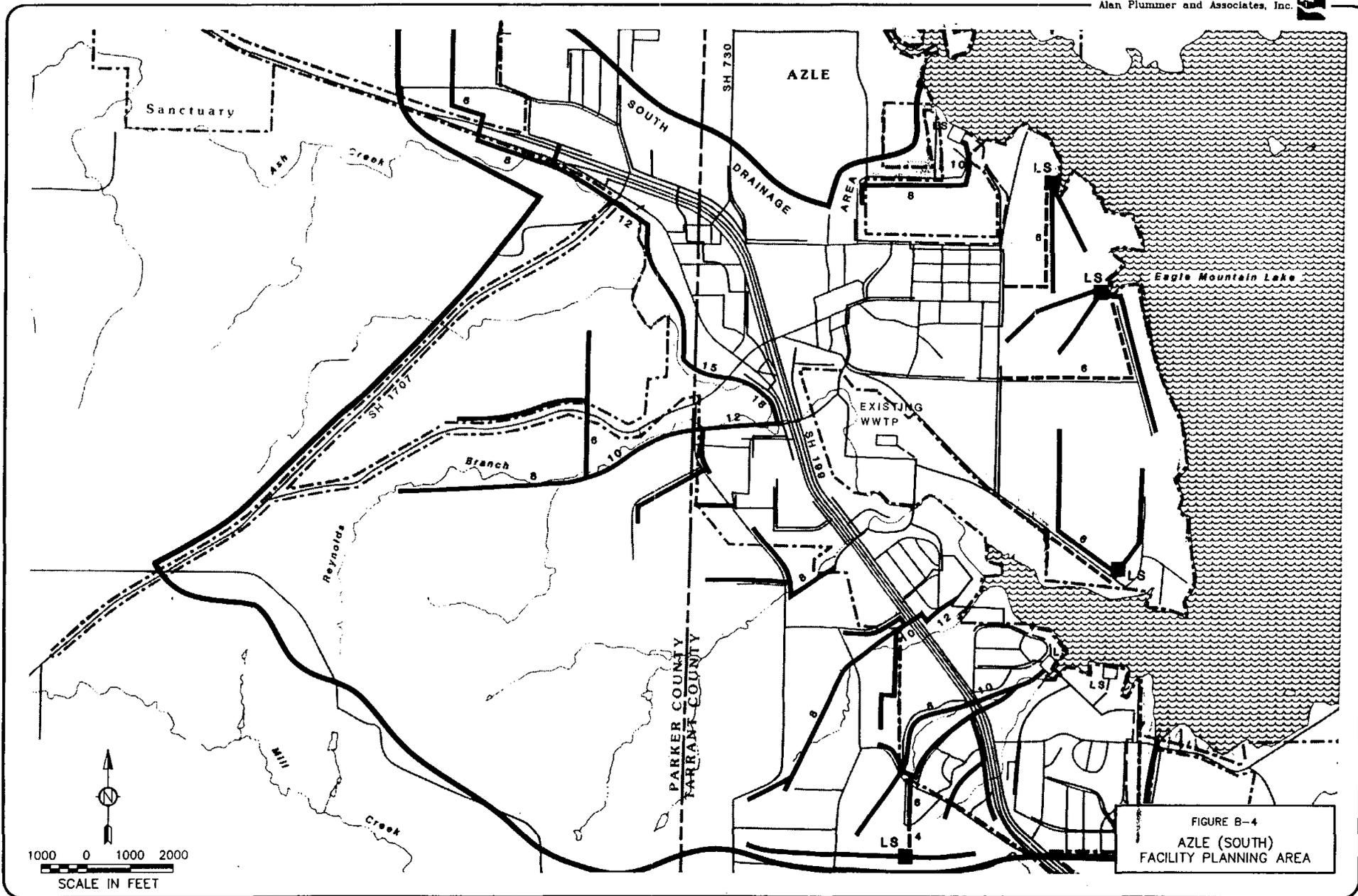


FIGURE B-4
AZLE (SOUTH)
FACILITY PLANNING AREA

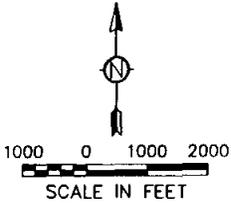
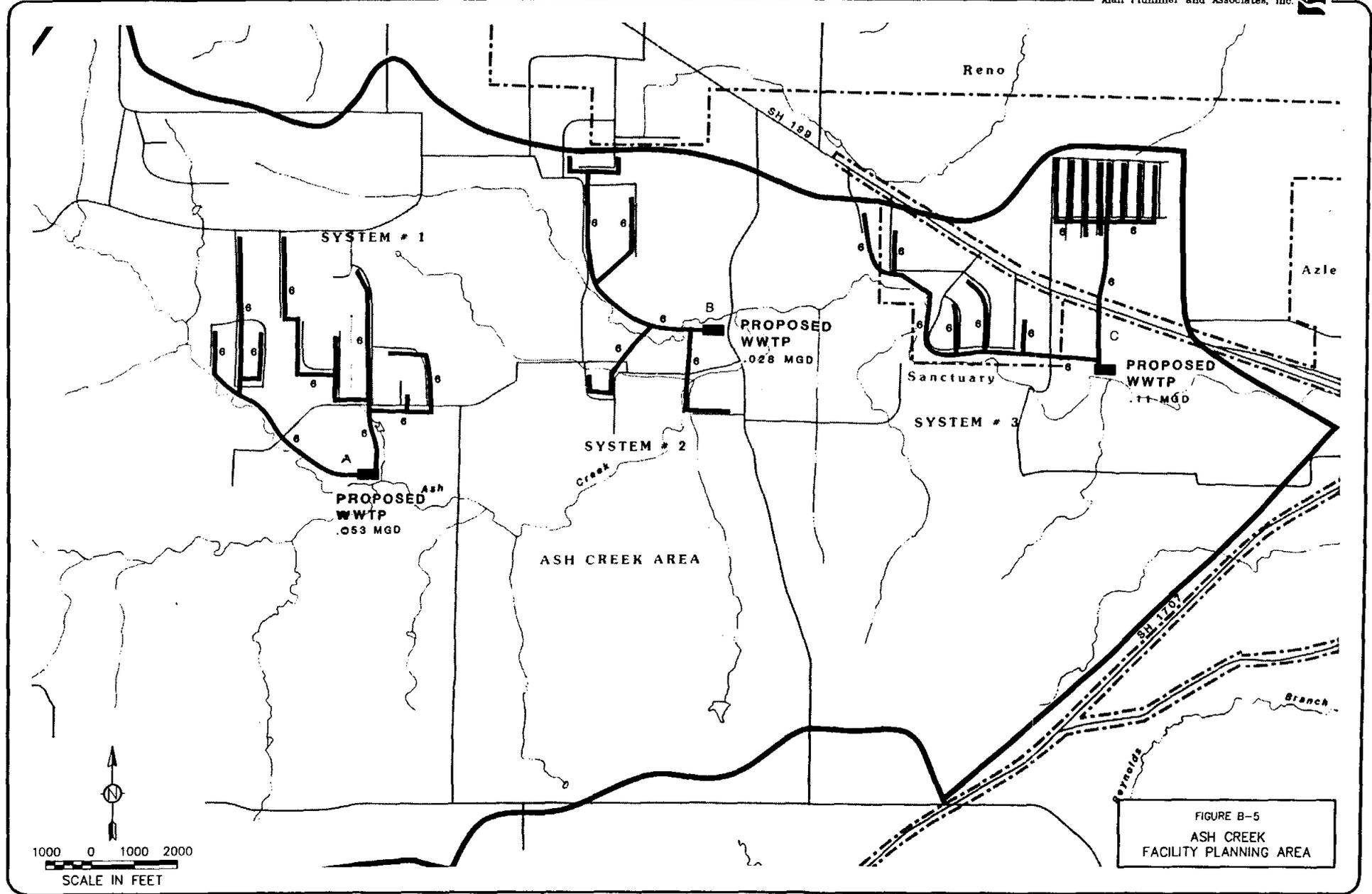


FIGURE B-5
ASH CREEK
FACILITY PLANNING AREA

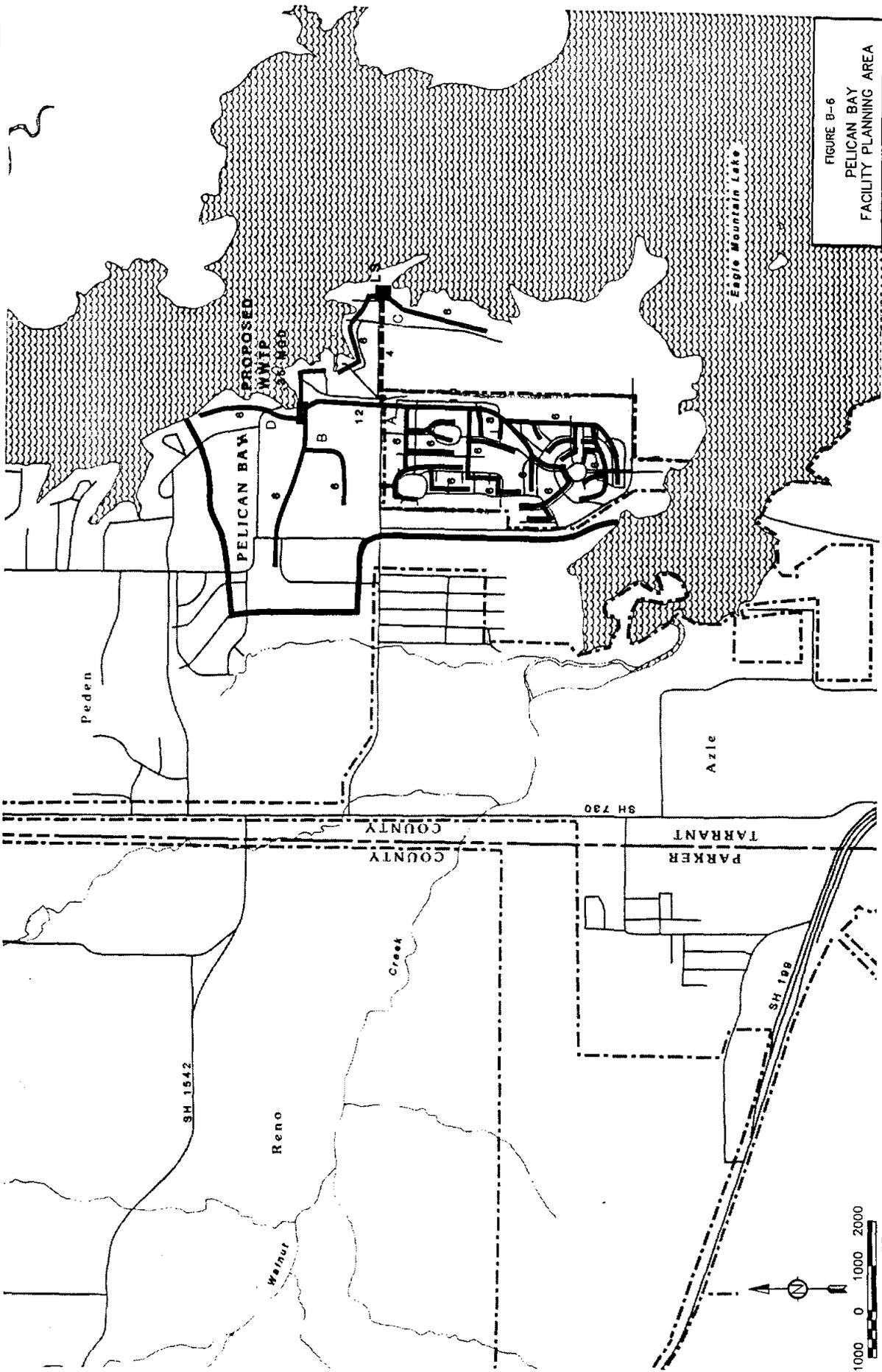


FIGURE B-6
PELICAN BAY
FACILITY PLANNING AREA



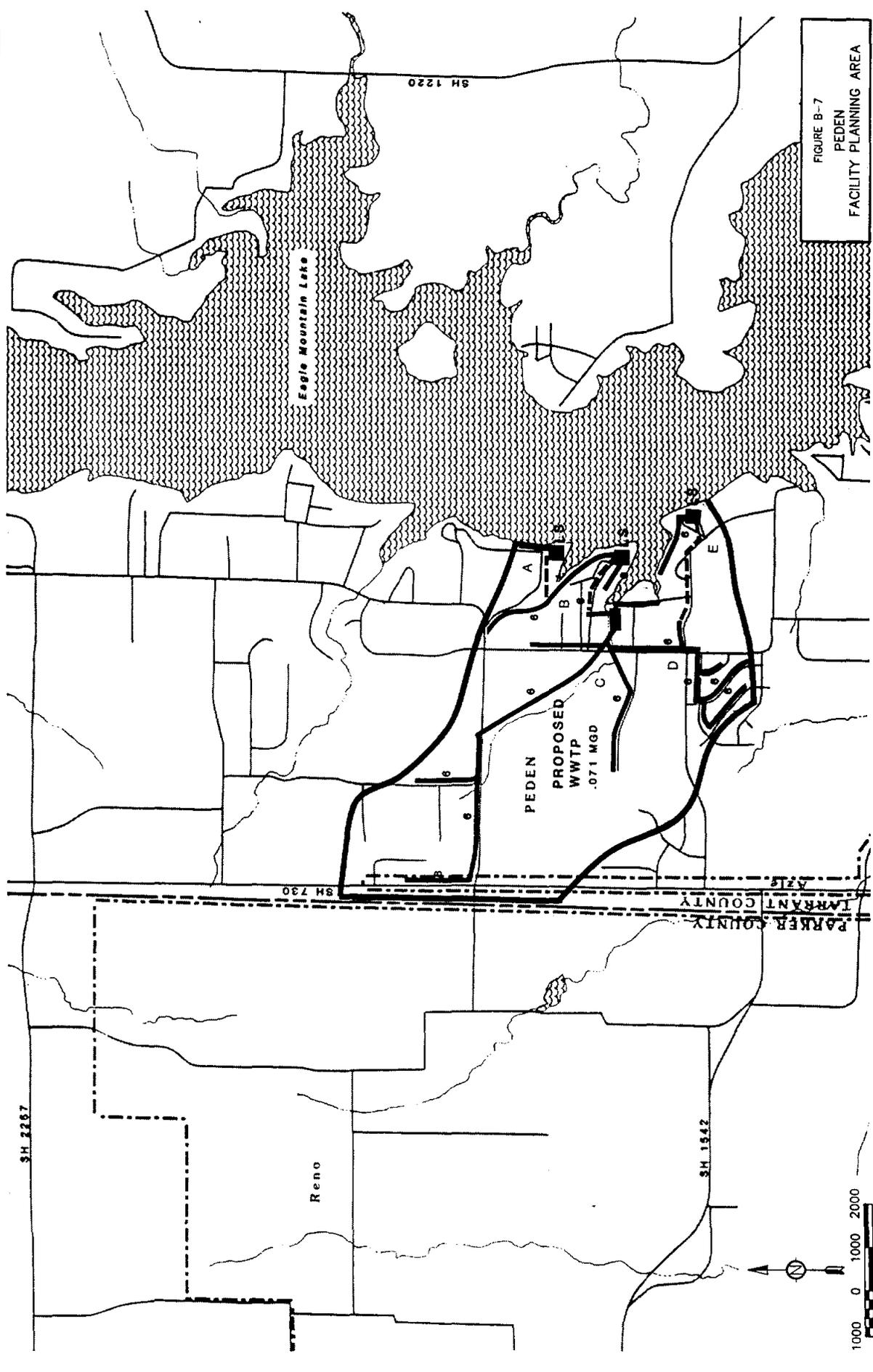
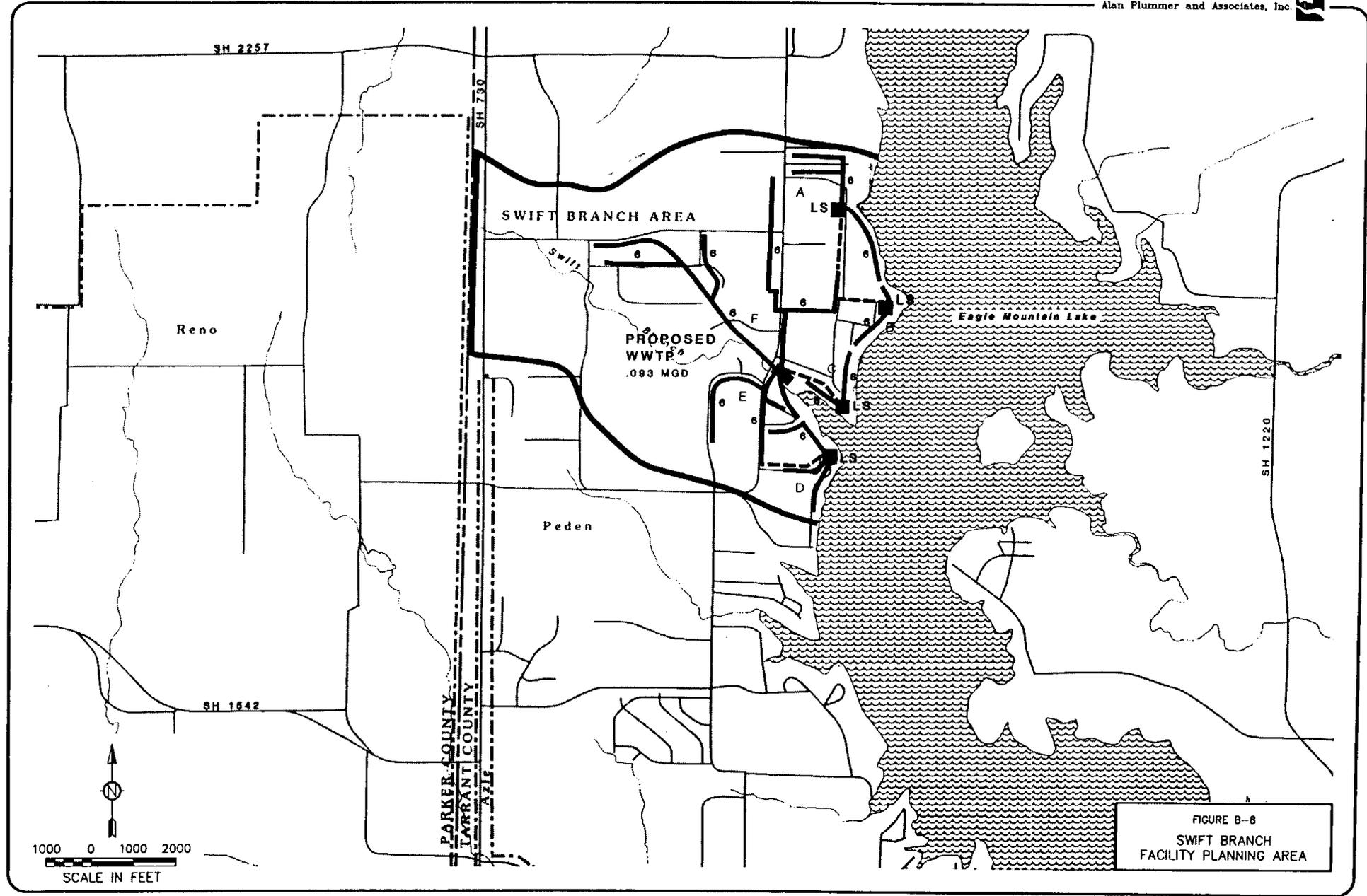
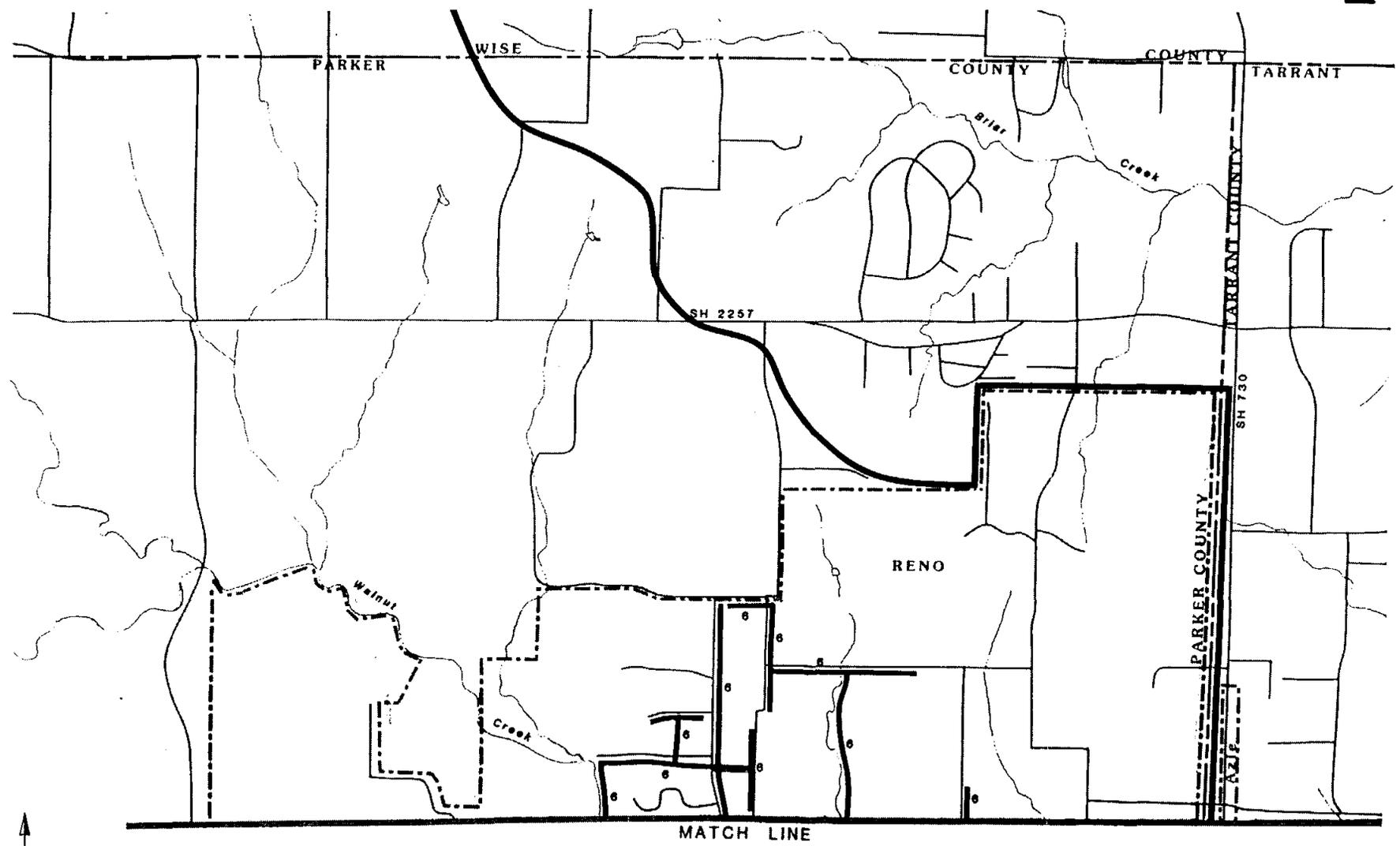


