BRAZOS RIVER AUTHORITY
OF TEXAS

Report
on

Lakes Belton and Stillhouse Hollow

FACILITY PLANNING STUDY

PREPARED BY:

ROMING AND PORTER
CONSULTING ENGINEERS
Temple, Texas 76505

Alan Plummer and Associates, Inc.
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I. METHODOLOGY AND APPROACH

The development of a regional facility plan for wastewater facilities in the study area is the a component which will protect the water quality of the Lake Belton and Lake Stillhouse Hollow area. A facility plan which will continue to be a useful tool as future growth in the area occurs, requires that existing facilities be inventoried and assessed to determine their actual treatment capabilities and capacities and that planning for future transport and treatment facilities, made necessary by future growth, be flexible enough to accommodate variations in the development of the area over time.

As can be seen from Exhibit I-1 Project Study Area, numerous wastewater treatment plants, serving communities, municipalities, and Fort Hood are located within the project study area boundaries. The larger urban portions of the study area in Bell County are served by plants discharging into Nolan Creek, which bypasses the area lakes and flows southeast to the Leon River. Existing wastewater treatment plants serving communities within the study area but outside of Bell County are remote from the lakes and have less effect on the overall area water quality.

It was recognized at the outset of this study that the greatest impact to the water quality in the study area will

come from future development in the area south of Killeen, Harker Heights and Nolanville, to the north and adjacent to Lake Stillhouse Hollow. The need to provide this area with wastewater treatment facilities and continue to protect the water quality of Lake Stillhouse Hollow requires that special consideration be given to the planning of future wastewater facilities in this area.

II. DATA COLLECTION AND ANALYSIS

GENERAL

Available data and information from numerous public and governmental sources were gathered and analyzed for use in this study. Previous studies and reports prepared for the local municipalities and county governments provide base line data and reference information for development of the various components of this study. Where existing data was not available, questionnaires were mailed out and responses received.

POPULATION PROJECTIONS

Population projections for the years 1990, 2000, 2010, 2020 and 2030 were derived using published information provided by the following governmental and public sources:

1. "Projections of Population and Municipal Water Requirements" by the Texas Department of Water Resources Water Use and Projection Unit.

2. "Revised Population Projections for Texas Counties" by the Texas Department of Water Resources Water Uses, Projections and Conservation Section, dated February, 1986.

Counties could be formulated. Tables II-1, II-2 and II-3 reflect the population as of the 1980 Census, the population projections for 1985, 2000, 2010, 2020 and 2030 as published by the various sources referenced previously, and the recommended population projections to be used for this study.

As can be seen, the recommended population projections to be used for this report are generally between the low and high range of the TDWR estimates. Lampasas County was estimated using a more conservative growth rate which results in a slightly lower population projection.

In Table II-4, a ratio is developed between historical populations and the number of sewer connections (for those cities which had the information). This ratio reflects the portion of a city's total population which is not served by the sanitary sewer system and would not be considered in future wastewater flows projections. In Table II-4, total and sewered populations were estimated for 1985 (a non-census year) by using the historical population per connection ratio from 1980.

Table II-5 and II-5a provide a breakdown of the historical and projected urban populations for Bell and Coryell Counties respectively. Rural populations are shown for each county in addition to the urban populations. Table II-5 for Bell County shows the individual city populations which were obtained from Source 4 for each decade. The historical

Bell County shows the individual city populations which were obtained from Source 4 for each decade. The historical urban population for Bell County in the 1980 census year amounted to 70% of the total county population. This urban percentage was shown to increase to 72.6% by the year 2030.

Table II-5a also shows the estimated 1985 urban population as well as the expected rural population for Bell County. The estimated 1985 population agrees very closely with the estimated 1985 populations given in "Population and Employment Projections for the Killeen - Temple Study Area" prepared by CITCOG, (Source 3).

Table II-5b shows population estimates for each city in Coryell County. It should be noted that a portion of the Fort Hood population is included in both Tables II-5a and II-5b for Bell County and Coryell County. Projected populations for Fort Hood have been assumed to stay constant at the 1980 census level throughout the planning period. This is consistent with the higher levels predicted in "Projections of Population and Municipal Water Requirements" prepared by the TDWR, (Source 1), and the assumptions used in the "Report to Bell County on Water Supply Requirements" by W. C. Roming P.E. Consulting Engineer, (Source 4).

GROWTH PATTERNS

In order to develop alternative facility plans for evaluation, future growth patterns were developed for those municipalities in Bell and Coryell Counties in the immediate vicinity of the lakes. Particular attention has been paid to the growth patterns in the area around Lake Belton and Lake Stillhouse Hollow because of the direct impact that future development will have on the water quality of the lakes and on the area streams such as Nolan Creek.

Expected growth patterns were developed for Killeen, Harker Heights and Nolanville based on projections of current trends, geographical and land use constraints, the projections given in the Source 3 population study and information provided by local City, County, and CTCOG officials. Because the area is bounded on the north and west by Fort Hood, the only available area for growth is to the south and east toward Lake Stillhouse Hollow. The recreational aspects of the Lake Stillhouse Hollow area will further encourage growth in this direction.

Detailed growth patterns were not projected for cities such as Lampasas, which are outside of the immediate vicinity of the lakes. The direction and location of future growth in these areas does not affect the projected overall waste loadings to be assimilated by the area's streams and lakes and thus do not impact the evaluation of the water quality.

Exhibit III-1 shows the expected growth patterns and the limits of growth for sewered areas, by decade, for each municipality in the lake area. The City of Harker Heights has recently annexed a portion of the area north of Lake Stillhouse Hollow which includes Comanche Hills Utility District. The new city limit line naturally becomes the boundary between the growth areas of Harker Heights and Killeen.

The growth areas by decade have been further broken down into logical sewer service areas based on topography. These areas have been assigned numbers, such as K2000-N-A. This coded I.D. number can be translated as follows:

1. The first alpha character stands for the city jurisdiction it is within (K for Killeen),

2. The next four numeric characters are the decade in which municipal sewer services are projected to be serving the area.

3. The next alpha character or characters are the initials of the drainage basin the area is located in, such as "N" for Nolan Creek or "T" for Trimmier Creek.

4. The final alpha character is the drainage basin sub-area identifier which further identifies the growth area.

Referring to Exhibit III-1, the area being provided sewer services by the City of Killeen, for the base year 1985, generally extends no further south than Elm Road. By the year 2010, it is expected to extend south to Stagecoach Road and to Chaparral Road by the Year 2030. An additional sewered area extending south along East Trimmier Road to the Lampasas River is expected around the year 2020.

For Harker Heights, the area being provided sewer services is expected to cover most of the area within the existing city limits north of F.M. 2410 by the year 2000. By 2010, the area south to Cedar Knob Drive is expected to be within the cities sewered area. By the year 2020, most of the Comanche Hills area on the north shore of Lake Stillhouse Hollow will be served by the Harker Heights sewer system.

Nolanville is expected to grow in both an easterly and westerly direction along Hwy 190. It is not projected to grow to the north of FM 439 or south of F.M. 2410 before the end of the planning period.

Table II-6a shows the base year population and the projected populations, by sewer service area, for the city of Killeen. The estimated average population density for the City of Killeen in the year 1980 is 4.68 people per acre, based on an existing developed area of 10,600 acres and a population of 49,600 in the year 1985. The population and density in the existing developed area of Killeen is assumed to increase to 61,800 and 5.83 people per acre in by the year 2030. The population densities decrease as you move away from the central Killeen area to a density of 2.5 people per acre in the most outlying growth area in the year 2030.

In the same manner, projected populations, by sewer service area, for the City of Harker Heights and Nolanville have been listed in Tables II-6b and II-6c. As with the City of Killeen, the population densities are expected to increase during the study period for the existing central sewered area of the city with densities gradually decreasing as development move further outward toward the lake.

EXISTING WASTEWATER TREATMENT PLANT INVENTORY

Preparing inventories of the existing wastewater treatment plants discharging into the waters of the Lake Belton and Lake Stillhouse Hollow area is an essential first step in the development of the facility plan. Using data provided by the Texas Department of Water Resources and the

communities involved, treatment capabilities and per capita flows can be calculated for facility planning purposes. On-site inspection of the treatment facilities and communication with operators and engineers involved with each plant provided information as to the status of planned expansions and upgrades.

For the purpose of inventory, the existing plants can be separated into three major categories based on service area; municipal and regional plants which serve the communities in the study area, federally owned plants which serve military facilities and Army Corps of Engineers facilities (parks) and privately owned plants which serve private development and industry.

MUNICIPAL AND REGIONAL WASTEWATER TREATMENT PLANTS

There are 14 wastewater treatment plants which serve communities within the study area. These plants range in size from 25,000 GPD to 15,000,000 GPD (15.0 MGD). Populations served by individual plants range from 1,368 to over 81,000 people. Exhibit II-1 indicates the approximate location of each plant.

The following paragraphs briefly describe the location, service area and treatment capabilities for each of the plants in this category:

Bell County WCID No. 1 (City of Killeen)

Bell County WCID No. 1 (TWC Permit No. 10351-01) provides wastewater treatment for the existing City of Killeen and a portion of the Fort Hood facility. The wastewater plant is located on the west side of FM 2410 approximately 0.5 miles north of U.S. Highway 190 and discharges into Nolan Creek in Segment 1218 of the Brazos River Basin. See Exhibit II-2.

The plant utilizes an extended aeration process with tertiary treatment and presently has a capacity of 15 MGD. Average daily flows reported by the plant in 1987 were approximately 13.1 MGD. Maximum daily flows recorded in 1986 and 1987 are approximately 29 MGD. The plant presently operates under a permitted effluent limit of 10 mg/1 BOD, 15 mg/1 TSS and a 4 DO.

Table II-7a summarizes the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. Influent flow, BOD and TSS concentrations for 1985, 1986, and 1987 were made available for use in this study and are shown in Table II-8a. Table II-8b provides effluent flows, BOD and TSS concentrations and are charted in Figure II-1a and II-1b. A 6 MGD expansion of the plant is presently ongoing which will bring the total plant capacity to 21 MGD.

Bell County WCID NO 3 (City of Nolanville)

Bell County WCID No. 3 (TWC Permit No. 10797-01) provides wastewater treatment for the City of Nolanville. The wastewater plant is located 3/4 mile southeast of Nolanville on South Nolan Creek and discharges into South Nolan Creek in Segment 1218 of the Brazos River Basin. See Exhibit II-3.

The plant utilizes a complete mix activated sludge process consisting of two aeration basins, a single clarifier and chlorine disinfection. The permitted average daily flow is 120,000 GPD. Average daily flows reported by the plant in 1987 were approximately 168,000 GPD. The maximum daily flow recorded in 1987 was approximately 395,000 GPD on a permitted flow of 240,000 GPD. The plant presently operates under a permitted effluent limit of 10 mg/1 BOD and 15 mg/1 TSS. An expansion is presently being designed which will increase the plants capacity to 750,000 GPD.

Table II-7a summarizes the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Tables II-9 and are charted on Figure II-2a and II-2b. Influent BOD and TSS concentrations were not available for use in this study.

Bell County WCID No. 4 (City of Harker Heights)

Bell County WCID No. 4 (TWC Permit No. 10155-01) provides wastewater treatment for the City of Harker Heights. The wastewater plant is located approximately 1.25 miles west of the intersection of U.S. Highway 190 and FM 439 and discharges into South Nolan Creek in segment 1218 of the Brazos River Basin. See Exhibit II-4.

The plant utilizes the activated sludge process consisting of two circular concrete plants with common wall aeration basins and clarifiers. The treatment units operate in parallel service. The permitted average daily flow for this facility is 1.45 MGD. Average daily flows reported by the plant in 1987 were approximately 1.347 MGD. The maximum daily flow recorded in 1987 was approximately 3.60 MGD on a permitted flow of 4.35 MGD. The plant presently operates under a permitted effluent limit of 10 mg/l BOD, 15 mg/l TSS and a 4 DO. An expansion of the plant is being designed which will increase the plants capacity to 3.0 MGD.

Table II-7a shows the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis Tables II-10a and charted in Figures II-3a and II-3b. Influent BOD and TSS concentrations are provided in Tables II-10b.

Brazos River Authority (Temple-Belton Regional Plant)

The Brazos River Authority Temple-Belton Regional Plant (TWC Permit No. 11318-01) provides wastewater treatment for the cities of Temple and Belton. The wastewater plant is located approximately 0.5 miles south of FM 93 and approximately 1.5 miles east of the intersection of U.S. Highway 35 and FM 93 and discharges into Nolan Creek in segment 1218 of the Brazos River Basin. See Exhibit II-5.

The plant utilizes the activated sludge process which consists of aerated grit removal, dual aeration basins using mechanical aerators, two final clarifiers and chlorine disinfection. The plant has a permitted average daily flow of 6.0 MGD and presently operates under a permitted effluent limit of 20 mg/1 BOD and 20 mg/1 TSS.

An expansion of the plant is presently underway which will add additional headworks, aeration basins with fine bubble diffused air, two additional clarifiers and expansion of the chlorine disinfection facilities by utilizing existing aerobic digester basins. The expansion will bring the plant capacity to 10 MGD.

Average daily flows reported by the plant in 1987 were approximately 3.34 MGD. The maximum daily flows recorded in 1987 was approximately 10.27 MGD on a permitted flow of 12 MGD. The plant presently operates under a permitted effluent limit of 10 mg/1 BOD, 15 mg/1 TSS and a 4 DO.

Table II-7a summarizes the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Tables II-11 and charted in Figures II-4a and II-4b.

Comanche Hills Utility District

The Comanche Hills Utility District plant (TWC Permit No. 12016-01) provides service to a small area which has recently been annexed into the City of Harker Heights. The service area consists of three mobile home parks and several single family residences. The plant is located approximately .5 miles north of Lake Stillhouse Hollow and 1,500 feet south of FM 2410. The plant is permitted to discharges into a tributary of Lake Stillhouse Hollow.

The plant presently operates under a permitted effluent limit of 10 mg/1 BOD and 15 mg/1 TSS. The plant does not discharge because the effluent has not met permitted values. At the present time, the effluent is being used for irrigation. No useful influent or effluent data is available for this plant.

Morgan's Point Resort, City of

The Morgan's Point Resort area was incorporated in 1970 and took over operation of Morgan's Point W.C.I.D in 1981. The plant is located on the east side of, and

adjacent to, the Leon River. Discharge from the plant is used for irrigation. However, the plant is permitted to discharge into the Leon River just upstream of Lake Belton.

The plant is presently permitted to operate under an effluent limit of 10 mg/l BOD and 15 mg/l TSS (TWC Permit No. 10918-02). No influent or effluent data is available for this plant.

Copperas Cove, City of (South Plant)

The Copperas Cove South Plant (TWC Permit No. 10045-03) provides wastewater treatment for the southern portion of the City of Copperas Cove. The wastewater plant is located approximately 1.5 miles south of the City, east of the intersection of FM 3046 and FM 116 and discharges into Clear Creek in segment 1217 of the Brazos River Basin. See Exhibit II-6.

The plant utilizes an oxidation ditch process and has a permitted average daily flow of 1.0 MGD. Average daily flow reported by the plant in 1987 were approximately 602,000 GPD. The maximum daily flow recorded in 1987 was approximately 1.057 MGD on a permitted flow of 2.0 MGD. The plant presently operates under a permitted effluent limit of 20 mg/l BOD and 20 mg/l TSS.

Table II-7a summarizes the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Table II-12a and charted in Figures II-5a and II-5b. Influent BOD and TSS concentrations for 1986 and 1987 are provided in Table II-12b.

Copperas Cove, City of (Northeast Plant)

The Copperas Cove Northeast Plant (TWC Permit No. 10045-04) provides wastewater treatment for the northeast portion of the City of Copperas Cove. The wastewater plant is located approximately 1.5 miles northeast of the City's central business district and approximately 2,000 feet northeast of the intersection of Georgetown Highway and Military Highway. The plant discharges into an unnamed tributary of Turkey Run Creek which ultimately flows into Lake Belton in segment 1220 of the Brazos River Basin. See Exhibit II-6.

The plant utilizes an oxidation ditch process and has a permitted average daily flow of 0.8 MGD. Average daily flows reported by the plant in 1987 were approximately

874,000 GPD. The maximum daily flow recorded in 1987 was approximately 1.75 MGD on a permitted flow of 1.6 MGD. The plant presently operates under a permitted effluent limit of 20 mg/l BOD and 20 mg/l TSS.

Table II-7a summarizes the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flow, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Table II-13a and charted in Figures II-6a and II-6b. Influent BOD and TSS concentrations for 1986 and 1987 are provided in Table II-13b. It is planned to gradually phase out this plant and divert the flow from it's service area to the Northwest Plant.

Copperas Cove, City of (Northwest Plant)

The Copperas Cove Northwest Plant (TWC Permit No. 10045-05) provides wastewater treatment for the northwest portion of the City of Copperas Cove. The wastewater plant is located approximately 1.8 miles northwest of the intersection of FM 116 and FM 1113 and discharges into House Creek which ultimately flows into Lake Belton in segment 1220 of the Brazos River Basin. See Exhibit II-6.

The plant utilizes an oxidation ditch process and has a permitted average daily flow of 1.2 MGD. Average daily flows reported by the plant in 1987 were approximately 1.29 MGD. The maximum daily flow recorded in 1987 was approximately 3.4 MGD on a permitted flow of 2.4 MGD. The plant presently operates under a permitted effluent limit of 20 mg/l BOD and 20 mg/l TSS.

An expansion of the plant, which will utilize an activated sludge process in parallel with the oxidation ditch, is being designed at this time. The expansion will upgrade the plant to 750,000 GPD. The City is intending to gradually phase out the Northeast Plant and divert the flow from it's service area to the Northwest Plant, which will become a regional facility.

Table II-7a summarizes the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Tables II-14a and charted in Figures II-7a and II-7b. Influent BOD and TSS concentrations for 1986 and 1987 are provided in Table II-14b.

Gatesville, City of

The wastewater plant is located approximately 1.8 miles northwest of the intersection of FM 116 and FM 1113 in the City of Gatesville. The plant discharges into the Leon River which ultimately flows into Lake Belton in segment 1220 of the Brazos River Basin (TWC Permit No. 10167-01). See Exhibit II-7.

The plant consists of a 0.5 MGD trickling filter and a 0.5 MGD activated sludge expansion built in 1980. The plant has a permitted average daily flow of 1.0 MGD. Average daily flows reported by the plant in 1987 were approximately 0.57 MGD. The maximum daily flow recorded in 1987 was approximately 1.9 MGD on a permitted flow of 2.0 MGD. The plant presently operates under a permitted effluent limit of 20 mg/l BOD and 20 mg/l TSS.

Table II-7a summarizes the current TWC permit condition as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Tables II-15a and are charted in Figures II-8a and II-8b. Influent BOD and TSS concentrations for 1986 are provided in Table II-15b.

Moody, City of

The City of Moody wastewater plant is located approximately 1,500 feet northwest of the intersection of State Hwy 317 and FM 107 and discharges into an unnamed branch of of Stampede Creek which ultimately flows into Lake Belton in segment 1220 of the Brazos River Basin (TWC Permit No. 10225-01). See Exhibit II-8.

The plant utilizes an oxidation ditch aeration system with two clarifiers and has a permitted average daily flow of 200,000 GPD. Average daily flows reported by the plant in 1987 were approximately 207,000 GPD. The maximum daily flow recorded in 1987 was approximately 764,000 GPD on a permitted flow of 500,000 GPD. The plant presently operates under a permitted effluent limit of 20 mg/l BOD and 20 mg/l TSS.

Table II-7 summarizes the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Table II-16. Influent BOD and TSS concentrations were not available for use in this study.

Oglesby, City of

The City of Oglesby wastewater plant is located approximately 1,000 feet west of the St. Louis Southwestern Railroad R.O.W. on the south side of the Old Gatesville Highway. The plant discharges into an unnamed tributary of Pew Branch which ultimately flows into the Leon River in segment 1221 of the Brazos River Basin (TWC Permit No. 10914-01). See Exhibit II-9.

The plant utilizes an oxidation ditch aeration system with a single clarifier and has a permitted average daily flow of 25,000 GPD. The plant is permitted to discharge as previously stated but generally does not because of the minimal flow. The maximum permitted daily flow is 50,000 GPD. The plant presently operates under a permitted effluent limit of 20 mg/l BOD and 20 mg/l TSS.

Table II-7a summarizes the current TWC permit conditions as of 1987.

Lampasas, City of (Sulphur Plant)

The City of Lampasas Sulphur Plant is located on the south side of Sulphur Creek near the east end of Creek Street in the City of Lampasas. The plant discharges into Sulphur Creek which ultimately flows into the Lampasas River in segment 1217 of the Brazos River Basin (TWC Permit No. 10205-01). See Exhibit II-10.

The plant utilizes the contact stabilization process with a single clarifier and chlorine disinfection. The facility has a permitted average daily flow of 500,000 GPD. Average daily flows reported by the plant in 1987 were approximately 275,000 GPD. The maximum daily flow recorded in 1987 was approximately 537,000 GPD on a permitted flow of 1.25 MGD. The plant presently operates under a permitted effluent limit of 20 mg/l BOD and 20 mg/l.

Table II-7a summarizes the current TWC permit conditions as of 1987. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Tables II-17 and are charted in Figures II-10a and II-10b. Influent BOD and TSS concentrations were not available for use in this study.

Lampasas, City of (Henderson Plant)

The City of Lampasas Henderson Plant is also located on the south side of Sulphur Creek adjacent to the previously described Sulphur Plant. The plant discharges into Sulphur Creek which ultimately flows into the Lampasas River in segment 1217 of the Brazos River Basin (TWC Permit No. 10205-02). See Exhibit II-10.

The plant consists of two primary clarifiers, two trickling filters in parallel, an abandoned trickling filter, a single final clarifier and chlorine disinfection. The facility has a permitted average daily flow of 500,000 GPD. Average daily flows reported by the plant in 1987 were approximately 337,000 GPD. The maximum daily flow recorded in 1987 was approximately 537,000 GPD on a permitted flow of 1.25 MGD. The plant presently operates under a permitted effluent limit of 20 mg/l BOD and 20 mg/l TSS.

Table II-7a summarizes the current TWC permit conditions as of 1987. Table II-7b shows the per capita wastewater flows for the years 1980 through 1987 for the municipal plants within the study area. The average daily effluent flows, BOD concentrations and TSS concentrations are shown for the years 1985, 1986 and 1987 on a monthly basis in Tables II-18 and are charted in Figures II-11a and II-11b. Influent BOD and TSS concentrations were not available for use in this study.

TREATMENT PLANTS SERVING MILITARY FACILITIES AND THE ARMY CORP OF ENGINEERS PARKS

There are six wastewater treatment plants which serve the military facilities in the study area. Five plants which serve Fort Hood are located in both Bell and Coryell Counties and are generally small in comparison with the municipal plants in the study area. The Fort Hood plants range in size from 10,000 to 30,000 GPD. According to the Texas Water Commission self-reporting information, not all of the Fort Hood plants discharge continuously, and depending on use, may not discharge for several months at a time. The plants presently operate under a permitted effluent limit of 200 mg/l COD and 30 mg/l TSS. Table II-7a summarizes the current TWC permit conditions as of 1987. Exhibit II-1 indicates the approximate location of each plant and point of discharge.

The U.S. Navy operates a plant which serves the Hercules, Inc. facility in McGregor as shown in Figure II-11. The plant consists of an Imhoff tank and an earthen lagoon to treat wastewater generated by their manufacturing process. There is no domestic discharge from restrooms or kitchen facilities entering this plant. The plant is permitted to discharge 25,000 GPD with an effluent BOD limit of 70 mg/l (TWC Permit No. 02335-01). At the present time, chlorine disinfection is being considered as an additional treatment step. Table II-7a summarizes the current TWC permit conditions as of 1987.

The Corp of Engineers provides wastewater treatment service for three recreational facilities located at Lake Stillhouse Hollow Park, Dana Peak Park and at Belton Lakeview Park. The plants were permitted for an average daily flows of 8,000 GPD, 10,000 GPD and 10,000 GPD respectively but stayed well below that figure on an average yearly basis. The plants are presently permitted for an effluent limit of 10 mg/l BOD and 15 mg/l TSS. Table II-7a summarizes the current TWC permit conditions as of 1987. The treatment facilities at Lake Stillhouse Hollow and at Dana Peak have recently been taken out of service and replaced with septic tank systems.

These facilities see their higher flows during the summer months due to the recreational use of the parks they serve. The highest flow experienced in 1986 by the Stillhouse Hollow Park plant was 4,100 GPD in July. The Dana Peak Park plant treated 5,200 GPD in July of 1986 and the Belton Lakeview Park treated 17,000 GPD in June of 1986. Because the use of the military facilities and the Corp of Engineers parks should remain relatively constant throughout the study period, and the discharges appear to have a limited impact on the overall water quality of the study area, it is not necessary to recommend a plan for the future expansion of these facilities. It is recommended however, that these facilities continue to be monitored and evaluated on a periodic basis to insure that the level of treatment being achieved continues to be adequate to maintain stream quality.

PRIVATE AND INDUSTRIAL WASTEWATER TREATMENT PLANTS

There are several private dischargers in the study area who operate plants which serve residential housing developments or are involved in commercial or manufacturing enterprises which require a discharge permit. Several of these operations do not discharge into the area streams, but

evaporate the wastewater or use the treated effluent for irrigation. The following is a list of the operations identified by this study:

PLANT NAME	FACILITY TYPE	PERMITTED FLOW	DISCHARGE STATUS
W.A. Matkin	Residential	25,000	L. Stlhse
U Rent M	Car Wash	1,000	Leon R.
M.L. Ellis & J. Baum	Golf Course	5,000	Irrigation
Rockwool Industries	Manufacturer	N/A	Evaporation
Ralph Wilson Plastics	Manufacturer	N/A	No Discharge

The W. A. Matkin plant is presently the largest discharger in this category. The plant is located approximately 1,200 feet east of the intersection of Indian Trail Drive and FM 2410 and serves three mobile home parks and several single family homes. The plant presently operates under a permitted effluent limit of 10 mg/l BOD and 15 mg/l TSS. This area was recently annexed by the City of Harker Heights. It is expected that the area served by this plant will eventually be served by the Harker Heights sewerage system, and the plant taken out of service.

The remaining permit holder which actually discharges effluent into a waterway is the U Rent M car wash. The establishment is located in the City of Temple and discharges into the the city storm sewer system which

eventually outfalls into the Leon River. The Texas Water Commission Permit for this discharge requires that the permitee tie into the City of Temple sanitary sewer system when utilities become available.

The current (1987) permit conditions for the private and industrial dischargers are shown in Table II-7b.

III. FACILITY PLAN DEVELOPMENT

FACILITY PLANNING ALTERNATIVES: UPPER NOLAN CREEK AND LAKE STILLHOUSE HOLLOW WATERSHEDS

Development of a useful facility plan requires balancing the projected cost of the planned wastewater transport and treatment facilities with the level of wastewater treatment and overall environmental benefit. Because the projected future growth within the Lake Stillhouse Hollow drainage basin has a potentially harmful impact on the water quality of Lake Stillhouse Hollow, a facility plan which can address both future wastewater collection and treatment requirements while maintaining the water quality of the area streams and lakes is the primary goal. Three facility plan alternatives were developed for the upper Nolan Creek and Lake Stillhouse Hollow drainage basins which offer varying limitations on discharge of treated effluent into the Lake. A general description of each alternative follows:

ALTERNATIVE NO. 1: <u>No point source discharges into Lake Stillhouse Hollow or tributaries.</u> This alternative assumes point discharge wasteflows into Lake Stillhouse Hollow or nearby tributaries will be prohibited. All projected wasteflows in the Killeen, Harker Heights, and Nolanville municipal growth areas and the future growth areas to the south, would be transported north, over the basin divide, to wastewater treatment facilities which discharge into Nolan Creek. No

sharing of facilities between municipalities would be required for this alternative. Refer to Exhibit III-1, Alternate No. 1 - No Discharge into Lake Stillhouse Hollow.