FIGURE B-7
PEDEN
FACILITY PLANNING AREA

1000 0 1000 2000
SCALE IN FEET





1000 0 1000 2000
 SCALE IN FEET

FIGURE B-9
 RENO (NORTH)
 FACILITY PLANNING AREA

MATCH LINE

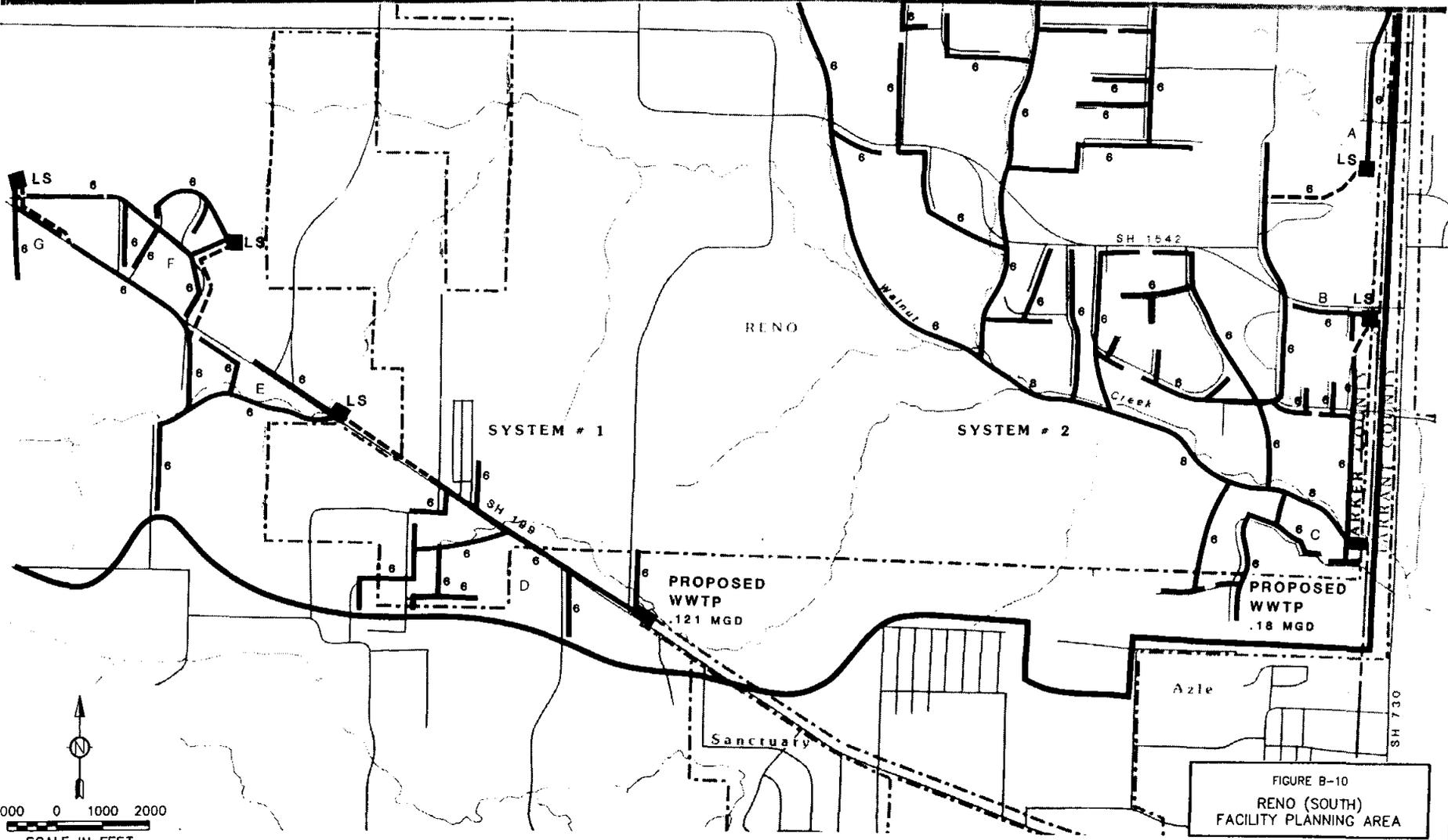


FIGURE B-10
RENO (SOUTH)
FACILITY PLANNING AREA

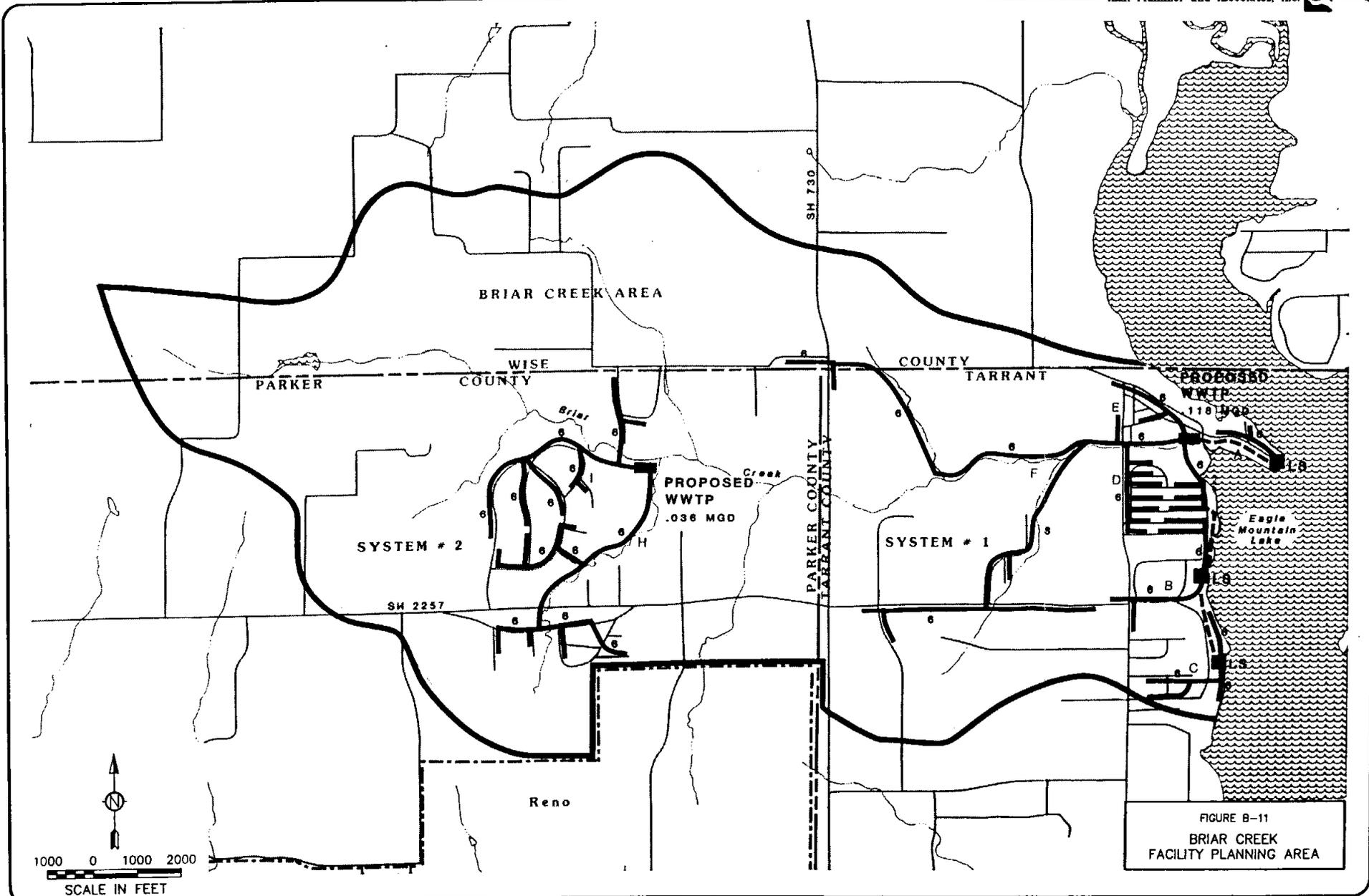


FIGURE B-11
BRIAR CREEK
FACILITY PLANNING AREA

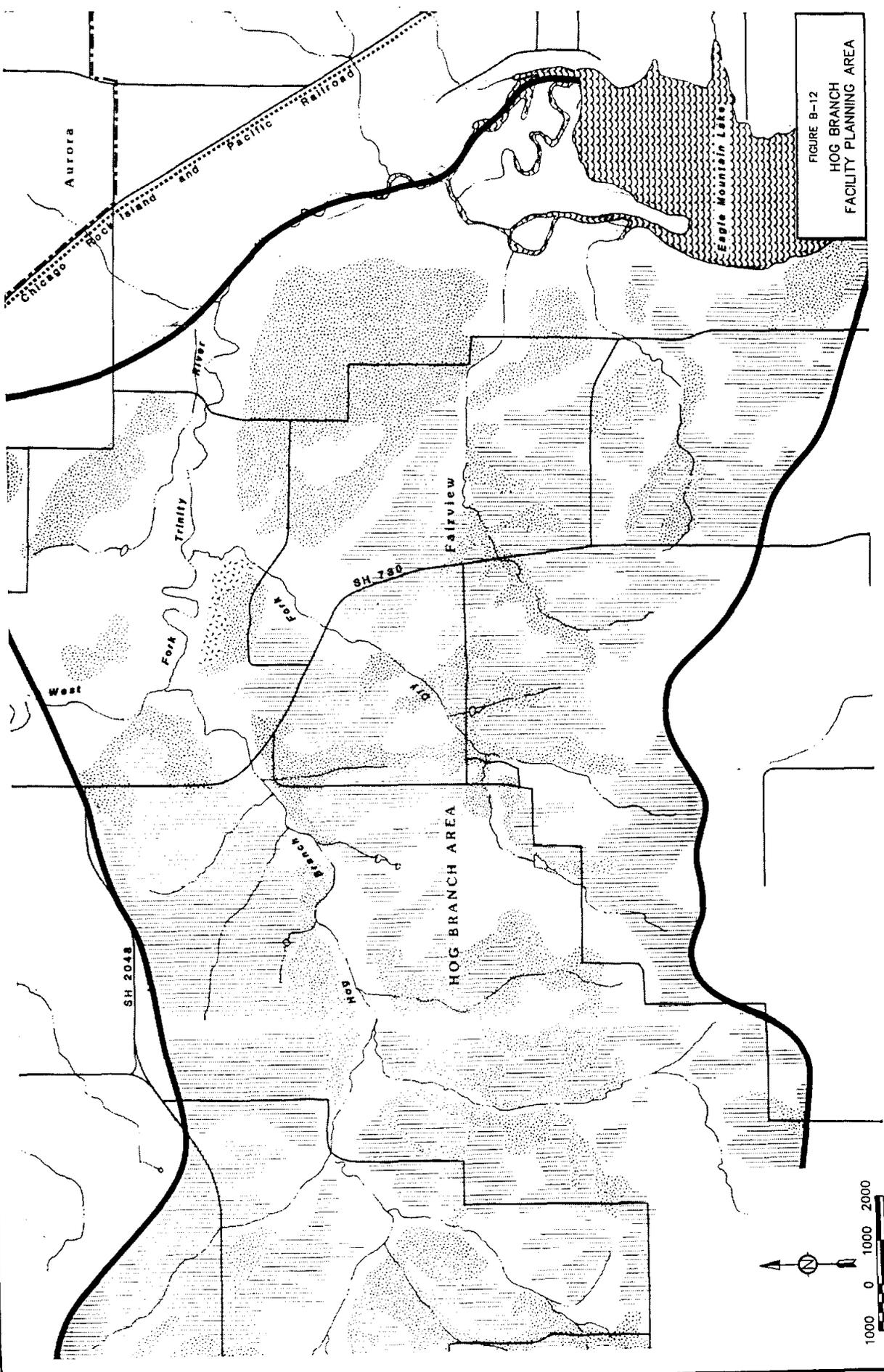


FIGURE B-12
HOG BRANCH
FACILITY PLANNING AREA



1000 0 1000 2000
SCALE IN FEET

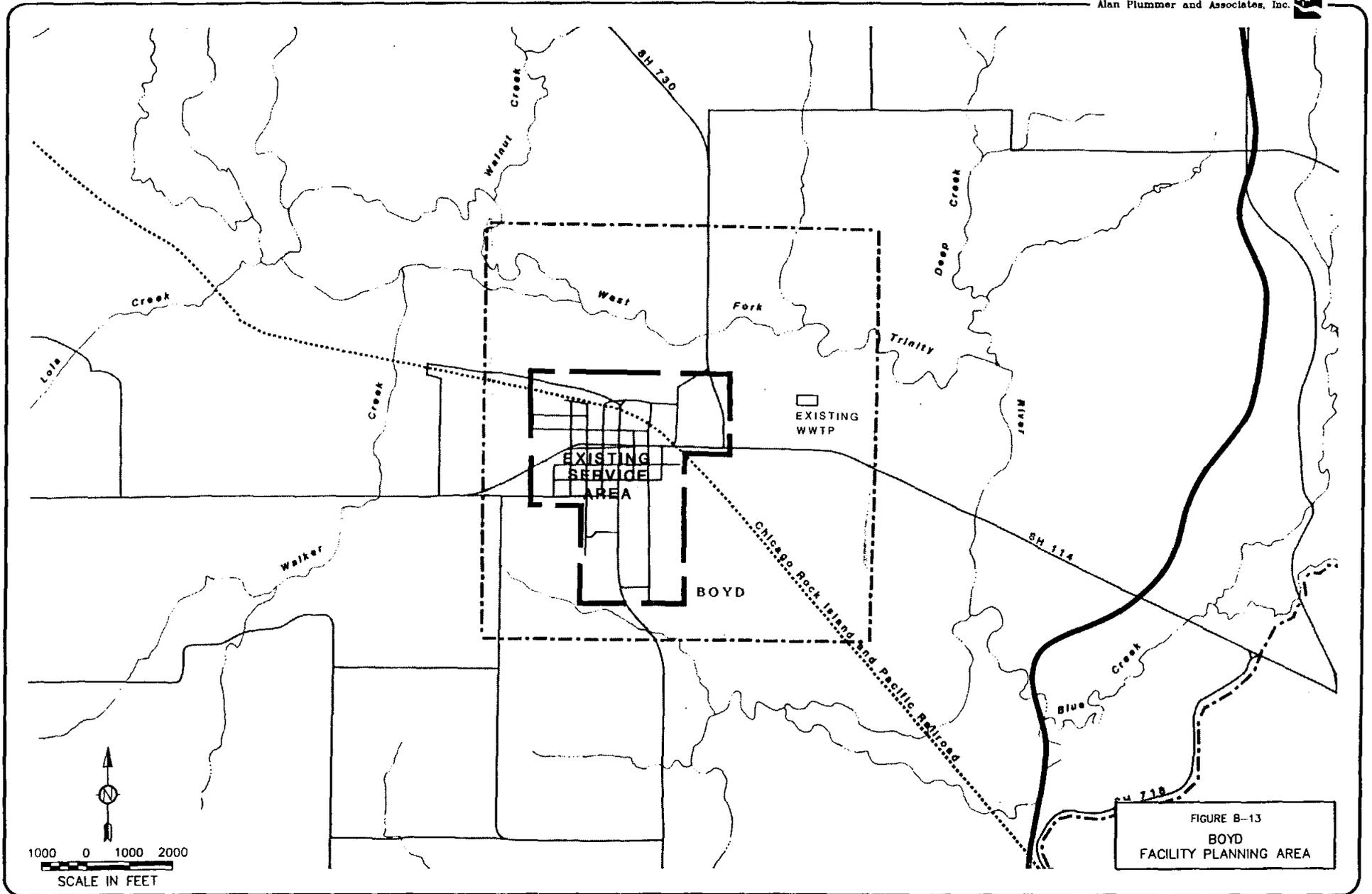


FIGURE B-13
BOYD
FACILITY PLANNING AREA

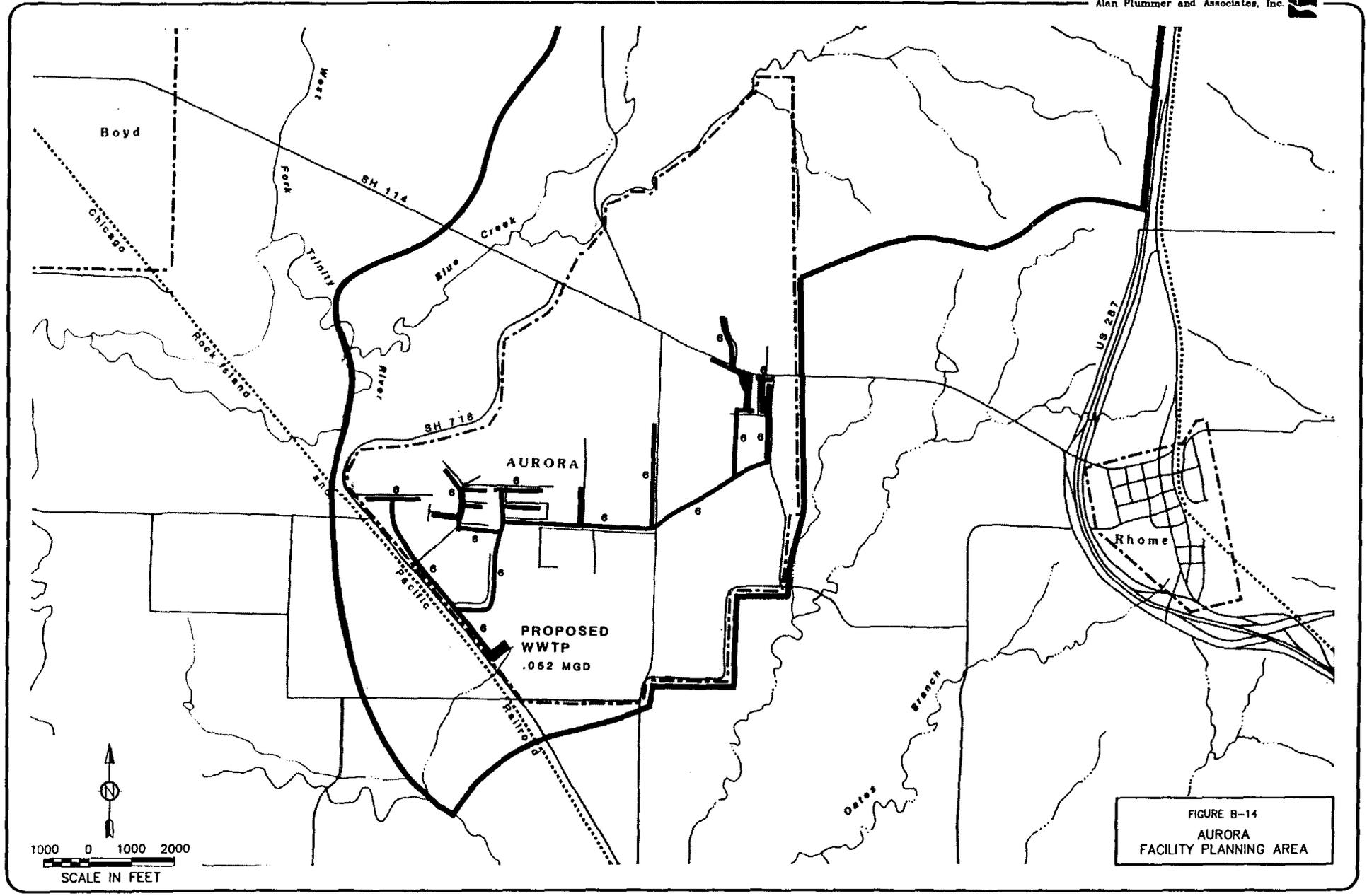


FIGURE B-14
AURORA
FACILITY PLANNING AREA

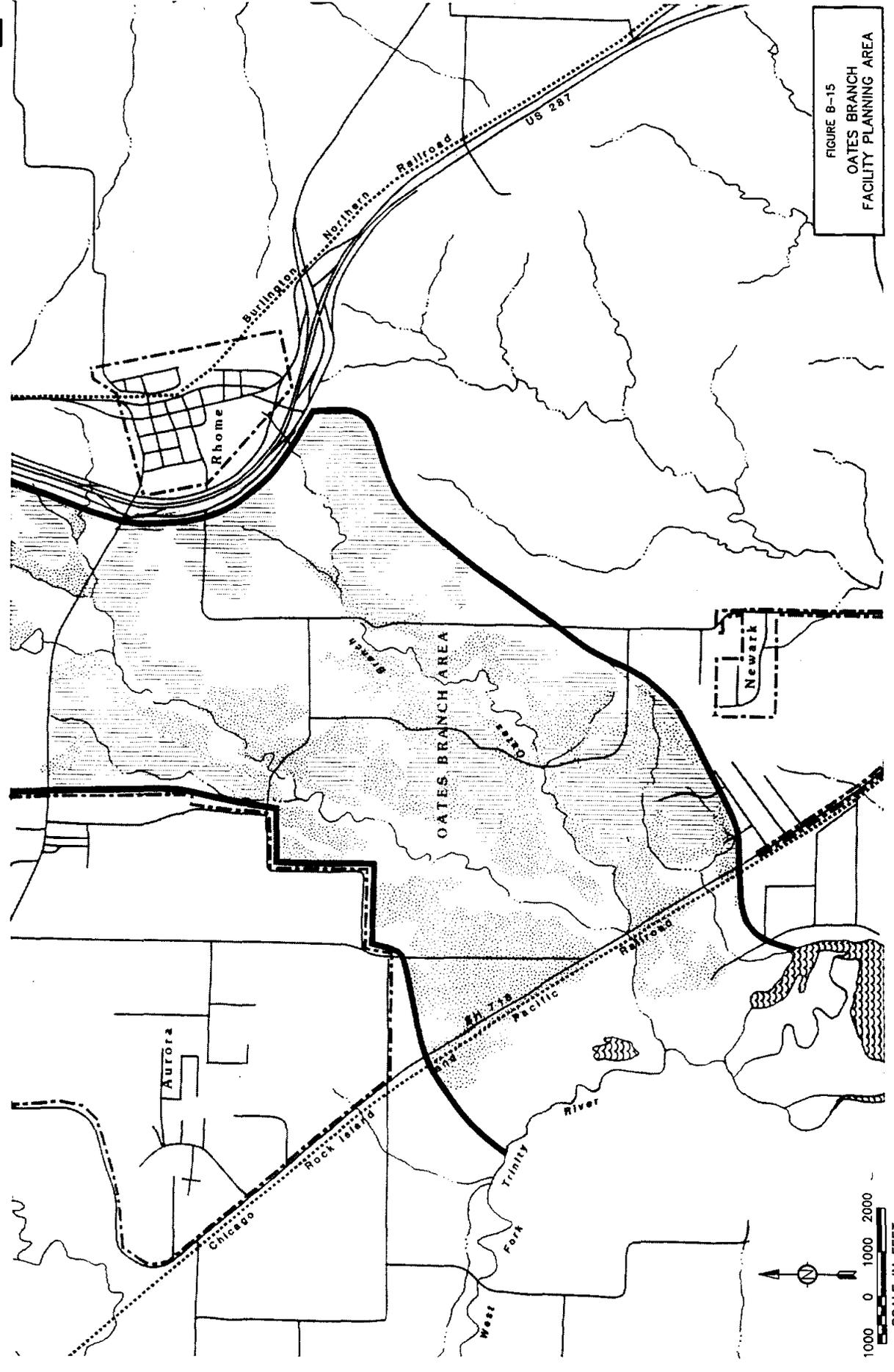


FIGURE B-15
OATES BRANCH
FACILITY PLANNING AREA

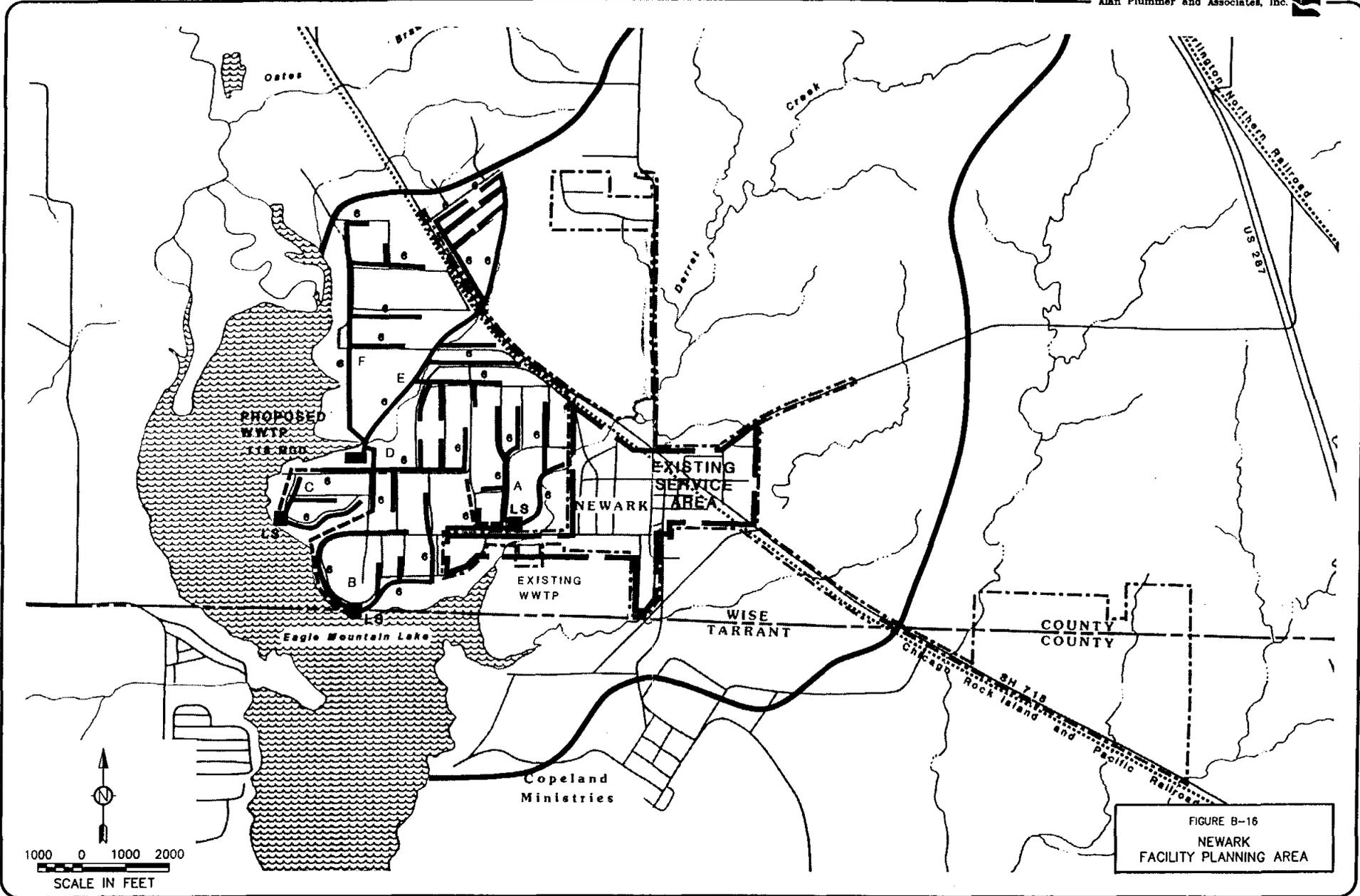


FIGURE B-16
NEWARK
FACILITY PLANNING AREA

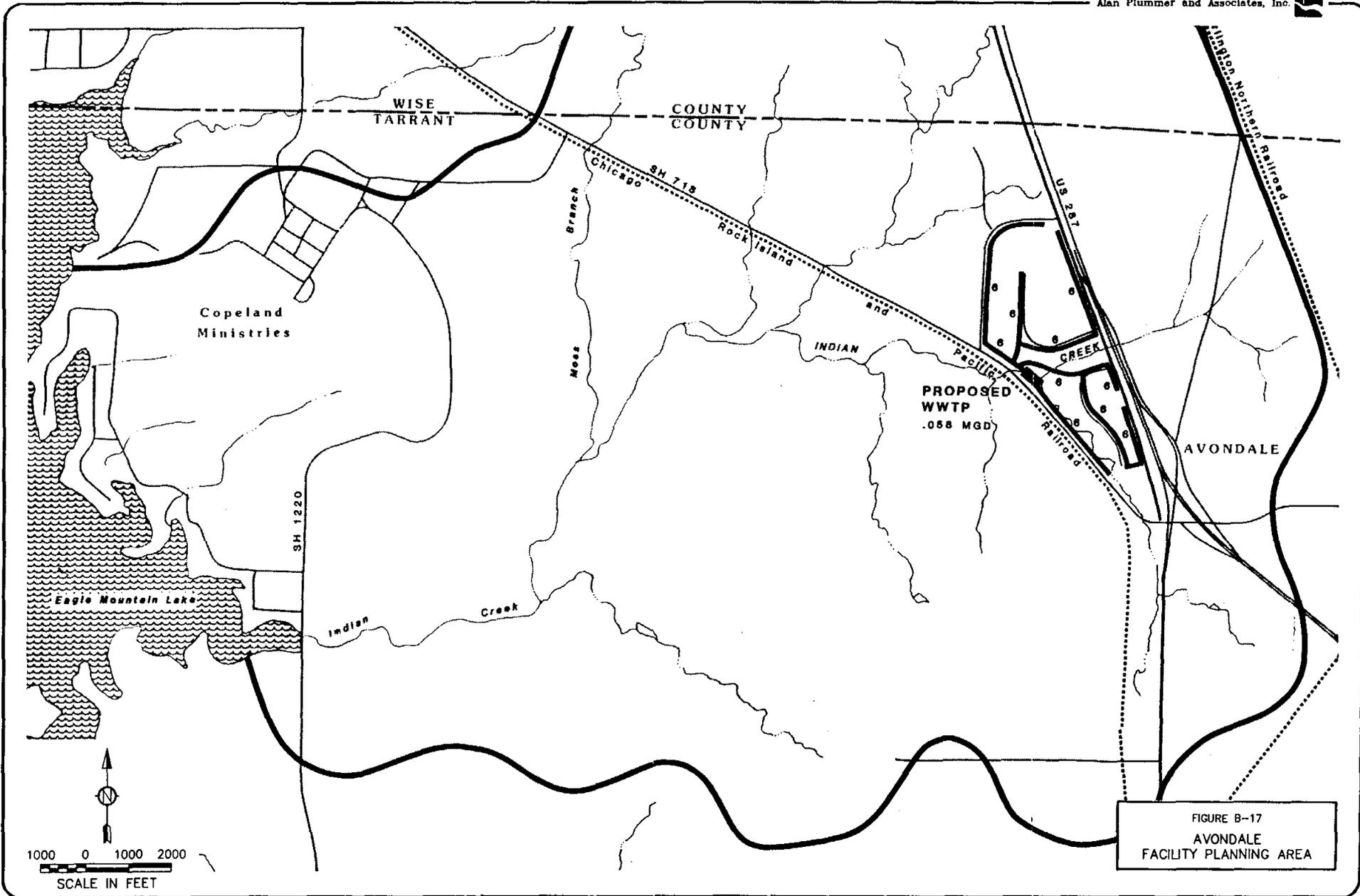


FIGURE B-17
AVONDALE
FACILITY PLANNING AREA

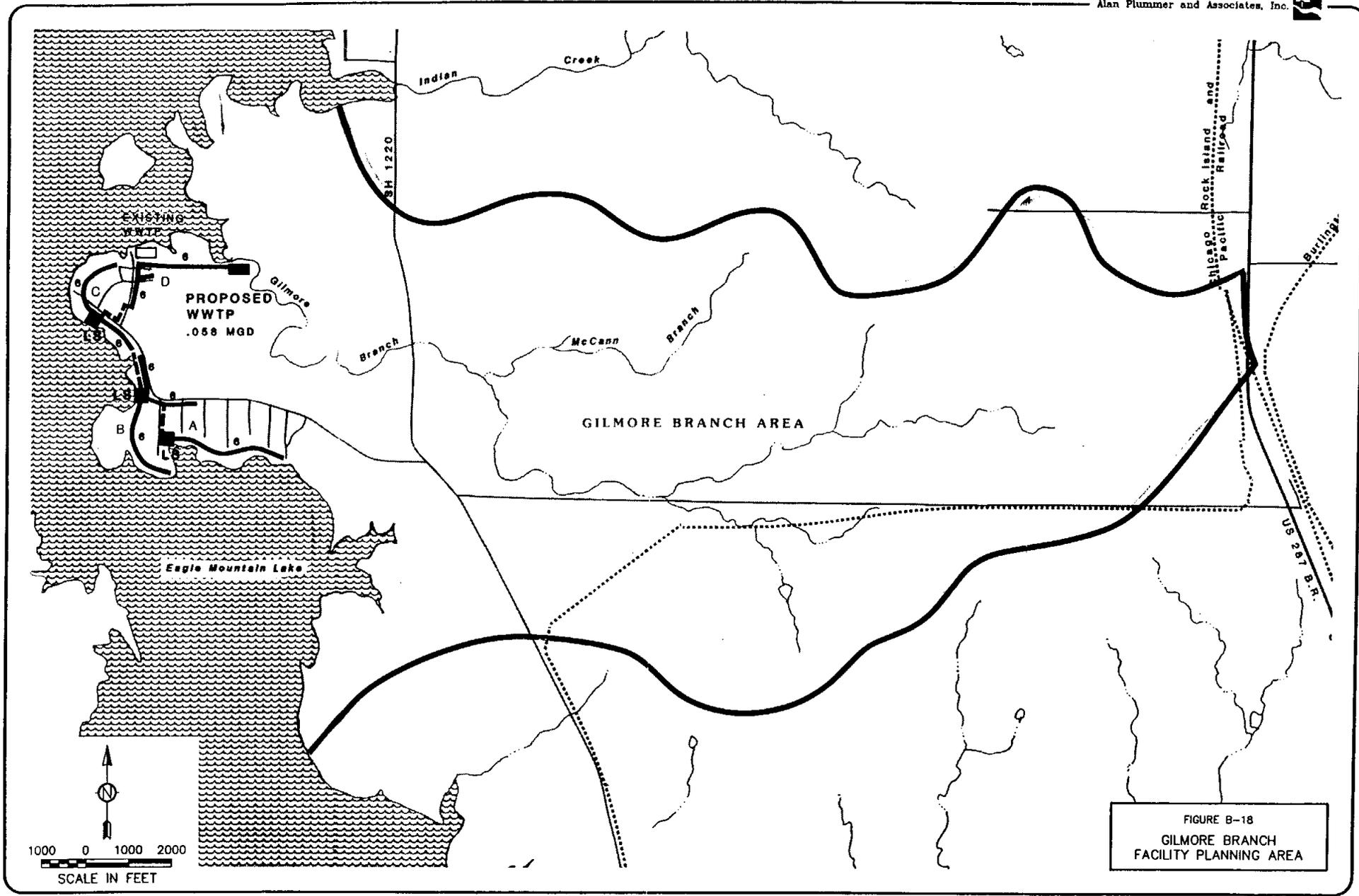


FIGURE B-18
GILMORE BRANCH
FACILITY PLANNING AREA

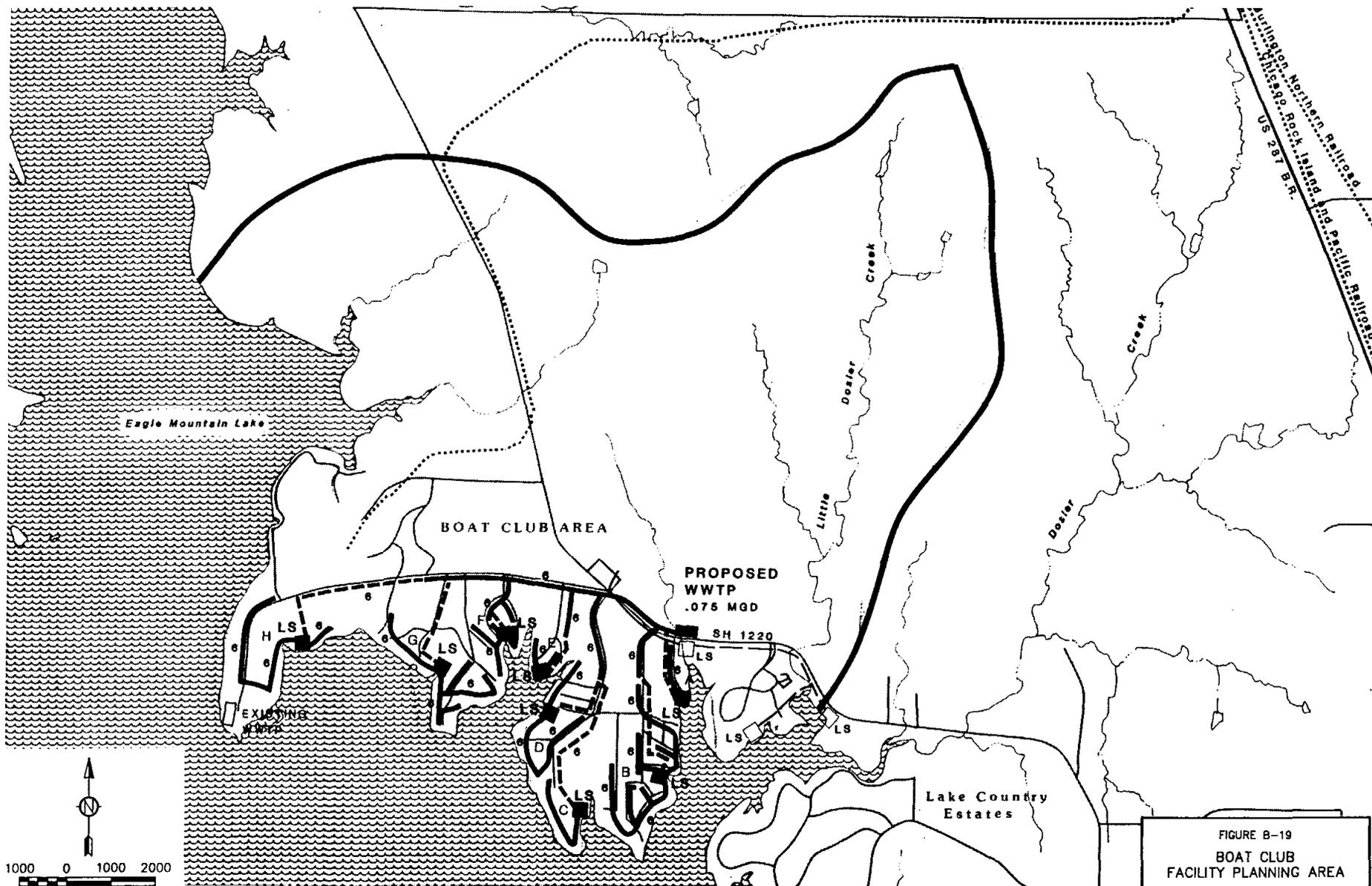
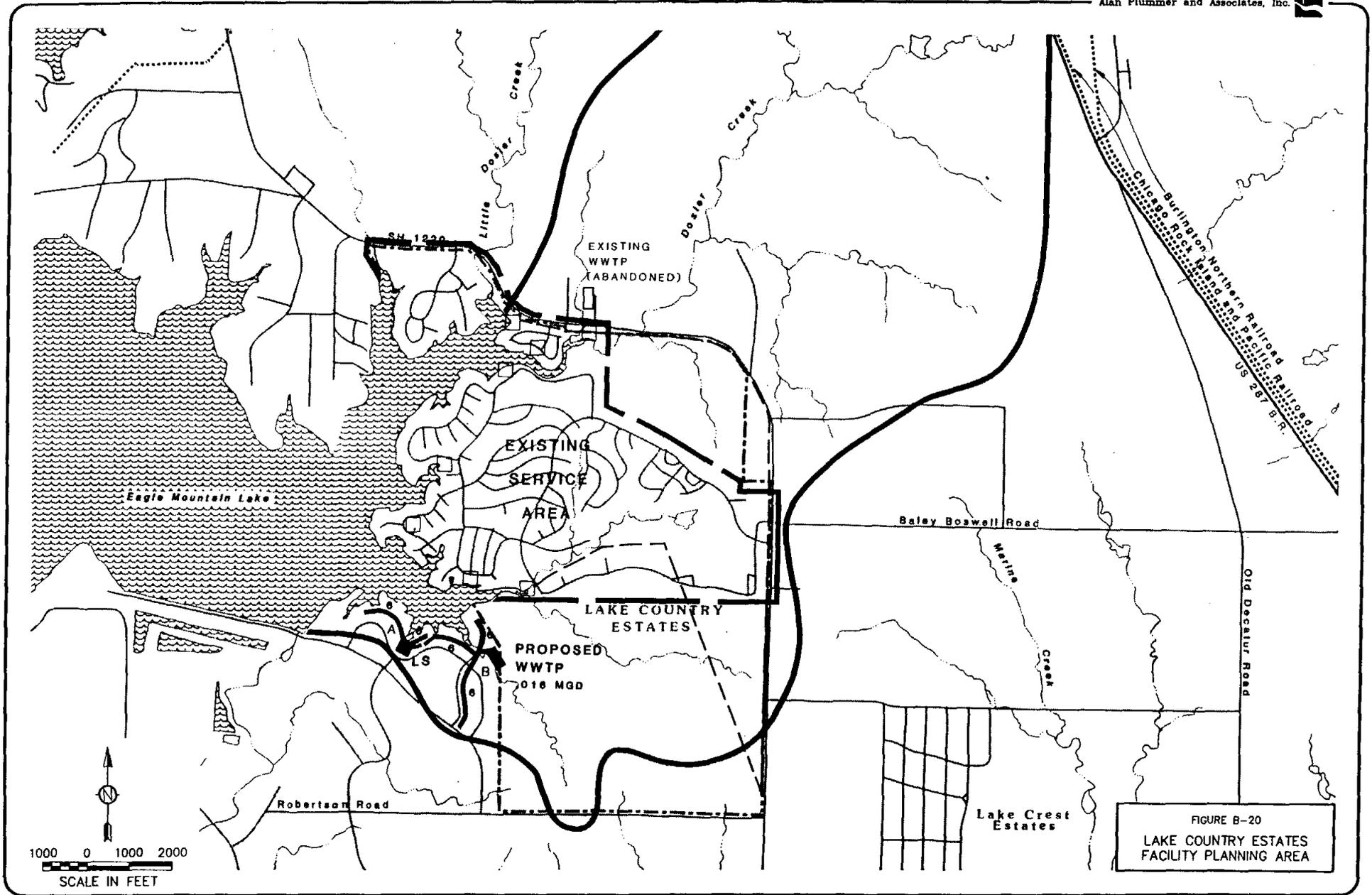


FIGURE B-19
BOAT CLUB
FACILITY PLANNING AREA



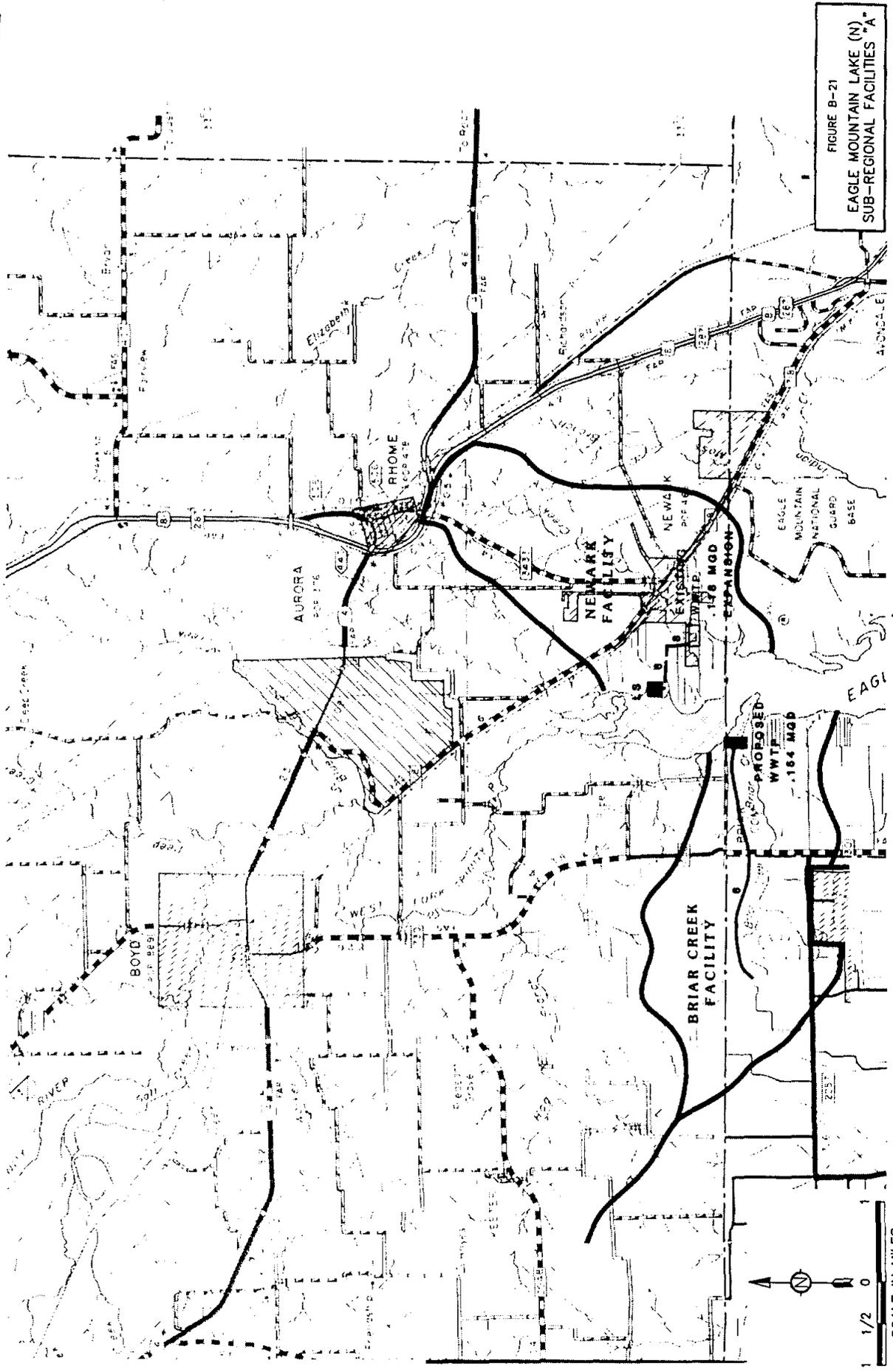
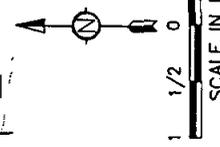


FIGURE B-21
EAGLE MOUNTAIN LAKE (N)
SUB-REGIONAL FACILITIES "A"



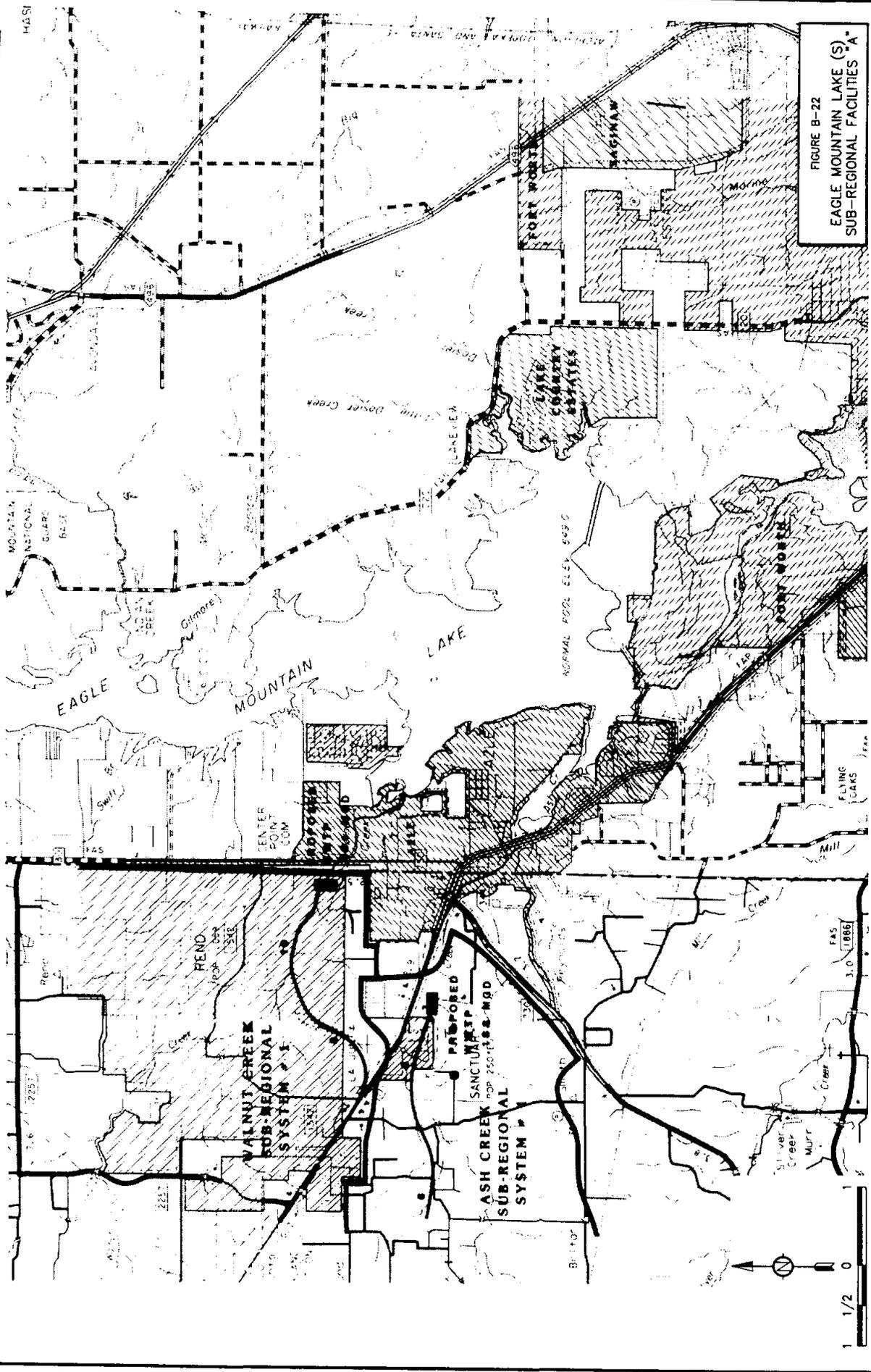


FIGURE B-22
EAGLE MOUNTAIN LAKE (S)
SUB-REGIONAL FACILITIES 'A'