Growth areas to the north, east and west of Killeen will be served by expansion of the existing Killeen sewer system and is common to the three alternatives being considered. Growth areas south of Killeen will be served by a system of lift stations, force mains and trunk sewers which will carry the wastewater flows to the WCID No. 1 Main Wastewater Treatment Plant and to the WCID No. 1 Wastewater Treatment Plant No. 2 (Roy Reynolds Plant).

Refering to Exhibit III-1, a trunk sewer system will be required to serve the K1990-N-A growth area as well as the future growth areas to the south. Growth area K1990-T-A would require construction of the Trimmier Creek L.S. #2 which will pump to WCID No. 1 Wastewater Treatment Plant No. 2.

As future development continues to the south, construction of additional trunk sewers as well as a lift station, designated as Stagecoach Road L.S. #1 serving Area K2000-T-A, would be required by the year

2000. Stagecoach Road L.S. #2 and the Reese Creek L.S. would be needed by the year 2010 to provide service to growth areas K2010-T-B and K2010-RE-A.

Sanitary sewer service for remaining Killeen growth areas to be developed through the year 2030 would require construction of the Trimmier Creek L.S. #1, the Trimmier Road L.S., the Rock Creek L.S., the Onion Creek L.S., and the Hollow Drive L.S. as well as a trunk sewer collection system to transport flow to Trimmier Creek L.S #1.

Areas to the north of Harker Heights, shown in Exhibit III-1 as H2010-N-A and H2020-N-A, would be served by expansion of the existing sewer system. Growth areas south of Harker Heights would be provided service through construction of several of lift stations, force mains and trunk sewers which would transport the wastewater flows to the Harker Heights Wastewater Treatment Plant

Wastewater flows from Comanche Hills Utility District (C.H.U.D.) and the W. A. Matkin plant service areas, which are within the city limits of Harker Heights, will be transported to the Harker Heights Wastewater Treatment Plant and the existing plants serving these areas taken out of service by year 2000. Growth areas

adjacent to the existing Harker Heights sewer service area, designated as H2000-N-A and H2000-N-B, would require extention of the existing Harker Heights sewer system by the year 2000.

Construction of the Cedar Knob Road L.S. as shown on Exhibit III-1 should take place by the year 2010 to provide service to area H2010-T-A and ultimately to areas H2030-T-A and H2030-T-B as well as the Warrior's Path L.S. which will serve H2010-N-B.

Development areas adjacent to the Lake Stillhouse Hollow and within the Harker Heights sewer service area would be served by Chappel Hills L.S #1 and Chappel Hills L.S #2 as shown on Exhibit III-1. Flow from these lift stations would discharge at the Cedar Knob Road L.S. which would pump to the WCID #1 wastewater treatment plants in the Nolan Creek watershed.

Growth areas around the City of Nolanville, designated as N2000-N-A, N2000-N-B, N2010-N-A, N2010-N-B, N2020-N-A, N2020-N-B, and N2030-N-A would be provided service by extending the existing Nolanville sanitary sewer system. The plan for extending sewer services to the Nolanville growth areas would be common to all three alternatives being evaluated and therefore is not a factor in the analysis of the Facility Plan alternatives.

Flows from development communities on the south and east sides of Lake Stillhouse Hollow would be served by the Northside, Union Grove and Southside Lift Stations which would transport their wastewater flows by force main and gravity sewer to a future regional plant downstream of the Lake Stillhouse Hollow dam (designated as the Lake Dam STP). This plant would discharge into the Lampasas River.

ALTERNATIVE NO. 2: Small, non-regional point discharges into Lake Stillhouse Hollow and nearby tributaries. This alternative assumes a limited discharge of treated effluent would be allowed into Lake Stillhouse Hollow. This approach eliminates the cost of pumping the wastewater generated by small lakeside communities to the plants outside of the Lake Stillhouse Hollow drainage basin while keeping the discharge of wasteflows into the lake at a minimum. Refer to Exhibit III-2, Alternate No. 2 - Limited Discharge into Lake Stillhouse Hollow.

As in Alternative No. 1, this alternative requires transporting wastewater generated in the Killeen, Harker Heights, and Nolanville municipal growth areas

and the future growth areas to plants discharging into Nolan Creek. No sharing or regionalization of plants between municipalities would be required.

This alternative differs from Alternative No. 1 in that flows generated in lakeside development communities would be served by small isolated treatment plants discharging into the lake or its tributaries. Flows from developments in the Union Grove area, the Southside area and the Onion Creek basin south of Killeen would be served by the Union Grove, Southside and Onion Creek Wastewater Treatment Plants respectively, and the proposed Lake Dam Wastewater Treatment Plant would be eliminated.

ALTERNATIVE NO. 3: Small, non-regional and major regional point discharges into Lake Stillhouse Hollow and nearby tributaries. This alternative does not limit the wasteflow discharges into Lake Stillhouse Hollow. Costs associated with transporting wastewater to treatment plants in other watersheds is minimized in comparison with the other alternatives. Refer to Exhibit III-3, Alternate No. 3 - Unlimited Discharge into Lake Stillhouse Hollow.

This alternative proposes to serve the Killeen and Harker Heights municipal growth areas which are located within the Lake Stillhouse Hollow drainage basin with a major regional treatment plant (Trimmier STP) which would discharge into the lake. The logical and most central location of this plant would be on Trimmier Creek, inside the City of Killeen Extra-Territorial Jurisdiction (ETJ) and close to the present city limits of Harker Heights.

The population projections for this study indicate that the Trimmier STP would not be needed until the year 2010. The flows generated by the 2000 and 2010 growth areas of Killeen and Harker Heights would be temporarily served by the plants which discharge into Nolan Creek. This arrangement takes advantage of the low wastewater flows in the early years of development and the available capacities at the Nolan Creek plants. When the regional plant is built however, these flows would be diverted to the new plant.

The Killeen growth areas designated on Exhibit III-3 as K2000-T-A, K2010-T-A, K2010-T-B, K2020-T-A, K2030-T-B and K2030-RO-A would be served by the Trimmier Wastewater Treatment Plant. The Harker Heights growth areas designated as H2020-T-A, H2020-T-B, H2030-T-A and H2030-T-B would also be served by the Trimmier Wastewater Treatment Plant.

The growth area designated on Exhibit III-3 as K2000-T-A would be served by the Stagecoach Road L.S. through the year 2010. During this period, the wastewater flow from this area would be transported to the W.C.I.D. No. 1 and No. 2 plants in the Nolan Creek watershed. In 2010, the flows would be transported south to the Trimmier Creek Wastewater Treatment Plant through a gravity trunk sewer.

The Harker Heights growth areas designated as H2020-T-A, H2020-T-B, H2030-T-A and H2030-T-B would be served by the Cedar Knob Road L.S. through the year 2010. The wastewater flow from this area would be transported to the Harker Heights Wastewater Treatment Plant the Nolan Creek watershed. In 2010, the flows would be transported south to the Trimmier Creek Wastewater Treatment Plant through a gravity trunk sewer.

Flows generated in the Onion Creek basin of Killeen's growth area would be transported to this regional plant also, as would flows from the Comanche Hills Utility District in Harker Heights. The Nolanville growth areas within the lake watershed would be served by the Nolanville (WCID #3) municipal plant. Development communities along the south and east side of the lake

would be served by the Union Grove, Southside and Northside wastewater treatment plants, discharging directly to the lake as shown in Exhibit III-3.

PROJECTION OF FUTURE WASTEWATER QUANTITY AND QUALITY

Wastewater flows calculated on a gallons per capita per day basis were developed for the existing major municipal areas to provide a basis from which to project the wastewater flows generated by future growth. It is generally accepted that due to the rising cost of water production and the acceptance of water conservation by the general public, the per capita water usage will most likely decrease in the years to come. We have made an effort to account for this by decreasing the per capita wastewater rate in future years for the projected growth areas around Killeen, Harker Heights and Nolanville. The resulting flows are shown in Tables II6a, II-6b and II-6c.

SIZING OF WASTEWATER TRANSPORTATION FACILITIES

Wastewater transportation facilities such as sanitary sewers, lift stations and force mains were sized to provide service to the growth areas identified within the Nolan Creek and Lake Stillhouse Hollow drainage basins. Sanitary sewers and force mains were sized for the ultimate capacity required during the study period while lift stations were sized and expanded in increments as population growth dictated. Tables III-1 and III-2 detail the sewered population and the maximum monthly flows for the minor

growth areas of Killeen and Harker Heights. Using these flows, the utilities proposed for these areas can be sized. Table III-3 provides sizing information for these facilities for each alternative described previously.

DEVELOPMENT OF TRANSPORT FACILITIES CAPITAL COSTS

Estimated costs for wastewater transport facilities were developed using itemized bid tabulations for comparable construction projects. Costs for proposed lift stations were formulated using historical construction costs for existing lift stations of different capacities. From this information, cost versus flow relationships were developed. Lift station capital costs were then determined using capacity as the basis for costs.

For sewer lines and force mains, average unit prices were developed for each incremental line size and depth on a linear foot basis and applied to the proposed new construction.

Table III-4 summarizes the present worth capital costs associated with the construction of future transport facilities for the alternatives proposed for the Nolan Creek and Lake Stillhouse Hollow drainage basin.

DEVELOPMENT OF TRANSPORT FACILITIES O & M COSTS

Costs associated with operating and maintaining future transport facilities were assumed to be approximately 10% of the capital cost of the facility per year. This cost covers the expenses associated with labor, overhead and materials necessary to maintain the transport facility during it's service life. Power consumption was calculated separately for each lift station based on the estimated horsepower requirements and the amount of power used per year.

Table III-5 summarizes the present worth O & M costs associated with the construction of future transport facilities for the alternatives proposed for the Nolan Creek and Lake Stillhouse Hollow drainage basin.

WASTEWATER TREATMENT PLANT EFFLUENT QUALITY REQUIREMENTS

The Texas Water Commission has established surface water quality standards for most of the major streams and lakes in the State. These standards categorize the uses of these streams and lakes in order to establish a benchmark for the level of water quality to be maintained. In order to maintain these standards as development occurs, it was necessary to model the streams and lakes using computer analysis to determine the level of treatment required for each plant. This procedure takes into consideration the assimilation capacity of the receiving stream or lake and the wasteload being discharged into it (Refer to Water Quality Evaluation Report).

Based on the water quality modeling performed on the Nolan Creek and Lake Stillhouse Hollow drainage basin, a number of wastewater treatment plants within the Killeen, Harker Heights and Nolanville area will require more stringent permit limits on effluent BOD, TKN, NH3-N and dissolved oxygen. Table III-6 shows the resulting permit limitations and wastewater flows for each plant for each alternative. As can be seen, those plants with the greater flows will be required to comply with a more stringent effluent standard than those plants with lesser flows. Those plants discharging into Lake Stillhouse Hollow will also have more limiting effluent standards.

SIZING OF WASTEWATER TREATMENT FACILITIES

Average daily flow values (Qa) for wastewater treatment facilities were based on the population and the gallons per capita per day calculated for each plant service area. Table III-7, Alternate Treatment Plant Populations and Flows by Decade, provides average daily flows and maximum monthly flows for each plant in the three alternatives.

The maximum daily flow (Qp) was assumed to be 3 x Qa for the purposes of sizing unit processes within the treatment plants. The values for BOD and TKN concentrations used for this study are as follows:

PER CAPITA WASTELOAD CONTRIBUTIONS

BOD = 0.21 lb/cap/day

TKN = 0.33 lb/cap/day

WASTEWATER STRENGTH AT 160 GPD

$$BOD = \frac{0.21 \text{ LB/CAP/DAY X } 1.0 \text{ MGD}}{160 \text{ GPCD X } 8.34} = 157 \text{ mg/l}$$

$$TKN = \frac{0.33 \text{ LB/CAP/DAY X } 1.0 \text{ MGD}}{160 \text{ GPCD X } 8.34} = 25 \text{ mg/l}$$

The following is the unit process design criteria used for the sizing of the treatment plant components for this study:

1. Influent Lift Station, Bar Screens, Grit Removal - sized at Qp hydraulic capacity.
2. Aeration Basins - sized at 45 lb. BOD/1000 cubic feet of aeration volume and BOD loading of .21 lb/capita/day
3. Secondary Clarifiers - Size at 1000 GPD /sq. ft. at Qp.
4. Chlorine Contact Basin - Size at 20 minutes detention time at Qp.
5. For Plants Requiring Nitrification (any limit less than 10 mg/l) - Add 50% extra aeration basin capacity, effectively reducing volumetric loading to 30 lb. BOD/1000 cubic feet
6. For Tertiary Solids Removal (any limit less than 10 mg/l) - Add effluent filtration for Qp.

DEVELOPMENT OF TREATMENT PLANT CAPITAL COSTS

The capital costs for wastewater treatment facilities were separated into two categories; the cost flow related treatment plant facilities and the cost of BOD and TKN related treatment plant facilities.

Flow related costs are associated with the construction of plant piping, headworks, clarifiers, clarifiers and disinfection basins. Table III-8 provides unit costs for the various flow related processes based on incremental plant size.

BOD and TKN related costs are associated with the construction of aeration basins, gravity thickeners, aerobic digesters, and sludge handling facilities. Table III-9 provides unit costs for the various BOD and TKN related processes based on incremental plant size.

Using the unit process sizing criteria established for this study, base plant designs were developed for average daily flows of 0.1 MGD, 1.0 MGD, 5.0 MGD, 10.0 MGD and 30.0 MGD. The base plant costs were based on an effluent limitation of 10 BOD, 15 TSS and 2 DO. Historical plant costs were used for various base plant sizes and a size versus cost relationship was developed. A size versus capital cost relationship was also developed for both the enhanced treatment processes and for nitrification, post aeration, and filtration.

Tables III-13a through III-13L provide the capital costs associated with the construction of proposed wastewater treatment plants and expansions of existing plants for the three alternatives being considered.

DEVELOPMENT OF TREATMENT PLANT O & M COSTS

Projected costs for operation and maintenance of wastewater treatment plant facilities were estimated for this study. Values for labor and maintenance related treatment plant costs were developed using information provided by the EPA Reference Guide for Estimating Cost and Manpower Requirements, 1980. Chemical use was projected by calculating the chemical quantity required for each unit process based flow or loading. Unit costs for the chemicals were based on information provided by local suppliers.

Power costs were developed by estimating motor horsepowers for the various flow and BOD/TKN related unit processes in a typical wastewater treatment plant. As the plant flow or BOD/TKN loadings increase, the associated power costs increases for that unit process.

Table III-10 provides power costs for flow related and BOD/TKN related unit processes based on plant size. Tables III-11a through III-11e provide O & M costs for flow related

treatment processes based on incremental plant size. Tables III-12a through III-12e provides unit costs for BOD and TKN related O & M based on incremental plant size.

Tables III-13a through III-13L provide the O & M costs associated with operation of the proposed wastewater treatment plants and existing wastewater treatment plants for the three alternatives being considered.

ESTIMATED CAPITAL AND O & M COSTS FOR THE NOLAN CREEK AND LAKE STILLHOUSE HOLLOW FACILITY PLAN ALTERNATIVES

Estimated present worth capital and O & M costs were totaled for the facilities and improvements proposed in the facility plan alternatives. The total costs for the alternative plans are as follows:

Alternative No. I	- No Discharge into Lake Stillhouse Hollow	$66,951,000
Alternative No. II	- Limited Discharge into Lake Stillhouse Hollow	$69,520,000
Alternative No. III	- Unlimited Discharge into Lake Stillhouse Hollow	$68,898,000

Table III-14, "Summary of Present Worth Costs for Each Alternative", presents the capital and O & M cost for the transport and treatment facilities by service areas.

TABLE II-1
BELL COUNTY 1980 CENSUS POPULATION = 157,889

REPORTS	POPULATION COUNT					
	1985	1990	2000	2010	2020	2030
1980 TDWR HIGH		202,687	266,290	359,183	455,909	588,503
1980 TDWR LOW		195,600	237,853	295,003	356,537	414,659
1986 TDWR HIGH		186,384	252,460.	341,727	437,727	569,127
1986 TDWR LOW		170,831	210,747	263,526	322,134	376,767
1985 CTCOG (1.)	172,136	186,384				
KIPLINGER LETTER (2.)	170,800	188,257	254,333			
1985 SALES & (3.) MARKETING MAGAZINE	169,956					
1985 R & P (4.)		191,186	232,486	283,186	345,036	424,486
1980 CTCOG (4.)		211,810	264,620	333,330	423,060	540,390
USED IN THIS REPORT (4)	174,500	191,186	232,486	283,186	345,036	424,486

1. 1985 estimates were obtained from the Graph of Total Population for Bell and Coryell Counties in the 1985 CTCOG report.
2. Estimates were reportedly based on TDWR 1980 data for the Texas Kiplinger Letter.
3. Obtained from CTCOG.
4. Report to Bell County on Water Supply Requirements April, 1985.

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TABLE II-2
CORYELL COUNTY 1980 CENSUS POPULATION = 56,767

REPORTS	POPULATION COUNT						
	1980	1985	1990	2000	2010	2020	2030
1986 TDWR HIGH	56,767		66,694	84,789	102,031	119,635	140,364
1986 TDWR LOW	56,767		64,076	75,395	86,203	96,474	107,523
1985 CTCOG (1.)	56,767	61,730	66,694				
KIPLINGER LETTER (2.)	56,767	57,200	70,630	88,275			
1985 SALES & (3.) MARKETING MAGAZINE	56,767	64,000					
USED IN THIS REPORT (4)	56,767	60,668	72,554	87,022	97,361	107,519	121,446

1. 1985 estimates were obtained from the Graph of Total Population for Bell and Coryell Counties in the 1985 CTCOG Report.
2. Estimates were reportedly based on TDWR 1980 data for the Texas Kiplinger Letter.
3. Obtained from CTCOG.
4. Based on above projections and totals of individual urban area populations.

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TABLE II-3

LAMPASAS COUNTY 1980 CENSUS POPULATION = 12,005

REPORTS	POPULATION COUNT						
	1980	1985	1990	2000	2010	2020	2030
1986 TDWR HIGH	12,005		15,851	22,468	31,805	42,691	58,420
1986 TDWR LOW	12,005		13,766	17,868	25,070	34,970	46,434
KIPLINGER LETTER (2.)	12,005	13,600		20,056			
1985 SALES & MARKETING MAGAZINE (3.)	12,005	14,000					
K/A RECOMMENDATION	12,005	13,000	14,000	18,000	25,000	35,000	46,000

TABLE II-4

ESTIMATED 1985 TOTAL AND SEWERED POPULATION BY CITY
BASED ON WATER/SEWER CONNECTION GROWTH

CITY	1980 CENSUS POP.	1980 WATER CONN.	POP./ WATER CONN.	1980 SEWER CONN.	% SEWERED CONN.	EST. SEWERED CONN.		1985 WATER CONN.	1985 SEWER CONN.	% SEWERED CONN.	% INCREASE WATER CONN.	% INCREASE SEWER CONN.	PROJ. 1985 WATER POP.	PROJ. 1985 SEWERED POP.
TEMPLE	42,483	12,275	3.46	11,975	97.6	41,463	==	14,095	13,795	97.9	14.8	15.2	48,770	47,746
BELTON	10,660	2,955	3.61	2,355	79.7	8,496	==	3,408	2,662	78.1	15.3	13.0	12,290	9,600
KILLEEN	46,296	12,107	3.82	11,649	96.2	44,537	==	15,351	14,445	94.1	26.8	24.0	58,703	55,240
FT. HOOD	18,036	18,036	NA	NA	100	18,036	==	18,036	NA	100	0	0	18,036	18,036
NOLANVILLE (Bell Co. WCID #3)	1,308	327	4.0	302	92.4	1,208	==	392	368	93.9	19.9	21.9	1,568	1,473
HARKER HEIGHTS (Bell Co. WCID #4)	7,345	2,842	2.58	2,742	96.5	7,088	==	3,271	3,170	96.9	15.1	15.6	8,454	8,192
COPPERAS COVE	19,469	6,900	2.82	6,600	95.7	18,623	==	7,690	7,416	96.4	11.4	12.4	21,700	20,919
GATESVILLE	6,260	2,271	2.76	2,080	91.6	5,734	==	2,458	2,211	90	8.2	6.3	6,775	6,100
MOODY	1,385	486	2.85	435	89.5	1,240	==	531	480	90.4	9.3	10.3	1,514	1,368
OGLESBY	470	NA	NA	NA	NA	440	==	NA	NA	NA	NA	NA	470	440
LAMPASAS	6,165	2,188	2.82	1,962	90	5,550	==	2,262	2,091	92.4	3.4	6.6	6,379	5,890
MORGAN'S POINT RESORT	1,082	303	3.57	79	26.1	283	==	550	79	14.4	81.5	0	1,964	283

* ESTIMATED
** EXTRAPOLATED BASED ON 1983 CONNECTIONS

TABLE II-5

BELL COUNTY STUDY AREA PROJECTED POPULATIONS AND FLOWS

CITY	1980 ALL BELL CO. CENSUS	1985 TOTAL POP.	1985 SEWERED POP.	1985 FLOW (MGD)	1990 TOTAL POP.	1990 SEWERED POP.	1990 FLOW (MGD)	2000 TOTAL POP.	2000 SEWERED POP.	2000 FLOW (MGD)	2010 TOTAL POP.	2010 SEWERED POP.	2010 FLOW (MGD)	2020 TOTAL POP.	2020 SEWERED POP.	2020 FLOW (MGD)	2030 TOTAL POP.	2030 SEWERED POP.	2030 FLOW (MGD)
BELTON	10,660	12,300	9,600 3400 AC 2.8/AC		14,000	11,300 110 GPCD	1.24	1,800	16,400 115 GPCD	1.89	23,000	22,000 115 GPCD	2.53	29,000	28,400 120 GPCD	3.41	37,000	36,300 14900 AC 2.4/AC 125 GPCD	4.54
HARKER HEIGHTS	7,345	8,400	8,200 3500 AC 2.3/AC	1.39	9,400	8,900	1.51	12,000	11,400	1.93	15,000	14,300	2.36	19,000	18,600	3.00	24,000	23,500 7800 AC 3/AC	3.72
KILLEEN	46,296	52,200	49,000 10600 AC 4.6/AC	13.43	58,000	55,100 15800 AC	14.37	72,000	68,400 20400 AC	16.53	90,000	85,500 23630 AC	19.16	112,000	109,800 26780 AC	22.80	140,000	137,200 29630 AC 4.6/AC	26.84
MORGAN'S POINT RESORT	1,082	1,900	100		2,100	100 100 GPCD	0.01	2,700	100 100 GPCD	0.01	3,400	100 100 GPCD	0.01	4,000	100 100 GPCD	0.01	4,700	100 100 GPCD	0.01
NOLANVILLE	1,308	1600	1,500 670 AC 2.2/AC		1,700	1,600 125 GPCD	0.20	2,200	2,100 125 GPCD	0.26	2,800	2,700 125 GPCD	0.34	3,600	3,500 125 GPCD	0.44	4,600	4,500 2878 AC 1.6/AC 125 GPCD	0.56
TEMPLE	24,640	27,800	24,500 9600 AC 2.55/AC		29,600	28,100 110 GPCD	3.09	39,700	37,700 115 GPCD	4.34	51,500	48,900 115 GPCD	5.62	64,300	63,000 120 GPCD	7.56	80,000	78,400 125 GPCD	9.80
FT. HOOD	18,036	18,000	18,000 160 GPCD	2.88	18,000	18,000 160 GPCD	2.88	18,000	18,000 160 GPCD	2.88	18,000	18,000 160 GPCD	2.88	18,000	18,000 160 GPCD	2.88	18,000	18,000 160 GPCD	2.88
SUBTOTAL: URBAN	109,367	122,200	(70% OF CO.)		132,800			164,600	(70.8% OF CO.)		203,700	(71.9% OF CO.)		249,900	(72.4% OF CO.)		308,300	(72.6% OF CO.)	
STUDY AREA RURAL:		9,400			11,200			14,000			17,100			20,400			24,000		
TOTAL: STUDY AREA		131,600	(75.4% OF CO.)		144,000			178,600	(76.8% OF CO.)		220,800	(78.0% OF CO.)		270,300	(78.3% OF CO.)		332,300	(78.3% OF CO.)	
ALL BELL COUNTY TOTAL	157,889	174,500			191,186			232,486			283,186			345,036			424,486		
ALL BELL COUNTY RURAL					28,000			33,000			38,000			43,000			48,000		

*37.5% OF TOTAL BELL RURAL BASED ON % OF RURAL ACREAGE IN STUDY AREA VS. TOTAL BELL CO. RURAL ACREAGE.
**50.0% OF TOTAL BELL RURAL
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TABLE II-5a

Coryell County Population and Wastewater Flow Projections

	1980	1985			1990			2000			2010			2020			2030		
CITY	Census	Total	Sewered	Flow (mgd)	Total	Sewered	Flow (mgd)	Total	Sewered	Flow (mgd)	Total	Sewered	Flow (mgd)	Total	Sewered	Flow (mgd)	Total	Sewered	Flow (mgd)
Copperas Cove	19,469	21,700	20,615 125	2.58	25,682	25,682 125	3.21	33,470	33,470 125	4.18	36,800	36,800 125	4.60	39,744	39,744 125	4.97	42,924	42,924 125	5.37
Gatesville & Fort Gates	7,015	7,550	6,436 100	0.64	12,000	11,400 100	1.14	14,500	13,775 110	1.52	18,500	17,575 115	2.02	22,750	22,295 120	2.68	29,575	28,984 125	3.62
Ft. Hood	13,200	13,200	13,200 160	2.12	13,200	13,200 160	2.12	13,200	13,200 160	2.12	13,200	13,200 160	2.12	13,200	13,200 160	2.12	13,200	13,200 160	2.12
Evant	425	425	425 100	0.04	425	425 100	0.04	425	425 100	0.04	425	425 100	0.04	425	425 100	0.04	425	425 100	0.04
Oglesby	470	517	491 100	0.05	569	541 100	0.05	626	595 100	0.06	688	654 100	0.07	757	719 100	0.07	833	791 100	0.08
Subtotal	40,579	43,392	41,167		51,876	51,248		62,221	61,465		69,613	68,654		76,876	76,383		86,957	86,324	
Rural - All Coryell Co.	16,188	17,296	16,409		20,678	20,428		24,801	24,500		27,748	27,366		30,643	30,446		34,489	34,409	
All Coryell County	56,767	60,688	57,576	5.43	72,554	71,676	6.56	87,022	85,965	7.92	97,361	96,020	8.85	107,519	106,829	9.88	121,446	120,733	11.23

Rural Acreage = 509,000
Fort Hood Urban = 169,000
Total County = 678000

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TABLE II-6 a

SUMMARY OF
PROJECTED SEWERED POPULATIONS & FLOWS FOR
KILLEEN AND FT. HOOD BY MAJOR GROWTH AREA & DECADE

GROWTH AREA	ACREAGE	YEAR 1985 SEWERED POP/AC	YEAR 2030 SEWERED POP/AC	1985 POP.	1985 AVG. DAILY FLOW(a) (MGD)	1990 POP. GROWTH	1990 CUM. POP.	1990 AVG. DAILY FLOW(a) (MGD)	2000 POP. GROWTH	2000 CUM. POP.	2000 AVG. DAILY FLOW(a) (MGD)	2010 POP. GROWTH	2010 CUM. POP.	2010 AVG. DAILY FLOW(a) (MGD)	2020 POP. GROWTH	2020 CUM. POP.	2020 AVG. DAILY FLOW(a) (MGD)	2030 POP. GROWTH	2030 CUM. POP.	2030 AVG. DAILY FLOW(a) (MGD)
	10,600	4.68	5.83	149,600	8.43	2,900	52,500	8.93	2,300	54,800	9.32	2,200	57,000	9.69	2,400	59,400	10.10	2,400	61,800	10.51
K1985					4.75 *			5.00 **			5.00 *			5.00 **			5.00 **			5.00 **
					-----			-----			-----			-----			-----			-----
@170 GPCD					13.18			13.93			14.32			14.69			15.10			15.51
K1990	5,200		5.00			2,600	2,600		7,500	10,100		5,900	16,000		5,500	21,500		4,500	26,000	
@170 GPCD								0.44			1.72			2.72			3.65			4.42
K2000	4,600		4.50						3,500	3,500		6,500	10,000		6,200	16,200		4,500	20,700	
@140 GPCD											0.49			1.40			2.27			2.90
K2010	3,150		3.75									2,500	2,500		6,500	9,000		2,800	11,800	
@140 GPCD														0.35			1.26			1.65
K2020	3,150		3.00												3,700	3,700		5,800	9,500	
@140 GPCD																	0.52			1.33
K2030	2,970		2.50															7,400	7,400	
@140 GPCD																				1.03
TOTALS	29,670			149,600	13.18	5,500	55,100	14.37	13,300	68,400	16.53	17,100	85,500	19.16	24,300	109,800	22.80	27,400	137,200	26.84

* Ft. Hood pop. of 31,200 x 152 GPCD
** Projected Ft. Hood pop. of 31200 x Projected 160 GPCD
(a) On average annual basis

TABLE II-6b

SUMMARY OF
PROJECTED SEWERED POPULATIONS & FLOWS FOR
HARKER HEIGHTS/COMANCHE HILLS/NATKIN BY MAJOR GROWTH AREA & DECADE

GROWTH AREA	ACREAGE	YEAR 1985 SEWERED POP/AC	YEAR 2030 SEWERED POP/AC	1985 POP.	1985 AVG. DAILY FLOW(a) (MGD)	1990 POP. GROWTH	1990 CUM. POP.	1990 AVG. DAILY FLOW(a) (MGD)	2000 POP. GROWTH	2000 CUM. POP.	2000 AVG. DAILY FLOW(a) (MGD)	2010 POP. GROWTH	2010 CUM. POP.	2010 AVG. DAILY FLOW(a) (MGD)	2020 POP. GROWTH	2020 CUM. POP.	2020 AVG. DAILY FLOW(a) (MGD)	2030 POP. GROWTH	2030 CUM. POP.	2030 AVG. DAILY FLOW(a) (MGD)
H1985	3,660	2.40	3.67	8,200			8,650		1,200	10,450		1,250	11,700		1,000	12,700		750	13,450	
				100*			100 *													
				500**			500 **													
@170 GPCD				8,800***	1.50		9,250 ***	1.57			1.78			1.99			2.16			2.29
H1990	260		3.00			250	250		200	450		150	600		100	700		80	780	
@170 GPCD								0.04			0.08			0.10			0.12			0.13
H2000	750		3.00						500	500		700	1,200		600	1,800		450	2,250	
@140 GPCD											0.07			0.17			0.25			0.31
H2010	1,520		2.50									800	800		1,800	2,600		1,200	3,800	
@140 GPCD														0.11			0.36			0.53
H2020	1,240		2.00												800	800		1,680	2,480	
@140 GPCD																	0.11			0.35
H2030	370		2.00															740	740	
@140 GPCD																				0.10
TOTALS	7,800			8,800	1.50	250	9,500	1.61	1,900	11,400	1.93	2,900	14,300	2.37	4,300	18,600	3.00	4,900	23,500	3.71

(a) ON AVERAGE ANNUAL BASIS
* ESTIMATED PRESENT POPULATION SERVED BY COMANCHE HILLS UTILITY DISTRICT (C.H.U.D.) SEWAGE TREATMENT PLANT
** ESTIMATED PRESENT POPULATION SERVED BY NATKIN SEWAGE TREATMENT PLANT
*** TOTAL ESTIMATED PRESENT POPULATION SERVED BY HARKER HEIGHTS, C.H.U.D., AND NATKIN SEWAGE TREATMENT PLANTS
7:508

TABLE II-6 c

SUMMARY OF
PROJECTED SEWERED POPULATIONS & FLOWS FOR
NOLANVILLE BY MAJOR GROWTH AREA & DECADE

				1985		1990			2000			2010			2020			2030		
GROWTH AREA	ACREAGE	YEAR 1985 SEWERED POP/AC	YEAR 2030 SEWERED POP/AC	POP.	AVG. DAILY FLOW(a) (MGD)	POP. GROWTH	CUM. POP.	AVG. DAILY FLOW(a) (MGD)	POP. GROWTH	CUM. POP.	AVG. DAILY FLOW(a) (MGD)	POP. GROWTH	CUM. POP.	AVG. DAILY FLOW(a) (MGD)	POP. GROWTH	CUM. POP.	AVG. DAILY FLOW(a) (MGD)	POP. GROWTH	CUM. POP.	AVG. DAILY FLOW(a) (MGD)
N1985	670	2.2	2.30	1500		0	1,500		40	1,540		0	1,540		0	1,540		0	1,540	
@125 GPCD					0.19			0.19			0.19			0.19			0.19			0.19
N1990	192		2.00			100	100		100	200		60	260		60	320		60	380	
@125 GPCD								0.01			0.03			0.03			0.04			0.05
N2000	704		1.50						360	360		240	600		240	840		220	1,060	
@125 GPCD											0.05			0.08			0.11			0.13
N2010	480		1.50									300	300		200	500		220	720	
@125 GPCD														0.04			0.06			0.09
N2020	512		1.20												300	300		310	610	
@125 GPCD																	0.04			0.08
N2030	192		1.00															190	190	
@125 GPCD																				0.02
TOTALS	2,750			1,500	0.19	100	1,600	0.20	500	2,100	0.27	600	2,700	0.34	800	3,500	0.44	1,000	4,500	0.56

(a) On average annual basis

TABLE II-7a

- CURRENT (1987) PERMIT CONDITIONS FOR ALL STUDY AREA DISCHARGERS

NAME	PERMIT NO.	FLOW AVG. DLY mgd	FLOW MAX DLY mgd	BOD AVG. DLY mg/l	BOD MAX DLY mg/l	TSS AVG. DLY mg/l	TSS MAX DLY mg/l	NH-3 AVG. DLY mg/l	NH-3 MAX DLY mg/l	COD AVG. DLY mg/l	COD MAX DLY mg/l	REMARKS
B.R.A. Temple- Belton Regional	WQ0011318001	6	12	20	45	20	45	--	--	--	--	
Bell County W.C.I.D. #1	WQ0010351002	15	35	10	25	15	40	13	10	--	--	
Bell County W.C.I.D. #3	WQ0010797001	0.12	0.24	10	35	15	60	--	--	--	--	
Bell County W.C.I.D. #4	WQ0010155001	1.45	4.35	10	25	15	40	--	--	--	--	
Copperas Cove - South Plant	WQ0010045003	1	2	20	45	20	45	--	--	--	--	
Copperas Cove - New Northeast Plant	WQ0010045004	0.8	1.6	20	45	20	45	--	--	--	--	
Copperas Cove - New Northwest Plant	WQ0010045005	1.2	2.4	20	45	20	45	--	--	--	--	
City of Gatesville	WQ0010167001	1	2	20	45	20	45	--	--	--	--	
City of Moody	WQ0010225001	0.2	0.5	20	65	20	65	--	--	--	--	
City of Oglesby	WQ0010914001	0.025	0.05	20	65	20	65	--	--	--	--	
City of Lampasses - Sulphur Plant	WQ0010205001	0.5	1.25	20	45	20	45	--	--	--	--	
City of Lampasses - Henderson Plant	WQ0010205002	0.5	1.25	20	45	20	45	--	--	--	--	
Evant	WQ0011011001	0.03	0.05	20	65	20	65	--	--	--	--	
Comanche Hills Utility District	WQ0012016001	0.02	0.05	10	35	15	60	--	--	--	--	
Matkin	WQ0013262001	0.025	--	10	35	15	60	--	--	--	--	
Morgan's Point Resort	WQ0010918002	--	--	--	--	--	--	--	--	--	--	a
Rockwool	WQ0002843001	--	--	--	--	--	75	--	--	--	--	b
Ralph Wilson Plastics	WQ0001599001	0.048	0.065	5	10	3	6	6	11	17	34	c
US Army COE - Stillhouse Park Plant	WQ0012156001	0.008	0.012	10	35	15	60	--	--	--	--	d
US Army COE - Dana Peak Park Plant	WQ0012156002	0.01	0.015	10	35	15	60	--	--	--	--	d
US Navy - Hercules Plant	WQ0002335001	0.025	0.05	--	70	--	--	--	--	--	--	
US Dept. of Army West Fort Hood	WQ0002230001	0.03	--	--	--	--	30	--	--	--	200	
US Dept. of Army Fort Hood - 001	WQ0002233001	--	--	--	--	--	30	--	--	--	200	
US Dept. of Army Fort Hood - 002	WQ0002233002	--	--	--	--	--	30	--	--	--	200	
US Dept. of Army Fort Hood - 003	WQ0002233003	--	--	--	--	--	30	--	--	--	200	

TABLE II-7a

TABLE __ - CURRENT (1987) PERMIT CONDITIONS FOR ALL STUDY AREA DISCHARGERS

NAME	PERMIT NO.	FLOW AVG. DLY mgd	FLOW MAX DLY mgd	BOD AVG. DLY mg/l	BOD MAX DLY mg/l	TSS AVG. DLY mg/l	TSS MAX DLY mg/l	NH-3 AVG. DLY mg/l	NH-3 MAX DLY mg/l	COD AVG. DLY mg/l	COD MAX DLY mg/l	REMARKS
US Dept. of Army Fort Hood - 004	WQ0002233004	--	--	--	--	--	30	--	--	--	200	
US Dept. of Army Fort Hood - 005	WQ0002233005	--	--	--	--	--	30	--	--	--	200	
US Dept. of Army Fort Hood - 006	WQ0002233006	--	--	--	--	--	30	--	--	--	200	
US Dept. of Army Fort Hood - 007	WQ0002233007	--	--	--	--	--	30	--	--	--	200	
US Dept. of Army Fort Hood - 010	WQ0002233010	0.01	--	20	45	20	45	--	--	--	200	
Greenbrier Golf Club	WQ0010888001	0.005	0.01	20	45	20	45	--	--	--	--	
U-Rent-M	WQ0002939001	--	--	--	--	--	--	--	--	--	--	e
Johnson Universal	WQ0013358001	--	--	--	--	--	--	--	--	--	--	f
Lacy Feed	WQ0002214001	--	--	--	--	--	--	--	--	--	--	g
Lacy Feed	WQ0002369001	--	--	--	--	--	--	--	--	--	--	h
Brazos Electric Power	WQ0001384004	--	--	--	--	--	--	--	--	--	--	j
Brazos Electric Power	WQ0001384005	--	--	--	--	--	--	--	--	--	--	j
Brazos Electric Power	WQ0001384104	--	--	--	--	--	--	--	--	--	--	j
Brazos Electric Power	WQ0001384105	--	--	--	--	--	--	--	--	--	--	j

a No Data Provided, Records Kept At Site
b No Discharge, Spray Irrigation for Final Effluent Disposal Only
c COD in LB/DAY
d Plants Abandoned Fall of 1987
e New Permit - Issued November 17,1987
f Permit Applied For But Not Issued. Waiting On Public Hearing
g Site Used for Irrigation Only
h Site Closed May 1987
j Out of Operation Since 1977

TABLE II-7b

AVG. DAILY, MAX. DAILY, & MAX. MONTHLY PER CAPITA SEWER FLOWS
FOR MAJOR MUNICIPAL DISCHARGERS

PERMIT NAME	DISCHARGE PERMIT NUMBER	FLOW AVG. MGD PERMIT	FLOW AVG. MGD ACTUAL	FLOW MAX. DAILY MGD PERMIT	FLOW MAX. DAILY MGD ACTUAL	FLOW MAX. MONTHLY MGD PERMIT	FLOW MAX. MONTHLY MGD ACTUAL	EST. SEWERED POP.	AVG. DAILY PER CAP. FLOW (GPCD)	AVG. DAILY REC'D. GPCD FOR STUDY	MAX. MONTHLY PER CAP. FLOW (GPCD)	MAX. MONTHLY REC'D. GCPC FOR STUDY
BRAZOS RIVER AUTHORITY	WQ0011318											
1980		5.000	3.840	12.000	9.590	N/A	5.986	29,620	-	110 IN 1990	202	
1985		5.000	3.740	12.000	12.490	N/A	4.823	34,000	110	TO	141	200
1986		6.000	3.524	12.000	10.560	N/A	5.484	-	-	125 IN 2030	-	
1987		6.000	3.340	12.000	10.277	N/A		-	-		-	
BELL CTY. WCID NO. 1	WQ0010351									170 FOR EXIST. KILLEEN AREAS		250 FOR EXIST. KILLEEN AREAS
1980		15.000	11.390	35.000	19.610	N/A	14.803	75,200 *	151 **	140 FOR NEW	197	200 FOR NEW
1985		15.000	13.150	35.000	36.100	N/A	17.011	80,238 *	163 **	KILLEEN DEV.	212	KILLEEN DEV.
1986		15.000	12.410	35.000	29.100	N/A	17.555	81,400	-	160 FOR FT.	-	200 FOR FT.
1987		15.000	13.140	35.000	28.700	N/A	17.116	-	-	HOOD ***	-	HOOD ***
BELL CTY. WCID NO. 3 (Nolanville)	WQ0010797											
1980		N/A	N/A	N/A	N/A	N/A	N/A	1,208	-	125	-	
1985		0.120	0.195	0.240	0.368	N/A	0.330	1,300	130		220	188
1986		0.120	0.172	0.240	0.337	N/A	0.263	1,520	113		173	
1987		0.120	0.168	0.240	0.395	N/A	0.198	1,540	109		129	
BELL CTY. WCID NO. 4 (Harker Heights)	WQ0010155									170 FOR EXIST. AREAS		250 FOR EXIST. DEVELOPMENT
1980		1.450	0.830	4.350	3.000	N/A	1.670	7,088	117	140 FOR NEW	236	200 FOR NEW
1985		1.450	1.130	4.350	3.210	N/A	1.802	8,192	138	SEWERED AREAS	220	DEVELOPMENT***
1986		1.450	1.380	4.350	4.210	N/A	2.354	8,340	165		282	
1987		1.450	1.347	4.350	3.600	N/A	1.906	8,480	159		225	
COPPERAS COVE, CITY OF (South Plant)	WQ0010045 -003											
1980		1.000	0.494	2.000	1.625	N/A	0.793	4,209	117	125	188	
1985		1.000	0.580	2.000	1.180	N/A	0.673	4,728	123		142	188
1986		1.000	0.598	2.000	1.695	N/A	0.897	4,910	122		183	
1987		1.000	0.602	2.000	1.057	N/A	0.754	5,092	118		148	

(NOTE: 1987 DATA FOR JAN/JULY ONLY)
* COMBINED FT. HOOD & CITY OF KILLEEN POPULATION
** COMBINED FT. HOOD & CITY OF KILLEEN FLOWS
*** SEE TABLE 8

TABLE II-7b

AVG. DAILY, MAX. DAILY, & MAX. MONTHLY PER CAPITA SEWER FLOWS
FOR MAJOR MUNICIPAL DISCHARGERS

PERMIT NAME	DISCHARGE PERMIT NUMBER	FLOW						EST. SEWERED POP.	AVG. DAILY PER CAP. FLOW (GPCD)	AVG. DAILY REC'D. GPCD FOR STUDY	MAX. MONTHLY PER CAP. FLOW (GPCD)	MAX. MONTHLY REC'D. GCPC FOR STUDY
		AVG. MGD		MAX. DAILY MGD		MAX. MONTHLY MGD						
		PERMIT	ACTUAL	PERMIT	ACTUAL	PERMIT	ACTUAL					
COPPERAS COVE, CITY OF (Northeast Plant)	WQ0010045 -004											
1980		0.800	0.538	1.600	2.420	N/A	1.243	5,848	92	125	213	
1985		0.800	0.676	1.600	2.030	N/A	1.040	6,569	103		158	188
1986		0.800	0.825	1.600	2.810	N/A	1.400	6,808	121		206	
1987		0.800	0.874	1.600	1.750	N/A	1.190	7,047	123		169	
COPPERAS COVE, CITY OF (Northwest Plant)	WQ0010045 -005											
1980		1.200	0.953	2.400	2.090	N/A	1.541	8,567	111	125	180	188
1985		1.200	0.880	2.400	2.240	N/A	1.290	9,623	91		134	
1986		1.200	0.966	2.400	5.270	N/A	2.280	9,974	-		229	
1987		1.200	1.290	2.400	3.400	N/A	1.880	10,325	-		182	
GATESVILLE, CITY OF	WQ0010176									100 IN 1990 TO 125 IN 2030		
1980		0.500	0.580	1.000	1.000	N/A	0.700	5,734	101			
1985		1.000	0.563	2.000	1.400	N/A	0.700	6,100	92			
1986		1.000	0.740	2.000	2.500	N/A	0.800	-	-			
1987		1.000	0.570	2.000	1.900	N/A	0.800	-	-			
MOODY, CITY OF	WQ0010225											
1980		0.200	0.083	0.500	0.398	N/A	0.239	1,240	67	125		
1985		0.200	0.183	0.500	0.570	N/A	0.350	1,368	134			
1986		0.200	0.192	0.500	0.738	N/A	0.308	-	-			
1987		0.200	0.206	0.500	0.764	N/A	0.288	-	-			
OGLESBY, CITY OF	WQ0010914											
1980		0.025	-	0.050	-	N/A	-	440	0			
1985		0.025	-	0.050	-	N/A	-	491	0	100	0	150
1986		0.025	-	0.050	-	N/A	-	501	0		0	
1987		0.025	-	0.050	-	N/A	-	511	0		0	

(NOTE: 1987 DATA FOR JAN. THRU JULY ONLY)

TABLE II-7b

AVG. DAILY, MAX. DAILY, & MAX. MONTHLY PER CAPITA SEWER FLOWS
FOR MAJOR MUNICIPAL DISCHARGERS

PERMIT NAME	DISCHARGE PERMIT NUMBER	FLOW						EST. SEWERED POP.	AVG. DAILY PER CAP. FLOW (GPCD)	AVG. DAILY REC'D. GPCD FOR STUDY	MAX. MONTHLY PER CAP. FLOW (GPCD)	MAX. MONTHLY REC'D. GPCD FOR STUDY
		AVG. MGD		MAX. DAILY MGD		MAX. MONTHLY MGD						
		PERMIT	ACTUAL	PERMIT	ACTUAL	PERMIT	ACTUAL					
LAMPASAS, CITY OF (Sulphur Plant)	WQ0010205 -001											
1980		0.500	0.223	1.250	0.233	N/A	0.224	2,775	80	100		
1985		0.500	0.228	1.250	0.344	N/A	0.239	2,945	77			
1986		0.500	0.228	1.250	0.279	N/A	0.232	-	-			
1987		0.500	0.275	1.250	0.537	N/A	0.323	-	-			
LAMPASAS, CITY OF (Henderson Plant)	WQ0010205 -002											
1980		0.500	0.225	1.250	0.231	N/A	0.225	2,775	81	100		
1985		0.500	0.234	1.250	0.390	N/A	0.247	2,945	79			
1986		0.500	0.237	1.250	0.361	N/A	0.254	-	-			
1987		0.500	0.337	1.250	0.537	N/A	0.386	-	-			

(NOTE: 1987 DATA FOR JAN. THRU JULY ONLY)

TABLE II-8a

BELL COUNTY WCID #1

1985

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	INFLUENT BOD in lbs.	INFLUENT TSS in mg/l	INFLUENT TSS in lbs.
Jan	13.972	130	15148	138	16081
Feb	14.200	138	16343	140	16580
Mar	13.368	131	14605	128	14271
Apr	11.136	124	11516	145	13467
May	11.672	132	12849	146	14212
Jun	12.994	138	14955	136	14738
Jul	12.131	128	12950	144	14569
Aug	12.107	140	14136	137	13833
Sep	12.319	134	13767	143	14692
Oct	12.288	135	13835	134	13733
Nov	13.603	144	16337	142	16110
Dec	17.011	151	21423	126	17876
Average	13.067	135	14822	138	15013

1986

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	INFLUENT BOD in lbs.	INFLUENT TSS in mg/l	INFLUENT TSS in lbs.
Jan	11.230	155	14517	133	12457
Feb	14.341	139	16625	129	15429
Mar	12.060	162	16294	144	14484
Apr	11.039	153	14086	143	13165
May	11.319	152	14349	137	12933
Jun	15.271	133	16939	127	16175
Jul	11.816	148	14585	143	14092
Aug	11.220	160	14972	137	12820
Sep	13.981	147	17140	127	14808
Oct	15.340	134	17143	132	16887
Nov	14.167	145	17132	132	15596
Dec	17.555	146	21376	121	17715
Average	13.278	148	16263	134	14713

BELL COUNTY WCID #1

1987

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	BOD in lbs.	TSS in mg/l	TSS in lbs.
Jan	15.013	145	18155	127	15901
Feb	13.294	143	15855	136	15079
Mar	14.083	136	15974	136	15974
Apr	11.545	147	14154	169	16272
May	11.337	165	15601	154	14561
Jun	17.116	126	17986	110	15702
Jul	11.357	134	12692	136	12882
Aug	11.361	139	13170	136	12886
Sep	10.269	128	10962	124	10620
Oct	10.278	122	10458	140	12001
Nov	10.435	130	11314	131	11401
Dec					
Average	12.372	138	14211	136	13934

TABLE II-8b

BELL COUNTY WCID #1

1985						1986						1987					
		EFFLUENT						EFFLUENT						EFFLUENT			
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	13.936	4.0	507.7	11.0	1276.4	JAN	11.230	7.0	609.4	8.0	752.3	JAN	15.042	6.0	751.6	9.0	1120.0
FEB	14.200	4.0	463.6	12.0	1493.7	FEB	14.341	11.0	1273.5	24.0	3058.4	FEB	13.294	6.0	654.8	10.0	1116.6
MAR	13.368	4.0	434.8	7.0	716.1	MAR	12.538	13.0	1381.8	29.0	3025.9	MAR	14.083	9.0	1113.3	20.0	2324.5
APR	11.136	4.0	382.9	6.0	568.3	APR	11.039	7.0	607.1	9.0	852.6	APR	11.521	10.0	997.9	22.0	2137.7
MAY	11.672	4.0	381.7	4.0	403.1	MAY	11.644	6.0	571.3	5.0	484.1	MAY	11.337	7.0	703.8	9.0	863.0
JUN	12.994	4.0	467.7	4.0	442.9	JUN	15.271	6.0	783.6	6.0	759.5	JUN	17.116	7.0	1017.6	5.0	785.6
JUL	12.131	3.0	317.3	4.0	393.3	JUL	11.817	4.0	428.5	5.0	462.4	JUL	11.357	5.0	437.3	5.0	466.5
AUG	12.107	4.0	388.0	4.0	443.6	AUG	11.220	3.0	297.9	4.0	401.0	AUG	11.361	5.0	436.1	4.0	412.5
SEP	12.319	4.0	358.2	5.0	475.3	SEP	13.980	4.0	412.6	4.0	503.7	SEP					
OCT	13.288	4.0	414.2	5.0	520.9	OCT	15.340	5.0	584.7	7.0	955.4	OCT					
NOV	13.603	8.0	882.7	13.0	1560.4	NOV	14.167	8.0	917.9	10.0	1248.5	NOV					
DEC	17.011	6.0	895.5	10.0	1541.2	DEC	17.555	9.0	1325.7	10.0	1520.4	DEC					
AVERAGE	13.147	4.4	491.2	7.1	819.6	AVERAGE	13.345	6.9	766.2	10.1	1168.7	AVERAGE	13.139	6.9	764.1	10.5	1153.3

FIGURE II-1a

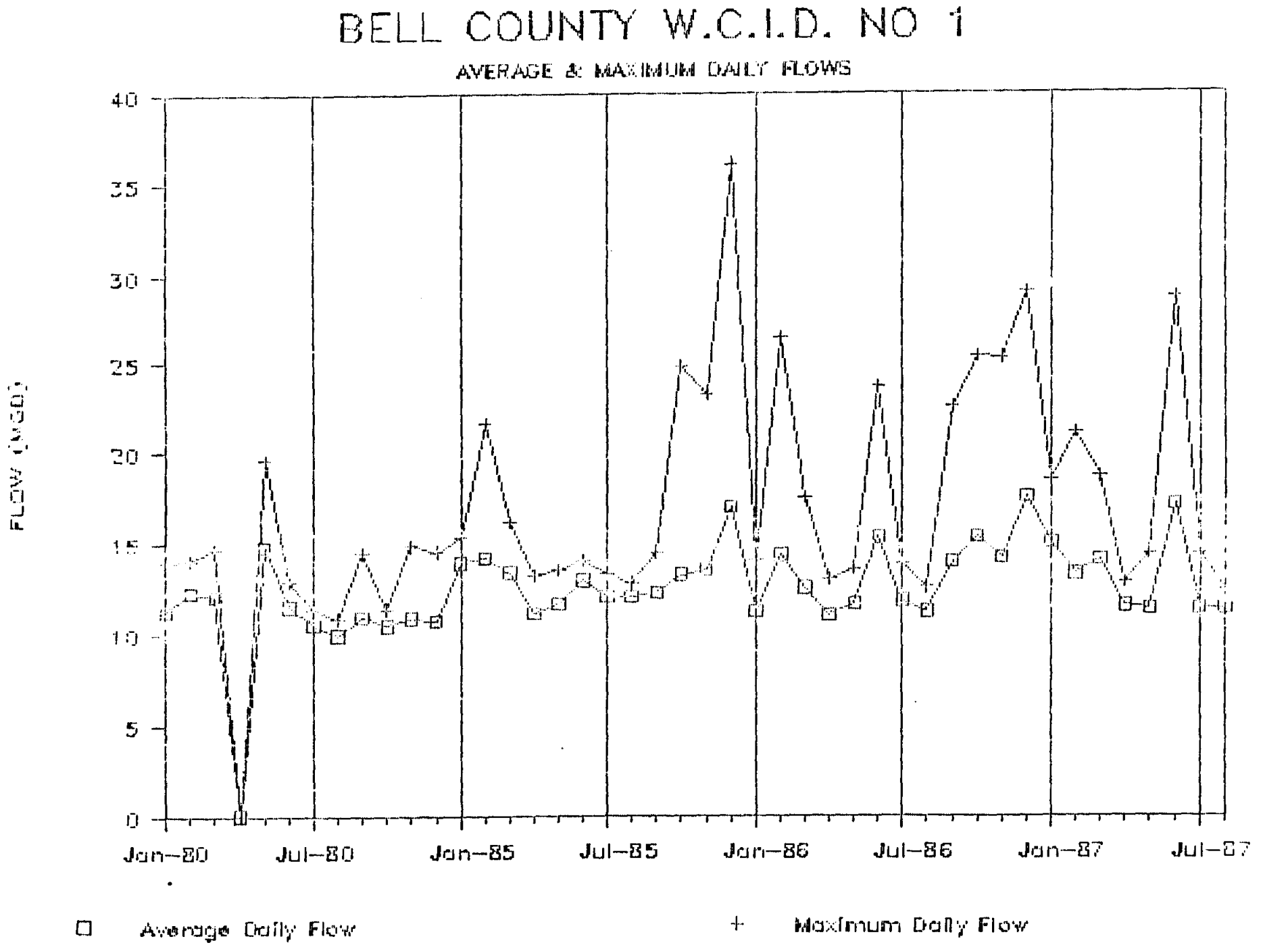
BELL COUNTY W.C.I.D. NO 1
AVERAGE & MAXIMUM DAILY FLOWS
FLOW (MGD)
40
35
30
25
20
15
10
5
0
Jan-80
Jul-80
Jan-85
Jul-85
Jan-86
Jul-86
Jan-87
Jul-87
Average Daily Flow
Maximum Daily Flow