SCALE IN MILES
1 1/2 0



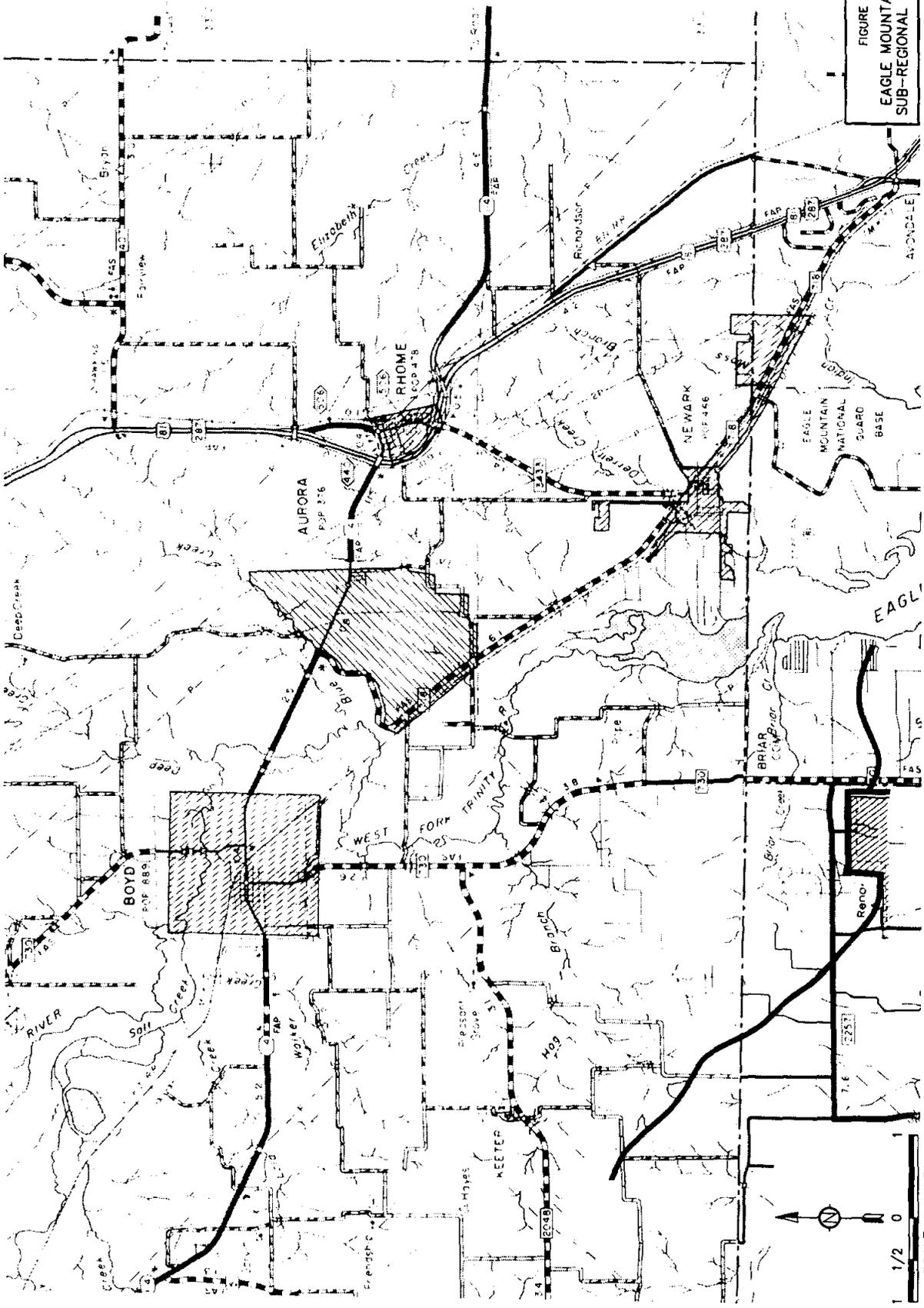


FIGURE B-23
EAGLE MOUNTAIN LAKE (N)
SUB-REGIONAL FACILITIES "B"

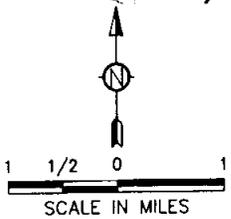
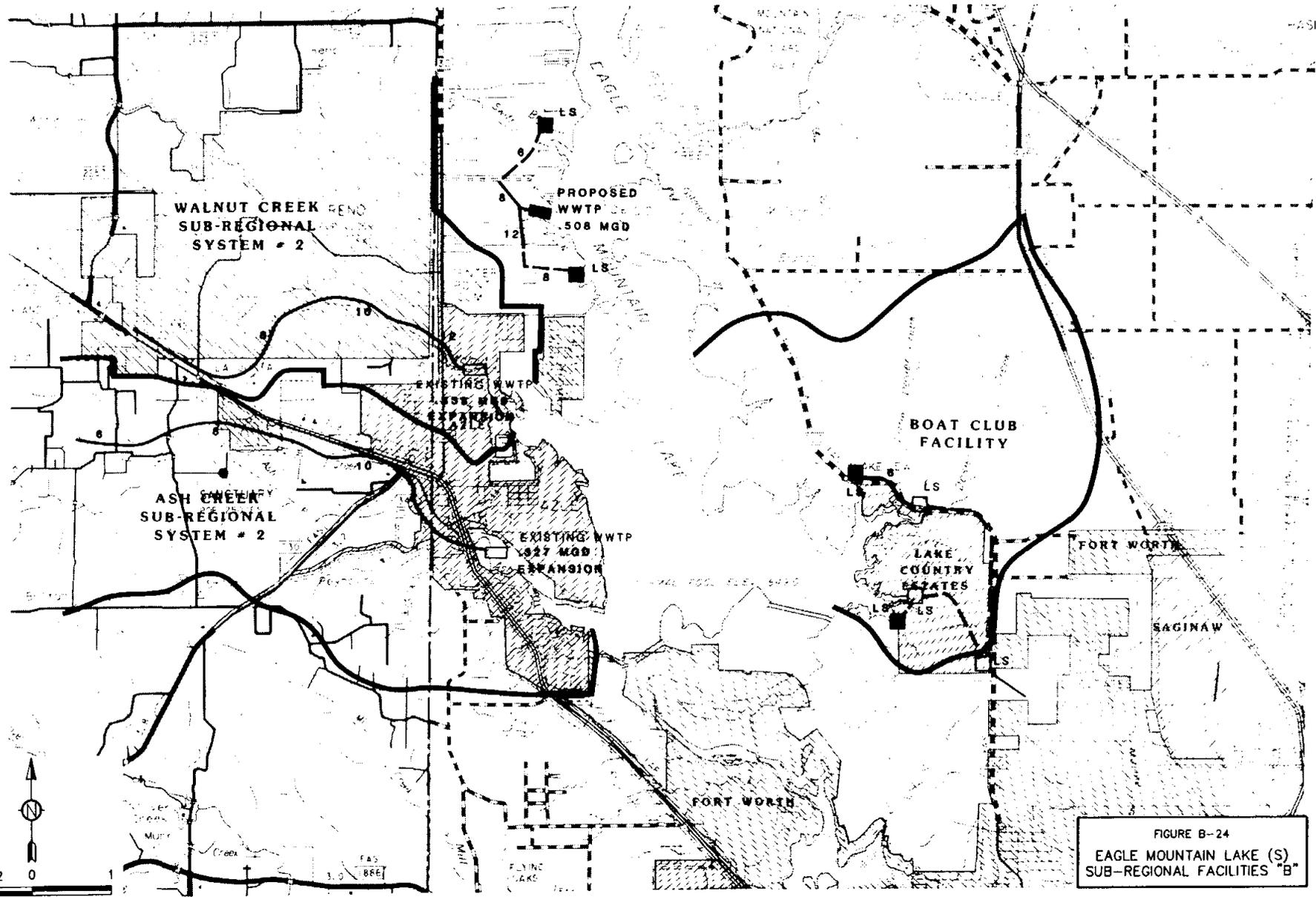


FIGURE B-24
EAGLE MOUNTAIN LAKE (S)
SUB-REGIONAL FACILITIES "B"

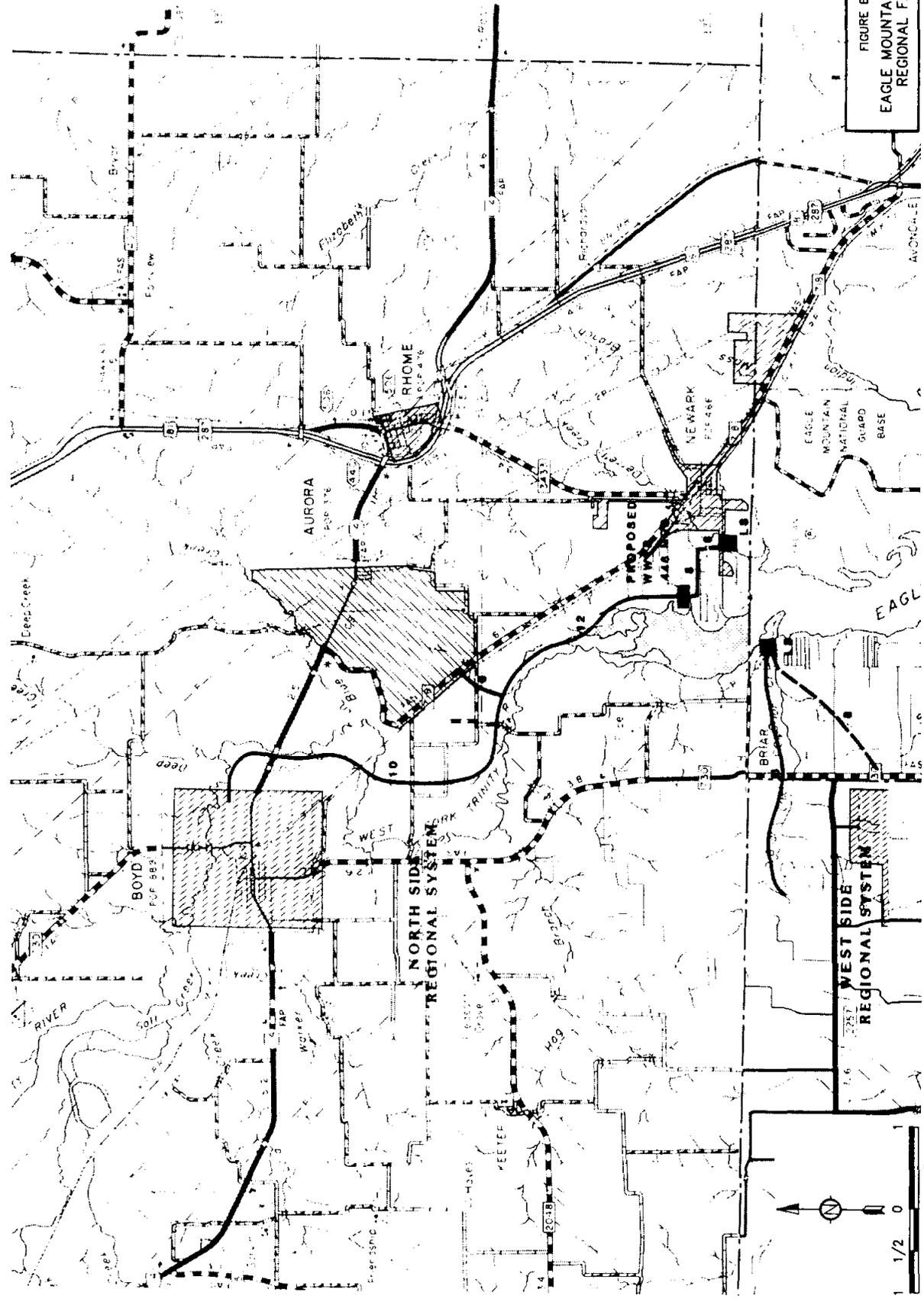


FIGURE B-25
EAGLE MOUNTAIN LAKE (N)
REGIONAL FACILITIES

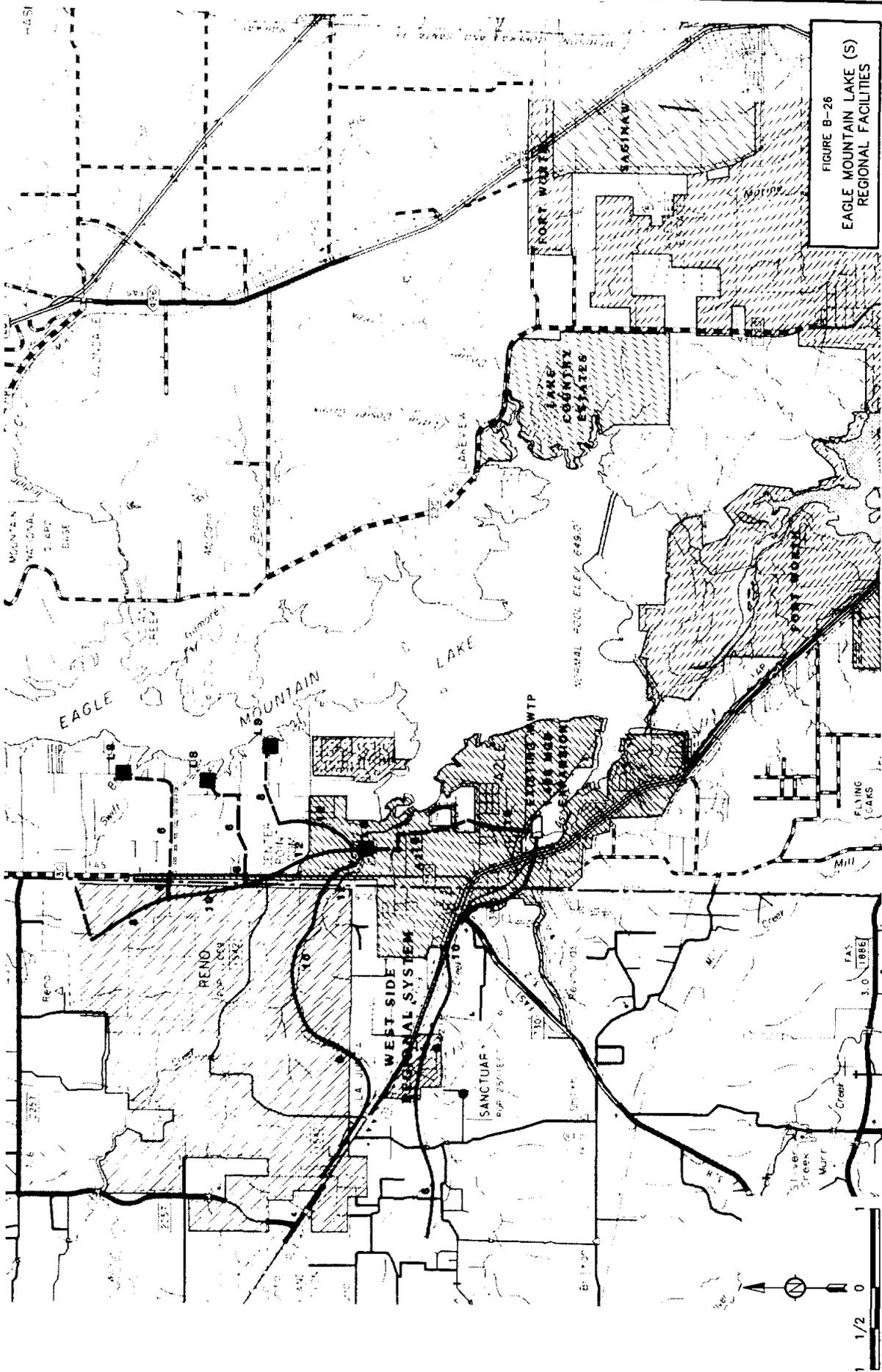
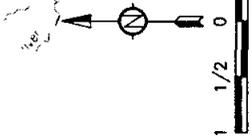
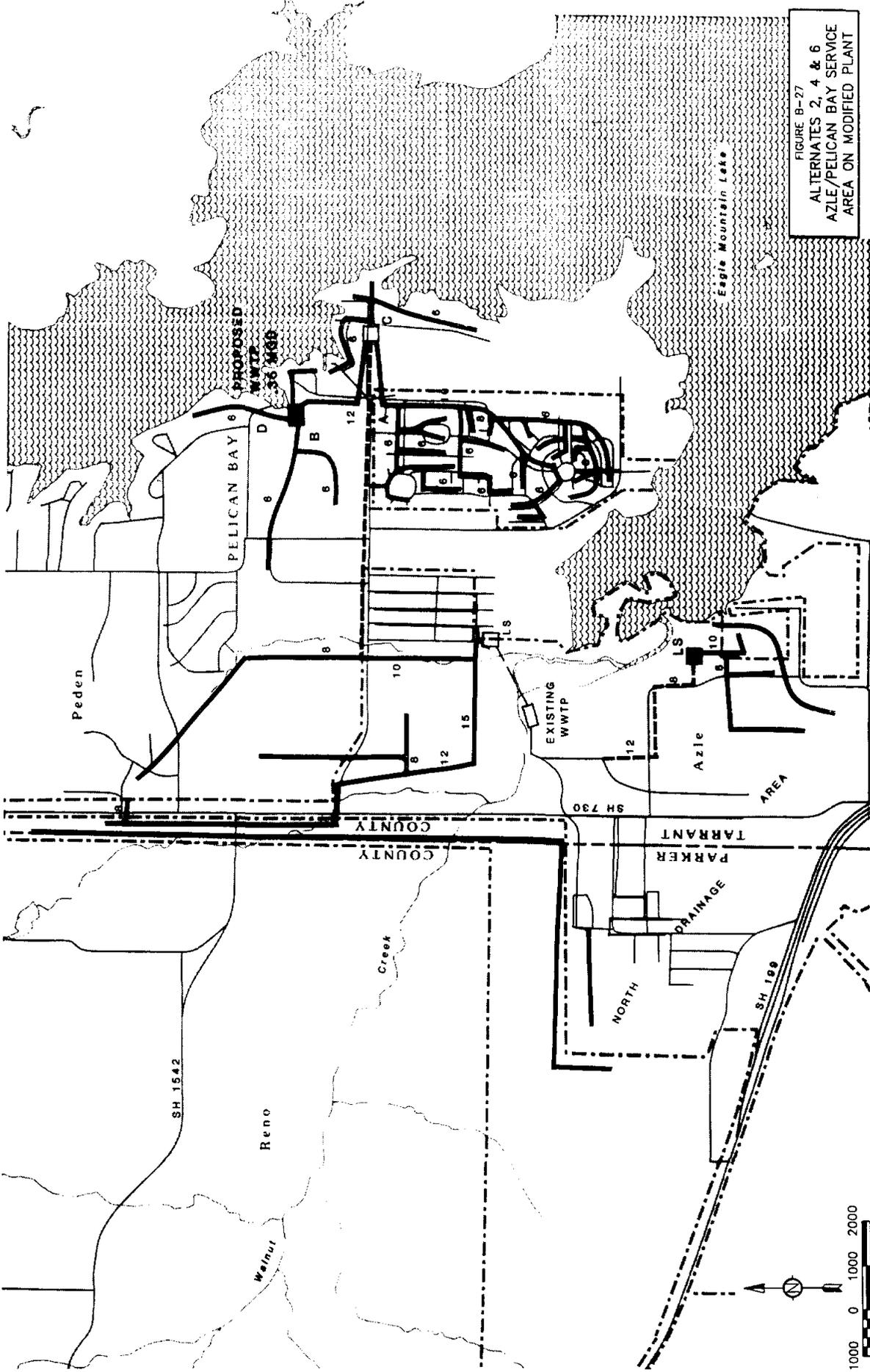