FIGURE II-1b

BELL COUNTY W.C.I.D. NO 1

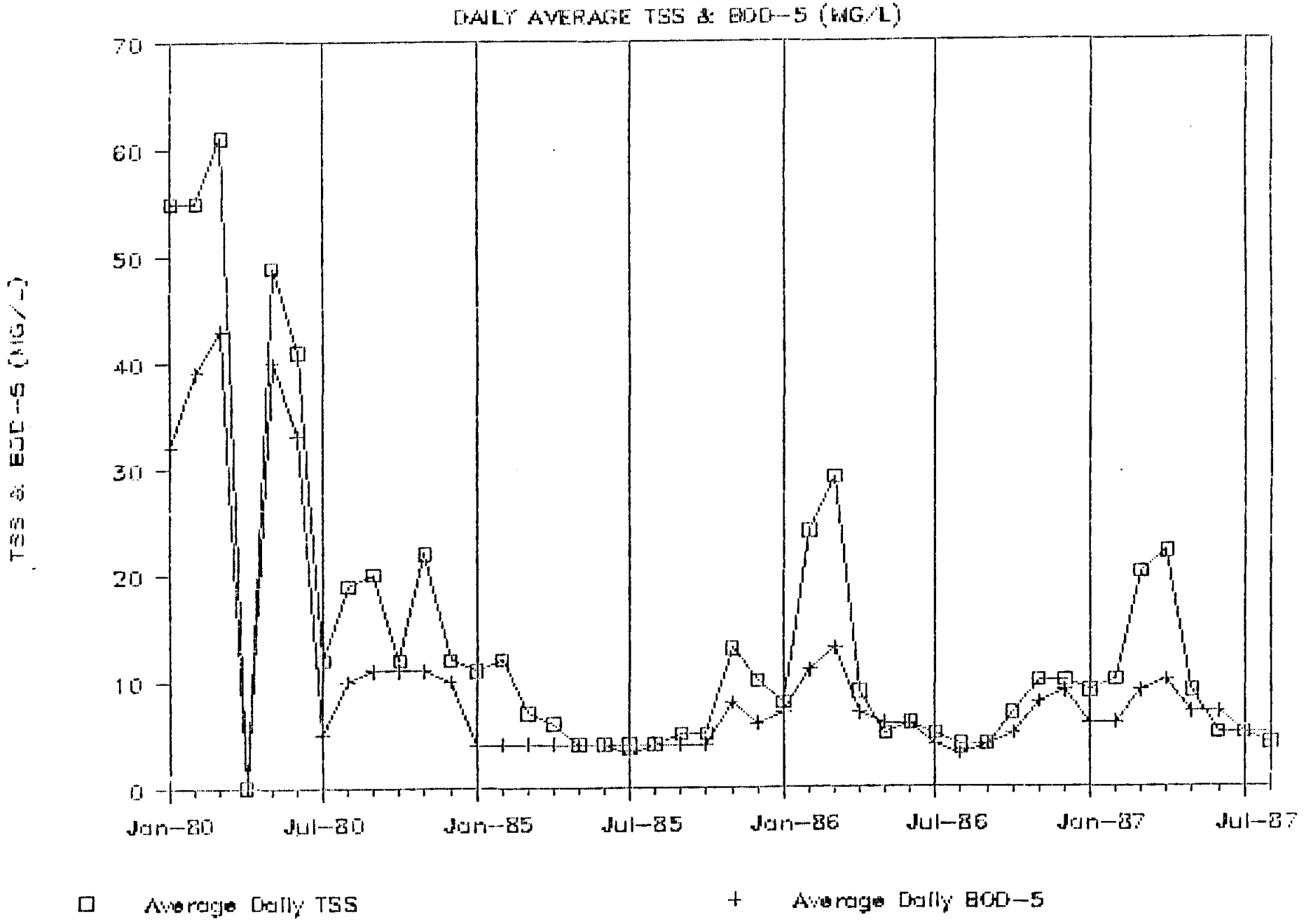

TABLE II-9

BELL COUNTY WCID #3

1985						1986						1987					
	EFFLUENT						EFFLUENT						EFFLUENT				
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	0.228	4.0	7.6	12.0	22.8	JAN	0.235	10.0	10.0	5.5	10.7	JAN	0.198	4.5	1.5	2.0	3.3
FEB	0.209	7.0	12.2	14.0	24.4	FEB	0.263	8.0	17.5	4.0	8.7	FEB	0.159	6.5	8.6	4.5	5.9
MAR	0.330	13.0	35.7	17.0	46.7	MAR	0.165	17.5	7.5	5.5	2.3	MAR	0.185	5.0	7.8	4.0	6.2
APR	0.296	7.0	17.2	17.5	43.2	APR	0.120	6.5	1.9	7.0	2.1	APR	0.148	6.5	6.2	4.5	5.0
MAY	0.253	6.5	13.6	6.0	25.3	MAY	0.093	6.5	1.6	5.0	1.2	MAY	0.151	7.5	9.4	8.5	10.7
JUN	0.170	8.5	12.0	15.5	21.9	JUN	0.217	20.0	10.8	135.5	73.8	JUN	0.186	14.5	22.4	41.5	64.3
JUL	0.123	7.0	14.3	11.0	11.2	JUL	0.132	8.5	9.3	14.5	15.9	JUL	0.150	7.0	8.8	5.0	6.2
AUG	0.083	10.0	10.8	9.0	9.6	AUG	0.168	11.5	16.1	8.0	11.2	AUG					
SEP	0.100	17.0	18.0	43.0	55.5	SEP	0.150	8.8	0.7	0.6	7.5	SEP					
OCT	0.120	15.5	24.3	6.0	9.4	OCT	0.160	10.0	13.3	10.5	14.0	OCT					
NOV	0.144	0.1	12.0	13.0	18.0	NOV	0.163	11.5	15.6	62.5	62.5	NOV					
DEC	0.284	8.0	18.9	1.0	4.7	DEC	0.195	9.0	9.0	8.0	8.0	DEC					
AVERAGE	0.195	8.6	16.4	13.8	24.4	AVERAGE	0.172	10.6	9.4	22.2	18.2	AVERAGE	0.168	7.4	9.2	10.0	14.5

FIGURE II-2a

BELL COUNTY W.C.I.D. NO 3

AVERAGE & MAXIMUM DAILY FLOWS

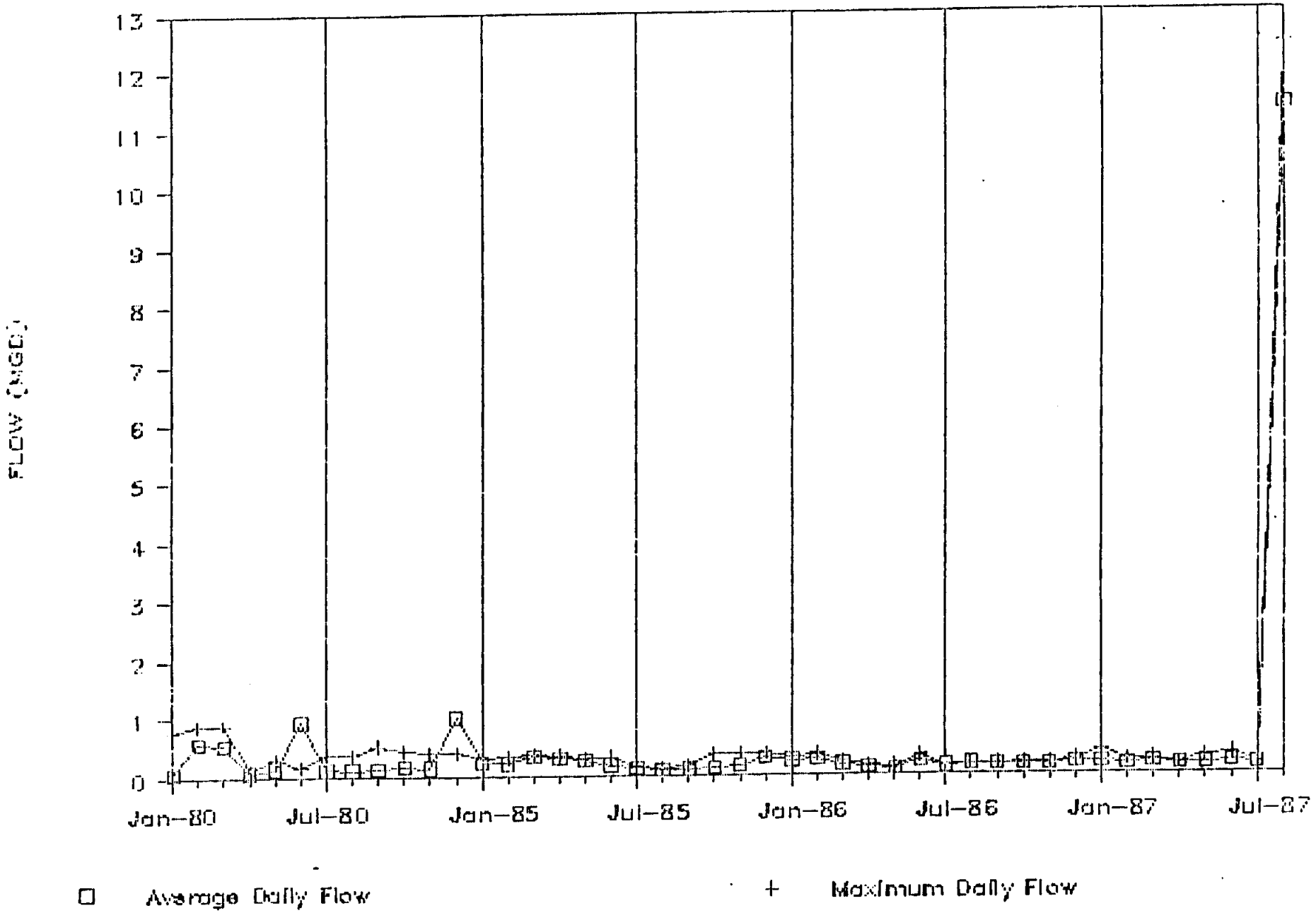

FIGURE II-2b

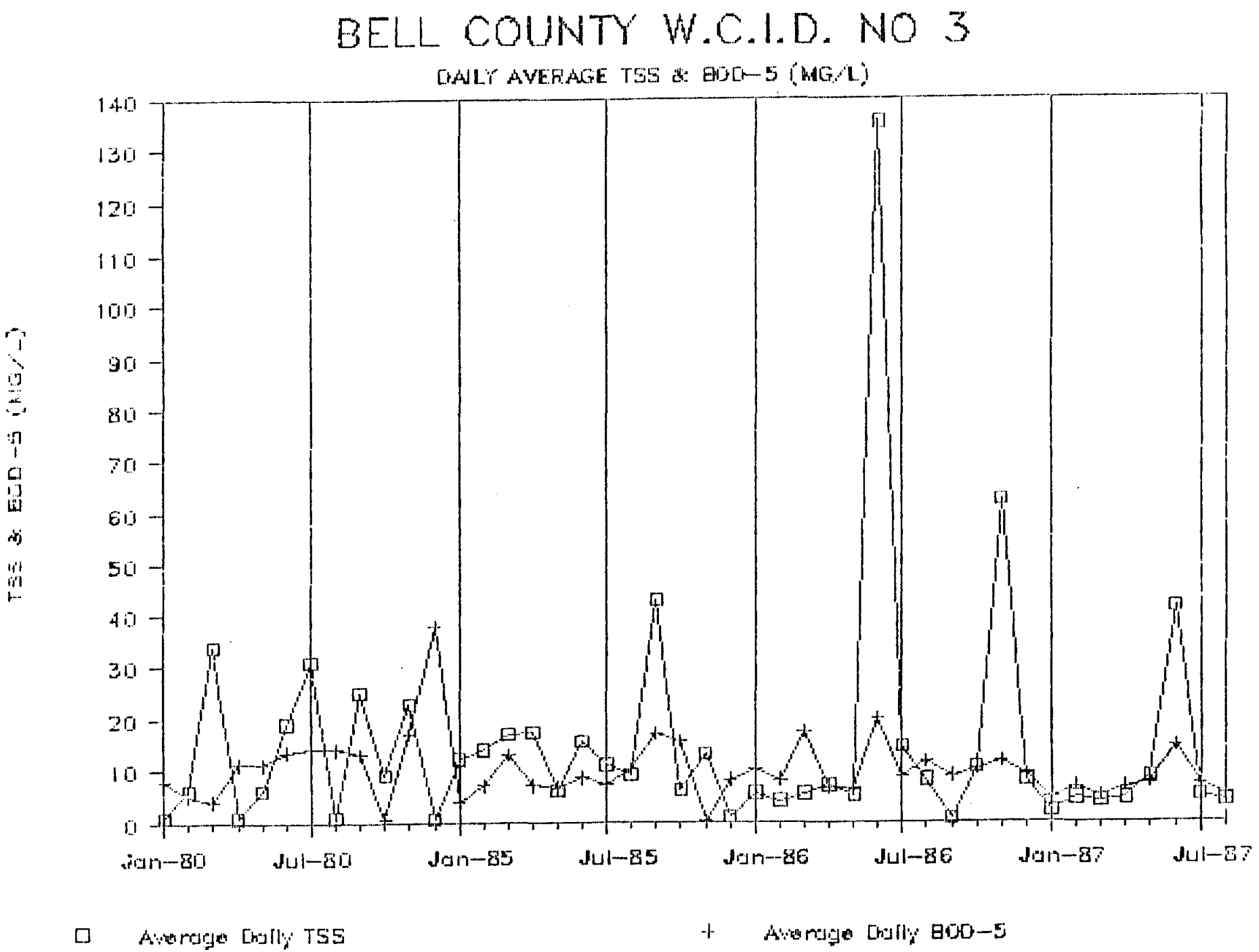
BELL COUNTY W.C.I.D. NO 3
DAILY AVERAGE TSS & BOD-5 (MG/L)
TSS & BOD-5 (MG/L)
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Jan-80
Jul-80
Jan-85
Jul-85
Jan-86
Jul-86
Jan-87
Jul-87
Average Daily TSS
Average Daily BOD-5

TABLE II-10a

BELL COUNTY WCID #4
(HARKER HEIGHTS)

	1985					1986					1987				
		EFFLUENT					EFFLUENT					EFFLUENT			
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	1.392	4.8	65.2	11.0	158.5	JAN	1.244	8.0	51.8	3.8	36.9	JAN	1.770	3.8	52.1	1.8	25.2
FEB	0.507	6.5	29.4	8.8	39.2	FEB	1.748	9.0	62.0	4.1	58.0	FEB	1.472	4.9	59.1	4.0	50.1
MAR	1.318	7.3	74.1	12.3	118.4	MAR	1.303	4.0	40.2	1.8	20.6	MAR	1.622	5.6	78.7	8.1	119.9
APR	1.443	5.5	82.7	8.5	127.7	APR	1.143	6.0	37.6	3.1	29.2	APR	1.020	4.2	35.7	2.6	22.4
MAY	1.304	6.0	69.8	8.5	102.5	MAY	1.139	6.0	41.8	2.8	26.1	MAY	0.933	4.4	33.8	2.9	22.0
JUN	0.982	6.3	55.0	11.8	102.7	JUN	1.285	5.0	47.5	2.6	34.1	JUN					
JUL	0.911	5.4	46.6	7.9	70.0	JUL	0.925	4.0	25.3	2.6	20.7	JUL	1.104	4.3	38.7	2.7	24.6
AUG	0.850	6.8	47.4	6.4	44.7	AUG	0.776	7.0	23.9	1.6	10.1	AUG	0.892	4.4	32.4	2.1	15.8
SEP	0.910	7.6	57.1	6.5	51.0	SEP	1.420	5.0	42.0	1.9	21.8	SEP					
OCT	0.980	5.5	45.1	8.3	66.7	OCT	1.733	5.0	49.2	3.0	45.6	OCT					
NOV	1.109	3.9	27.8	3.6	26.5	NOV	1.517	5.0	47.4	2.0	28.0	NOV					
DEC	1.802	4.9	79.3	6.5	96.5	DEC	2.354	8.0	89.5	6.5	145.7	DEC					
AVERAGE	1.126	5.9	56.6	8.3	83.7	AVERAGE	1.382	6.0	46.5	3.0	39.7	AVERAGE	1.258	4.5	47.1	3.4	39.9

TABLE II-10b

BELL COUNTY WCID #4

1986

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	INFLUENT BOD in lbs.	INFLUENT TSS in mg/l	INFLUENT TSS in lbs.
Jan					
Feb					
Mar					
Apr					
May	1.121			143	1337
Jun					
Jul					
Aug					
Sep					
Oct	1.967	92	1509	75	1230
Nov	1.620	52	703	39	527
Dec	2.789	32	744	56	1303
Average	1.874	59	985	78	1099

1987

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	INFLUENT BOD in lbs.	INFLUENT TSS in mg/l	INFLUENT TSS in lbs.
Jan	1.935	57	920	132	2130
Feb	1.491	98	1219	110	1368
Mar	1.856	83	1285	89	1378
Apr	0.991	90	744	108	893
May	0.966	110	886	154	1241
Jun	1.508	45	566	56	704
Jul	1.197	138	1378	150	1497
Aug	0.955	75	597	92	733
Sep	0.808	121	815	118	795
Oct	0.707	154	908	171	1008
Nov					
Dec					
Average	1.241	97	932	118	1175

FIGURE II-3a

BELL COUNTY W.C.I.D. NO.4

AVERAGE & MAXIMUM DAILY FLOWS

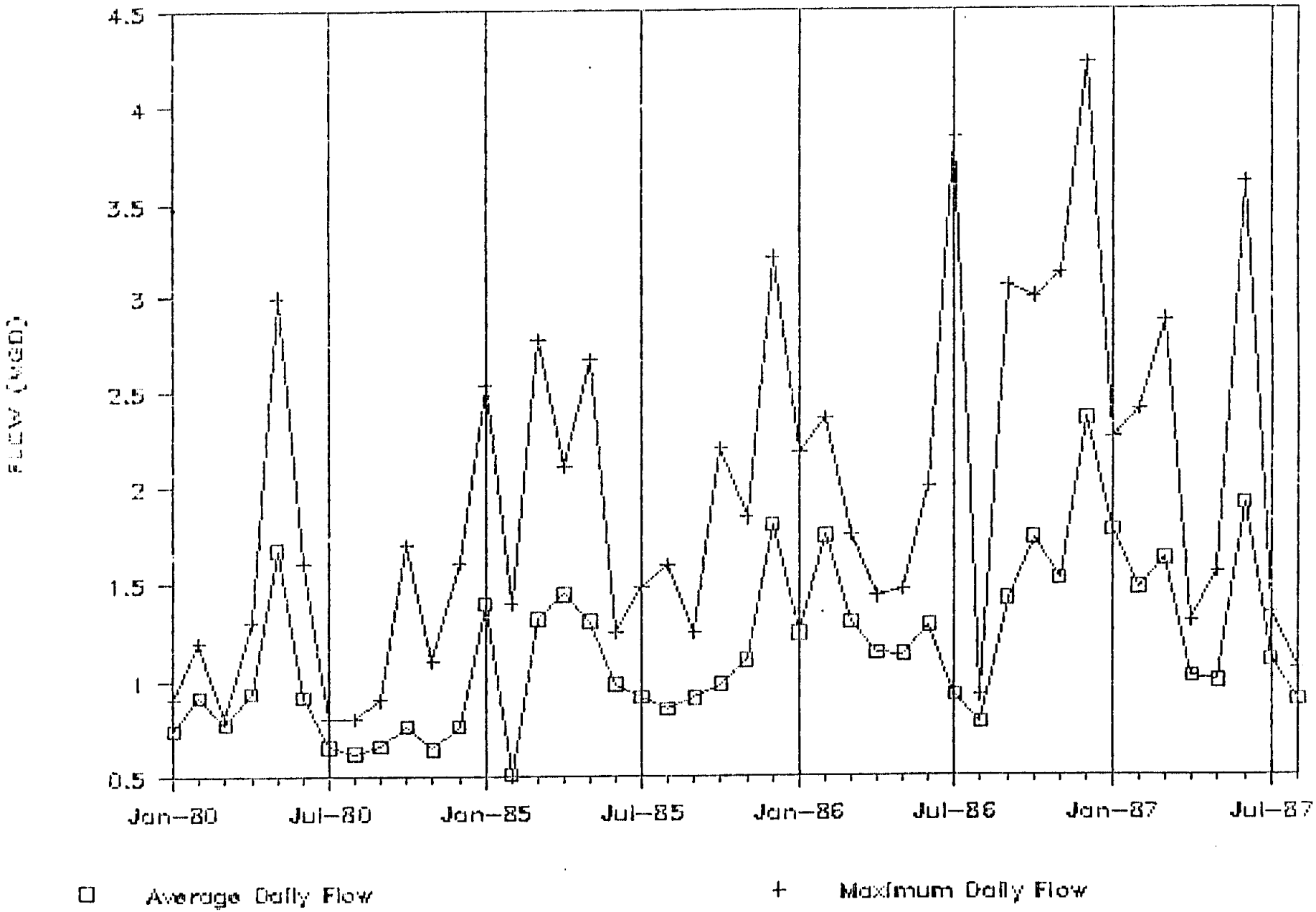

FIGURE II-3b

BELL COUNTY W.C.I.D. NO.4

DAILY AVERAGE TSS & BOD-5 (MG/L)

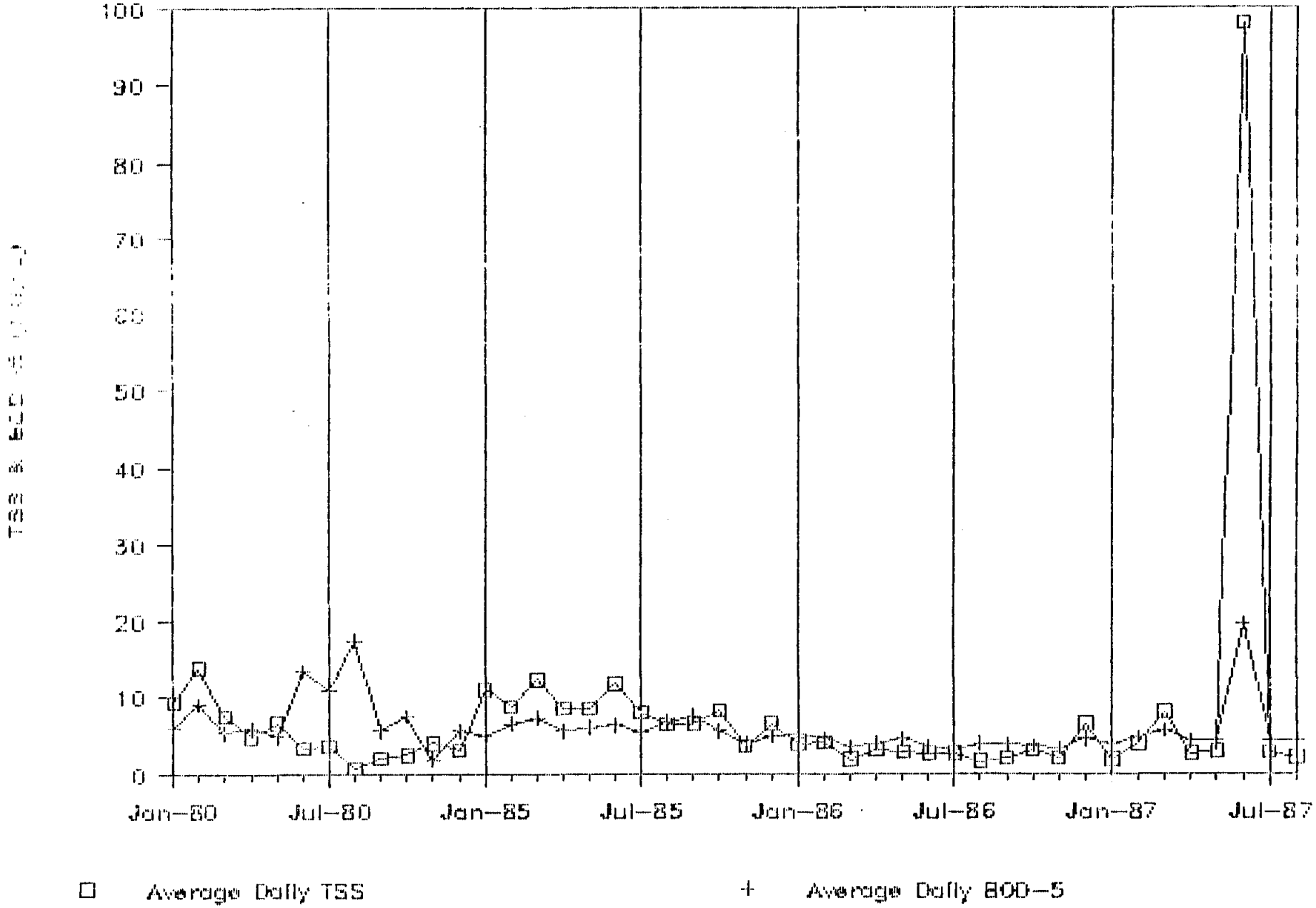

TABLE II-11

TEMPLE-BELTON REGIONAL PLANT
(BRAZOS RIVER AUTHORITY)