FIGURE B-26
EAGLE MOUNTAIN LAKE (S)
REGIONAL FACILITIES





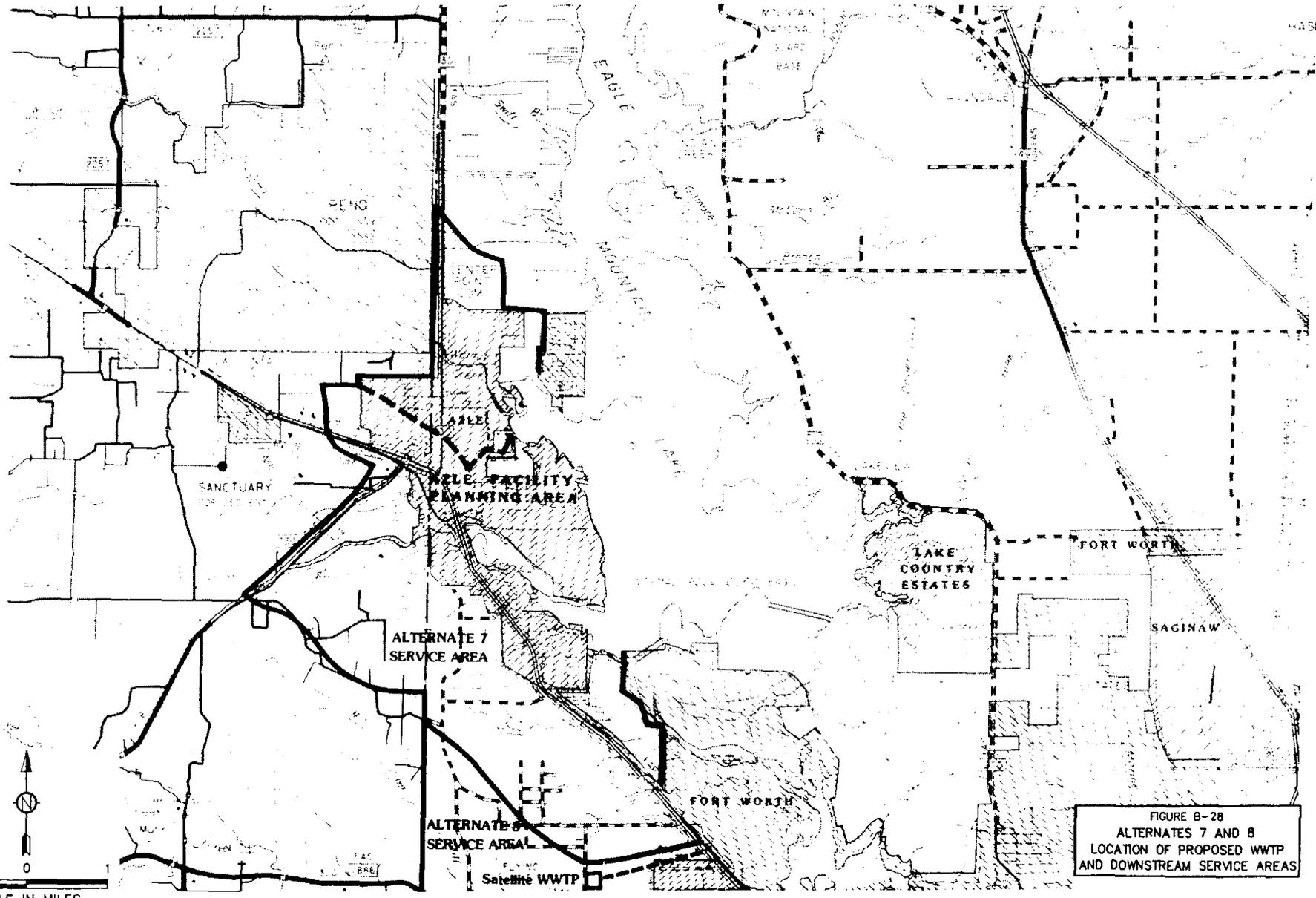


FIGURE B-28
ALTERNATES 7 AND 8
LOCATION OF PROPOSED WWTP
AND DOWNSTREAM SERVICE AREAS

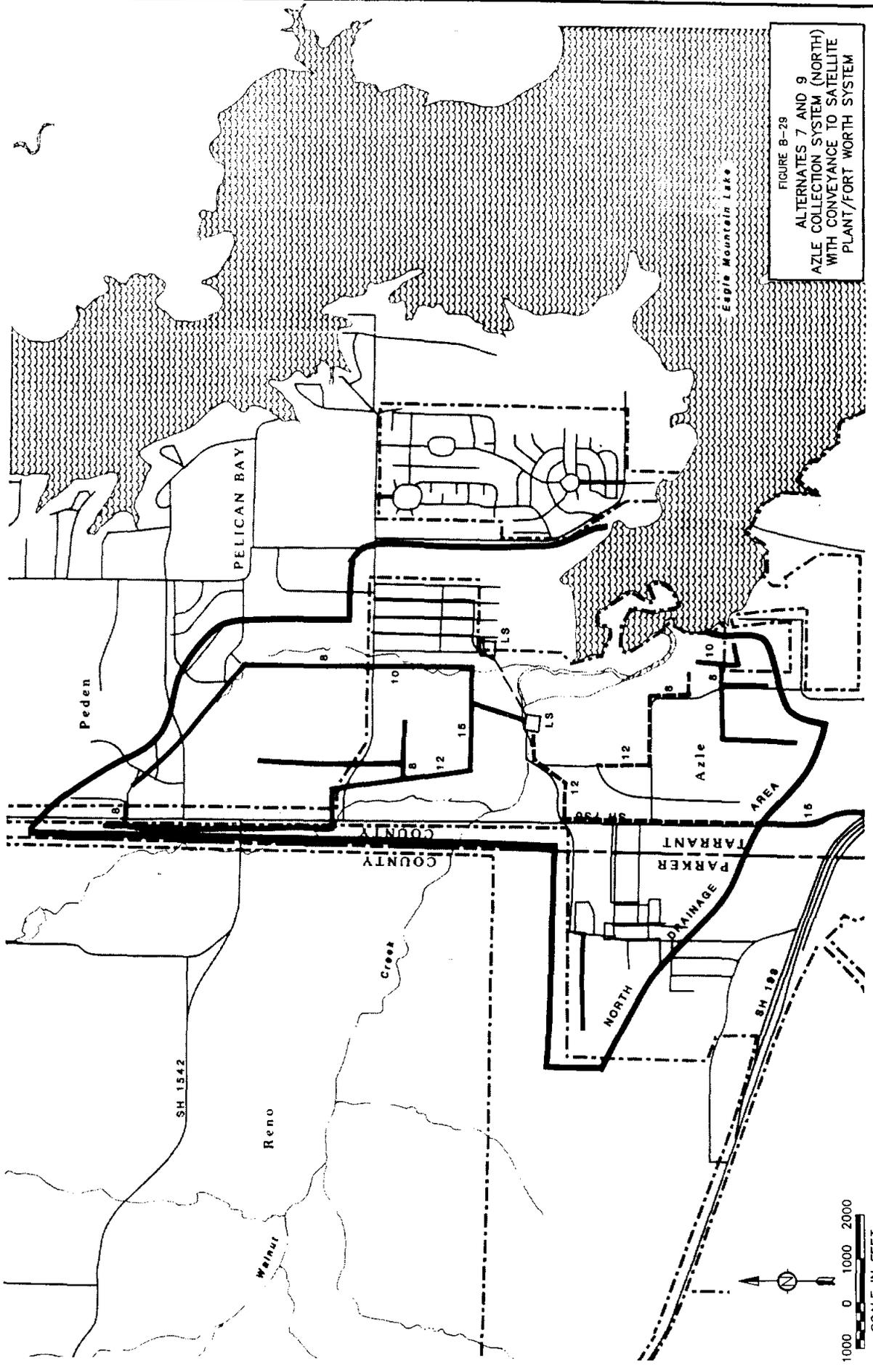


FIGURE B-29
 ALTERNATES 7 AND 9
 AZLE COLLECTION SYSTEM (NORTH)
 WITH CONVEYANCE TO SATELLITE
 PLANT/FORT WORTH SYSTEM

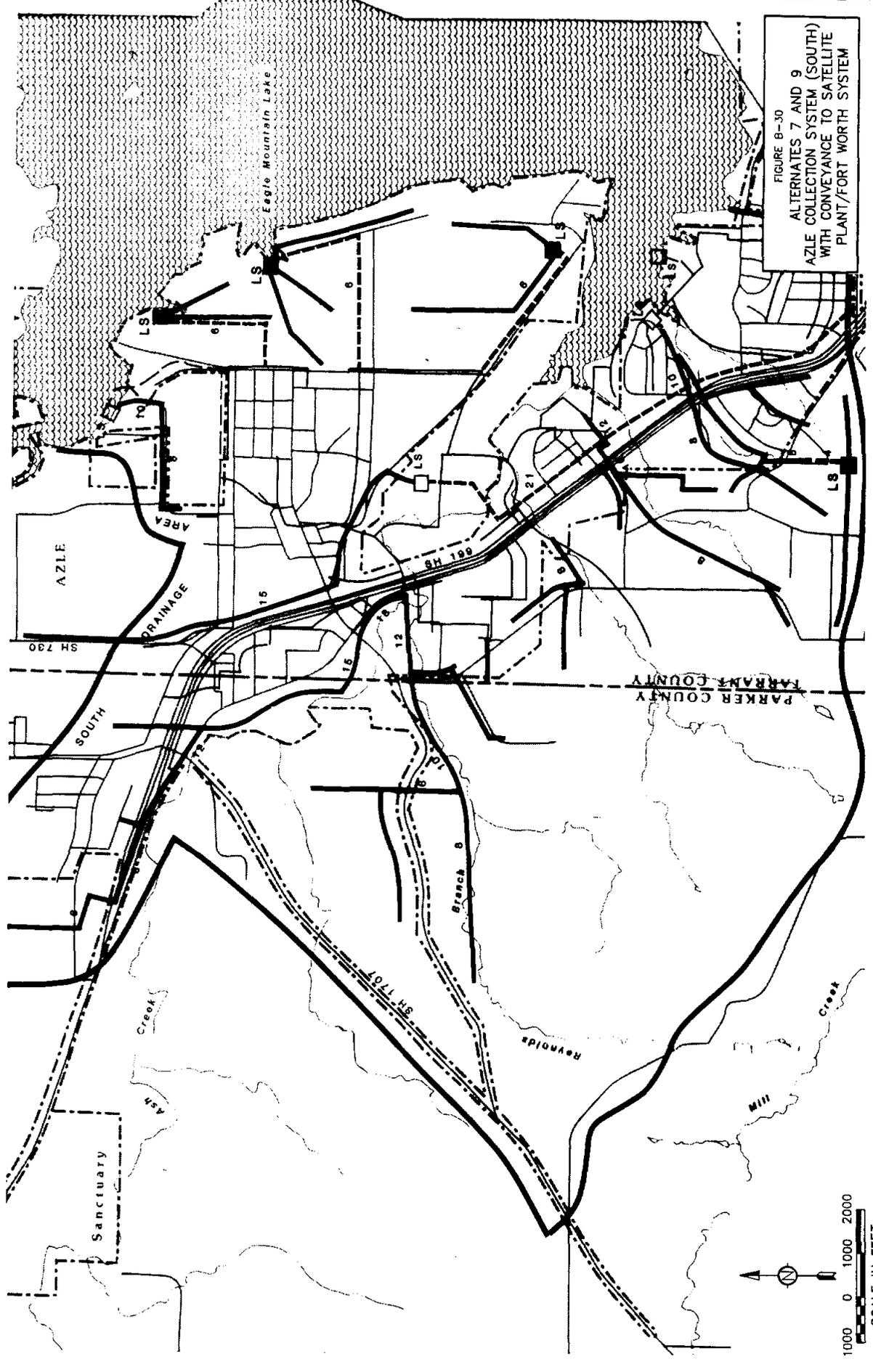


FIGURE B-30
ALTERNATES 7 AND 9
AZLE COLLECTION SYSTEM (SOUTH)
WITH CONVEYANCE TO SATELLITE
PLANT/FORT WORTH SYSTEM

1000 0 1000 2000
SCALE IN FEET

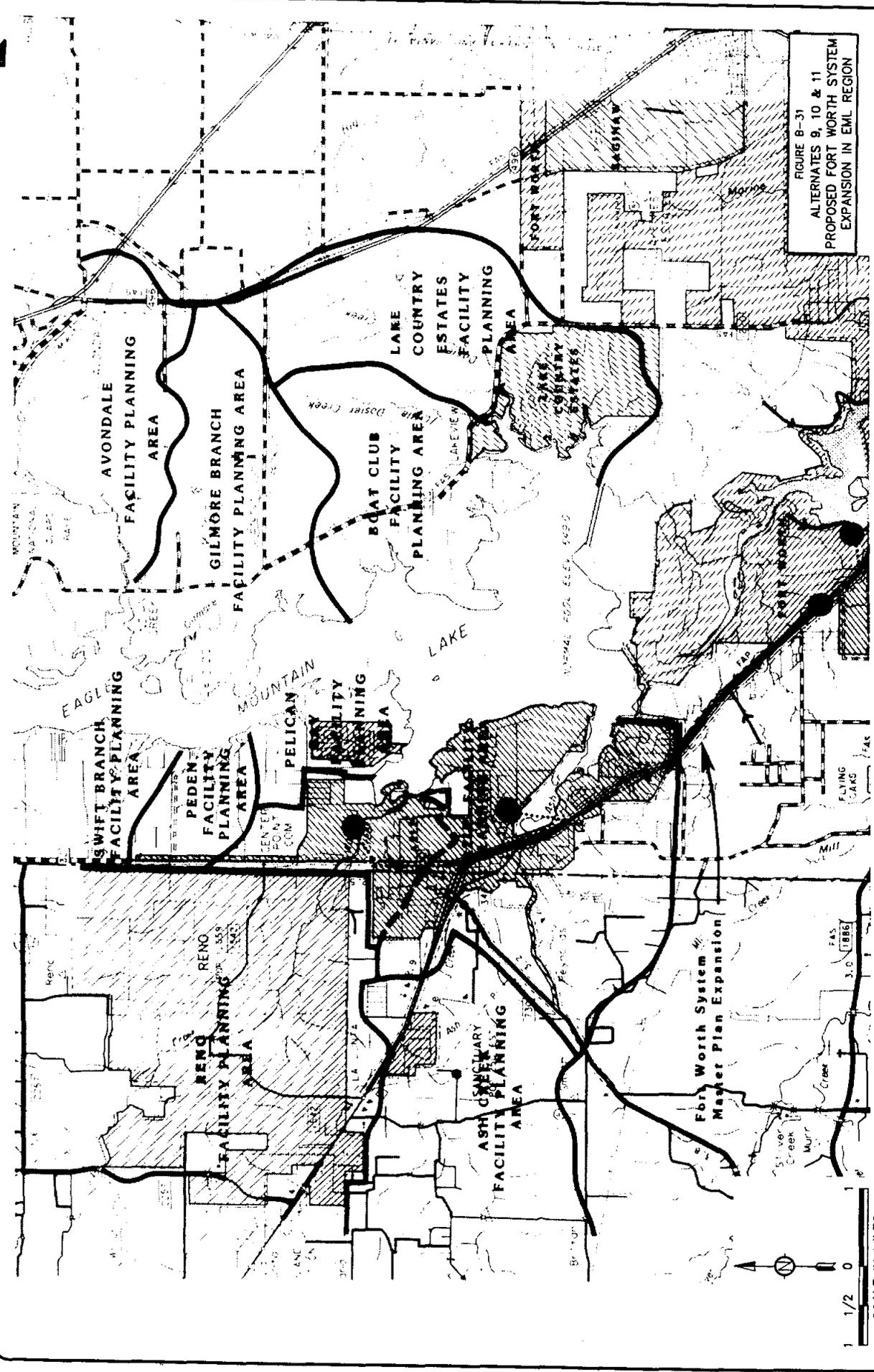


FIGURE B-31
ALTERNATES 9, 10 & 11
PROPOSED FORT WORTH SYSTEM
EXPANSION IN EML REGION

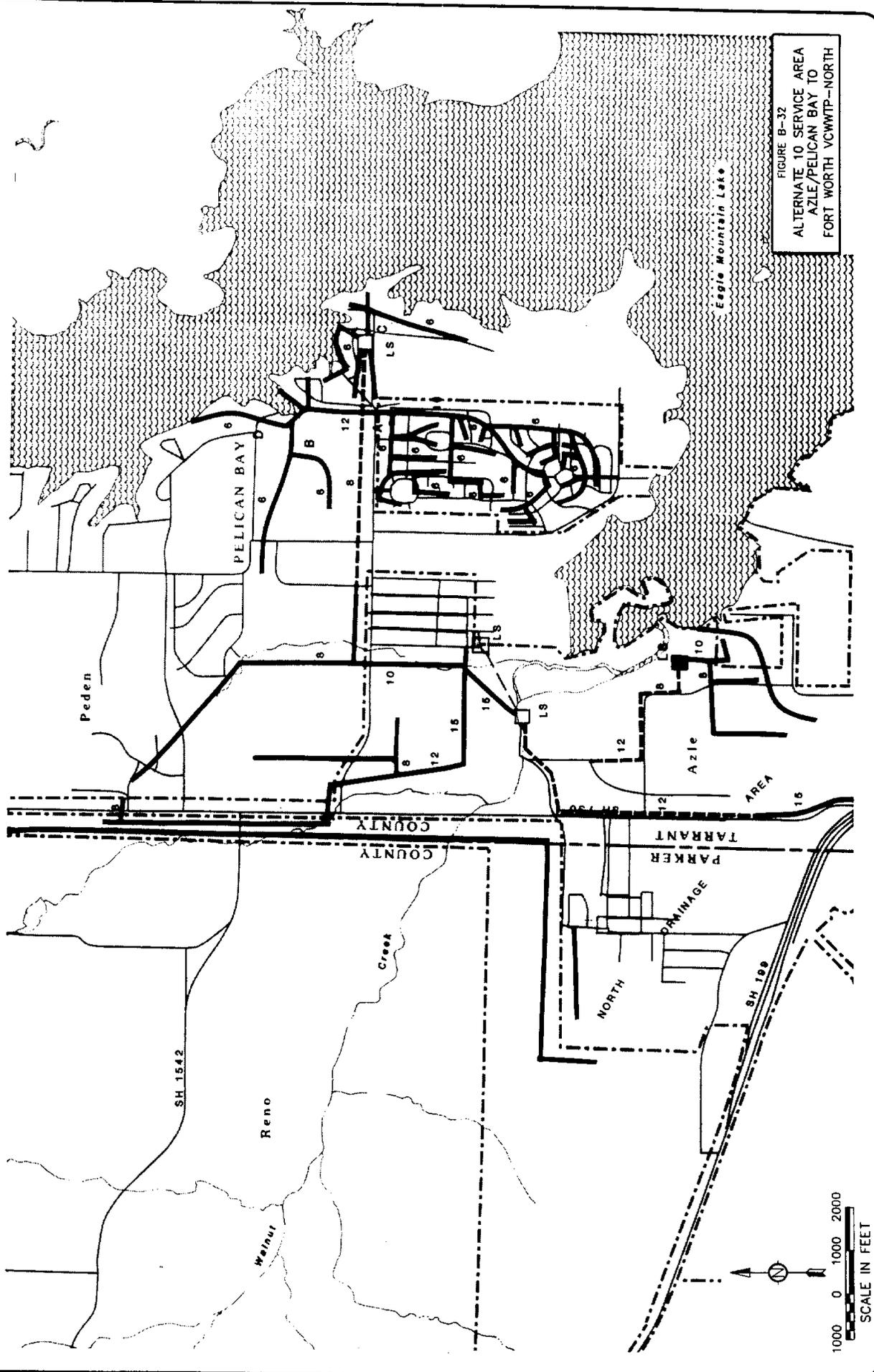


FIGURE B-32
ALTERNATE 10 SERVICE AREA
AZLE/PELICAN BAY TO
FORT WORTH VCWTP-NORTH

1000 0 1000 2000
SCALE IN FEET

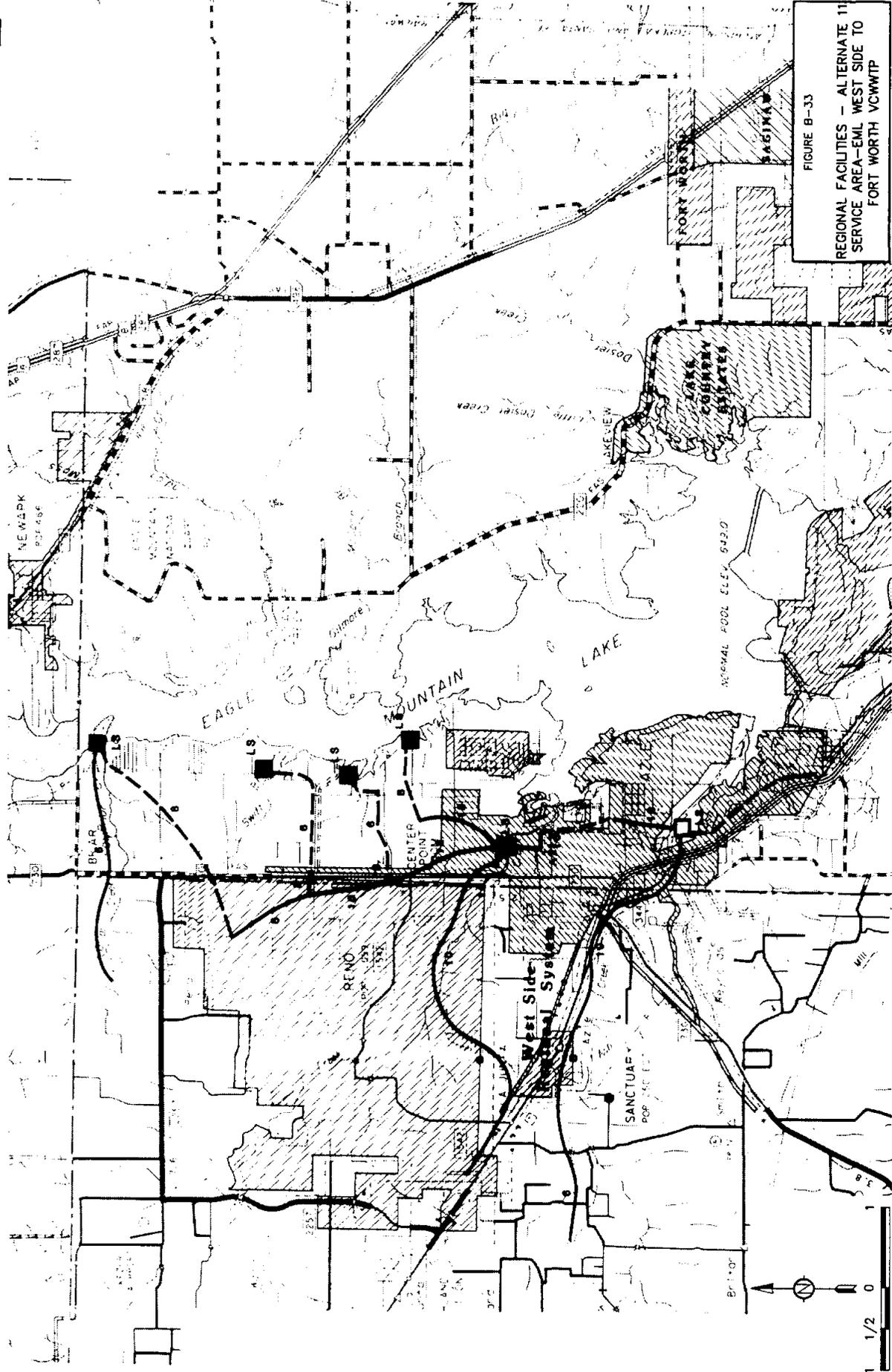
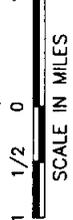


FIGURE B-33
REGIONAL FACILITIES - ALTERNATE 11
SERVICE AREA-EML WEST SIDE TO
FORT WORTH VOWWITP



**FACILITY PLANNING
DATA SUMMARY**

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

System No. 1 Subdivisions: Loma Vista, Allison Cattle Company, Oak Country, Horseshoe Acres, Fox-Hollow

2. NUMBER OF SERVICE AREAS: 1

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
			<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					310	520
B						
C						
D						
E						
F						
G						
H						
TOTAL					310	520

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.052	4	7	7
10/15/2	.052	4	7	1

Note: All figures given above reflect average daily values assuming full development of planning area.

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	22,500	20	\$ 450,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	22,500	N/A	\$ 450,000

B. Lift Stations: None

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			

C. Force Mains: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8		19.00	
Total			

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

D. Base Sewer Cost: \$450,000

E. Cost Factors:

- 1. Engineering Cost Factor (Fe): .13
- 2. Contractor Cost Factor (Fc): .12

F. Total Collection System Capital Cost: \$563,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	0.052	\$400,000	\$450,000
2			
3			
Total	0.052	\$400,000	\$450,000

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way	5	\$20,000	\$100,000
Plant site			

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Household	136	204.7
10/15	785	520
10/15/2	845	560

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>0</u> percent
Severe Limitations: (slow percolation rates)	<u>50</u> percent
Severe Limitations: (rock or flooding)	<u>50</u> percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

System No. 2 Subdivisions: Sabathany Acres (2), Whispering Oaks

2. NUMBER OF SERVICE AREAS: 1

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					165	280
B						
C						
D						
E						
F						
G						
H						
TOTAL					165	280

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	0.028	2	4	4
10/15/2	0.028	2	4	0.5

Note: All figures given above reflect average daily values assuming full development of planning area.

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	15,000	20	\$ 300,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	15,000	N/A	\$ 300,000

B. Lift Stations: None

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			

C. Force Mains: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8		19.00	
Total			

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

D. Base Sewer Cost: \$300,000

E. Cost Factors:

- 1. Engineering Cost Factor (Fe): .15
- 2. Contractor Cost Factor (Fc): .13

F. Total Collection System Capital Cost: \$384,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	0.028	\$260,000	\$280,000
2			
3			
Total	0.028	\$260,000	\$280,000

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$ 744,000
10/15/2	\$ 764,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 57,000
10/15/2	\$ 59,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$9,000
(total linear feet gravity sewers + force mains) X \$.59/linear foot

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$12,000
10/15/2	\$16,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 78,000
10/15/2	\$ 84,000

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	72.5	110.2
10/15	1075	710
10/15/2	1160	760

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>50</u> percent
Severe Limitations: (slow percolation rates)	<u>50</u> percent
Severe Limitations: (rock or flooding)	<u>0</u> percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

System No. 3 (Sanctuary), Subdivisions: Ash Creek Estates, Live Oak Park, Shadow Lane Estates, Tanglewood Estates

2. NUMBER OF SERVICE AREAS: 1

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					647	1075
B						
C						
D						
E						
F						
G						
H						
TOTAL					647	1075

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.108	9	14	14
10/15/2	.108	9	14	2

Note: All figures given above reflect average daily values assuming full development of planning area.

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	20,000	20	\$ 400,000
8			
10			
12			
15			
18			
21			
24			
Total	20,000	N/A	\$ 400,000

B. Lift Stations: None

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			

C. Force Mains: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8		19.00	
Total			

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

D. Base Sewer Cost: \$400,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .13
2. Contractor Cost Factor (Fc): .12

F. Total Collection System Capital Cost: \$500,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.108	\$680,000	\$800,000
2			
3			
Total	.108	\$680,000	\$800,000

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$1,280,000
10/15/2	\$1,400,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 98,000
10/15/2	\$ 108,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$12,000
(total linear feet gravity sewers + force mains) X \$.59/linear foot

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$13,000
10/15/2	\$17,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$123,000
10/15/2	\$137,000

**ASH CREEK FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	282.8	423.2
10/15	435	290
10/15/2	485	325

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>0</u> percent
Severe Limitations: (slow percolation rates)	<u>100</u> percent
Severe Limitations: (rock or flooding)	<u>0</u> percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**PELICAN BAY FPA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Swift Branch Basin, Subbasin I - Pelican Bay
Subdivisions: Aqua Vista, Dunaway, Eustance-Hill-Stanfield, Executive Acres, Pelican Bay, Scotty's West Bay Marina, Swan Estates, Tierra Grande Phase I, L.W. Cole

2. NUMBER OF SERVICE AREAS: 4

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A			1300	2150		
B				1010		15
C					100	110
D					140	150
E						
F						
G						
H						
TOTAL			1300	3160	240	275

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	0.35	29	44	44
10/15/2	0.35	29	44	6

Note: All figures given above reflect average daily values assuming full development of planning area.

**PELICAN BAY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	39,000	20	\$780,000
8	3,000	25	75,000
10	1,500	30	45,000
12	2,000	34	68,000
15		42	
18		49	
21		56	
24		63	
Total	45,500	N/A	\$968,000

B. Lift Stations: None

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	100	0.01	\$25,000
2			
3			
4			
5			
Total Cost			\$25,000

**PELICAN BAY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4	2,200	10.00	\$22,000
6		13.50	
8		19.00	
Total	2,200		\$22,000

D. Base Sewer Cost: \$1,015,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .097
2. Contractor Cost Factor (Fc): .098

F. Total Collection System Capital Cost: \$1,213,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.35	\$1,700,000	\$2,000,000
2			
3			
Total		\$1,700,000	\$2,000,000

**PELICAN BAY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$3,013,000
10/15/2	\$3,313,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 232,000
10/15/2	\$ 255,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$38,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (lift stations (1) .01 MGD)

**PELICAN BAY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 46,000
10/15/2	\$ 62,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$316,000
10/15/2	\$355,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	730.6	1352.4
10/15	435	235
10/15/2	485	260

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>0</u> percent
Severe Limitations: (slow percolation rates)	<u>95</u> percent
Severe Limitations: (rock or flooding)	<u>0</u> percent

**PELICAN BAY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**PEDEN FPA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Swift Branch Basin, Subbasin 2 - Peden Subdivisions: L.W. Cole, The Estate, Pocos Ranchos Estates, Wood Valley Addition, Wudco Trails, W. H. Younger, Schantile, Lake Forest

2. NUMBER OF SERVICE AREAS: 5

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					15	20
B					65	80
C					150	300
D					150	250
E					50	60
F						
G						
H						
TOTAL					430	710

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.071	6	9	9
10/15/2	.071	6	9	1

Note: All figures given above reflect average daily values assuming full development of planning area.

**PEDEN FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	26,000	20	520,000
8			
10			
12			
15			
18			
21			
24			
Total		N/A	\$520,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	20	.002	\$25,000
2	80	.008	\$25,000
3	60	.006	\$25,000
4			
5			
Total Cost			\$75,000

**PEDEN FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4	5,500	10.00	\$55,000
6			
8			
Total	5,500		\$55,000

D. Base Sewer Cost: \$650,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .115
2. Contractor Cost Factor (Fc): .11

F. Total Collection System Capital Cost: \$796,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.071	\$520,000	\$580,000
2			
3			
Total		\$520,000	\$580,000

**PEDEN FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$1,416,000
10/15/2	\$1,476,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 109,000
10/15/2	\$ 114,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$49,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (lift stations (3), total - 0.016 MGD)

**PEDEN FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 12,000
10/15/2	\$ 16,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$170,000
10/15/2	\$179,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	187.7	279.5
10/15	905	610
10/15/2	955	640

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>45</u> percent
Severe Limitations: (slow percolation rates)	<u>35</u> percent
Severe Limitations: (rock or flooding)	<u>20</u> percent

**PEDEN FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**SWIFT BRANCH FPA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Swift Branch Basin, Subbasin 3 Subdivisions: English Creek Estates, Gantt-Stuart-Foster, Holly Hills, Lake Forest, Perry Miller, R. W. Foster, Ranch Oak Farm Estates

2. NUMBER OF SERVICE AREAS: 6

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					135	175
B					50	60
C					65	80
D					125	150
E					60	220
F					125	245
G						
H						
TOTAL					560	930

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.093	8	12	12
10/15/2	.093	8	12	2

Note: All figures given above reflect average daily values assuming full development of planning area.

**SWIFT BRANCH FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	28,500	20	\$570,000
8			
10			
12			
15			
18			
21			
24			
Total		N/A	\$570,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	175	0.018	\$25,000
2	60	0.006	\$25,000
3	80	0.008	\$25,000
4	150	0.015	\$25,000
5			
Total Cost			\$100,000

**SWIFT BRANCH FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4	5,000	10.00	\$50,000
6			
8			
Total	5,000		\$50,000

D. Base Sewer Cost: \$720,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .11
2. Contractor Cost Factor (Fc): .11

F. Total Collection System Capital Cost: \$878,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.093	\$630,000	\$720,000
2			
3			
Total		\$630,000	\$720,000

**SWIFT BRANCH FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$1,608,000
10/15/2	\$1,698,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 124,000
10/15/2	\$ 131,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$62,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (lift stations (3), total 0.04 7 MGD)

**SWIFT BRANCH FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 12,000
10/15/2	\$ 16,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$198,000
10/15/2	\$209,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	244.8	366.1
10/15	810	540
10/15/2	855	570

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	_0 percent
Moderation Limitations:	_35 percent
Severe Limitations: (slow percolation rates)	_40 percent
Severe Limitations: (rock or flooding)	_25 percent

**SWIFT BRANCH FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**RENO - SYSTEM 1
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Walnut Creek Basin System No. 1

2. NUMBER OF SERVICE AREAS: 3

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A			45	100		
B			40	90		
C			730	1610		
D						
E						
F						
G						
H						
TOTAL			815	1800		

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.180	15	23	23
10/15/2	.180	15	23	3

Note: All figures given above reflect average daily values assuming full development of planning area.

**RENO - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	108,000	20	\$2,160,000
8	9,000	25	\$ 225,000
10			
12			
15			
18			
21			
24			
Total	117,000	N/A	\$2,385,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	100	.010	\$25,000
2	90	.009	\$25,000
3			
4			
5			
Total Cost			\$ 50,000

**RENO - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4	3,500	10.00	\$35,000
6			
8			
Total	3,500		\$35,000

D. Base Sewer Cost: \$2,470,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .075
2. Contractor Cost Factor (Fc): .085

F. Total Collection System Capital Cost: \$2,865,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.180	\$1,100,000	\$1,300,000
2			
3			
Total		\$1,100,000	\$1,300,000

**RENO - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$4,065,000
10/15/2	\$4,265,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 313,000
10/15/2	\$ 328,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$91,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (lift stations (2), total .019 MGD)

**RENO - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 25,000
10/15/2	\$ 30,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$429,000
10/15/2	\$449,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	385.6	708.7
10/15	1115	605
10/15/2	1165	635

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>5</u> percent
Moderation Limitations:	<u>25</u> percent
Severe Limitations: (slow percolation rates)	<u>60</u> percent
Severe Limitations: (rock or flooding)	<u>10</u> percent

**RENO - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**RENO - SYSTEM 2
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Walnut Creek Basin System No. 2 Subdivisions: Midway, Oak Valley, Highlands Addition, H & H Investments Addition, Country Acres, LaJunta Addition, Reno North, Walnut Creek Ranch, Walnut Creek Estates

2. NUMBER OF SERVICE AREAS: 4

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A			340	750		
B					120	265
C					60	130
D					30	65
E						
F						
G						
H						
TOTAL			340	750	210	460

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.121	10	15	15
10/15/2	.121	10	15	2

Note: All figures given above reflect average daily values assuming full development of planning area.

**RENO - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	40,000	20	\$800,000
8			
10			
12			
15			
18			
21			
24			
Total	40,000	N/A	\$800,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	460	.046	\$25,000
2	195	.020	\$25,000
3	65	.007	\$25,000
4			
5			
Total Cost			\$ 75,000

**RENO - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4	4,500	10.00	\$45,000
6			
8			
Total	4,500		\$45,000

D. Base Sewer Cost: \$920,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .10
2. Contractor Cost Factor (Fc): .10

F. Total Collection System Capital Cost: \$1,104,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.121	\$700,000	\$810,000
2			
3			
Total	.121	\$700,000	\$810,000

**RENO - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$1,904,000
10/15/2	\$2,014,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 146,000
10/15/2	\$ 155,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$58,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (lift stations (3), total .073 MGD)

**RENO - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 13,000
10/15/2	\$ 17,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$217,000
10/15/2	\$230,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	259.8	476.4
10/15	835	455
10/15/2	885	485

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>5</u> percent
Moderation Limitations:	<u>25</u> percent
Severe Limitations: (slow percolation rates)	<u>60</u> percent
Severe Limitations: (rock or flooding)	<u>10</u> percent

**RENO - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**BRIAR CREEK FPA - SYSTEM 1
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Briar Creek Drainage Basin - System 1 Subdivisions: Briar, Briarwood Estates, Eagle Mountain Acres, D. L. Marshall, Turpin, Allyndale, Cooley, Westwood Addition

2. NUMBER OF SERVICE AREAS: 6

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					125	210
B					90	150
C					65	110
D					90	150
E					65	110
F					270	450
G						
H						
TOTAL					705	1,180

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.118	10	15	15
10/15/2	.118	10	15	2

Note: All figures given above reflect average daily values assuming full development of planning area.

**BRIAR CREEK FPA - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	40,700	20	\$814,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	40,700	N/A	\$814,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	210	.021	\$25,000
2	150	.015	\$25,000
3	110	.011	\$25,000
4			
5			
Total Cost			\$ 75,000

**BRIAR CREEK FPA - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4	5,000	10.00	\$50,000
6		13.50	
8		19.00	
Total	5,000		\$50,000

D. Base Sewer Cost: \$939,0000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.1
2. Contractor Cost Factor (Fc): 0.1

F. Total Collection System Capital Cost: \$1,127,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.118	\$700,000	\$810,000
2			
3			
Total	.118	\$700,000	\$810,000

**BRIAR CREEK FPA - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$1,927,000
10/15/2	\$2,037,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 148,000
10/15/2	\$ 157,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$57,000**
(total linear feet gravity sewers + force mains X \$.59/linear foot) +
(lift stations (3), total .047 MGD)

**BRIAR CREEK FPA - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 13,000
10/15/2	\$ 17,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$218,000
10/15/2	\$231,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	308.8	464.6
10/15	705	470
10/15/2	750	500

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>40</u> percent
Severe Limitations: (slow percolation rates)	<u>30</u> percent
Severe Limitations: (rock or flooding)	<u>30</u> percent

**BRIAR CREEK FPA - SYSTEM 1
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**BRIAR CREEK FPA - SYSTEM 2
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Briar Creek Drainage Basin - System 2

2. NUMBER OF SERVICE AREAS: 2

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					105	175
B					110	180
C						
D						
E						
F						
G						
H						
TOTAL					215	355

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.036	3	5	5
10/15/2	.036	3	5	1

Note: All figures given above reflect average daily values assuming full development of planning area.

**BRIAR CREEK FPA - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	21,000	20	\$420,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	21,000	N/A	\$420,000

B. Lift Stations: None

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			
Total Cost			

**BRIAR CREEK FPA - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4			
6			
8			
Total			

D. Base Sewer Cost: \$420,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.14
2. Contractor Cost Factor (Fc): 0.13

F. Total Collection System Capital Cost: \$533,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.036	\$300,000	\$350,000
2			
3			
Total	.036	\$300,000	\$350,000

**BRIAR CREEK FPA - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$ 933,000
10/15/2	\$ 983,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 72,000
10/15/2	\$ 76,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$12,000
(total linear feet gravity sewers + force mains) X \$.59/linear foot

**BRIAR CREEK FPA - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 12,000
10/15/2	\$ 16,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 96,000
10/15/2	\$104,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	93.8	139.8
10/15	1025	685
10/15/2	1110	745

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>40</u> percent
Severe Limitations: (slow percolation rates)	<u>30</u> percent
Severe Limitations: (rock or flooding)	<u>30</u> percent

**BRIAR CREEK FPA - SYSTEM 2
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**AURORA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Blue Creek Basin - Three mobile home subdivision (.7 ac) and large lot (2 ac+) areas

2. NUMBER OF SERVICE AREAS: 1

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
			<u>In City</u>		<u>Rural</u>	
	<u>In City</u>	<u>Rural</u>	<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A			360	520		
B						
C						
D						
E						
F						
G						
H						
TOTAL			360	520		

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.052	4	7	7
10/15/2	.052	4	7	1

Note: All figures given above reflect average daily values assuming full development of planning area.

**AURORA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	32,000	20	\$640,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	32,000	N/A	\$640,000

B. Lift Stations: NONE

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			
Total Cost			

**AURORA
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4			
6			
8			
Total			

D. Base Sewer Cost: \$640,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.12
2. Contractor Cost Factor (Fc): 0.11

F. Total Collection System Capital Cost: \$787,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.052	\$400,000	\$440,000
2			
3			
Total	.052	\$400,000	\$440,000

**AURORA
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$1,287,000
10/15/2	\$1,327,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 99,000
10/15/2	\$ 101,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$19,000**
(total linear feet gravity sewers + force mains) X \$.59/linear foot

**AURORA
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 12,000
10/15/2	\$ 16,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$130,000
10/15/2	\$136,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	152.2	204.7
10/15	855	635
10/15/2	895	665

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>50</u> percent
Severe Limitations: (slow percolation rates)	<u>25</u> percent
Severe Limitations: (rock or flooding)	<u>25</u> percent

**AURORA
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**NEWARK
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Derrett Creek Drainage Basin - No known subdivisions

2. NUMBER OF SERVICE AREAS: 6

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					110	155
B					125	175
C					70	100
D					120	170
E					290	410
F					115	165
G						
H						
TOTAL					830	1,175

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.118	10	15	15
10/15/2	.118	10	15	2

Note: All figures given above reflect average daily values assuming full development of planning area.

**NEWARK
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	64,000	20	\$1,280,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	64,000	N/A	\$1,280,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	155	.016	\$25,000
2	175	.018	\$25,000
3	100	.010	\$25,000
4			
5			
Total Cost			\$75,000

**NEWARK
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4	6,500	10.00	\$65,000
6		13.50	
8		19.00	
Total	6,500		\$65,000

D. Base Sewer Cost: \$1,420,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .090
2. Contractor Cost Factor (Fc): .095

F. Total Collection System Capital Cost: \$1,683,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.118	\$700,000	\$800,000
2			
3			
Total	.118	\$700,000	\$800,000

**NEWARK
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$2,483,000
10/15/2	\$2,583,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 191,000
10/15/2	\$ 199,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$73,000
(total linear feet gravity sewers + force mains X \$.59/linear foot) +
(lift stations (3) - total .044 MGD)

**NEWARK
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 14,000
10/15/2	\$ 17,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$278,000
10/15/2	\$289,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	349.4	462.6
10/15	795	600
10/15/2	830	625

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>60</u> percent
Severe Limitations: (slow percolation rates)	<u>5</u> percent
Severe Limitations: (rock or flooding)	<u>35</u> percent

**NEWARK
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**AVONDALE
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Indian Creek Basin - Avondale Subdivision

2. NUMBER OF SERVICE AREAS: 1

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					345	575
B						
C						
D						
E						
F						
G						
H						
TOTAL					345	575

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.058	5	7	7
10/15/2	.058	5	7	1

Note: All figures given above reflect average daily values assuming full development of planning area.

**AVONDALE
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	20,500	20	\$410,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	20,500	N/A	\$410,000

B. Lift Stations: NONE

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			
Total Cost			

**AVONDALE
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains: NONE

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4			
6			
8			
Total			

D. Base Sewer Cost: \$410,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.14
2. Contractor Cost Factor (Fc): 0.12

F. Total Collection System Capital Cost: \$517,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.058	\$450,000	\$510,000
2			
3			
Total	.058	\$450,000	\$510,000

**AVONDALE
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$1,067,000
10/15/2	\$1,127,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 82,000
10/15/2	\$ 87,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$12,000
(total linear feet gravity sewers + force mains) X \$.59/linear foot

**AVONDALE
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 12,000
10/15/2	\$ 16,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$106,000
10/15/2	\$115,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	150.9	226.4
10/15	700	470
10/15/2	760	570

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>0</u> percent
Severe Limitations: (slow percolation rates)	<u>60</u> percent
Severe Limitations: (rock or flooding)	<u>40</u> percent

**AVONDALE
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

Soil:	In Avondale	-	60% C
			40% D
	In Basin	-	5% A
			20% C
			75% D

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**GILMORE BRANCH
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Gilmore Branch - Sub-Basin 5 (Dido Area) Subdivisions: Harbor East Estates, Lake Shore Acres, Lakeside Acres, McKee's Port, Oak Lane Subdivision

2. NUMBER OF SERVICE AREAS: 4

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					125	210
B					70	115
C					70	135
D						115
E						
F						
G						
H						
TOTAL					345	575

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.058	5	7	7
10/15/2	.058	5	7	1

Note: All figures given above reflect average daily values assuming full development of planning area.

**GILMORE BRANCH
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	12,000	20	\$240,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	12,000	N/A	\$240,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	125	.013	\$25,000
2	70	.007	\$25,000
3	80	.008	\$25,000
4			
5			
Total Cost			\$75,000

**GILMORE BRANCH
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4	3,000	10.00	\$30,000
6		13.50	
8		19.00	
Total	3,000		\$30,000

D. Base Sewer Cost: \$345,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.14
2. Contractor Cost Factor (Fc): 0.12

F. Total Collection System Capital Cost: \$435,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	0.58	\$450,000	\$510,000
2			
3			
Total	0.58	\$450,000	\$510,000

**GILMORE BRANCH
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$ 985,000
10/15/2	\$1,045,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 76,000
10/15/2	\$ 78,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$39,000
(total linear feet gravity sewers + force mains X \$.59/linear foot) +
(lift station (3) total .028 MGD)

**GILMORE BRANCH
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 12,000
10/15/2	\$ 16,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$127,000
10/15/2	\$133,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	150.9	226.4
10/15	840	560
10/15/2	880	585

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>35</u> percent
Severe Limitations: (slow percolation rates)	<u>65</u> percent
Severe Limitations: (rock or flooding)	<u>0</u> percent

**GILMORE BRANCH
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**BOAT CLUB FPA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Dosier Creek Subbasins 1 and 2

Subdivisions: Ambrose Eagle Nest Estates, Seville, Burgess Land, Corky Court, Crest Point, Marina Cove, Tranquil Acres, West Fork Addition

2. NUMBER OF SERVICE AREAS: 10

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					75	145
B					65	125
C					30	60
D					50	95
E					10	20
F					15	35
G					75	145
H					65	125
TOTAL					385	750

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.075	6	9	9
10/15/2	.075	6	9	1

Note: All figures given above reflect average daily values assuming full development of planning area.

**BOAT CLUB FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	40,200	20	\$804,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	40,200	N/A	\$804,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	145	.015	\$ 25,000
2	125	.013	\$ 25,000
3	60	.006	\$ 25,000
4	95	.010	\$ 25,000
5	20	.002	\$ 25,000
6	35	.004	\$ 25,000
7	145	.015	\$ 25,000
8	125	.013	\$ 25,000
Total Cost			\$200,000

**BOAT CLUB FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4	16,000	10.00	\$160,000
6			
8			
Total	16,000		\$160,000

D. Base Sewer Cost: \$1,164,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.095
2. Contractor Cost Factor (Fc): 0.095

F. Total Collection System Capital Cost: \$1,385,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.075	\$540,000	\$600,000
2			
3			
Total		\$540,000	\$600,000

**BOAT CLUB FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$2,025,000
10/15/2	\$2,085,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 156,000
10/15/2	\$ 160,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$113,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (lift station (8) total .078 MGD)

**BOAT CLUB FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 12,000
10/15/2	\$ 16,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$281,000
10/15/2	\$289,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	175.5	295.3
10/15	1600	950
10/15/2	1645	980

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>0</u> percent
Moderation Limitations:	<u>0</u> percent
Severe Limitations: (slow percolation rates)	<u>5</u> percent
Severe Limitations: (rock or flooding)	<u>95</u> percent

**BOAT CLUB FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**LAKE COUNTRY FPA
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Dosier Creek Subbasins 3-7

Subdivisions: Lake Country Estates, Secret Harbor, The Landing, Eagle Mountain Lake Estates, Meacham Brants

2. NUMBER OF SERVICE AREAS: 2

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					35	65
B					50	95
C						
D						
E						
F						
G						
H						
TOTAL					85	160

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.016	1	2	2
10/15/2	.016	1	2	0.3

Note: All figures given above reflect average daily values assuming full development of planning area.

**LAKE COUNTRY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	5,500	20	\$110,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	5,500	N/A	\$110,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	65	.007	\$25,000
2			
3			
4			
5			
Total Cost			\$25,000

**LAKE COUNTRY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4	500	10.00	\$5,000
6		13.50	
8		19.00	
Total	500		\$5,000

D. Base Sewer Cost: \$140,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.018
2. Contractor Cost Factor (Fc): 0.015

F. Total Collection System Capital Cost: \$186,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.016	\$160,000	\$170,000
2			
3			
Total		\$160,000	\$170,000

**LAKE COUNTRY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$446,000
10/15/2	\$456,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 34,000
10/15/2	\$ 35,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$14,000
(total linear feet gravity sewers + force mains X \$.59/linear foot) +
(lift station - .007 MGD - \$10,000)

**LAKE COUNTRY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 11,000
10/15/2	\$ 15,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 59,000
10/15/2	\$ 64,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	38.4	63.0
10/15	1535	935
10/15/2	1665	1015

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area)

Slight Limitations:	<u>10</u> percent
Moderation Limitations:	<u>0</u> percent
Severe Limitations: (slow percolation rates)	<u>10</u> percent
Severe Limitations: (rock or flooding)	<u>80</u> percent

**LAKE COUNTRY FPA
FACILITY PLANNING DATA SUMMARY
(continued)**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ASH CREEK SUBREGIONAL SYSTEM NO. 1
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Entire Ash Creek FPA

2. NUMBER OF SERVICE AREAS: 3

3. SIZE AND POPULATION SUMMARY:

Service Area	Service Area size (acres)		Population			
	In City	Rural	In City		Rural	
			1987	2005	1987	2005
A					310	520
B					165	280
C					647	1075
D						
E						
F						
G						
H						
TOTAL					1122	1875

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15	.188	47	47	24
10/15/2	.188	16	24	3

Note: All figures given above reflect average daily values assuming full development of planning area.

**ASH CREEK SUBREGIONAL SYSTEM NO. 1
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>System</u>	<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
	6	9,000	20	\$ 180,000
	8	9,000	25	\$ 225,000
	10		30	
	12		34	
	15		42	
1		22,500		\$ 450,000
2		15,000		\$ 300,000
3		20,000		\$ 400,000
	Total	75,500	N/A	\$1,555,000

B. Lift Stations: None

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			

C. Force Mains: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8		19.00	
Total			

D. Base Sewer Cost: \$1,555,000

**ASH CREEK SUBREGIONAL SYSTEM NO. 1
FACILITY PLANNING DATA SUMMARY**

E. Cost Factors:

1. Engineering Cost Factor (Fe): .085
2. Contractor Cost Factor (Fc): .090

F. Total Collection System Capital Cost: \$1,827,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.188	\$1,050,000	\$1,350,000
2			
3			
Total	.188	\$1,050,000	\$1,350,000

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$2,977,000
10/15/2	\$3,277,000

**ASH CREEK SUBREGIONAL SYSTEM NO. 1
FACILITY PLANNING DATA SUMMARY**

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 229,000
10/15/2	\$ 252,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$45,000
(total linear feet gravity sewers + force mains) X \$.59/linear foot

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$25,000
10/15/2	\$30,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$299,000
10/15/2	\$327,000

**ASH CREEK SUBREGIONAL SYSTEM NO. 2
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Azle FPA and Ash Creek FPA

- 1. Q = .053 MGD
- 2. Q = .028 MGD
- 3. Q = .110 MGD

Azle Ash Creek STP, Q = .84 MGD (Q_{avail} = .704) Q_{design} = .136
Plant Design Q = .327 MGD

2. NUMBER OF SERVICE AREAS: 4

3. SIZE AND POPULATION SUMMARY:

Service Area	Service Area size (acres)		Population			
	In City	Rural	In City		Rural	
			1987	2005	1987	2005
A					310	520
B					165	280
C					647	1075
D			0	1395		
E						
F						
G						
H						
TOTAL			0	1395	1122	1875
*Additional for Azle					1987 = 1122, Q=.112	2005 = 3270, Q=.327

4. DISCHARGE SUMMARY:

Additional exist

Q_{Total} = .327 + .704 = 1.031

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15	1.031	86	129	129
10/15/2	1.031	86	129	17

Note: All figures given above reflect average daily values assuming full development of planning area.