1985						1986						1987					
	EFFLUENT						EFFLUENT						EFFLUENT				
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	2.853	6.0	143.0	18.0	428.0	JAN	2.787	9.6	223.2	12.7	295.2	JAN	3.610	11.3	340.2	12.6	379.3
FEB	3.704	6.0	185.0	15.0	463.0	FEB	4.916	8.9	364.9	13.3	545.2	FEB	3.665	13.5	388.3	14.3	258.5
MAR	4.540	8.0	303.0	20.0	757.0	MAR	2.783	7.4	171.8	11.1	257.6	MAR	4.360	10.4	373.5	13.3	479.0
APR	3.450	9.0	259.0	22.0	633.0	APR	2.658	11.2	248.3	12.6	279.3	APR	2.865	12.2	297.2	14.7	354.8
MAY	3.465	6.0	173.0	16.0	462.0	MAY	3.511	9.5	278.2	13.5	395.3	MAY	2.749	8.4	195.3	9.8	227.7
JUN	3.330	3.0	83.0	4.0	111.0	JUN	3.508	8.0	234.1	8.1	237.0	JUN	4.343	8.4	313.0	11.7	447.4
JUL	2.956	4.0	99.0	6.0	148.0	JUL	2.466	6.5	133.7	7.2	148.1	JUL	2.707	7.2	166.6	7.3	170.4
AUG	2.944	4.0	98.0	9.0	221.0	AUG	2.467	6.2	127.6	10.0	205.7	AUG	2.416	7.6	159.4	7.9	160.2
SEP	3.380	6.0	169.0	13.0	366.0	SEP	3.796	6.9	218.5	10.7	338.8	SEP					
OCT	4.699	6.4	250.8	12.7	497.6	OCT	4.625	6.9	266.1	10.0	385.7	OCT					
NOV	4.823	9.2	370.0	16.0	644.0	NOV	3.283	9.5	260.1	10.7	293.0	NOV					
DEC	4.785	10.0	399.1	12.7	506.8	DEC	5.484	10.1	462.0	11.8	593.7	DEC					
AVERAGE	3.744	6.5	211.0	13.7	436.5	AVERAGE	3.524	8.4	249.0	11.0	331.2	AVERAGE	3.339	9.9	279.2	11.5	309.7

FIGURE II-4a

B.R.A. TEMPLE–BELTON REGIONAL

AVERAGE & MAXIMUM DAILY FLOWS

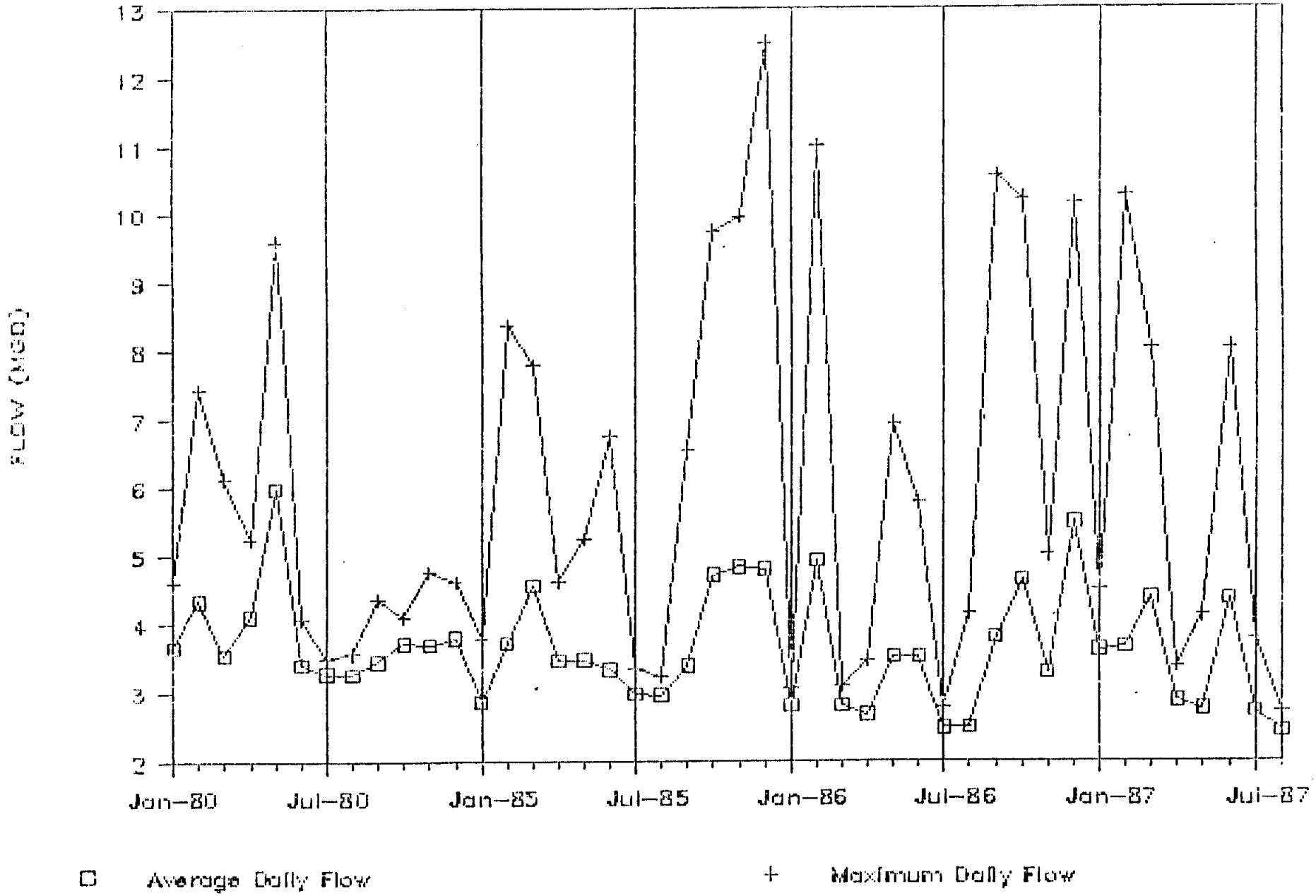

FIGURE II-4b

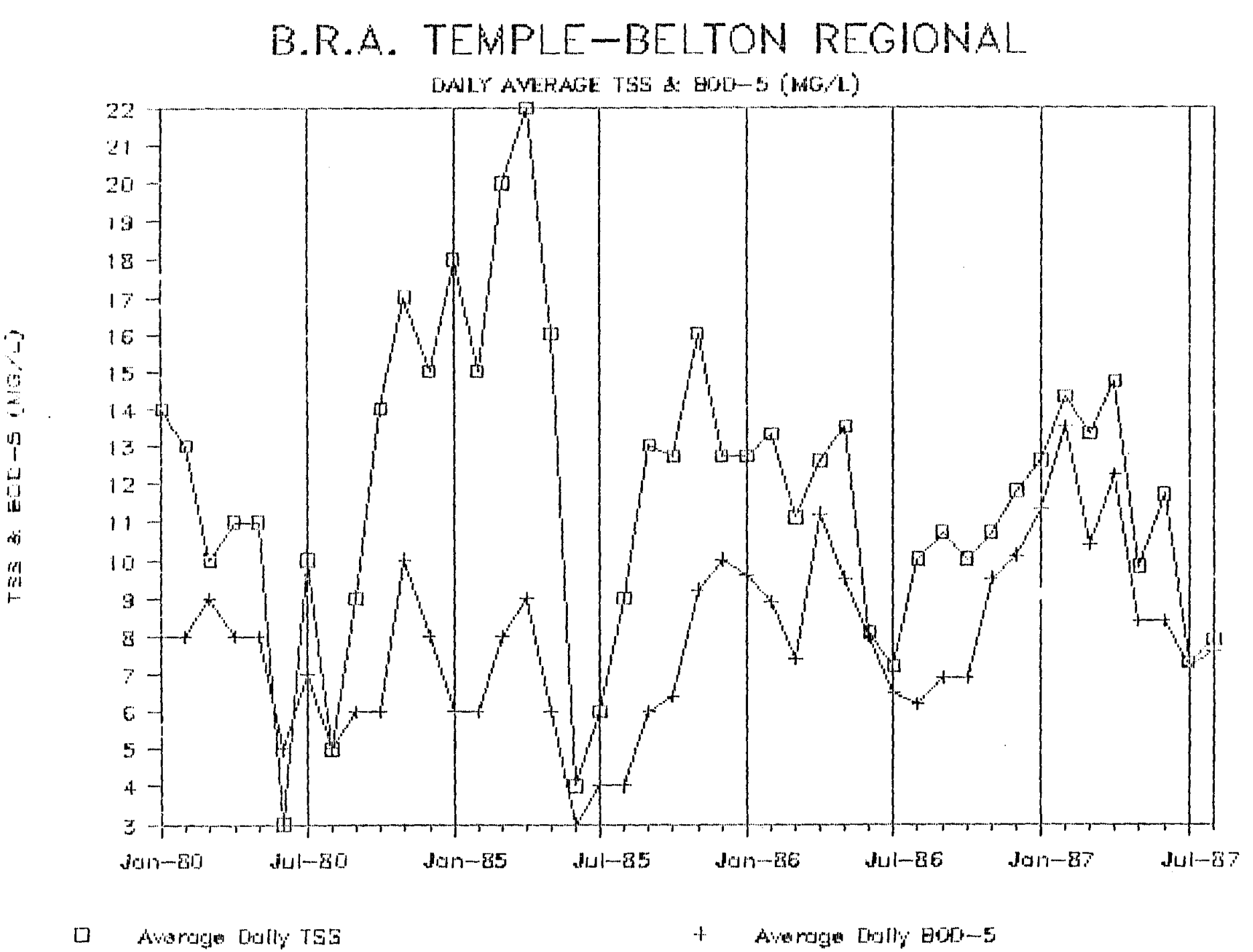
B.R.A. TEMPLE-BELTON REGIONAL
DAILY AVERAGE TSS & BOD-5 (MG/L)
TSS & BOD-5 (MG/L)
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
Jan-80
Jul-80
Jan-85
Jul-85
Jan-86
Jul-86
Jan-87
Jul-87
Average Daily TSS
Average Daily BOD-5

TABLE II-12a

COPPERAS COVE
SOUTH PLANT

1985		EFFLUENT				1986		EFFLUENT				1987		EFFLUENT			
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	0.672	3.0	16.8	8.8	49.3	JAN	0.536	4.2	18.8	4.7	21.0	JAN	0.754	4.3	26.7	3.6	22.6
FEB	0.564	2.9	13.6	4.8	22.7	FEB	0.537	2.8	12.5	4.0	17.9	FEB	0.662	5.0	27.6	3.5	19.3
MAR	0.420	3.9	13.7	7.4	25.9	MAR	0.490	3.2	13.1	11.5	47.0	MAR	0.634	4.8	25.5	3.0	16.2
APR	0.487	4.1	16.7	3.8	15.4	APR	0.489	3.2	41.8	8.8	35.7	APR	0.554	5.5	25.0	2.3	10.8
MAY	0.522	3.0	13.1	7.4	32.4	MAY	0.570	2.8	13.5	5.5	26.3	MAY	0.520	4.9	21.0	3.0	13.0
JUN	0.637	3.4	19.1	6.5	36.5	JUN	0.426	4.3	15.3	2.4	8.7	JUN	0.740	4.9	30.2	3.0	18.5
JUL	0.604	3.2	16.1	4.2	21.2	JUL	0.550	4.9	22.6	5.3	24.3	JUL	0.501	5.2	21.7	2.5	10.4
AUG	0.594	2.5	11.9	8.1	40.1	AUG	0.510	4.8	20.4	5.2	21.9	AUG	0.448	4.3	16.1	2.4	9.0
SEP	0.622	2.5	13.0	6.5	33.7	SEP	0.659	5.2	28.4	5.5	30.2	SEP					
OCT	0.612	2.5	12.8	4.6	23.5	OCT	0.777	5.0	32.4	33.0	33.0	OCT					
NOV	0.555	4.0	18.5	4.6	21.3	NOV	0.736	4.9	30.0	5.5	33.7	NOV					
DEC	0.629	4.3	22.6	4.5	23.3	DEC	0.897	4.0	29.9	5.7	42.8	DEC					
AVERAGE	0.577	3.3	15.6	5.9	28.8	AVERAGE	0.598	4.1	23.2	8.1	28.5	AVERAGE	0.602	4.9	24.2	2.9	15.0

TABLE II-12b

COPPERAS COVE
SOUTH PLANT

1986

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	INFLUENT BOD in lbs.	INFLUENT TSS in mg/l	INFLUENT TSS in lbs.
Jan	0.536	189	845	124	554
Feb	0.537	166	743	92	412
Mar	0.490	178	727	167	682
Apr	0.489	183	746	112	457
May	0.570	198	941	126	599
Jun	0.426	147	522	96	341
Jul	0.550	154	706	103	472
Aug	0.510	156	664	97	413
Sep	0.659	134	736	76	418
Oct	0.777	205	1328	70	454
Nov	0.736	189	1160	88	540
Dec	0.897	160	1197	75	561
Average	0.598	172	860	102	492

1987

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	INFLUENT BOD in lbs.	INFLUENT TSS in mg/l	INFLUENT TSS in lbs.
Jan	0.719	181	1085	73	438
Feb	0.648	220	1189	98	530
Mar	0.627	178	931	89	465
Apr	0.539	168	755	107	481
May	0.490	180	736	128	523
Jun	0.818	184	1255	111	757
Jul	0.496	213	881	143	592
Aug	0.443	286	1057	125	462
Sep	0.423	173	610	103	363
Oct	0.414	193	666	128	442
Nov					
Dec					
Average	0.562	198	917	111	505

TABLE II-13a

COPPERAS COVE
NORTHEAST PLANT

1985		EFFLUENT				1986		EFFLUENT				1987		EFFLUENT			
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	0.860	6.1	44.0	8.3	59.7	JAN	0.743	4.2	26.0	3.4	21.0	JAN	1.190	6.6	65.5	4.5	44.6
FEB	0.691	2.6	15.0	2.5	14.4	FEB	0.793	4.6	30.4	3.0	19.8	FEB	0.995	6.3	52.2	5.0	41.4
MAR	0.795	7.2	44.7	8.1	53.7	MAR	0.555	4.3	19.9	9.0	41.7	MAR	0.970	5.2	41.7	4.1	32.9
APR	0.668	3.5	19.5	5.1	28.4	APR	0.499	3.3	13.7	7.4	30.8	APR	0.752	5.5	34.0	3.5	21.9
MAY	0.609	5.4	27.3	5.9	30.0	MAY	0.575	3.5	16.8	6.2	29.7	MAY	0.681	5.8	32.0	3.7	21.0
JUN	0.559	2.8	13.1	5.8	27.0	JUN	1.400	3.3	38.5	5.7	66.1	JUN	1.050	5.1	44.4	3.6	31.5
JUL	0.536	4.2	18.8	8.2	36.7	JUL	0.531	10.3	45.6	7.6	33.6	JUL	0.721	4.9	29.4	3.5	21.0
AUG	0.560	3.0	14.0	7.0	32.7	AUG	0.538	4.6	31.4	5.3	23.6	AUG	0.630	4.3	22.3	3.5	18.8
SEP	0.604	3.9	19.7	7.6	38.3	SEP	0.784	4.6	29.9	4.5	29.4	SEP					
OCT	0.630	3.8	20.0	5.9	31.0	OCT	1.060	9.3	82.2	7.9	69.8	OCT					
NOV	0.564	4.3	20.2	5.3	24.9	NOV	1.050	6.0	52.5	6.7	59.1	NOV					
DEC	1.040	2.8	23.9	6.3	44.2	DEC	1.370	13.1	149.7	14.1	161.0	DEC					
AVERAGE	0.676	4.1	23.3	6.3	35.1	AVERAGE	0.825	5.9	44.7	6.7	48.8	AVERAGE	0.874	5.4	40.2	3.9	29.1

TABLE II-13b

COPPERAS COVE
NORTHEAST PLANT

1986

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	BOD in lbs.	TSS in mg/l	TSS in lbs.
Jan	0.743	217	1345	157	973
Feb	0.793	170	1124	102	675
Mar	0.555	214	991	196	907
Apr	0.499	230	957	196	816
May	0.575	275	1319	168	806
Jun	1.400	166	1938	79	922
Jul	0.531	182	806	100	443
Aug	0.538	176	790	109	489
Sep	0.784	156	1020	121	791
Oct	1.060	203	1795	90	796
Nov	1.050	179	1568	101	884
Dec	0.137	180	206	131	150
Average	0.722	196	1155	129	721

1987

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	BOD in lbs.	TSS in mg/l	TSS in lbs.
Jan	1.115	152	1413	116	1079
Feb	0.980	206	1684	112	915
Mar	0.971	168	1360	104	842
Apr	0.743	172	1066	142	880
May	0.655	163	890	157	858
Jun	1.119	167	1559	108	1008
Jul	0.709	220	1301	176	1041
Aug	0.627	276	1443	170	889
Sep	0.577	186	895	131	630
Oct	0.567	235	1111	180	851
Nov					
Dec					
Average	0.806	195	1272	140	899

FIGURE II-5a

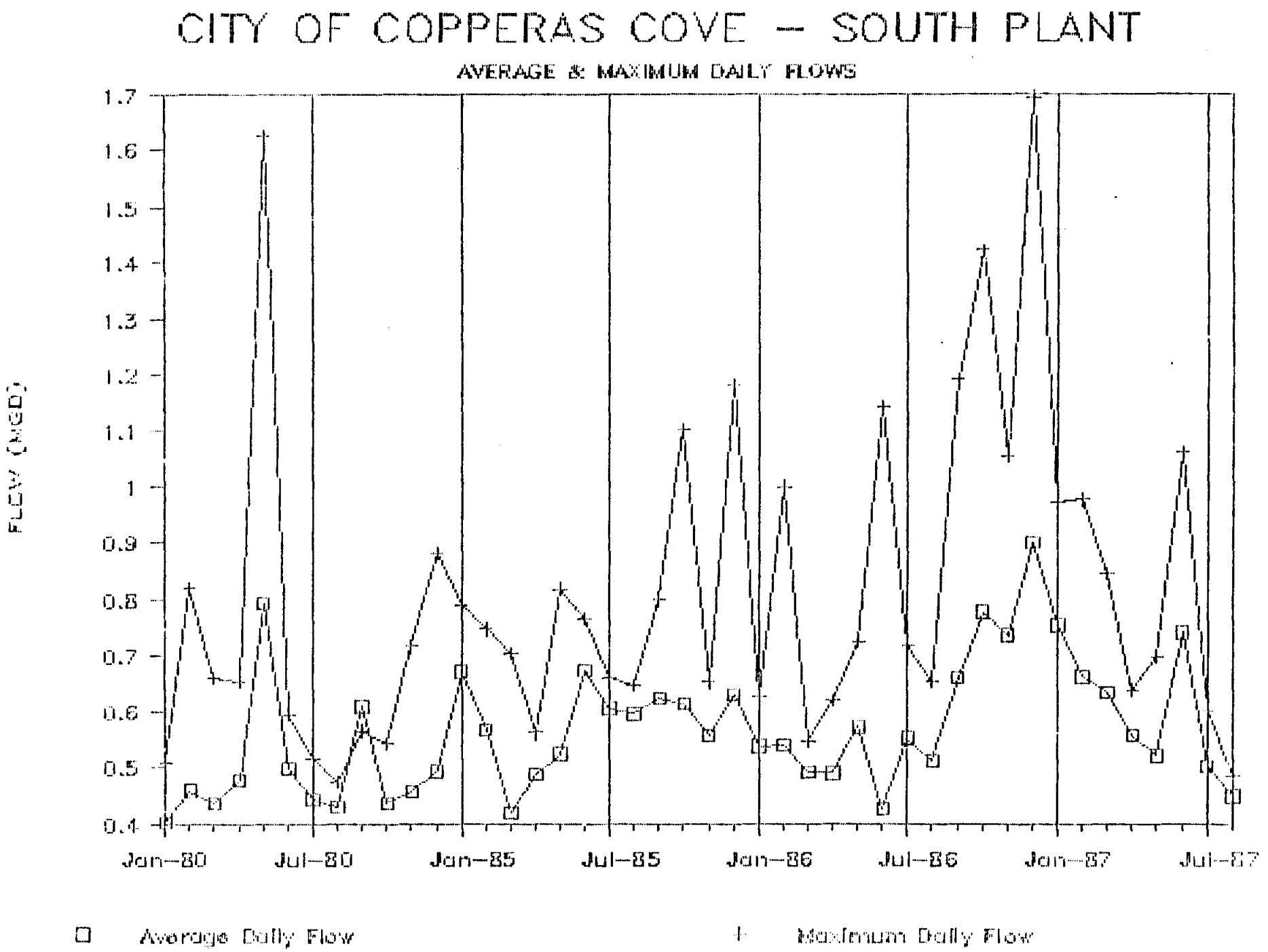
CITY OF COPPERAS COVE – SOUTH PLANT
AVERAGE & MAXIMUM DAILY FLOWS
FLOW (MGD)
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
Jan–80
Jul–80
Jan–85
Jul–85
Jan–86
Jul–86
Jan–87
Jul–87
Average Daily Flow
Maximum Daily Flow

FIGURE II-5b

CITY OF COPPERAS COVE – SOUTH PLANT

DAILY AVERAGE TSS & BOD-5 (MG/L)

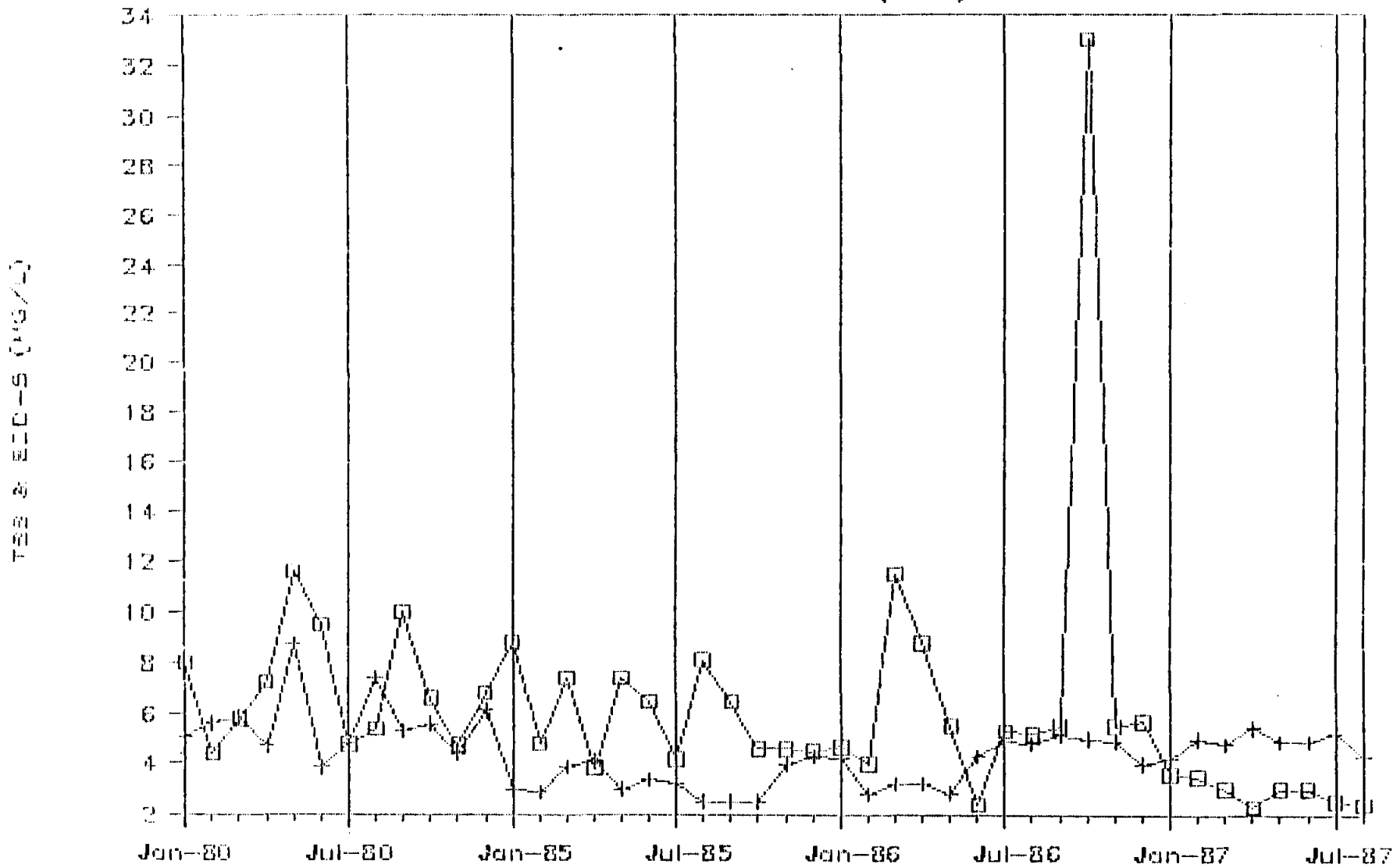

FIGURE II-6a

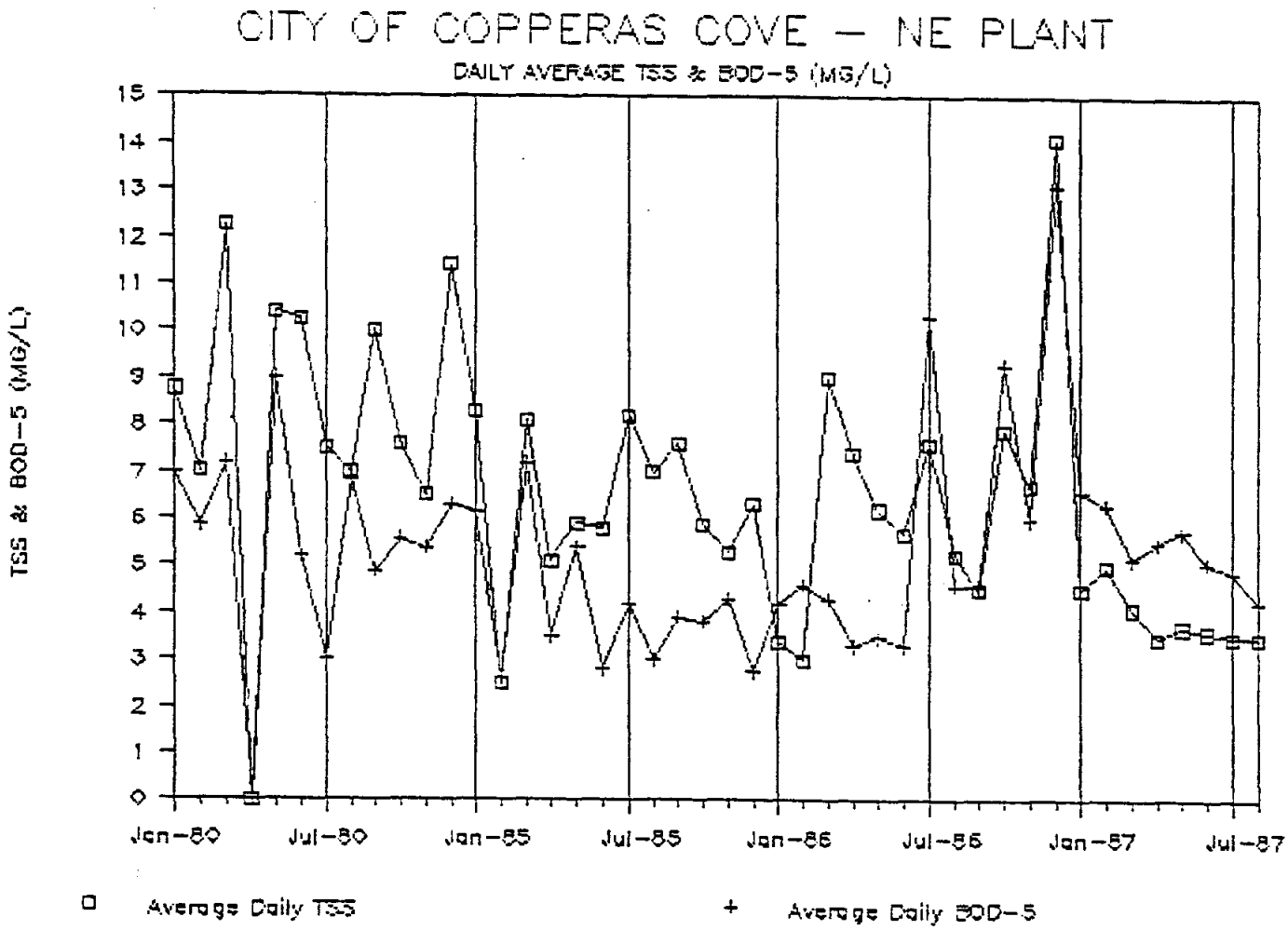
CITY OF COPPERAS COVE — NE PLANT
DAILY AVERAGE TSS & BOD-5 (MG/L)
TSS & BOD-5 (MG/L)
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-80
Jul-80
Jan-85
Jul-85
Jan-86
Jul-86
Jan-87
Jul-87
Average Daily TSS
Average Daily BOD-5