**ASH CREEK SUBREGIONAL SYSTEM NO. 2
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	9,000	20	\$180,000
8	9,000	25	\$225,000
10	4,000	30	\$120,000
12		34	
15		42	
18		49	
21		56	
24		63	
Total	22,000	N/A	\$525,000

B. Lift Stations: None

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			

C. Force Mains: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8		19.00	
Total			

**ASH CREEK SUBREGIONAL SYSTEM NO. 2
FACILITY PLANNING DATA SUMMARY**

D. Base Sewer Cost: \$525,000

E. Cost Factors:

- 1. Engineering Cost Factor (Fe): .12
- 2. Contractor Cost Factor (Fc): .115

F. Total Collection System Capital Cost: \$648,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1 (expansion only)

B. Plant Capacity and Cost Summary:

Plant number	Capacity MGD	Construction Cost	
		10/15	10/15/2
1	.327	\$1,600,000	\$2,000,000
2			
3			
Total	.327	\$1,600,000	\$2,000,000

7. ESTIMATED LAND NEEDS

Description	Land required (acres)	Cost per acre	Extended cost
Pipeline right-of-way	--	--	\$0.00
Plant site			

**ASH CREEK SUBREGIONAL SYSTEM NO. 2
FACILITY PLANNING DATA SUMMARY**

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$2,248,000
10/15/2	\$2,648,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$173,000
10/15/2	\$204,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$13,000
(total linear feet gravity sewers + force mains) X \$.59/linear foot

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$43,000
10/15/2	\$56,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$229,000
10/15/2	\$273,000

**WALNUT CREEK SUBREGIONAL SYSTEM NO. 1
TOWN OF RENO
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Walnut Creek Basin in Reno
Subdivisions: Midway, Oak Valley, Highlands Addition, H&H Investments Addition, Country Acres, La Junta Addition, Reno North Walnut Creek Ranch, Walnut Creek Estates

2. NUMBER OF SERVICE AREAS: 7

3. SIZE AND POPULATION SUMMARY:

Service Area	Service Area size (acres)		Population			
	In City	Rural	In City		Rural	
			1987	2005	1987	2005
A			45	100		
B			40	90		
C			730	1610		
D			340	750		
E					120	262
F					60	130
G					30	65
H						
TOTAL			1,155	2,550	210	460

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15	1.301	25	38	38
10/15/2	1.301	25	38	5

Note: All figures given above reflect average daily values assuming full development of planning area.

**WALNUT CREEK SUBREGIONAL SYSTEM NO. 1
TOWN OF RENO
FACILITY PLANNING DATA SUMMARY**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3	8,000	10.00	\$80,000
4			
6			
8			
Total			\$80,000

D. Base Sewer Cost: \$3,703,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .067
2. Contractor Cost Factor (Fc): .08

F. Total Collection System Capital Cost: \$4,247,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.301	\$1,500,000	\$1,800,000
2			
3			
Total		\$1,500,000	\$1,800,000

**WALNUT CREEK SUBREGIONAL SYSTEM NO. 1
TOWN OF RENO
FACILITY PLANNING DATA SUMMARY**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total land cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$5,847,000
10/15/2	\$6,147,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$450,000
10/15/2	\$473,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$154,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (Lift stations (5) .267 MGD)

**WALNUT CREEK SUBREGIONAL SYSTEM NO. 1
TOWN OF RENO
FACILITY PLANNING DATA SUMMARY**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$40,000
10/15/2	\$52,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$644,000
10/15/2	\$679,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	645.3	1185.0
10/15	1000	545
10/15/2	1050	575

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS

Slight Limitations:	<u>5</u> percent
Moderation Limitations:	<u>25</u> percent
Severe Limitations: (slow percolation rates)	<u>60</u> percent
Severe Limitations: (rock or flooding)	<u>10</u> percent

**WALNUT CREEK SUBREGIONAL SYSTEM NO. 1
TOWN OF RENO
FACILITY PLANNING DATA SUMMARY**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**WALNUT CREEK SUBREGIONAL SYSTEM No. 2
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Azle FPA and Reno FPA

Reno FPA:

Q = .121 MGD, system No. 2

Q = .18 MGD, system No. 1

Azle Ash Creek STP, Q = .21 MGD ($Q_{avail} = .176$) $Q_{design} = .034$

Plant Design Q = .335 MGD

2. NUMBER OF SERVICE AREAS: 3

3. SIZE AND POPULATION SUMMARY:

Service Area	Service Area size (acres)		Population			
	In City	Rural	In City		Rural	
			1987	2005	1987	2005
Reno System 2			340	750	210	460
Reno System 1			815	1800		
Addtl for Azle			0	340		
TOTAL			1155	2890	210	460

1987 = 1365, Q=.1365
2005 = 3350, Q=.335

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15	.511	43	64	64
10/15/2	.511	43	64	9

Note: All figures given above reflect average daily values assuming full development of planning area.

**WALNUT CREEK SUBREGIONAL SYSTEM No. 2
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6		20	
8	11,000	25	\$275,000
10	(7,500)	30	\$ 37,500 (change from 8")
12	3,000	34	102,000
15		42	
18		49	
21		56	
24		63	
Total	14,000	N/A	\$414,500

B. Lift Stations: None

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			

C. Force Mains: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8		19.00	
Total			

D. Base Sewer Cost: \$415,000

**WALNUT CREEK SUBREGIONAL SYSTEM No. 2
FACILITY PLANNING DATA SUMMARY**

E. Cost Factors:

1. Engineering Cost Factor (Fe): .13
2. Contractor Cost Factor (Fc): .12

F. Total Collection System Capital Cost: \$518,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.335	\$1,650,000	\$1,950,000
2			
3			
Total	.335	\$1,650,000	\$1,950,000

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way	--	--	\$0.00
Plant site			

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$2,168,000
10/15/2	\$2,468,000

**WALNUT CREEK SUBREGIONAL SYSTEM No. 2
FACILITY PLANNING DATA SUMMARY**

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$167,000
10/15/2	\$190,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$8,000
(total linear feet gravity sewers + force mains) X \$.59/linear foot

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$42,000
10/15/2	\$58,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$217,000
10/15/2	\$256,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	667.6	1318.9
10/15	325	165
10/15/2	385	195

**WALNUT CREEK SUBREGIONAL SYSTEM No. 2
FACILITY PLANNING DATA SUMMARY**

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS

Slight Limitations: __ percent

Moderation Limitations: __ percent

Severe Limitations: __ percent
(slow percolation rates)

Severe Limitations: __ percent
(rock or flooding)

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**SWIFT BRANCH SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Subregional System

1. Pelican Bay FPA
2. Peden FPA
3. Swift Branch FPA

2. NUMBER OF SERVICE AREAS: 3

3. SIZE AND POPULATION SUMMARY:

Service Area	Service Area size (acres)		Population			
	In City	Rural	In City		Rural	
			1987	2005	1987	2005
A Pelican Bay			1300	3160	240	275
B Swift					560	930
C Peden					430	710
D						
E						
F						
G						
H						
TOTAL			1300	3160	1230	1915
					1987 = 2530, Q=.253	
					2005 = 5075, Q=.508	

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15	.508	42	64	64
10/15/2	.508	42	64	8

Note: All figures given above reflect average daily values assuming full development of planning area.

**SWIFT BRANCH SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6		20	
8	2,000	25	\$ 50,000
10		30	\$ 62,000
12	3,000	34	
15	(2,000'		
18	@ 14 LF,		
21	6"-12")		
24			
Total	3,000' for O&M	N/A	\$112,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	3435	.344	\$90,000
2	930	.093	\$25,000
3			
4			
5			
Total Cost			\$115,000

**SWIFT BRANCH SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6	4,500	13.50	\$ 60,750
8	4,500	19.00	\$ 85,500
Total	9,000		\$146,000

D. Base Sewer Cost: \$373,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .135
2. Contractor Cost Factor (Fc): .125

F. Total Collection System Capital Cost: \$470,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.508	\$2,100,000	\$2,600,000
2			
3			
Total	.508	\$2,100,000	\$2,600,000

**SWIFT BRANCH SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way	5	\$20,000	\$100,000
Plant site			
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$2,670,000
10/15/2	\$3,170,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$205,000
10/15/2	\$244,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$29,000
(total linear feet gravity sewers + force mains X \$.59/linear foot) +
(Lift Station, (2) .437 MGD)

**SWIFT BRANCH SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$72,000
10/15/2	\$95,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$306,000
10/15/2	\$368,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	1163.1	1998.0
10/15	265	155
10/15/2	315	185

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS

Slight Limitations:	__ percent
Moderation Limitations:	__ percent
Severe Limitations: (slow percolation rates)	__ percent
Severe Limitations: (rock or flooding)	__ percent

**SWIFT BRANCH SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**BRIAR CREEK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Briar Creek Drainage Basin

Subdivisions: Briar, Briarwood Estates, Eagle Mountain Acres, D. L. Marshall, Turpin, Allyndale, Cooley, Westwood Addition

2. NUMBER OF SERVICE AREAS: 8

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					125	210
B					90	150
C					65	110
D					90	150
E					65	110
F					270	450
G					105	175
H					110	180
TOTAL					920	1,535

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.154	13	19	19
10/15/2	.154	13	19	3

Note: All figures given above reflect average daily values assuming full development of planning area.

**BRIAR CREEK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>System</u>	<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
	6	7,000	20	\$140,000
	8		25	
	10		30	
	12		34	
	15		42	
	18		49	
1		40,700	56	\$814,000
2		21,000	63	\$420,000
	Total	68,700	N/A	\$1,374,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	210	.021	\$25,000
2	150	.015	\$25,000
3	110	.011	\$25,000
4			
5			
	Total Cost		\$ 75,000

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4	5,000	10.00	\$50,000
6		13.50	
8		19.00	
	Total	5,000	\$50,000

**BRIAR CREEK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

D. Base Sewer Cost: \$1,499,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.088
2. Contractor Cost Factor (Fc): 0.090

F. Total Collection System Capital Cost: \$1,766,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.154	\$900,000	\$1,100,000
2			
3	.154	\$900,000	\$1,100,000
Total			\$2,200,000

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way			
Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

**BRIAR CREEK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$2,766,000
10/15/2	\$2,966,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 213,000
10/15/2	\$ 228,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$73,000
(total linear feet gravity sewers + force mains X \$.59/linear foot) +
(lift stations (3), total .047 MGD)

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 18,000
10/15/2	\$ 24,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$304,000
10/15/2	\$325,000

**TOWN OF NEWARK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

City of Newark and area in FPA outside of city

2. NUMBER OF SERVICE AREAS: 3

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					110	155
B					720	1020
C						
D						
E						
F						
G						
H						
TOTAL					830	1,175
						Q-.118

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	.212	18	27	27
10/15/2	.212	18	27	4

Note: All figures given above reflect average daily values assuming full development of planning area.

**TOWN OF NEWARK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	1,000	30	\$30,000
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total	1,000	N/A	\$30,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1		.102	\$25,000
2			
3			
4			
5			
Total Cost			\$25,000

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4	3,000		\$40,500
6			
8			
Total	3,000		\$40,500

**TOWN OF NEWARK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

D. Base Sewer Cost: \$96,000

E. Cost Factors:

- 1. Engineering Cost Factor (Fe): .20
- 2. Contractor Cost Factor (Fc): .15

F. Total Collection System Capital Cost: \$129,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.118	\$700,000	\$800,000
2			
3			
Total	.118	\$700,000	\$800,000

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way			
Plant site			\$0.00
Total Land Cost			

**TOWN OF NEWARK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$829,000
10/15/2	\$929,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 64,000
10/15/2	\$ 71,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$13,000
(total linear feet gravity sewers + force mains X \$.59/linear foot) +
(lift stations (1) - total .102 MGD)

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 14,000
10/15/2	\$ 19,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$ 91,000
10/15/2	\$103,000

**TOWN OF NEWARK SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	349.4	462.6
10/15	260	195
10/15/2	295	225

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS

Slight Limitations:	___ percent
Moderation Limitations:	___ percent
Severe Limitations: (slow percolation rates)	___ percent
Severe Limitations: (rock or flooding)	___ percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**BOAT CLUB/LAKE COUNTRY SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Boat Club FPA and Meacham Brants Subdivision in Lake Country FPA

2. NUMBER OF SERVICE AREAS: 2

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					85	160
B					385	750
C						
D						
E						
F						
G						
H						
TOTAL					470	910

4. DISCHARGE SUMMARY: None

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15				
10/15/2				

Note: All figures given above reflect average daily values assuming full development of planning area.

**BOAT CLUB/LAKE COUNTRY SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6			
8			
10			
12			
15			
18			
21			
24			

Total

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
1	160	.016	\$25,000
2	750	.075	\$25,000
3			
4			
5			
Total Cost			\$50,000

**BOAT CLUB/LAKE COUNTRY SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4	9,500	10.00	\$ 95,000
6	14,000	13.50	\$189,000
8			
Total	23,500		\$284,000

D. Base Sewer Cost: \$334,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.15
2. Contractor Cost Factor (Fc): 0.13

F. Total Collection System Capital Cost: \$428,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 0 TCMUD #1 to Fort Worth

B. Plant Capacity and Cost Summary: None

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1			
2			
3			
Total			

**BOAT CLUB/LAKE COUNTRY SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site			\$0.00
Total Land Cost			

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
By Fort Worth	\$428,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
By Fort Worth	\$ 33 ,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$34,000
(total linear feet gravity sewers + force mains X \$.59/linear foot) +
(lift station (2) total .091 MGD)

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

Treatment Costs: \$19,000

**BOAT CLUB/LAKE COUNTRY SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
By Fort Worth	\$ 86,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	218.3	385.3
By Fort Worth	395	225

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS

Slight Limitations:	___ percent
Moderation Limitations:	___ percent
Severe Limitations: (slow percolation rates)	___ percent
Severe Limitations: (rock or flooding)	___ percent

15. LOT SIZE RESTRICTION SUMMARY

**BOAT CLUB/LAKE COUNTRY SUBREGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**WESTSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Briar Creek, Swift Branch, Peden, Pelican Bay, Reno, Azle (Walnut Creek)
Ash Creek and Azle (Ash Creek)

2. NUMBER OF SERVICE AREAS: 8

3. SIZE AND POPULATION SUMMARY:

<u>Service Area</u>	<u>Service Area size (acres)</u>		<u>Population</u>			
	<u>In City</u>	<u>Rural</u>	<u>In City</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
A					920	1,535
B					560	930
C					430	710
D			1,300	3,160	240	275
E			1,155	2,550	210	460
F			1,550	2,100		
G			6,200	8,400		
H					1,122	1,875
TOTAL			10,205	16,210	3,482	5,785
					WWTP Azle Exist = 7,050	
					1987 = 6,627	
					2005 = 14,955	

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15	2.2	183	275	275
10/15/2	2.2	183	275	37

Note: All figures given above reflect average daily values assuming full development of planning area.

**WESTSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	16,000	20	\$320,000
8	31,500	25	787,500
10	16,500	30	307,500 (7500' @ \$5/LF;
12	18,000	34	612,000 8" to 10")
15	2,000	42	84,000
18	6,000	49	294,000
21			
24			
Total	82,500 (for O&M)	N/A	\$2,405,000

B. Lift Stations:

	<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
Briar Creek	1		.154	38,000
Swift Branch	2		.093	25,000
Peden	3		.071	25,000
Pelican Bay	4		.344	90,000
	5		1,167	340,000
Total Cost				\$518,000

**WESTSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4		7.00	
6	16,000	10.50	\$216,000
8	26,000	19.00	\$494,000
16	7,500	30.00	\$225,000
Total	49,500		\$935,000

D. Base Sewer Cost: \$3,858,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.064
2. Contractor Cost Factor (Fc): 0.078

F. Total Collection System Capital Cost: \$4,406,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	1.496	\$5,786,000	\$6,019,000
2			
3			
Total	1,496	\$5,786,000	\$6,019,000

**WESTSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way			
Plant site			\$0.00
Total Land Cost			

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$10,192,000
10/15/2	\$10,425,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 784,000
10/15/2	\$ 802,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$135,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (lift station (5) total 1.829 MGD)

**WESTSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual debt service cost Annual Costs</u>
10/15	\$240,000
10/15/2	\$300,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$1,159,000
10/15/2	\$1,237,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	1626	5887.8
10/15	715	195
10/15/2	760	210

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS

Slight Limitations: _____ percent

Moderation Limitations: _____ percent

Severe Limitations: _____ percent
(slow percolation rates)

Severe Limitations: _____ percent
(rock or flooding)

**WESTSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

A 4 4

**NORTHSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

1. PLANNING AREA BOUNDARY:

Aurora, Newark, Boyd and rural Newark

2. NUMBER OF SERVICE AREAS: 4

3. SIZE AND POPULATION SUMMARY:

Service Area	Service Area size (acres)		Population			
	In City	Rural	In City		Rural	
			1987	2005	1987	2005
Boyd			1150	1820	1262	447
Aurora			360	520	387	152
Newark			600	940	657	259
rural Newark					882	830
TOTAL			2110	3280		1175
						1987 = 2,940
						2005 = 4,455

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15	.446	37	56	56
10/15/2	.446	37	56	7

Note: All figures given above reflect average daily values assuming full development of planning area.

**NORTHSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

5. ESTIMATED CAPITAL IMPROVEMENT NEEDS: COLLECTION SYSTEM

A. Gravity Collection System: None

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	3,000	20	\$ 60,000
8	2,000	25	\$ 50,000
10	23,000	30	\$690,000
12	14,000	34	\$476,000
15			
18			
21			
24			
Total	42,000	N/A	\$1,276,000

B. Lift Stations:

	<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity required (MGD)</u>	<u>Cost</u>
Newark	1	940	.094	\$25,000
	2			
	3			
	4			
	5			
	Total Cost			\$25,000

**NORTHSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

C. Force Mains:

<u>Pipe size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4			
6	3,000	13.50	\$41,000
8			
Total	3,000		\$41,000

D. Base Sewer Cost: \$1,342,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): 0.09
2. Contractor Cost Factor (Fc): 0.095

F. Total Collection System Capital Cost: \$1,590,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: TREATMENT PLANT(S)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	.446	\$2,000,000	\$2,500,000
2			
3			
Total	.446	\$2,000,000	\$2,500,000

**NORTHSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

7. ESTIMATED LAND NEEDS

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way Plant site	5	\$20,000	\$100,000
Total Land Cost			\$100,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment level</u>	<u>Total cost</u>
10/10	\$3,690,000
10/15/2	\$4,190,000

9. ANNUALIZED CAPITAL COSTS

<u>Treatment level</u>	<u>Annual debt service cost</u>
10/15	\$ 284,000
10/15/2	\$ 322,000

Annual capital costs based on 4 1/2 percent interest over a 20-year term.

- 10. ANNUAL COLLECTION SYSTEM O&M COST: \$38,000**
 (total linear feet gravity sewers + force mains X \$.59/linear foot) +
 (lift station (1) total .094 MGD)

**NORTHSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment level</u>	<u>Annual debt service cost</u> <i>Annual Cost</i>
10/15	\$62,000
10/15/2	\$84,000

12. TOTAL ANNUAL COST:

<u>Treatment level</u>	<u>Annual costs</u>
10/15	\$384,000
10/15/2	\$443,000 4

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	1256.9	1753.9
10/15	305	220
10/15/2	350	250

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS

Slight Limitations: _____ percent

Moderation Limitations: _____ percent

Severe Limitations: _____ percent
(slow percolation rates)

Severe Limitations: _____ percent
(rock or flooding)

**NORTHSIDE REGIONAL SYSTEM
FACILITY PLANNING DATA SUMMARY**

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ALTERNATE NO. 1
AZLE PLANTS MODIFICATION TO 10/15/2
AZLE SERVICE AREA**

1. PLANNING AREA BOUNDARY:

Azle City limits

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

Service area	Service area size (acres)		Population			
	In city	Rural	In city		Rural	
			1987	2005	1987	2005
			7750	10500		
Total			7750	10500		

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15/2	1.26	10	15	2

Note: Proposed modifications by adding new units to existing plants. Size based on 2005 population at 120 gpcd.

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Collection System (Existing System)

A. Gravity Collection System: None

B. Lift Stations: None

C. Force Mains: None

D. Base Sewer Cost: None

E. Cost Factors:

1. Engineering Cost Factor (Fe):

2. Contractor Cost Factor (Fc):

F. Total Collection System Capital Cost: None

**ALTERNATE NO. 1
AZLE PLANTS MODIFICATION TO 10/15/2
AZLE SERVICE AREA**

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: 2

B. Plant Capacity and Cost Summary: Cost of new units at existing plants

<u>Plant Number</u>	<u>Capacity MGD</u>	<u>Construction Cost 10/15/2</u>
1 & 2	1.26	1,700,000
Total		1,700,000

7. ESTIMATED LAND NEEDS: None

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment Level</u>	<u>Total Cost</u>
10/15/2	\$1,700,000

9. ANNUALIZED CAPITAL COST

<u>Treatment Level</u>	<u>Annual Debt Service Cost</u>
10/15/2	\$131,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: Existing System

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$280,000

**ALTERNATE NO. 1
AZLE PLANTS MODIFICATION TO 10/15/2
AZLE SERVICE AREA**

12. TOTAL ANNUAL COST:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$411,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	2723	4133.8
10/15/2	150	100

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations: ___ percent

Moderation Limitations: ___ percent

Severe Limitations:
(slow percolation rates) ___ percent

Severe Limitations:
(rock or flooding) ___ percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ALTERNATE NO. 2
AZLE PLANTS MODIFICATION TO 10/15/2
AZLE/PELICAN BAY SERVICE AREA**

1. PLANNING AREA BOUNDARY:

Azle and Pelican Bay

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

<u>Service area</u>	<u>Service area size (acres)</u>		<u>Population</u>			
	<u>In city</u>	<u>Rural</u>	<u>In city</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
			9290	13935		
Total			9290	13935		

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15/2	1.604	10	15	2

Note: Proposed modifications by adding new units to existing plants. Size based on 2005 population at 120 gpcd for Azle and 100 gpcd for Pelican Bay.

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Collection System (Azle - Existing; Pelican Bay - See individual FPA)

**ALTERNATE NO. 2
AZLE PLANTS MODIFICATION TO 10/15/2
AZLE/PELICAN BAY SERVICE AREA**

A. Gravity Collection System:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6		20	
8		25	
10			
12			
15			
18			
21			
24			
Total		N/A	

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity Required (MGD)</u>	<u>Cost</u>
1		.010	
2		.009	
3			
4			
5			
Total Cost			

C. Force Mains:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4		10.00	
6			
8			
Total			

D. Base Sewer Cost: None

**ALTERNATE NO. 2
AZLE PLANTS MODIFICATION TO 10/15/2
AZLE/PELICAN BAY SERVICE AREA**

- E. Cost Factors:
 1. Engineering Cost Factor (Fe):
 2. Contractor Cost Factor (Fc):

F. Total Collection System Capital Cost: None

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: 2

B. Plant Capacity and Cost Summary: Cost of new units at existing plants

<u>Plant Number</u>	<u>Capacity MGD</u>	<u>Construction Cost 10/15/2</u>
1 & 2	1.604	2,900,000
Total		2,900,000

7. ESTIMATED LAND NEEDS: None

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment Level</u>	<u>Total Cost</u>
10/15/2	\$2,900,000

9. ANNUALIZED CAPITAL COST

<u>Treatment Level</u>	<u>Annual Debt Service Cost</u>
10/15/2	\$223,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: None (total linear feet gravity sewers + force mains x \$.59/linear foot)

**ALTERNATE NO. 2
AZLE PLANTS MODIFICATION TO 10/15/2
AZLE/PELICAN BAY SERVICE AREA**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$280,000

12. TOTAL ANNUAL COST:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$503,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	3962.2	5486.2
10/15/2	125	90

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations:	___ percent
Moderation Limitations:	___ percent
Severe Limitations: (slow percolation rates)	___ percent
Severe Limitations: (rock or flooding)	___ percent

15. LOT SIZE RESTRICTION SUMMARY

**ALTERNATE NO. 2
AZLE PLANTS MODIFICATION TO 10/15/2
AZLE/PELICAN BAY SERVICE AREA**

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ALTERNATE NO. 3
AZLE PLANTS MODIFICATION TO 10/15/2
WITH PHOSPHROUS REMOVAL
AZLE SERVICE AREA**

1. PLANNING AREA BOUNDARY:

Azle City Limits

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

<u>Service area</u>	<u>Service area size (acres)</u>		<u>Population</u>			
	<u>In city</u>	<u>Rural</u>	<u>In city</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
			7750	10500		
Total			7750	10500		

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15/2	1.26	10	15	2

Note: Proposed modifications by adding new units to existing plants. Size based on 2005 population at 120 gpcd.