TABLE II-14a

COPPERAS COVE
NORTHWEST PLANT

1985						1986						1987					
	EFFLUENT						EFFLUENT						EFFLUENT				
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	1.020	4.3	36.8	5.8	49.3	JAN	0.668	3.4	10.9	3.8	21.2	JAN	1.880	5.3	83.1	5.6	56.4
FEB	0.772	4.2	27.2	6.2	40.2	FEB	0.782	4.2	27.4	5.9	38.5	FEB	1.170	5.4	52.6	2.8	27.3
MAR	1.190	3.3	32.8	11.0	109.2	MAR	0.723	3.8	22.9	10.0	60.3	MAR	1.270	5.3	55.6	3.3	35.0
APR	1.010	2.9	24.4	6.8	57.3	APR	0.697	3.3	19.2	6.9	40.1	APR	1.070	5.5	49.0	3.1	28.0
MAY	1.290	7.3	78.5	6.4	68.9	MAY	0.742	3.4	21.2	6.3	38.9	MAY	1.100	5.9	54.0	2.3	21.0
JUN	1.010	3.0	25.3	7.6	64.0	JUN	1.120	7.0	65.4	4.3	39.7	JUN	1.680	5.7	79.8	4.0	53.3
JUL	0.675	2.6	14.6	5.9	33.2	JUL	0.773	5.0	32.8	3.4	21.9	JUL	1.140	5.6	53.2	2.7	25.6
AUG	0.689	3.3	19.0	15.0	36.2	AUG	0.726	5.4	32.7	2.9	17.6	AUG	1.010	5.5	46.3	1.5	13.3
SEP	0.710	3.8	22.5	7.1	42.0	SEP	0.942	5.8	45.2	3.6	28.2	SEP					
OCT	0.712	3.3	19.6	5.6	33.3	OCT	1.150	5.5	52.7	2.8	26.8	OCT					
NOV	0.709	3.3	9.5	5.3	31.3	NOV	0.984	5.4	44.3	5.0	41.0	NOV					
DEC	0.775	3.5	22.6	5.7	36.8	DEC	2.280	5.1	97.0	5.6	106.0	DEC					
AVERAGE	0.880	3.7	27.7	7.4	50.1	AVERAGE	0.966	4.8	39.3	5.0	40.0	AVERAGE	1.290	5.5	59.2	3.2	32.5

TABLE II-14b

COPPERAS COVE
NORTHWEST PLANT

1986

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	BOD in lbs.	TSS in mg/l	TSS in lbs.
Jan	0.668	217	1209	163	908
Feb	0.782	186	1213	139	907
Mar	0.723	208	1254	208	1254
Apr	0.697	239	1389	167	971
May	0.742	210	1300	156	965
Jun	1.120	157	1467	104	971
Jul	0.773	186	1199	85	548
Aug	0.726	208	1259	136	823
Sep	0.942	177	1391	133	1045
Oct	1.150	165	1583	68	652
Nov	0.984	187	1535	124	1018
Dec	2.280	169	3214	94	1787
Average	0.966	192	1501	131	987

1987

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	BOD in lbs.	TSS in mg/l	TSS in lbs.
Jan	1.730	162	2337	98	1414
Feb	1.130	200	1885	119	1121
Mar	1.250	174	1814	118	1230
Apr	1.060	189	1671	146	1291
May	1.060	181	1600	140	1238
Jun	1.800	174	2612	105	1576
Jul	1.130	205	1932	165	1555
Aug	0.989	267	2202	158	1303
Sep	0.816	155	1055	124	844
Oct	0.638	221	1176	175	931
Nov					
Dec					
Average	1.160	193	1828	135	1250

FIGURE II-7a

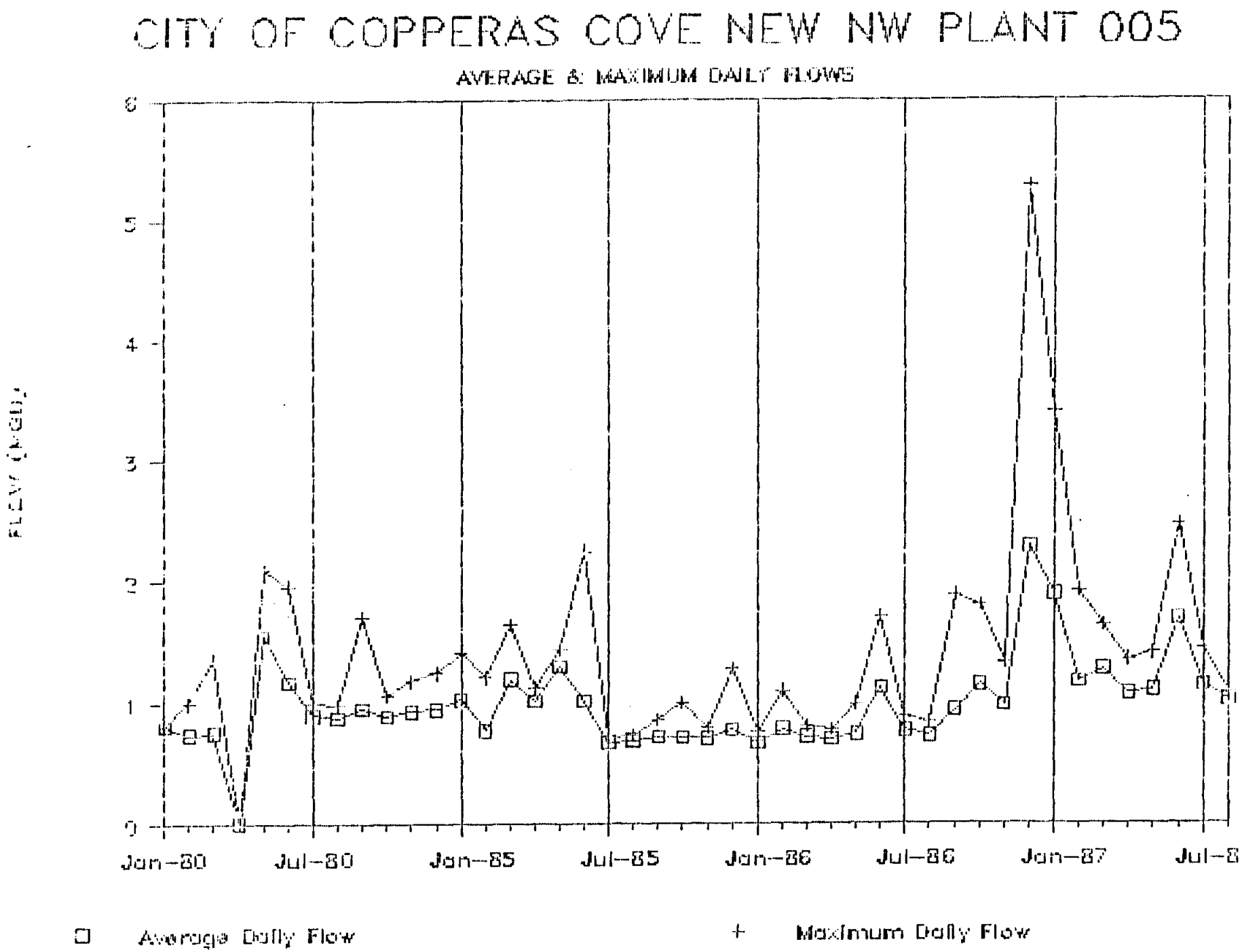
CITY OF COPPERAS COVE NEW NW PLANT 005
AVERAGE & MAXIMUM DAILY FLOWS
FLOW (MGD)
0
1
2
3
4
5
6
Jan-80
Jul-80
Jan-85
Jul-85
Jan-86
Jul-86
Jan-87
Jul-87
Average Daily Flow
Maximum Daily Flow

FIGURE II-7b

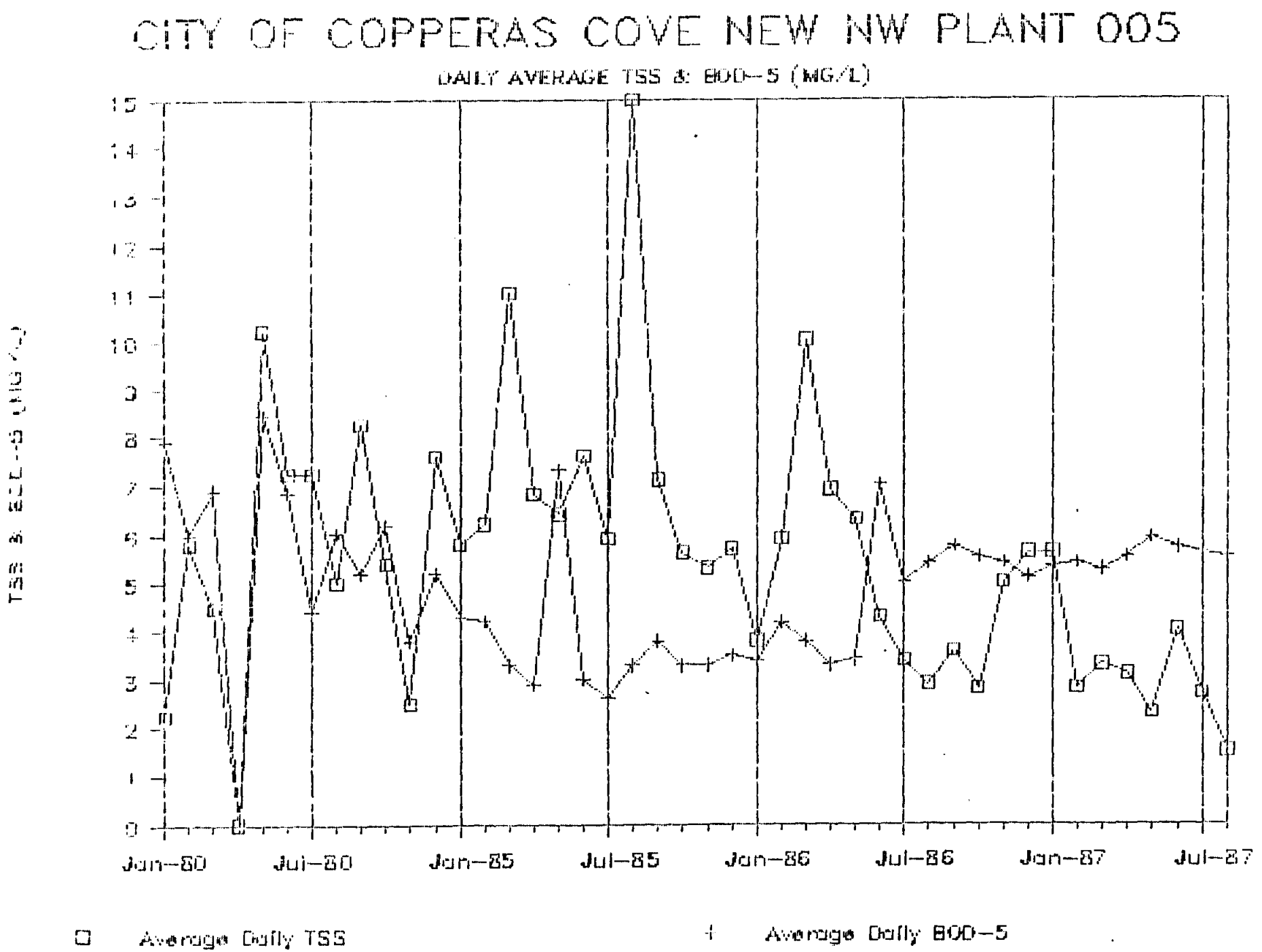
CITY OF COPPERAS COVE NEW NW PLANT 005
DAILY AVERAGE TSS & BOD-5 (MG/L)
TSS & BOD-5 (MG/L)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Jan-80
Jul-80
Jan-85
Jul-85
Jan-86
Jul-86
Jan-87
Jul-87
Average Daily TSS
Average Daily BOD-5

TABLE II-15a

GATESVILLE

1985						1986						1987					
		EFFLUENT						EFFLUENT						EFFLUENT			
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	0.500	7.3	30.0	14.8	61.0	JAN	0.500	12.6	53.0	6.4	37.0	JAN	0.600	9.0	45.0	9.0	45.0
FEB	0.500	12.8	53.0	22.3	93.0	FEB	0.500	9.5	40.0	7.0	29.0	FEB	0.600	10.5	52.0	7.5	37.0
MAR	0.600	17.5	88.0	22.0	110.0	MAR	0.500	8.0	33.0	5.0	21.0	MAR	0.800	7.0	46.0	10.0	66.0
APR	0.500	21.0	88.0	30.5	127.0	APR	0.400	7.5	25.0	4.0	13.0	APR	0.500	10.0	116.0	8.0	93.0
MAY	0.600	22.4	112.0	34.0	170.0	MAY	0.800	10.6	71.0	7.0	47.0	MAY	0.500	7.0	29.0	5.0	20.0
JUN	0.700	18.0	105.0	29.8	169.0	JUN	2.100	7.0	123.0	11.0	193.0	JUN	0.900	6.0	45.0	6.0	45.0
JUL	0.700	21.0	123.0	31.0	181.0	JUL	0.800	7.0	47.0	8.0	53.0	JUL	0.400	4.0	13.0	2.0	6.6
AUG	0.700	11.6	68.0	14.4	84.0	AUG	0.700	4.0	23.0	3.0	18.0	AUG	0.800	6.0	40.0	5.0	33.0
SEP	0.500	16.0	68.0	8.0	33.0	SEP	0.800	7.0	47.0	3.0	20.0	SEP					
OCT	0.450	15.0	56.0	13.0	49.0	OCT	0.600	4.0	20.0	3.0	15.0	OCT					
NOV	0.500	14.5	60.0	14.0	58.0	NOV	0.600	11.0	55.0	7.0	35.0	NOV					
DEC	0.500	20.0	83.0	16.0	67.0	DEC	0.600	10.0	50.0	7.0	35.0	DEC					
AVERAGE	0.563	16.4	77.8	20.8	100.2	AVERAGE	0.742	8.2	48.9	6.0	43.0	AVERAGE	0.638	7.5	48.3	6.6	43.2

TABLE II-15b

GATESVILLE

1986

Month	Av. Day Flow in mgd	INFLUENT BOD in mg/l	INFLUENT BOD in lbs.	INFLUENT TSS in mg/l	INFLUENT TSS in lbs.
Jan					
Feb					
Mar					
Apr	0.400	120	400		
May					
Jun	2.100	134	2347	139	2434
Jul	0.800	136	907	139	927
Aug	0.700	135	788	129	753
Sep	0.800	134	894	137	914
Oct	0.600	141	706	131	656
Nov	0.600	119	595	204	1021
Dec	0.600			218	1091
Average	0.825	131	948	157	1114

FIGURE II-8a

CITY OF GATESVILLE

AVERAGE & MAXIMUM DAILY FLOWS

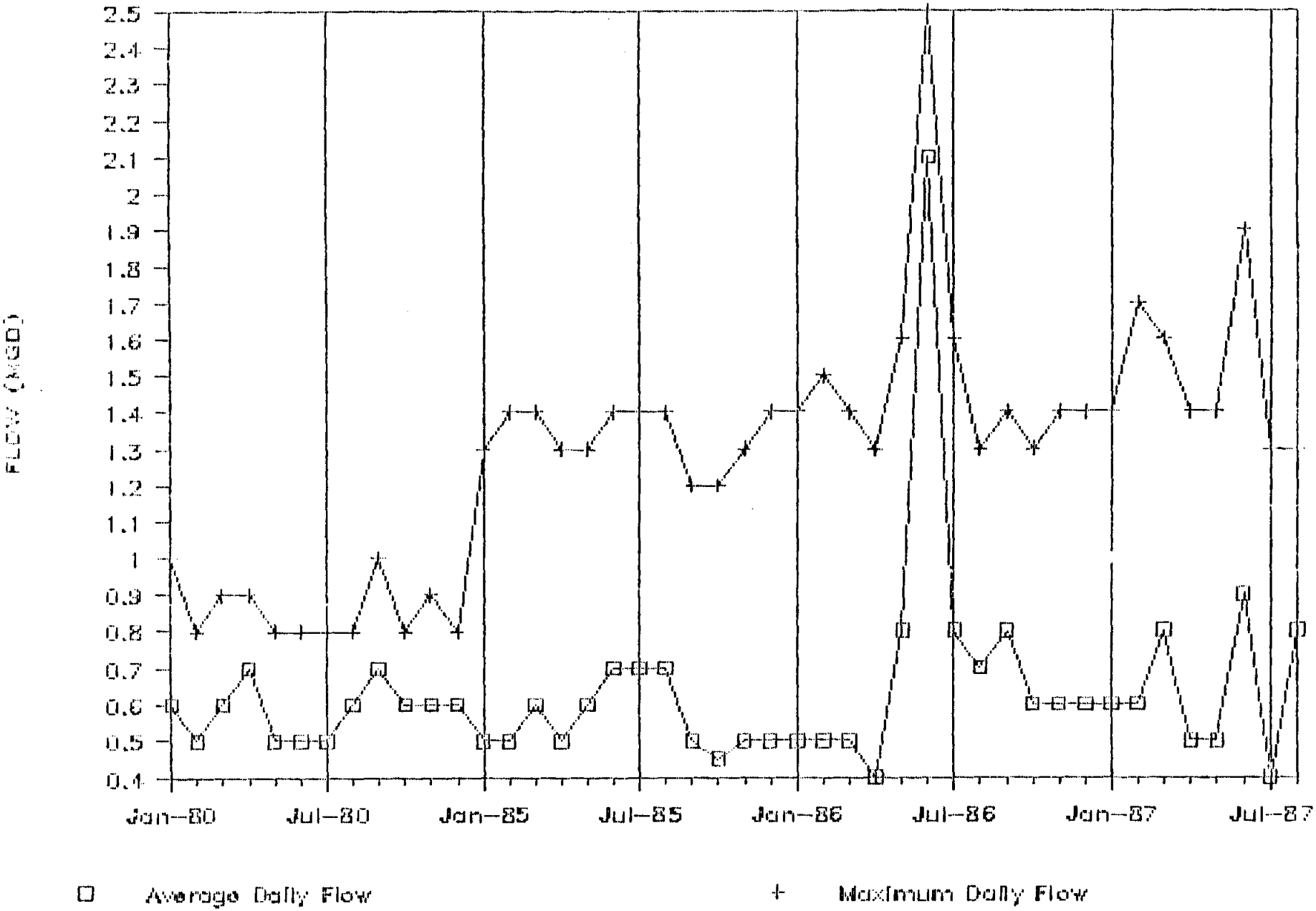

FIGURE II-8b

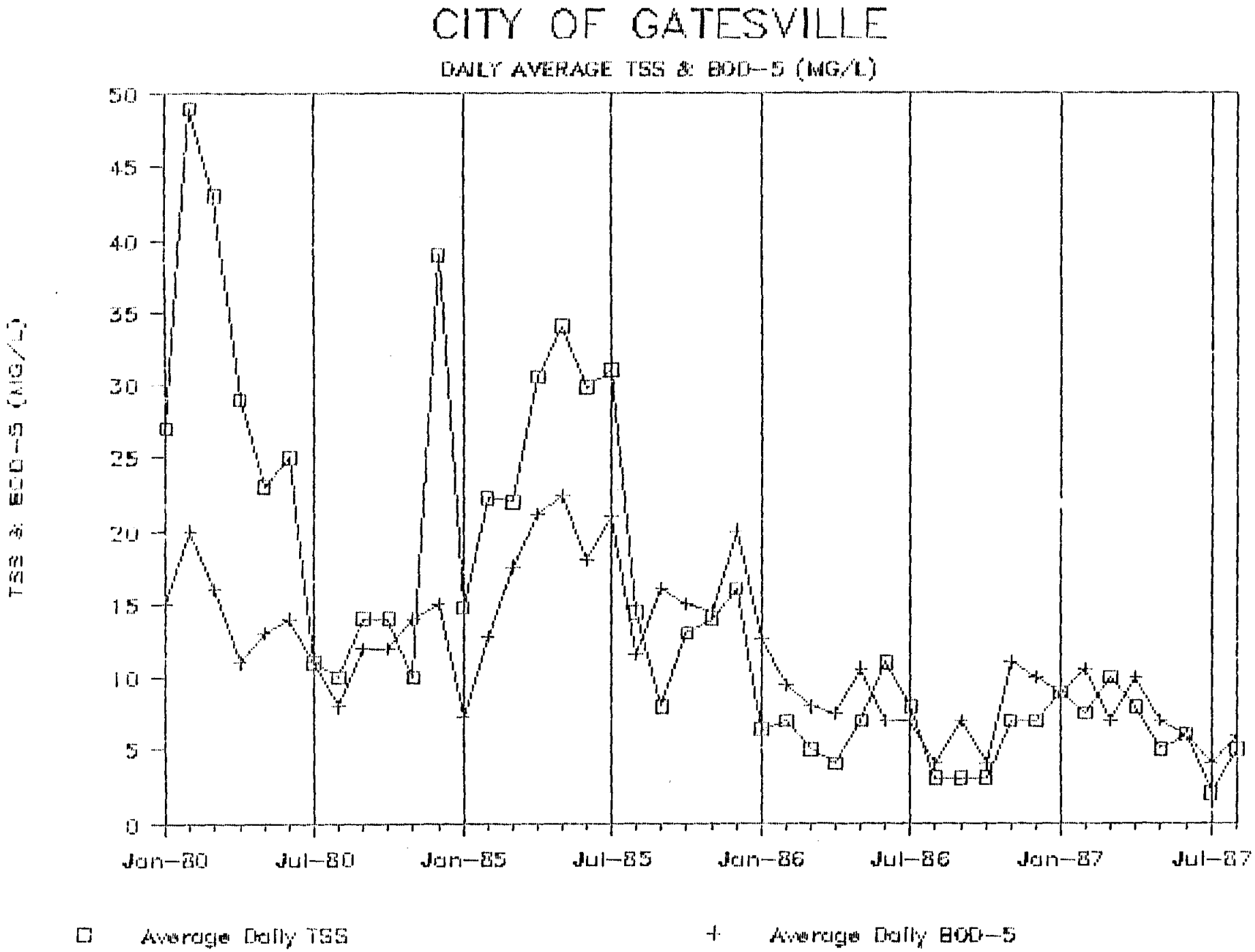
CITY OF GATESVILLE
DAILY AVERAGE TSS & BOD-5 (MG/L)
TSS & BOD-5 (MG/L)
50
45
40
35
30
25
20
15
10
5
0
Jan-80
Jul-80
Jan-85
Jul-85
Jan-86
Jul-86
Jan-87
Jul-87
Average Daily TSS
Average Daily BOD-5

TABLE II-16

CITY OF MOODY

1985						1986						1987					
		EFFLUENT						EFFLUENT						EFFLUENT			
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	0.185	3.5	6.9	7.5	14.8	JAN	0.136	4.0	3.4	0.5	0.5	JAN	0.215	7.0	6.1	13.5	12.6
FEB	0.266	20.0	32.4	51.0	82.8	FEB	0.297	5.0	5.5	11.5	13.4	FEB	0.262	4.5	8.7	4.5	14.0
MAR	0.350	10.0	34.6	14.0	48.1	MAR	0.149	13.0	12.7	25.5	38.2	MAR	0.288	3.5	5.5	3.5	5.9
APR	0.202	5.5	10.4	9.5	17.7	APR	0.151	5.0	3.7	2.0	2.2	APR	0.158	3.5	3.1	1.5	1.4
MAY	0.177	6.0	7.2	9.0	12.0	MAY	0.305	4.0	3.5	2.5	2.6	MAY	0.107	3.5	2.0	1.5	0.7
JUN	0.147	7.0	18.1	10.0	23.8	JUN	0.261	4.0	5.8	2.0	3.6	JUN	0.272	10.0	16.2	29.0	49.7
JUL	0.115	4.0	4.3	5.0	5.2	JUL	0.112	2.0	3.8	1.0	1.9	JUL	0.140	3.0	2.2	1.0	0.7
AUG	0.097	9.5	5.9	10.5	7.7	AUG	0.110	6.0	1.4	5.0	1.5	AUG					
SEP	0.123	5.5	6.1	4.0	4.5	SEP	0.143	4.0	1.6	1.0	0.6	SEP					
OCT	0.135	3.0	3.0	5.5	5.4	OCT	0.162	4.0	1.4	2.0	0.9	OCT					
NOV	0.183	4.0	3.8	8.5	8.4	NOV	0.169	26.0	13.9	122.0	121.7	NOV					
DEC	0.217	4.0	6.0	3.0	4.4	DEC	0.308	4.0	8.3	8.0	15.1	DEC					
AVERAGE	0.183	6.8	11.6	11.5	19.6	AVERAGE	0.192	6.8	5.4	15.3	16.9	AVERAGE	0.206	5.0	6.3	7.8	12.1