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Collection System Existing System

A. Gravity Collection System: None

B. Lift Stations: None

C. Force Mains: None

D. Base Sewer Cost: None

E. Cost Factors:

1. Engineering Cost Factor (Fe):
2. Contractor Cost Factor (Fc):

ALTERNATE NO. 3
 AZLE PLANTS MODIFICATION TO 10/15/2
 WITH PHOSPHROUS REMOVAL
 AZLE SERVICE AREA

F. Total Collection System Capital Cost: None

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: 2

B. Plant Capacity and Cost Summary: Cost of new units at existing plants

<u>Plant Number</u>	<u>Capacity MGD</u>	<u>Construction Cost 10/15/2</u>
1 & 2	1.21	2,005,000
Total		2,005,000

7. ESTIMATED LAND NEEDS: None

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment Level</u>	<u>Total Cost</u>
10/15/2	\$2,005,000

9. ANNUALIZED CAPITAL COST

<u>Treatment Level</u>	<u>Annual Debt Service Cost</u>
10/15/2	\$154,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: Existing System
 (total linear feet gravity sewers + force mains x \$.59/linear foot)

ALTERNATE NO. 3
 AZLE PLANTS MODIFICATION TO 10/15/2
 WITH PHOSPHROUS REMOVAL
 AZLE SERVICE AREA

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$369,000

12. TOTAL ANNUAL COST:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$523,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	2723.2	4133.8
10/15/2	190	125

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

- Slight Limitations: __ percent
- Moderation Limitations: __ percent
- Severe Limitations: __ percent
(slow percolation rates)
- Severe Limitations: __ percent
(rock or flooding)

15. LOT SIZE RESTRICTION SUMMARY

ALTERNATE NO. 3
AZLE PLANTS MODIFICATION TO 10/15/2
WITH PHOSPHROUS REMOVAL
AZLE SERVICE AREA

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ALTERNATE NO. 4
AZLE PLANTS MODIFICATION TO 10/15/2
WITH PHOSPHOROUS REMOVAL
AZLE/PELICAN BAY SERVICE AREA**

1. PLANNING AREA BOUNDARY:

Azle and Pelican Bay

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

<u>Service area</u>	<u>Service area size (acres)</u>		<u>Population</u>			
	<u>In city</u>	<u>Rural</u>	<u>In city</u>		<u>Rural</u>	
			<u>1987</u>	<u>2005</u>	<u>1987</u>	<u>2005</u>
			9290	13935		
Total			9290	13935		

4. DISCHARGE SUMMARY:

<u>Permit conditions</u>	<u>Flow (MGD)</u>	<u>BOD (lb/day)</u>	<u>TSS (lb/day)</u>	<u>Ammonia (lb/day)</u>
10/15/2	1.604	10	15	2

Note: Proposed modifications by adding new units to existing plants. Size based on 2005 population at 120 gpcd.

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Collection System (Azle - Existing; Pelican Bay - See individual FPA)

ALTERNATE NO. 4
 AZLE PLANTS MODIFICATION TO 10/15/2
 WITH PHOSPHOROUS REMOVAL
 AZLE/PELICAN BAY SERVICE AREA

A. Gravity Collection System:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6		20	
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total		N/A	

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity Required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			
Total Cost			

C. Force Mains:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8		17.00	
Total			

**ALTERNATE NO. 4
AZLE PLANTS MODIFICATION TO 10/15/2
WITH PHOSPHOROUS REMOVAL
AZLE/PELICAN BAY SERVICE AREA**

D. Base Sewer Cost:

E. Cost Factors:

1. Engineering Cost Factor (Fe):
2. Contractor Cost Factor (Fc):

F. Total Collection System Capital Cost: None

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: 2

B. Plant Capacity and Cost Summary: Cost of new units of existing plants.

<u>Plant Number</u>	<u>Capacity MGD</u>	<u>Construction Cost 10/15/2</u>
1 & 2	1.604	\$3,205,000
Total		\$3,205,000

7. ESTIMATED LAND NEEDS: None

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment Level</u>	<u>Total Cost</u>
10/15/2	\$3,205,000

9. ANNUALIZED CAPITAL COST

<u>Treatment Level</u>	<u>Annual Debt Service Cost</u>
10/15/2	\$246,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: None
(total linear feet gravity sewers + force mains x \$.59/linear foot)

**ALTERNATE NO. 4
AZLE PLANTS MODIFICATION TO 10/15/2
WITH PHOSPHOROUS REMOVAL
AZLE/PELICAN BAY SERVICE AREA**

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$369,000

12. TOTAL ANNUAL COST:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$615,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	3962.2	5486.2
10/15/2	155	110

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations:	__ percent
Moderation Limitations:	__ percent
Severe Limitations: (slow percolation rates)	__ percent
Severe Limitations: (rock or flooding)	__ percent

15. LOT SIZE RESTRICTION SUMMARY

**ALTERNATE NO. 4
AZLE PLANTS MODIFICATION TO 10/15/2
WITH PHOSPHOROUS REMOVAL
AZLE/PELICAN BAY SERVICE AREA**

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ALTERNATE NO. 5
AZLE PLANTS MODIFICATION TO 10/15/2
WITH NITRATE REMOVAL
AZLE SERVICE AREA**

1. PLANNING AREA BOUNDARY:

Azle City limits

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

Service area	Service area size (acres)		Population			
	In city	Rural	In city		Rural	
			1987	2005	1987	2005
			7750	10500		
Total			7750	10500		

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15/2	1.26	10	15	2

Note: Proposed modifications by adding new units to existing plants. Size based on 2005 population at 120 gpcd.

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Collection System (Existing System)

A. Gravity Collection System: None

B. Lift Stations: None

C. Force Mains: None

D. Base Sewer Cost: None

E. Cost Factors:

1. Engineering Cost Factor (Fe):

2. Contractor Cost Factor (Fc):

F. Total Collection System Capital Cost: None

**ALTERNATE NO. 5
AZLE PLANTS MODIFICATION TO 10/15/2
WITH NITRATE REMOVAL
AZLE SERVICE AREA**

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: 2

B. Plant Capacity and Cost Summary: Cost of new units at existing plants

<u>Plant Number</u>	<u>Capacity MGD</u>	<u>Construction Cost 10/15/2</u>
1 & 2	1.26	2,553,000
Total		2,553,000

7. ESTIMATED LAND NEEDS: None

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment Level</u>	<u>Total Cost</u>
10/15/2	\$2,553,000

9. ANNUALIZED CAPITAL COST

<u>Treatment Level</u>	<u>Annual Debt Service Cost</u>
10/15/2	\$196,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: Existing System

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$369,000

**ALTERNATE NO. 5
AZLE PLANTS MODIFICATION TO 10/15/2
WITH NITRATE REMOVAL
AZLE SERVICE AREA**

12. TOTAL ANNUAL COST:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$565,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	2723.2	4133.8
10/15/2	205	135

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations:	__ percent
Moderation Limitations:	__ percent
Severe Limitations: (slow percolation rates)	__ percent
Severe Limitations: (rock or flooding)	__ percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

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ALTERNATE NO. 6
AZLE PLANTS MODIFICATION TO 10/15/2
WITH NITRATE REMOVAL
AZLE, PELICAN BAY SERVICE AREA

1. PLANNING AREA BOUNDARY:

Azle, Pelican Bay

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

Service area	Service area size (acres)		Population			
	In city	Rural	In city		Rural	
			1987	2005	1987	2005
			7750	16500		
			9290	13935		
Total			9290	13935	Azle 2372	8204

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15/2	1.604	10	15	2

Note: Proposed modifications by adding new units to existing plants. Size based on 2005 population at 120 gpcd for Azle and 100 gpcd for Pelican Bay.

**ALTERNATE NO. 6
AZLE PLANTS MODIFICATION TO 10/15/2
WITH NITRATE REMOVAL
AZLE, PELICAN BAY SERVICE AREA**

**5. ESTIMATED CAPITAL IMPROVEMENT NEED: Collection System (Azle - Existing;
Pelican Bay - See individual FPA)**

A. Gravity Collection System:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6		20	
8		25	
10		30	
12		34	
15		42	
18		49	
21		56	
24		63	
Total		N/A	

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity Required (MGD)</u>	<u>Cost</u>
1			
2			
3			
4			
5			
Total Cost			

**ALTERNATE NO. 6
AZLE PLANTS MODIFICATION TO 10/15/2
WITH NITRATE REMOVAL
AZLE, PELICAN BAY SERVICE AREA**

C. Force Mains:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3			
4			
6			
8			
Total			

D. Base Sewer Cost:

E. Cost Factors:

1. Engineering Cost Factor (Fe):
2. Contractor Cost Factor (Fc):

F. Total Collection System Capital Cost: None

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: 2

B. Plant Capacity and Cost Summary: Cost of new units at existing plants.

<u>Plant Number</u>	<u>Capacity MGD</u>	<u>Construction Cost 10/15/2</u>
1 & 2	1.26	3,753,000
Total		3,753,000

7. ESTIMATED LAND NEEDS: None

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment Level</u>	<u>Total Cost</u>
10/15/2	\$3,753,000

**ALTERNATE NO. 6
AZLE PLANTS MODIFICATION TO 10/15/2
WITH NITRATE REMOVAL
AZLE, PELICAN BAY SERVICE AREA**

9. ANNUALIZED CAPITAL COST

<u>Treatment Level</u>	<u>Annual Debt Service Cost</u>
10/15/2	\$289,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: None (total linear feet gravity sewers + force mains x \$.59/linear foot)

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$369,000

12. TOTAL ANNUAL COST:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15/2	\$658,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	3962.2	5486.2
10/15/2	165	120

**ALTERNATE NO. 6
AZLE PLANTS MODIFICATION TO 10/15/2
WITH NITRATE REMOVAL
AZLE, PELICAN BAY SERVICE AREA**

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations: __ percent

Moderation Limitations: __ percent

Severe Limitations:
(slow percolation rates) __ percent

Severe Limitations:
(rock or flooding) __ percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

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ALTERNATE NO. 7
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
2.04 MGD

1. PLANNING AREA BOUNDARY:

Azle City Limits, Fort Worth Intervening Area, Azle to Lakeside

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

Service area	Service area size (acres)		Population			
	In city	Rural	In city		Rural	
			1987	2005	1987	2005
			7750	10500	2068	6540
Total			7750	10500	2068	6540

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15	2.04	10	15	2
10/15/2	2.04	10	15	2

Note: Size based on 2005 population at 120 gpcd.

**ALTERNATE NO. 7
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
2.04 MGD**

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Conveyance Facilities Only

A. Gravity Collection System:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6		20	
8		25	
10		30	
12	5600	34	\$190,000
15		42	
18		49	
21		56	
24		63	
Total	5600	N/A	\$190,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity Required (MGD)</u>	<u>Cost</u>
1	2500	0.30	\$120,000
2	10,500	1.26	\$380,000
3			
4			
5			
Total Cost			\$500,000

**ALTERNATE NO. 7
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
2.04 MGD**

C. Force Mains:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8	6,800	19.00	\$129,000
10	24,400	30.00	\$732,000
Total			\$861,000

D. Base Sewer Cost: \$1,551,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .088
2. Contractor Cost Factor (Fc): .096

F. Total Collection System Capital Cost: \$1,836,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary:

<u>Plant Number</u>	<u>Capacity MGD</u>	<u>Construction Cost</u>	
		<u>10/15</u>	<u>10/15/2</u>
1	2.04	7,225,000	7,517,000
Total	2.04	7,225,000	7,517,000

**ALTERNATE NO. 7
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
2.04 MGD**

7. ESTIMATED LAND NEEDS:

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way	25	\$20,000	\$500,000
Plant site	5	\$20,000	\$100,000
Total land cost			\$600,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment Level</u>	<u>Total Cost</u>
10/15	\$9,661,000
10/15/2	\$9,953,000

9. ANNUALIZED CAPITAL COST

<u>Treatment Level</u>	<u>Annual Debt Service Cost</u>
10/15	\$743,000
10/15/2	\$765,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$44,000
(total linear feet gravity sewers + force mains x \$.59/linear foot) +
(Lift Stations (2) 1.56 MGD)

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15	\$410,000
10/15/2	\$510,000

**ALTERNATE NO. 7
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
2.04 MGD**

12. TOTAL ANNUAL COST:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15	\$1,197,000
10/15/2	\$1,319,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	4339.2	6708.7
10/15	275	180
10/15/2	305	195

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations: __ percent
Moderation Limitations: __ percent
Severe Limitations: __ percent
(slow percolation rates)
Severe Limitations: __ percent
(rock or flooding)

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ALTERNATE NO. 8
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
6.3 MGD**

1. PLANNING AREA BOUNDARY:

Azle City Limits, Fort Worth Intervening Area, Azle to Lakeside, Live Oak and Silver Creek Watersheds

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

Service area	Service area size (acres)		Population			
	In city	Rural	In city		Rural	
			1987	2005	1987	2005
			7750	10500	4288	8877
Total			7750	10500	4288	8877

4. DISCHARGE SUMMARY:

Permit conditions	Flow (MGD)	BOD (lb/day)	TSS (lb/day)	Ammonia (lb/day)
10/15	6.3	10	15	2

Note: Plant size and permit requirements per Fort Worth 201 Facilities Plan with effluent discharge to Marys Creek.

**ALTERNATE NO. 8
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
6.3 MGD**

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Conveyance Facilities Only

A. Gravity Collection System:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6		20	
8		25	
10		30	
12	5600	34	\$190,000
15		42	
18		49	
21		56	
24		63	
Total	5600	N/A	\$190,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity Required (MGD)</u>	<u>Cost</u>
1	2500	0.30	\$120,000
2	10,500	1.26	\$380,000
3			
4			
5			
Total Cost			\$500,000

**ALTERNATE NO. 8
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
6.3 MGD**

C. Force Mains:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8	6,800	19.00	\$129,000
16	24,400	30.00	\$732,000
Total			\$861,000

D. Base Sewer Cost: \$1,551,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .088
2. Contractor Cost Factor (Fc): .096

F. Total Collection System Capital Cost: \$1,836,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: 1

B. Plant Capacity and Cost Summary: Taken from Fort Worth 201 Facilities Plan and includes \$2,000,000 for outfall to Marys Creek.

<u>Plant Number</u>	<u>Capacity MGD</u>	<u>Construction Cost 10/15</u>
1	6.3	\$20,900,000
Total	6.3	\$20,900,000

**ALTERNATE NO. 8
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
6.3 MGD**

7. ESTIMATED LAND NEEDS:

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way	25	\$20,000	\$500,000
Plant site	5	\$20,000	\$100,000
Total land cost			\$600,000

8. TOTAL SYSTEM CAPITAL COST

<u>Treatment Level</u>	<u>Total Cost</u>
10/15	\$23,336,000

9. ANNUALIZED CAPITAL COST

<u>Treatment Level</u>	<u>Annual Debt Service Cost</u>
10/15	\$1,795,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$44,000
(total linear feet gravity sewers + force mains x \$.59/linear foot) +
(lift stations (2) 1.56 MGD)

11. ANNUAL O&M COSTS FOR TREATMENT FACILITY:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15	\$1,200,000

**ALTERNATE NO. 8
AZLE/FORT WORTH REGIONAL SYSTEM
SATELLITE TREATMENT SYSTEM
6.3 MGD**

12. TOTAL ANNUAL COST:

<u>Treatment Level</u>	<u>Annual Costs</u>
10/15	\$3,039,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	5220.9	7628.7
10/15	580	400

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations:	___ percent
Moderation Limitations:	___ percent
Severe Limitations: (slow percolation rates)	___ percent
Severe Limitations: (rock or flooding)	___ percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ALTERNATE NO. 9
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWTP
AZLE ONLY**

1. PLANNING AREA BOUNDARY:

Azle City Limits

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

Service area	Service area size (acres)		Population			
	In city	Rural	In city		Rural	
			1987	2005	1987	2005
			7750	10500		
Total			7750	10500		

4. DISCHARGE SUMMARY: No Local Discharge

Note: Discharge to Fort Worth System for treatment at Village Creek WWTP.
In 1980 approximately 60% of Azle population served by municipal
system and present level has increased to 80%.

**ALTERNATE NO. 9
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWT
AZLE ONLY**

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Conveyance Facilities Only

A. Gravity Collection System:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6		20	
8		25	
10	8,700	30	\$261,000
12		34	
15		42	
18		49	
21		56	
24		63	
Total	8,700	N/A	\$261,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity Required (MGD)</u>	<u>Cost</u>
1	2,100	.252	\$ 65,000
2	10,500	1.26	\$380,000
3			
4			
5			
Total Cost			\$445,000

**ALTERNATE NO. 9
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWP
AZLE ONLY**

C. Force Mains:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8	6,800	19.00	\$129,000
16	11,000	30.00	\$330,000
Total			\$459,000

D. Base Sewer Cost: \$1,165,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .094
2. Contractor Cost Factor (Fc): .10

F. Total Collection System Capital Cost: \$1,391,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: None

7. ESTIMATED LAND NEEDS:

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way	16	\$20,000	\$320,000
Total land cost			\$320,000

8. TOTAL SYSTEM CAPITAL COST: \$1,711,000

9. ANNUALIZED CAPITAL COST: \$132,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

**ALTERNATE NO. 9
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWT
AZLE ONLY**

10. ANNUAL COLLECTION SYSTEM O&M COST: \$44,000
(total linear feet gravity sewers + force mains x \$.59/linear foot) +
(lift stations (2) 1.512 MGD)
11. ANNUAL TREATMENT COSTS: \$248,000
Flow based on 2005 population at 120 gpcd
12. TOTAL ANNUAL COST: \$424,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	2723	4134
By Fort Worth	155	105

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations: __ percent

Moderation Limitations: __ percent

Severe Limitations:
(slow percolation rates) __ percent

Severe Limitations:
(rock or flooding) __ percent

15. LOT SIZE RESTRICTION SUMMARY

**ALTERNATE NO. 9
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWP
AZLE ONLY**

16. SEPTIC TANK REGULATIONS

17. COMMENTS

**ALTERNATE NO. 10
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWTP
AZLE, PELICAN BAY**

1. PLANNING AREA BOUNDARY:

Azle, Pelican Bay

2. NUMBER OF SERVICE AREAS:

3. SIZE AND POPULATION SUMMARY:

Service area	Service area size (acres)		Population			
	In city	Rural	In city		Rural	
			1987	2005	1987	2005
			9290	13,935		
Total			9290	13,935		

4. DISCHARGE SUMMARY: No Local Discharge

Note: Discharge to Fort Worth System for treatment at Village Creek WWTP.

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Conveyance Facilities Only

A. Gravity Collection System:

Pipe Size (inches)	Length (LF)	Unit cost (\$/LF)	Extended cost
6		20	
8		25	
10		30	
12		34	
15	8,700	42	\$365,000
18		49	
21		56	
24		63	
Total	8,700	N/A	\$365,000

**ALTERNATE NO. 10
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWTP
AZLE, PELICAN BAY**

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity Required (MGD)</u>	<u>Cost</u>
1	5,535	.596	\$180,000
2	13,935	1.604	\$450,000
3			
4			
5			
Total Cost			\$630,000

C. Force Mains:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6		13.50	
8		19.00	
12	6,800	24.00	\$163,000
21	11,000	45.00	495,000
Total	17,800		\$658,000

D. Base Sewer Cost: \$1,653,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .088
2. Contractor Cost Factor (Fc): .095

F. Total Collection System Capital Cost: \$1,955,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: None

**ALTERNATE NO. 10
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WTP
AZLE, PELICAN BAY**

7. ESTIMATED LAND NEEDS:

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way	16	\$20,000	\$320,000
Total land cost			\$320,000

8. TOTAL SYSTEM CAPITAL COST: \$2,275,000

9. ANNUALIZED CAPITAL COST: \$175,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

10. ANNUAL COLLECTION SYSTEM O&M COST: \$45,000
(total linear feet gravity sewers + force mains x \$.59/linear foot) +
(lift stations (2) 2.2 MGD)

11. ANNUAL TREATMENT COSTS: \$315,000
Flow based on 2005 population at 120 gpcd for Azle and 100 gpcd for
Pelican Bay.

12. TOTAL ANNUAL COST: \$535,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	3962.2	5486.2
By Fort Worth	135	95

ALTERNATE NO. 10
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWTP
AZLE, PELICAN BAY

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations: __ percent

Moderation Limitations: __ percent

Severe Limitations:
(slow percolation rates) __ percent

Severe Limitations:
(rock or flooding) __ percent

15. LOT SIZE RESTRICTION SUMMARY

16. SEPTIC TANK REGULATIONS

17. COMMENTS

A17 7

ALTERNATE NO. 11
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWTP
AZLE, WEST SIDE EML

1. PLANNING AREA BOUNDARY:

Azle, Pelican Bay, Briar Creek, Swift Branch, Peden, Reno, Ash Creek, Walnut Creek

2. NUMBER OF SERVICE AREAS: 8

3. SIZE AND POPULATION SUMMARY:

Service area	Service area size (acres)		Population				
	In city	Rural	In city		Rural		
			1987	2005	1987	2005	
Briar Crk					920	1,535	423
Swift Br					560	930	245
Peden					430	710	122
Pelican Bay	1,300		3,160		240	275	
Reno	1,155		2,550				
Azle (Walnut)	1,550		2,100				
Azle (Ash)	6,200		8,400				
Ash Crk					1,122	1,875	491
Total			10,205	16,210	3,482	5,785	

4. DISCHARGE SUMMARY: No Local Discharge

Note: Discharge to Fort Worth System for treatment at Village Creek WWTP.

5. ESTIMATED CAPITAL IMPROVEMENT NEED: Collection System

**ALTERNATE NO. 11
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWT
AZLE, WEST SIDE EML**

A. Gravity Collection System:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
6	16,000	20	\$ 320,000
8	31,500	25	787,500
10	16,500	30	307,500 (7500' @
12	18,000	34	612,000 \$5/LF;
15	2,000	42	84,000 8"to10")
18	6,000	49	294,000
21		56	
24		63	
Total	82,500 (for O&M)	N/A	\$2,405,000

B. Lift Stations:

<u>Lift Station</u>	<u>2005 population served</u>	<u>Capacity Required (MGD)</u>	<u>Cost</u>
Briar Crk 1		.154	38,000
Swift Br 2		.093	25,000
Peden 3		.071	25,000
Pelican B 4		.344	90,000
Walnut Ck 5		1.167	340,000
Ash Crk 6		2.2	<u>740,000</u>
Total Cost			\$1,258,000

**ALTERNATE NO. 11
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWTP
AZLE, WEST SIDE EML**

C. Force Mains:

<u>Pipe Size (inches)</u>	<u>Length (LF)</u>	<u>Unit cost (\$/LF)</u>	<u>Extended cost</u>
3		7.00	
4		10.00	
6	16,000	13.50	\$ 216,000
8	26,000	19.00	494,000
16	16,000	30.00	480,000
Total	58,000		\$1,190,000

D. Base Sewer Cost: \$4,853,000

E. Cost Factors:

1. Engineering Cost Factor (Fe): .062
2. Contractor Cost Factor (Fc): .076

F. Total Collection System Capital Cost: \$5,523,000

6. ESTIMATED CAPITAL IMPROVEMENT NEEDS: Treatment Plant(s)

A. Number of Treatment Plants: None

7. ESTIMATED LAND NEEDS:

<u>Description</u>	<u>Land required (acres)</u>	<u>Cost per acre</u>	<u>Extended cost</u>
Pipeline right-of-way	6	\$20,000	\$120,000
Total land cost			\$120,000

8. TOTAL SYSTEM CAPITAL COST: \$5,643,000

9. ANNUALIZED CAPITAL COST: \$434,000

Annual Capital costs based on 4 1/2 percent interest over a 20-year term.

**ALTERNATE NO. 11
AZLE/FORT WORTH REGIONAL SYSTEM
VILLAGE CREEK WWT
AZLE, WEST SIDE EML**

10. ANNUAL COLLECTION SYSTEM O&M COST: \$153,000
(total linear feet gravity sewers + force mains x \$.59/linear foot) +
(lift stations (6) 4.029 MGD)
11. ANNUAL TREATMENT COSTS: \$475,000
Flow based on 2005 population at 120 gpcd for Azle and 100 gpcd for
Other Service Areas.
12. TOTAL ANNUAL COST: \$1,062,000

13. ANNUAL COST PER HOUSEHOLD

<u>Treatment Level</u>	<u>Population</u>	
	<u>1990</u>	<u>2005</u>
Households	5933.7	8659.4
By Fort Worth	180	125

14. SOIL SUITABILITY FOR SEPTIC TANK SYSTEMS (for developed area):

Slight Limitations: __ percent

Moderation Limitations: __ percent

Severe Limitations:
(slow percolation rates) __ percent

Severe Limitations:
(rock or flooding) __ percent

15. LOT SIZE RESTRICTION SUMMARY