FIGURE II-9a

CITY OF MOODY

AVERAGE & MAXIMUM DAILY FLOWS

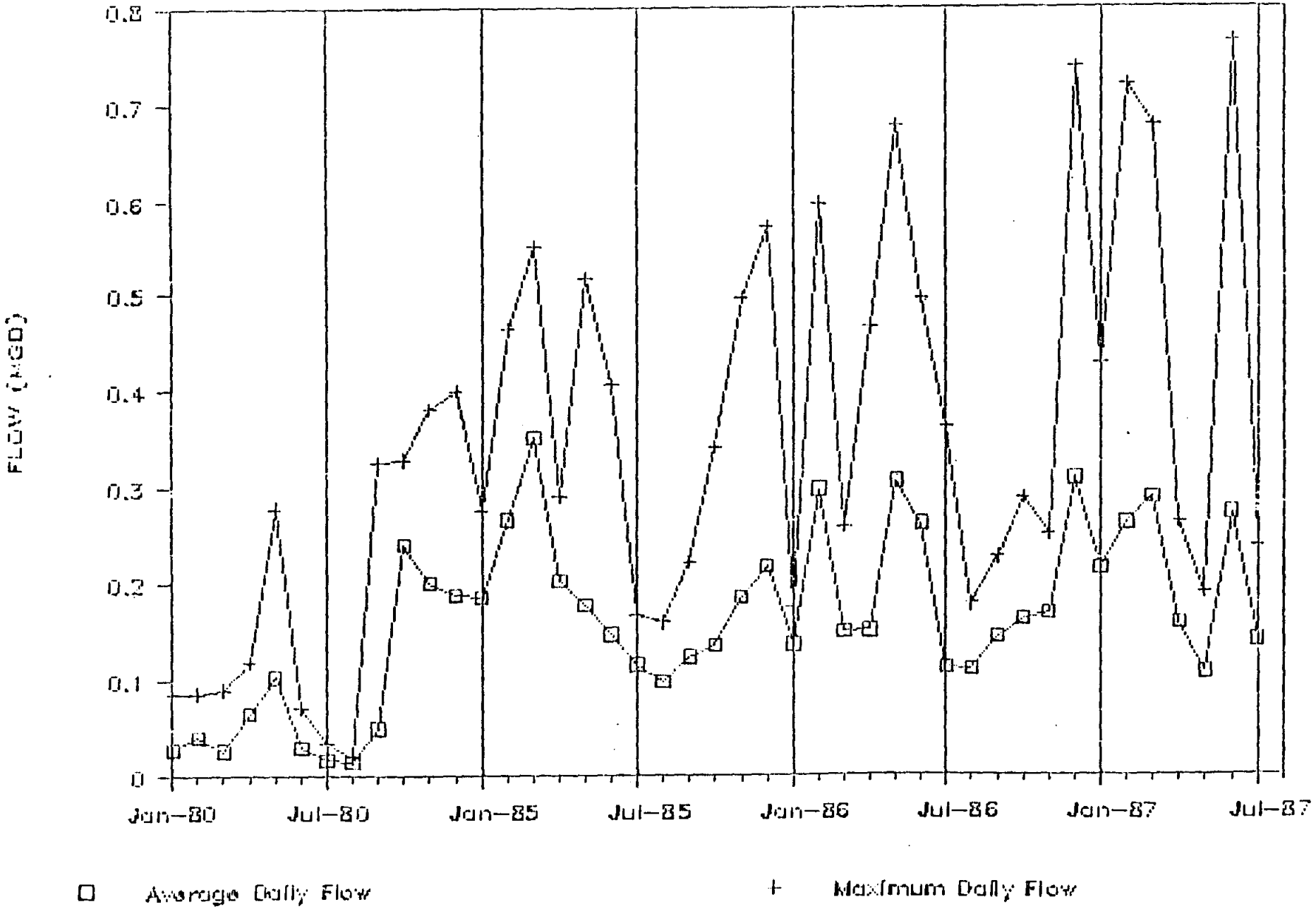

FIGURE II-9b

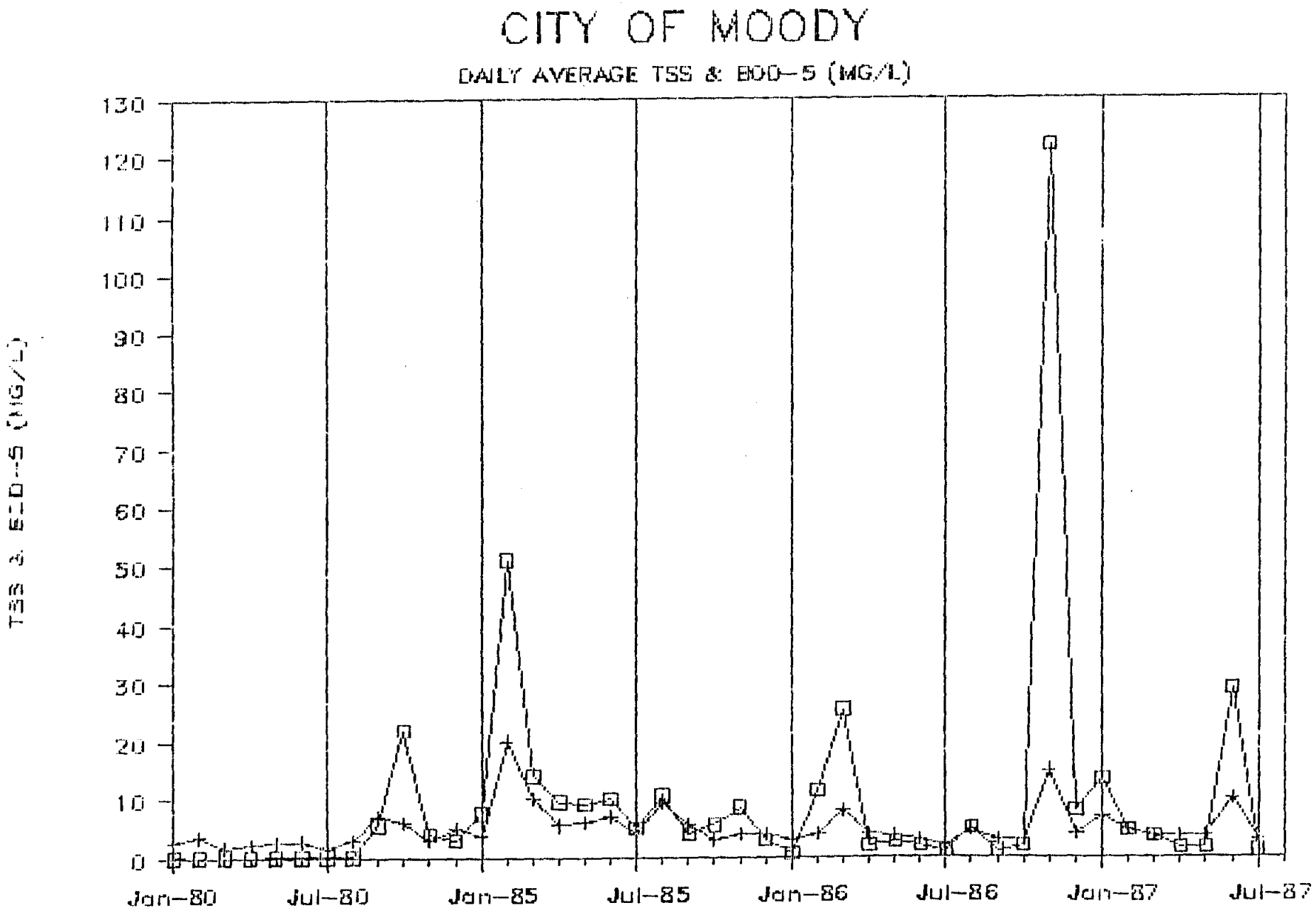
CITY OF MOODY
DAILY AVERAGE TSS & BOD-5 (MG/L)
TSS & BOD-5 (MG/L)
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Jan-80
Jul-80
Jan-85
Jul-85
Jan-86
Jul-86
Jan-87
Jul-87
□ Average Daily TSS
+ Average Daily BOD-5

TABLE II-17

CITY OF LAMPASAS
(Sulphur Plant)

	1985					1986					1987				
		EFFLUENT					EFFLUENT					EFFLUENT			
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	0.227	7.5	14.2	14.0	26.5	JAN	0.226	7.3	13.6	6.3	11.8	JAN	0.228	4.8	9.0	5.3	10.0
FEB	0.227	6.0	11.4	9.2	17.4	FEB	0.226	8.3	15.6	10.0	18.5	FEB	0.257	18.8	40.2	21.3	45.5
MAR	0.224	6.8	15.0	11.3	26.2	MAR	0.226	3.8	7.1	8.0	15.1	MAR	0.293	8.5	20.1	7.5	13.9
APR	0.225	17.8	33.3	24.3	45.2	APR	0.224	4.3	7.9	4.0	7.7	APR	0.323	4.0	10.8	3.3	8.7
MAY	0.227	12.8	24.2	21.5	40.6	MAY	0.225	4.8	8.9	3.3	6.1	MAY	0.261	3.5	7.6	2.0	4.4
JUN	0.226	9.5	17.9	17.0	32.1	JUN	0.229	3.8	7.2	3.8	7.2	JUN	0.305	7.5	19.1	8.0	20.3
JUL	0.226	11.1	26.4	12.0	22.6	JUL	0.227	5.0	9.4	4.3	8.0	JUL	0.287	12.5	29.9	12.5	29.9
AUG	0.225	8.5	15.9	7.8	14.3	AUG	0.228	6.8	12.8	11.5	21.8	AUG	0.247	14.8	30.4	20.0	41.3
SEP	0.231	5.8	11.1	4.8	9.1	SEP	0.232	5.8	11.1	8.0	15.5	SEP					
OCT	0.239	3.5	7.0	3.5	7.0	OCT	0.228	4.3	8.1	2.5	4.7	OCT					
NOV	0.235	5.3	10.3	5.8	11.3	NOV	0.232	5.8	11.1	9.0	17.4	NOV					
DEC	0.226	5.3	9.9	11.0	20.7	DEC	0.232	5.3	10.2	4.8	9.2	DEC					
AVERAGE	0.228	8.3	16.4	11.8	22.8	AVERAGE	0.228	5.4	10.3	6.3	11.9	AVERAGE	0.275	9.3	20.9	10.0	21.8

FIGURE II-10a

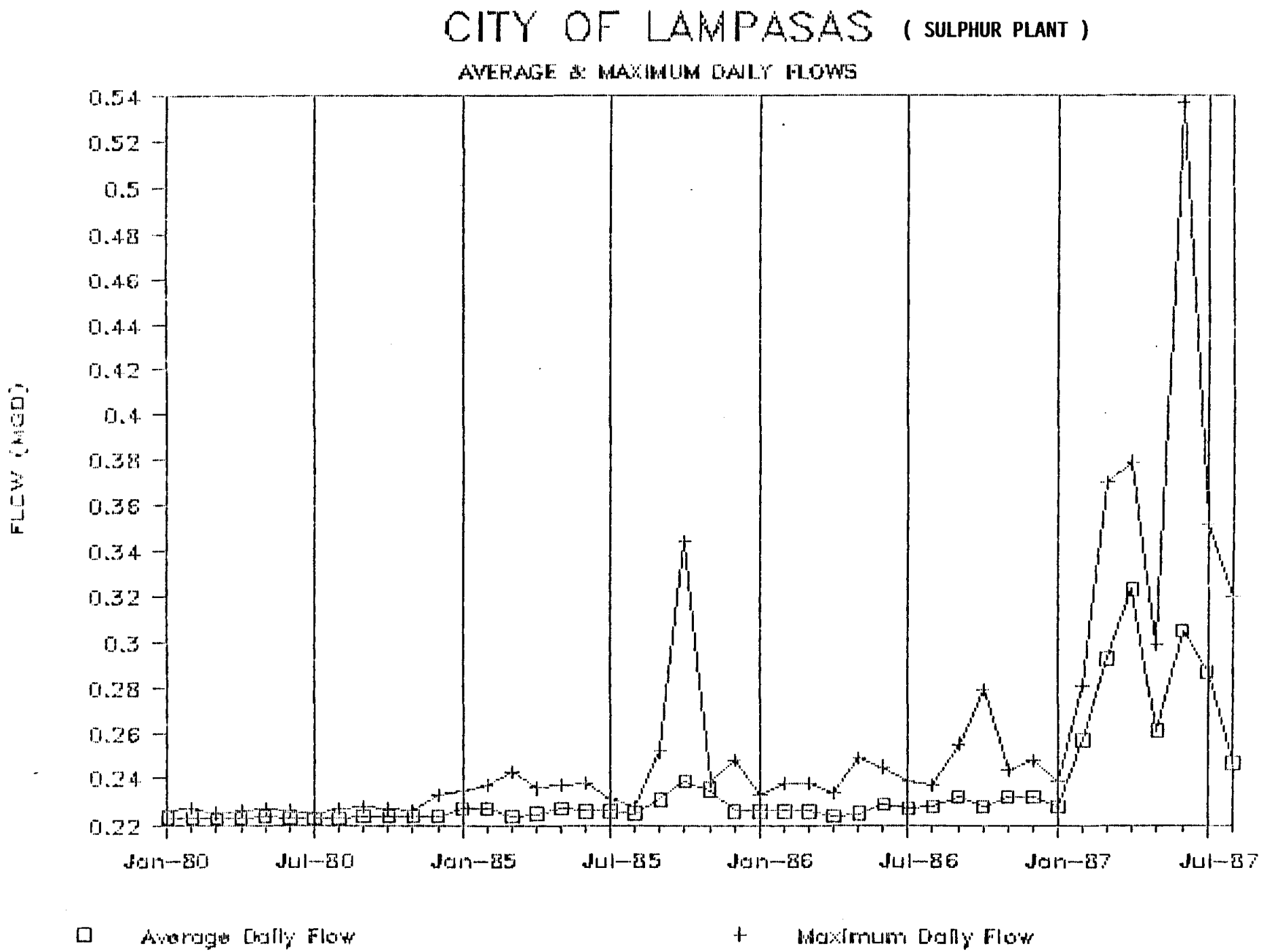

FIGURE II-10b

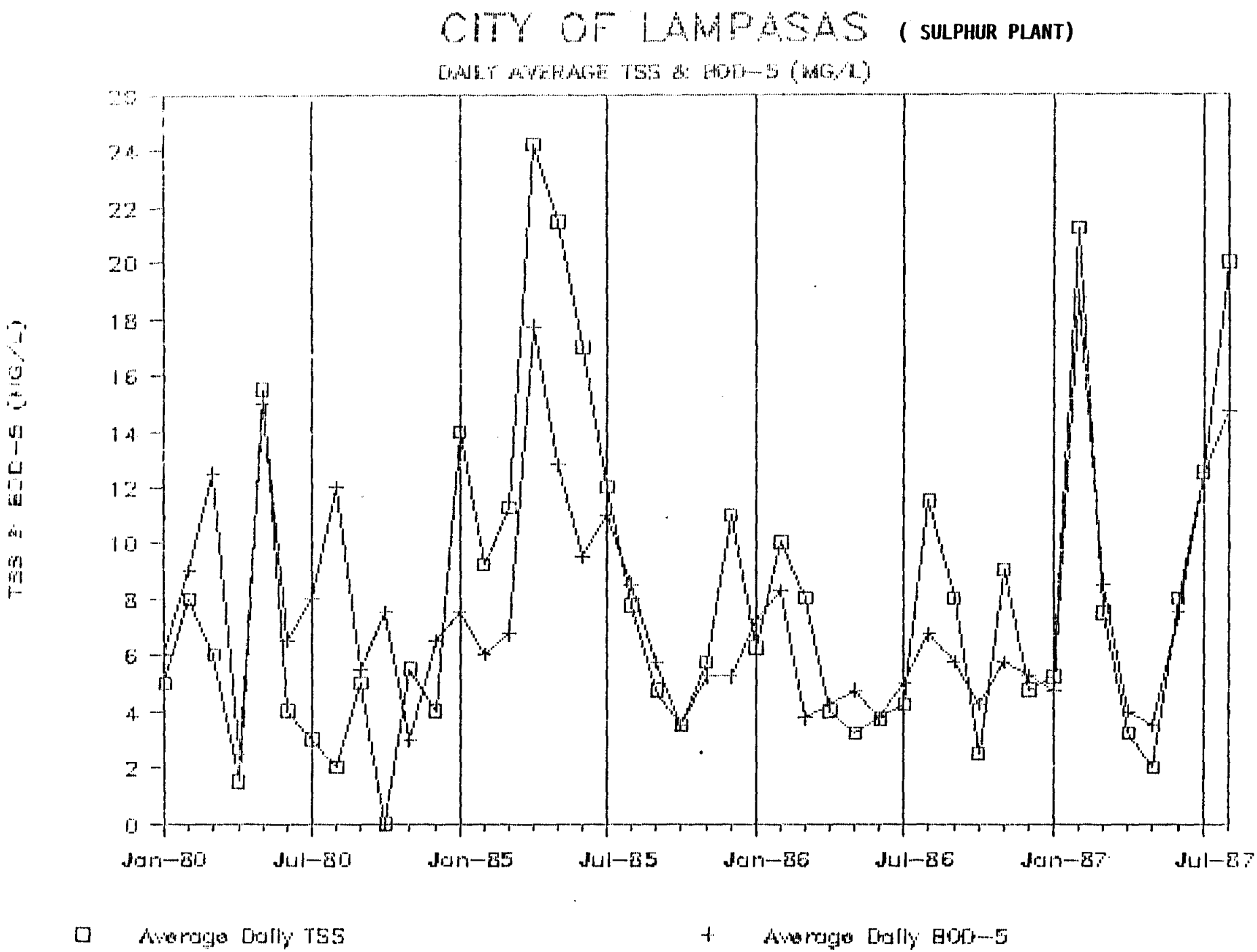

TABLE II-18

CITY OF LAMPASAS
HENDERSON PLANT

1985		EFFLUENT				1986		EFFLUENT				1987		EFFLUENT			
MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY	MONTH	AV.DAY FLOW IN MGD	BOD IN MG/L	BOD IN LBS/DAY	TSS IN MG/L	TSS IN LBS/DAY
JAN	0.230	5.3	10.1	10.8	20.6	JAN	0.235	5.8	11.2	8.5	16.6	JAN	0.234	3.8	7.3	4.5	8.8
FEB	0.231	4.0	7.7	8.2	15.8	FEB	0.232	5.3	10.4	6.3	12.1	FEB	0.315	4.8	12.5	4.0	10.5
MAR	0.231	5.0	9.6	8.3	15.9	MAR	0.230	3.8	7.2	5.8	11.1	MAR	0.348	3.5	10.1	3.0	8.7
APR	0.231	6.5	12.5	12.2	23.5	APR	0.231	3.8	7.2	4.8	9.2	APR	0.350	3.3	9.5	2.8	8.0
MAY	0.232	6.3	12.1	9.5	18.4	MAY	0.233	5.0	9.7	3.5	6.8	MAY	0.361	3.3	9.8	2.8	8.3
JUN	0.231	4.5	8.7	5.8	11.1	JUN	0.237	4.0	7.9	4.0	7.9	JUN	0.386	7.3	23.3	6.0	19.3
JUL	0.231	5.5	10.6	8.0	19.4	JUL	0.233	5.3	10.2	3.5	6.8	JUL	0.349	4.8	13.8	7.5	21.8
AUG	0.235	6.8	11.8	6.8	13.2	AUG	0.235	3.3	6.7	3.3	6.7	AUG	0.356	4.3	8.7	3.3	9.7
SEP	0.236	5.0	9.8	6.0	11.8	SEP	0.254	3.3	6.9	3.0	6.3	SEP					
OCT	0.247	3.3	6.7	2.3	4.6	OCT	0.244	3.5	7.1	2.5	5.1	OCT					
NOV	0.229	5.3	10.0	8.3	15.7	NOV	0.236	2.8	5.4	3.3	6.4	NOV					
DEC	0.246	5.0	10.2	9.5	19.5	DEC	0.243	3.8	7.6	3.8	7.6	DEC					
AVERAGE	0.234	5.2	10.0	8.0	15.8	AVERAGE	0.237	4.1	8.1	4.3	8.6	AVERAGE	0.337	4.3	11.9	4.2	11.9

FIGURE II-11a

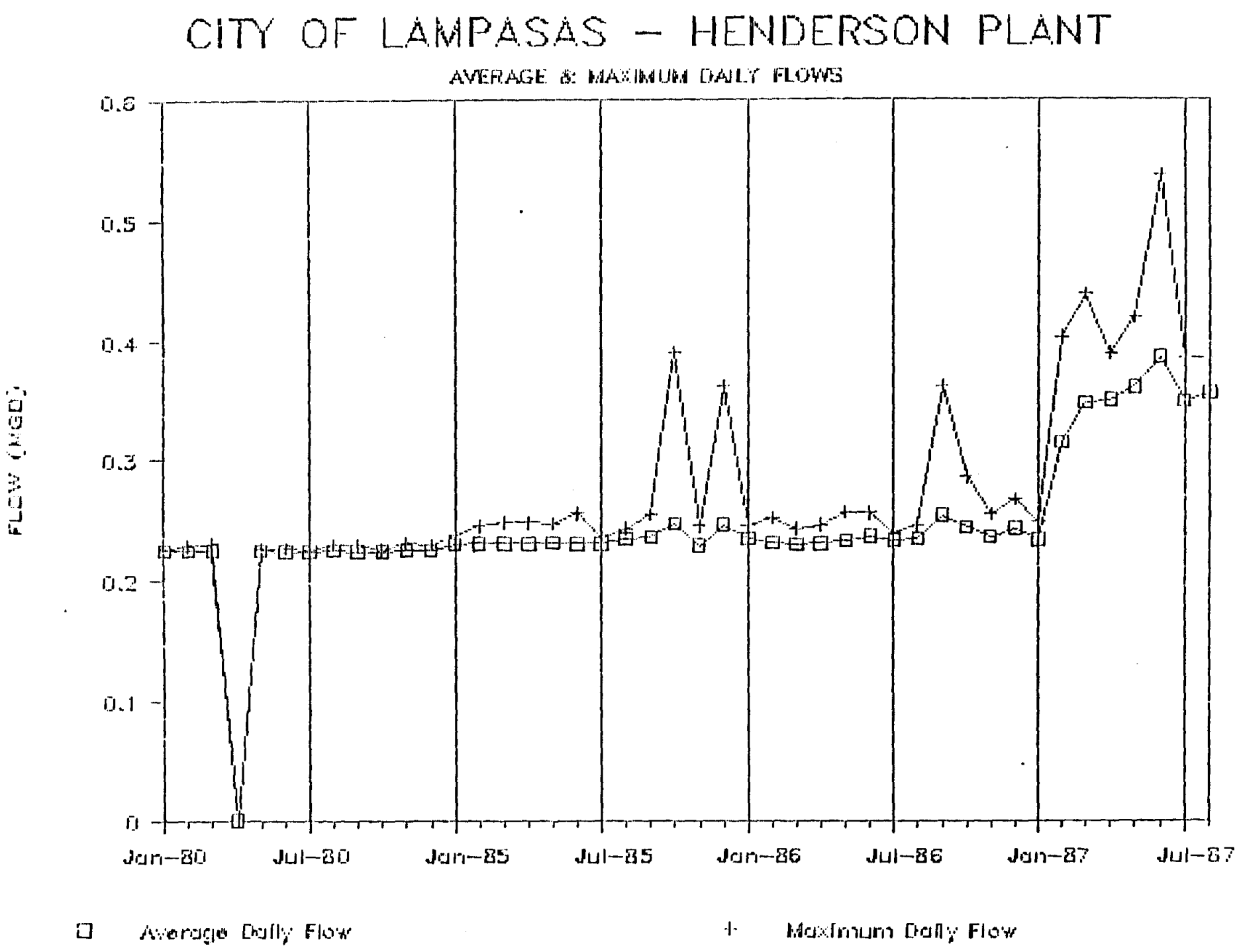

FIGURE II-11b

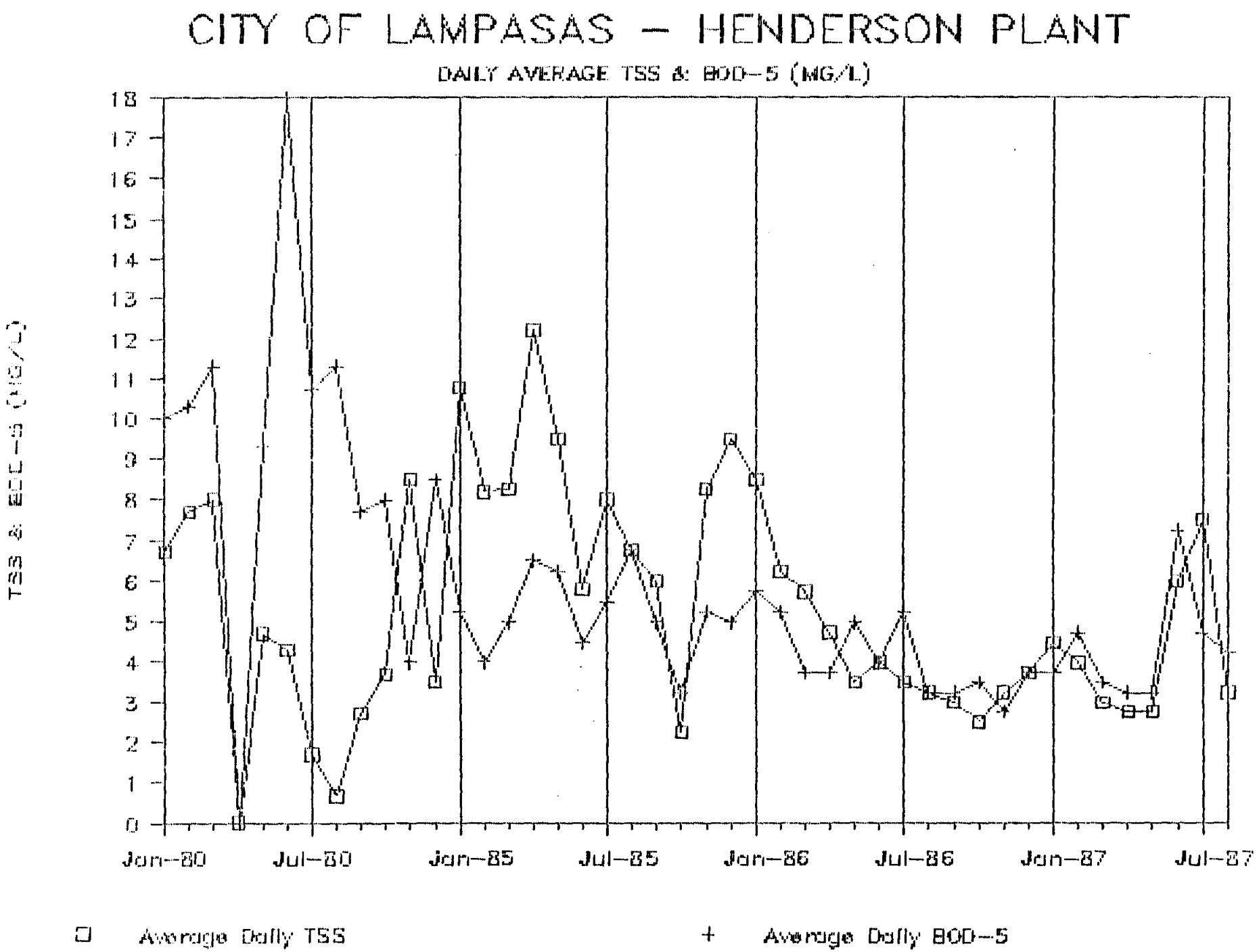

TABLE III-1

PROJECTED POPULATIONS, AVERAGE DAILY AND
MAXIMUM MONTHLY FLOWS FOR KILLEEN AND FT. HOOD
BY MINOR GROWTH AREA

		1985			1990			2000			2010			2020			2030		
AREA NO.	ACREAGE	CUM. POP.	AVG. DAILY FLOW (MGD)	MAX. MO. FLOW (MGD)	CUM. POP.	AVG. DAILY FLOW (MGD)	MAX. MO. FLOW (MGD)	CUM. POP.	AVG. DAILY FLOW (MGD)	MAX. MO. FLOW (MGD)	CUM. POP.	AVG. DAILY FLOW (MGD)	MAX. MO. FLOW (MGD)	CUM. POP.	AVG. DAILY FLOW (MGD)	MAX. MO. FLOW (MGD)	CUM. POP.	AVG. DAILY FLOW (MGD)	MAX. MO. FLOW (MGD)
K1985-N-A	10,200	47,730	8.11	11.93	50,520	8.57	12.63	52,730	8.97	13.18	54,850	9.32	13.71	57,160	9.72	14.29	59,470	10.11	14.87
FT. HOOD			4.75	6.23		5.00	6.23		5.00	6.23		5.00	6.23		5.00	6.23		5.00	6.23
SUBTOTAL			12.86	18.16		13.59	18.86		13.97	19.41		14.32	19.94		14.72	20.52		15.11	21.10
K1985-T-A	400	1,870	0.32	0.47	1,980	0.34	0.50	2,070	0.35	0.52	2,150	0.37	0.54	2,240	0.38	0.56	2,330	0.40	.58
SUBTOTAL 1985	10,600	49,600	13.18	18.63	52,500	13.93	19.36	54,800	14.32	19.93	57,000	14.69	20.48	59,400	15.10	21.08	61,800	15.51	21.68
K1990-N-A	4,500				2,260	0.33	0.56	8,740	1.49	2.19	13,850	2.35	3.46	18,600	3.16	4.65	22,500	3.82	5.63
K1990-T-A	700				340	0.06	0.09	1,360	0.23	0.34	2,150	0.37	0.54	2,900	0.49	0.73	3,500	0.60	0.87
SUBTOTAL K1990	5,200				2,600	0.44	0.65	10,100	1.72	2.53	16,000	2.72	4.00	21,500	3.65	5.38	26,000	4.42	6.50
K2000-N-A	1,200							910	0.13	0.18	2,610	0.37	0.52	4,230	0.59	0.85	5,400	0.76	1.08
K2000-N-B	840							640	0.09	0.13	1,830	0.25	0.37	2,960	0.42	0.59	3,780	0.53	0.76
K2000-N-C	1,200							910	0.13	0.18	2,610	0.37	0.52	4,230	0.59	0.85	5,400	0.76	1.08
K2000-T-A	1,100							840	0.11	0.17	2,390	0.33	0.48	3,870	0.54	0.77	4,950	0.69	0.99
K2000-REA	260							200	0.03	0.04	560	0.08	0.11	910	0.13	0.18	1,170	0.16	0.23
SUBTOTAL K2000	4,600							3,500	0.49	0.70	10,000	1.40	2.00	16,200	2.27	3.24	20,700	2.90	4.14
K2010-N-A	800										630	0.09	0.13	2,290	0.32	0.46	3,000	0.42	0.60
K2010-N-B	120										100	0.01	0.02	340	0.05	0.07	450	0.06	0.09
K2010-N-C	500										400	0.06	0.08	1,430	0.2	0.29	1870	0.26	0.37
K2010-RE-A	830										660	0.09	0.13	2,370	0.33	0.47	3,110	0.44	0.62
K2010-T-A	320										250	0.04	0.05	910	0.13	0.18	1,200	0.17	0.24
K2010-T-B	580										460	0.06	0.09	1,660	0.23	0.33	2,170	0.30	0.44

TABLE III-1

SUBTOTAL K2000	4,600							3,500	0.49	0.70	10,000	1.40	2.00	16,200	2.27	3.24	20,700	2.90	4.14
K2010-N-A	800										630	0.09	0.13	2,290	0.32	0.46	3,000	0.42	0.60
K2010-N-B	120										100	0.01	0.02	340	0.05	0.07	450	0.06	0.09
K2010-N-C	500										400	0.06	0.08	1,430	0.2	0.29	1870	0.26	0.37
K2010-RE-A	830										660	0.09	0.13	2,370	0.33	0.47	3,110	0.44	0.62
K2010-T-A	320										250	0.04	0.05	910	0.13	0.18	1,200	0.17	0.24
K2010-T-B	580										460	0.06	0.09	1,660	0.23	0.33	2,170	0.30	0.44
SUBTOTAL K2010	3,150										2,500	0.35	0.50	9,000	1.26	1.80	11,800	1.65	2.36
K2020-T-A	1,650													1,940	0.27	0.39	4,980	0.70	1.00
K2020-LTO-A	1,500													1,760	0.25	0.35	4,520	0.63	0.90
SUBTOTAL K2020	3,150													3,700	0.52	0.74	9,500	1.33	1.90
K2030-T-A	1,100																2,740	0.38	0.55
K2030-T-B	1,200																2,990	0.42	0.60
K2030-LTO-A	150																370	0.05	0.07
K2030-RO-A	520																1,300	0.18	0.26
SUBTOTAL K2030	2,970																7,400	1.03	1.48
TOTAL	29,670	49,600	13.43	18.63	55,100	14.37	20.01	68,400	16.53	23.16	85,500	19.16	26.98	109,800	22.80	32.24	137,200	26.84	38.06

NOTES:

Avg. Daily Flows for all K1985 and K1990 areas are based on 170 GPCD.
Avg. Daily Flows for all K2000, K2010, K2020, and K2030 areas are based on 140 GPCD.
Max. Monthly Flows for all K1985 and K1990 areas are based on 250 GPCD.
Max. Monthly Flows for all K2000, K2010, K2020, K2030 areas are based on 200 GPCD.

Ft. Hood Population of 31,200 is not included in above population figures. However,
Ft. Hood flows are included in applicable Subtotals and Totals.

TABLE III-2

PROJECTED POPULATIONS, AVERAGE DAILY AND
MAXIMUM MONTHLY FLOWS FOR HARKER HEIGHTS
BY MINOR GROWTH AREA

AREA NO.	ACREAGE	1985 CUM. POP.	1985 AVG. DAILY FLOW (MGD)	1985 MAX. MO. FLOW (MGD)	1990 CUM. POP.	1990 AVG. DAILY FLOW (MGD)	1990 MAX. MO. FLOW (MGD)	2000 CUM. POP.	2000 AVG. DAILY FLOW (MGD)	2000 MAX. MO. FLOW (MGD)	2010 CUM. POP.	2010 AVG. DAILY FLOW (MGD)	2010 MAX. MO. FLOW (MGD)	2020 CUM. POP.	2020 AVG. DAILY FLOW (MGD)	2020 MAX. MO. FLOW (MGD)	2030 CUM. POP.	2030 AVG. DAILY FLOW (MGD)	2030 MAX. MO. FLOW (MGD)
HM1985-M-A	2,510	8,000	1.36	2.00	8,300	1.41	2.07	8,400	1.43	2.10	8,650	1.47	2.16	8,900	1.51	2.23	9,150	1.56	2.29
HM1985-T-A	990	200	0.03	0.05	350	0.06	0.09	1,400	0.24	0.35	2,400	0.41	0.60	3,100	0.53	0.77	3,600	0.61	0.90
CH1985-T-A	160	N/A	N/A	N/A	N/A	N/A	N/A	650	0.11	0.16	650	0.11	0.16	700	0.12	0.18	700	0.12	0.18
SUBTOTAL 1985	3,660	8,200	1.39	2.05	8,650	1.47	2.16	10,450	1.78	2.61	11,700	1.99	2.92	12,700	2.16	3.18	13,450	2.29	3.37
HM1990-T-A	130				20	0.00	0.01	100	0.02	0.03	150	0.02	0.03	200	0.03	0.05	250	0.04	0.06
HM1990-T-B	130				230	0.04	0.06	350	0.06	0.09	450	0.08	0.12	500	0.09	0.13	530	0.09	0.14
SUBTOTAL M1990	260				230	0.04	0.07	450	0.08	0.11	600	0.10	0.15	700	0.12	0.18	780	0.13	0.20
HM2000-M-A	450							300	0.04	0.06	700	0.10	0.14	1,100	0.15	0.22	1,350	0.19	0.27
HM2000-T-A	300							200	0.03	0.04	500	0.07	0.10	700	0.10	0.14	900	0.13	0.18
SUBTOTAL M2000	750							500	0.07	0.10	1,200	0.17	0.24	1,800	0.25	0.36	2,250	0.32	0.45
HM2010-M-A	480										100	0.01	0.02	500	0.07	0.10	700	0.10	0.14
HM2010-M-B	160										100	0.01	0.02	300	0.04	0.06	500	0.07	0.10
HM2010-T-A	880										600	0.08	0.12	1,800	0.25	0.36	2600	0.36	0.52
SUBTOTAL M2010	1,520										800	0.10	0.16	2,600	0.36	0.52	3,800	0.53	0.76
HM2020-M-A	240													150	0.02	0.03	300	0.04	0.06
HM2020-T-A	700													450	0.06	0.09	1,530	0.22	0.31
HM2020-T-B	300													200	0.03	0.04	650	0.09	0.13
SUBTOTAL M2020	1,240													800	0.11	0.16	2,480	0.35	0.50
HM2030-T-A	300																590	0.08	0.12

TABLE III-2

M2030-T-B	70																150	0.02	0.03
SUBTOTAL M2030	370																740	0.10	0.15
TOTAL	7,800	8,200	1.39	2.05	8,900	1.51	2.23	11,400	1.92	2.82	14,300	2.36	3.47	18,600	3.00	4.40	23,500	3.72	5.43

NOTES:

Avg. Daily Flows for all M1985 and M1990 areas are based on 170 GPCD.
Avg. Daily Flows for all M2000, M2010, M2020, and M2030 areas are based on 140 GPCD.
Max. Monthly Flows for all M1985 and M1990 areas are based on 250 GPCD.
Max. Monthly Flows for all M2000, M2010, M2020, M2030 areas are based on 200 GPCD.

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TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1988

LINE	AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 1									
PHASE I:									
16	LINE 15	1.02	1.28	3.84	SWR	21"	0.14	2.5	7100
	H2010-N-B	0.07							
	H2000-N-A	0.19							
7	K2000-T-A	0.69	0.86	2.58	SWR	18"	0.15	2.3	10200
	K2010-T-A	0.17							
8	LINE 5	0.3	1.16	3.48	F.M.	14"		5	10600
	LINE 7	0.86							
9	LINE 8	1.16	2.42	7.26	SWR	30"	0.07	2.3	3200
	K2010-RE-A	0.44							
	K2000-N-A	0.76							
	K2010-N-B	0.06							
10	LINE 9	2.42	2.42	7.26	SWR	30"	0.07	2.3	12600
11	LINE 10	0.26	2.68	8.04	SWR	30"	0.09	2.5	4000
	LINE 9	2.42							

TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1999

LINE	AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 1 (CONT'D.)									
PHASE II:									
5	K2010-T-B	0.30	0.30	0.90	F.M.	8"		4	6100
6A	H2000-T-A	0.13	0.61	1.83	SWR	15"	0.19	2.3	4800
	H2010-T-A	0.36							
	LINE 17B 1/2(CH1985	0.09	0.12	0.36	F.M.	6"		2.8	7920
6	LINE 18B H2020-T-A	0.22	0.31	0.93	F.M.	8"		4.1	11200
	H2030-T-A	0.08							
	H2030-T-B	0.02							
	LINE 6A	0.61							
14	LINE 6	1.02	1.02	3.06	F.M.	14"		4.4	4600
15	LINE 14	1.02	1.02	3.06	SWR	18"	0.20	2.6	2200
17		0.1	0.1	0.3	F.M.	6"		2.3	45000
18		0.275	0.275	0.83	F.M.	10"		2.4	13000
19		0.275	0.275	0.83	F.M.	10"		2.4	14000

TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1988

LINE	AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 1 (CONT'D.) PHASE III									
1A	1/2(K2020-LTO-A)	0.31	0.31	0.93	F.M.	8"		4.3	7100
1	1/2(K2020-LTO-A)	0.32	0.32	0.96	F.M.	8"		4.3	3400
2	LINE 1	0.32	0.63	1.89	F.M.	12"		5.3	8200
	LINE 1A	0.31							
3	K2030-LTO-A	0.05	1.94	5.82	SWR	24"	0.16	2.9	4100
	K2030-T-A	0.38							
	K2030-RO-A	0.18							
	K2020-T-A	0.7							
	LINE 2	0.63							
3A	LINE 3		1.94	5.82	SWR	24"	0.16	2.9	5800
4	K2030-T-B	0.42	0.42	1.26	SWR	12"	0.33	2.3	9600
13	LINE 3A	1.94	2.36	7.08	F.M.	20"		5	26400
	LINE 4	0.42							
12		3.8	3.8	11.4	SWR	36"	0.07	2.5	5900
	LINE 17A 1/2(CH1985	0.03	0.03	0.09	F.M.	4"		1.6	1980
	LINE 17B 1/2(CH1985	0.09	0.12	0.36	F.M.	6"		2.8	7920
	LINE 18A H2020-T-B	0.09	0.09	0.27	F.M.	6"		2.1	12400
	LINE 19B H2020-T-A	0.22	0.31	0.93	F.M.	8"		4.1	11200

TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1988

LINE	AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 2									
PHASE I									
16	LINE 15	1.02	1.28	3.84	SWR	21"	0.14	2.5	7100
	H2010-N-B	0.07							
	H2000-N-A	0.19							
7	K2000-T-A	0.69	0.86	2.58	SWR	18"	0.15	2.3	10200
	K2010-T-A	0.17							
8	LINE 5	0.3	1.16	3.48	F.M.	14"		5	10600
	LINE 7	0.86							
9	LINE 8	1.16	2.42	7.26	SWR	30"	0.07	2.3	3200
	K2010-RE-A	0.44							
	K2000-N-A	0.76							
	K2010-N-B	0.06							
10	LINE 9	2.42	2.42	7.26	SWR	30"	0.07	2.3	12600
11	LINE 10	2.42	2.42	7.26	SWR	30"	0.07	2.3	4000

TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1988

LINE	AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 2 (CONT'D.)									
PHASE II:									
5	K2010-T-B	0.3	0.3	0.9	F.M.	8"		4	6100
6A	H2000-T-A	0.13	0.61	1.83	SWR	15"	0.19	2.3	4800
	H2010-T-A	0.36							
	LINE 17B 1/21CH1985	0.09	0.12	0.36	F.M.	6"		2.8	7920
6	LINE 18B H2020-T-A	0.22	0.31	0.93	F.M.	8"		4.1	11200
	H2030-T-A	0.08							
	H2030-T-B	0.02							
	LINE 6A	0.61							
14	LINE 6	1.02	1.02	3.06	F.M.	14"		4.4	4600
15	LINE 14	1.02	1.02	3.06	SWR	18"	0.2	2.6	2200

TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1988

LINE	AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 2 (CONT'D.)									
PHASE III:									
1A	1/2(K2020-LTD-A)	0.31	0.31	0.93		8"		4.2	7100
1	LINE 1A	0.31	0.31	0.93	F.M.	8"		4.2	3400
3	K2030-LTD-A	0.05	1.31	3.93	SWR	18"	0.32	3.3	4100
	K2030-TA	0.38							
	K2030-RD-A	0.18							
	K2020-T-A	0.7							
3A	LINE 3	1.31	1.31	3.93	SWR	18"	0.32	3.3	5800
4	K2030-T-B	0.42	0.42	1.26	SWR	12"	0.33	2.3	9600
13	LINE 3A	1.31	1.73	5.19	F.M.	18"		4.4	26400
	LINE 4	0.42							
12		3.8	3.8	11.4	SWR	36"	0.07	2.5	5900

TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1988

	LINE	AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 3										
PHASE I:										
	7	K2000-T-A	0.69	0.86	2.58	SWR	18"	0.15	2.3	10200
		K2010-T-A	0.17							
(a)	8	LINE 5	0.06	0.43	1.29	F.M.	10"		3.65	10500
		LINE 7	0.37							
	9	K2010-RE-A	0.44	1.26	3.78	SWR	21"	0.13	2.4	3200
		K2000-N-A	0.76							
		K2010-N-B	0.06							
	10	LINE 9	1.26	1.26	3.78	SWR	21"	0.13	2.4	12600
	11	LINE 10	1.26	1.26	3.78	SWR	21"	0.10	2.2	4000
	16	LINE 15	0.19	0.45	1.35	SWR	12"	0.33	2.6	7100
		H2010-N-B	0.07							
		H2000-N-A	0.19							

(a) Sized to carry capacities through the year 2010.

TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1988

LINE		AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 3 (CONT'D.)										
PHASE II:										
(a)	5	K2010-T-B	0.06	0.06	0.18	F.M.	6"		1.4	6100
	6A	H2000-T-A	0.13	0.61	1.83	SWR	15"	0.19	2.3	4800
		H2010-T-A	0.36							
		LINE 178 1/2(CH1985	0.09	0.12	0.36	F.M.	6"		2.8	7920
(a)	6	H2000-T-A	0.07	0.15	0.45	F.M.	6"		3.4	5800
		H2010-T-A	0.08							
(a)	14	LINE 6	0.26	0.26	0.78	F.M.	8"		3.4	4600
(a)	15	LINE 14	0.26	0.26	0.78	SWR	8"	1	3.4	2200

(a) Sized to carry capacities thRough the year 2010.

TABLE III-3

TRANSPORT FACILITY SIZING
BRAZOS RIVER AUTHORITY
AUGUST 24, 1988

LINE	AREAS	AVG DAILY FLOW (MGD)	CUM AVG DAILY FLOW (MGD)	PK CUM DAILY FLOW (3X AVG) (MGD)	F.M. OR SWR	DIA. (IN)	SLOPE (%)	VEL. (FPS)	LENGTH (FT)
ALTERNATE 3 (CONT'D.)									
PHASE III:									
1A	1/2(K2020-LTD-A)	1/2(.63)	0.31	0.93	F.M.	8"		4.2	7100
1	LINE 1A	0.31	0.31	0.93	F.M.	8"		4.2	3400
3	K2030-T-A	0.38	1.31	3.93	SWR	21"	0.14	2.5	4100
	K2030-RD-A	0.18							
	K2020-T-A	0.7							
	K2030-LTD-A	0.05							
3B	K2000-T-A	0.69	0.86	2.58	SWR	18"	0.14	2.2	5900
	K2010-T-A	0.17							
4	K2010-T-B	0.3	0.72	2.16	SWR	15"	0.34	2.7	9600
	K2030-T-B	0.42							
3A	LINE 3B	0.86	2.17	6.51	SWR	30"	0.06	2	5800
	LINE 3	1.31							
6B	LINE 6A	0.61	1.02	3.06	SWR	18"	0.20	2.6	2100
	H2020-T-B	0.09							
	H2020-T-A	0.22							
	H2030-T-A	0.08							
	H2030-T-B	0.02							
12		2.47	2.47	7.41	SWR	30"	0.08	2.3	5900

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 1
PHASE 1
BUILT BY 1990

KILLEEN:					
**********					
14" F.M.	L.F.	10,600	$30	$318,000	
18" SWR	L.F.	10,200	$60	$612,000	
30" SWR	L.F.	19,800	$90	$1,782,000	
Stage Coach Road L.S. #1 (3.48 MGD)				$180,000	
SUBTOTAL				$2,892,000	
ENGINEERING/CONTINGENCIES (20%)				$578,400	
EASEMENT/R.O.W.		10,600 L.F. F.M.	$2.50	$26,500	
		30,000 L.F. SWR	$5.00	$150,000	
PRESENT WORTH (1990)					$3,646,900
HARKER HEIGHTS:					
**********					
21" SWR	L.F.	7,100	$70	$497,000	
HARKER HEIGHTS STP/L.S. (3.84 MGD)				$195,000	
SUBTOTAL				$692,000	
ENGINEERING/CONTINGENCIES (20%)				$138,400	
EASEMENT/R.O.W.		7,100 L.F. SWR	$5.00	$35,500	
PRESENT WORTH (1990)					$865,900
TOTAL PRESENT WORTH ALTERNATE 1 PHASE 1					$4,512,800

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 1
PHASE II
BUILT BY 2000

KILLEEN:					
**********					
8" F.M.	L.F.	6,100	$20	$122,000	
Stage Coach Rd. L.S. #2 (0.9 MGD)				$100,000	
SUBTOTAL				$222,000	
ENGINEERING/CONTINGENCIES (20%)				$44,400	
EASEMENT/R.O.W.		6,100 L.F. F.M.	$2.50	$15,250	
TOTAL (2000)				$281,650	
PRESENT WORTH (1990)		$281,650 (0.5083) =			$143,163
HARKER HEIGHTS:					
**********					
4" F.M.	L.F.	1,980	$14	$27,700	
6" F.M.	L.F.	20,320	$16	$325,100	
8" F.M.	L.F.	11,200	$20	$224,000	
14" F.M.	L.F.	10,400	$30	$312,000	
15" SWR	L.F.	4,800	$50	$240,000	
18" SWR	L.F.	2,200	$60	$132,000	
MATKIN L.S. (0.36 MGD)				$80,000	
C.H.U.D. L.S. (0.09 MGD)				$80,000	
C.HILLS L.S. #1 (0.27 MGD)				$80,000	
C.HILLS L.S. #2 (0.93 MGD)				$100,000	

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 1
PHASE II (CONT'D.)

Cedar Knob Rd. L.S. (3.06 MGD)				$170,000	
Trimmier Creek L.S. #3 (3.06 MGD)				$170,000	
SUBTOTAL				$1,940,800	
ENGINEERING/CONTINGENCIES (20%)				$388,160	
EASEMENT/R.O.W.		43,900 L.F. F.M.	$2.50	$109,750	
		7,000 L.F. SWR	$5.00	$35,000	
TOTAL (2000)				$2,473,710	
PRESENT WORTH (1990)	$2,473,710 (0.5083) =				$1,257,387
MISC. LAKE					
6" F.M.	L.F.	45,000	$16	$720,000	
10" F.M.	L.F.	27,000	$25	$675,000	
Union Grove L.S. (0.3 MGD)				$80,000	
Southside L.S. (0.83 MGD)				$95,000	
Northside L.S. (0.83 MGD)				$95,000	
SUBTOTAL				$1,665,000	
ENGINEERING/CONTINGENCIES (20%)				$333,000	
EASEMENT/R.O.W.		72,000 L.F. F.M.	$2.50	$180,000	
TOTAL (2000)				$2,178,000	
PRESENT WORTH (1990)	$2,178,000 (0.5083) =				$1,107,077

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 1
PHASE II (CONT'D.)

NOLANVILLE			
**********			
NOLANVILLE L.S. PHASE 1 (0.3 MGD)		$80,000	
SUBTOTAL		$80,000	
ENGINEERING/CONTINGENCIES (20%)		$16,000	
PRESENT WORTH (2000)		$96,000	
PRESENT WORTH (1990)	$96,000 (0.5083) =		$48,797
TOTAL PRESENT WORTH (1990) ALTERNATE 1 PHASE II			$2,556,424

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 1
PHASE III
BUILT BY 2010

KILLEEN:					
******************					
8" F.M.	L.F.	10,500	$20	$210,000	
12" F.M.	L.F.	8,200	$28	$229,600	
20" F.M.	L.F.	26,400	$45	$1,188,000	
24" SWR	L.F.	9,900	$50	$495,000	
12" SWR	L.F.	9,600	$40	$384,000	
36" SWR	L.F.	5,900	$110	$649,000	
Trimmier Creek L.S. #1 (7.08 MGD)				$270,000	
Trimmier Creek L.S. #2 (7.08 MGD)				$270,000	
Hollow Drive L.S. (0.93 MGD)				$100,000	
Onion Creek L.S. (0.93 MGD)				$100,000	
Trimmier Rd. L.S. (1.86 MGD)				$120,000	
Roy Road L.S. (11.4 MGD)				$360,000	
SUBTOTAL				$4,375,600	
ENGINEERING/CONTINGENCIES (20%)				$875,120	
EASEMENT/R.O.W.		45,100 L.F. F.M.	$2.50	$112,750	
		19,500 L.F. SWR	$5.00	$97,500	
TOTAL (2010)				$5,460,970	
PRESENT WORTH (1990)	$5,460,970 (0.2584) =				$1,411,115

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 1
PHASE III (CONT'D.)
BUILT BY 2010

NOLANVILLE			
**********			
Nolanville L.S. Phase II (0.6 MGD)		$90,000	
SUBTOTAL		$90,000	
ENGINEERING/CONTINGENCIES (20%)		$18,000	
TOTAL (2010)		$108,000	
PRESENT WORTH (1990)	$108,000 (0.2584) =		$27,907
TOTAL PRESENT WORTH (1990)			$1,439,022
ALTERNATE 1			
PHASE III			

****

TOTAL PRESENT WORTH ALTERNATE 1:	
PHASE I	$4,512,800
PHASE II	$2,556,424
PHASE III	$1,439,022
	$8,508,246

TOTAL PRESENT WORTH ALTERNATE 1 BY AREA (1990):	
KILLEEN	$5,201,177
HARKER HEIGHTS	$2,123,287
MISC. LAKE	$1,107,077
NOLANVILLE	$76,704

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 2
PHASE I
BUILT BY 1990

KILLEEN:					
**********					
14" F.M.	L.F.	10,600	$30	$318,000	
18" SWR	L.F.	10,200	$60	$612,000	
30" SWR	L.F.	19,800	$90	$1,782,000	
Stage Coach Rd. L.S. #1 (3.48 MGD)				$180,000	
SUBTOTAL				$2,892,000	
ENGINEERING/CONTINGENCIES (20%)				$578,400	
EASEMENT/R.O.W.		10,600 L.F. F.M.	$2.50	$26,500	
		30,000 L.F. SWR	$5.00	$150,000	
PRESENT WORTH (1990)					$3,646,900
HARKER HEIGHTS:					
**********					
21" SWR	L.F.	7,100	$70	$497,000	
Harker Heights STP/L.S. (3.84 MGD)				$195,000	
SUBTOTAL				$692,000	
ENGINEERING/CONTINGENCIES (20%)				$138,400	
EASEMENTS/R.O.W.		7,100 L.F. SWR	$5.00	$35,500	
PRESENT WORTH (1990)					$865,900
TOTAL PRESENT WORTH ALTERNATE 2 PHASE I					$4,512,800

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 2
PHASE II
BUILT BY 2000

KILLEEN:					
**********					
8" F.M.	L.F.	6,100	$20	$122,000	
Stage Coach Road L.S. #2 (0.9 MGD)				$100,000	
SUBTOTAL				$222,000	
ENGINEERING/CONTINGENCIES (20%)				$44,400	
EASEMENTS/R.O.W.		6,100 L.F. F.M.	$2.50	$15,250	
TOTAL (2000)				$281,650	
PRESENT WORTH (1990)		$281,650 (0.5083) =			$143,163
HARKER HEIGHTS:					
**********					
4" F.M.	L.F.	1,980	$14	$27,700	
6" F.M.	L.F.	20,320	$16	$325,100	
8" F.M.	L.F.	11,200	$20	$224,000	
14" SEW.	L.F.	10,400	$30	$312,000	
15" SEW.	L.F.	4,800	$50	$240,000	
18" SWR	L.F.	2,200	$60	$132,000	
MATKIN L.S. (0.36 MGD)				$80,000	
C.H.U.D. L.S. (0.09 MGD)				$80,000	
C.HILLS L.S. #1 (0.27 MGD)				$80,000	
C.HILLS L.S. #2 (0.93 MGD)				$100,000	
Cedar Knob Rd. L.S. (3.06 MGD)				$170,000	
Trimmier Creek L.S. #3 (3.06 MGD)				$170,000	
SUBTOTAL				$1,940,800	
ENGINEERING/CONTINGENCIES (20%)				$388,160	
EASEMENT/R.O.W.		43,900 L.F. F.M.	$2.50	$109,750	

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH CAPITAL COSTS

	7,000 L.F. SWR	$5.00	$35,000	
TOTAL (2000)			$2,473,710	
PRESENT WORTH (1990)	$2,473,710 (0.5083) =			$1,257,387

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 2
PHASE II (CONT'D.)
BUILT BY 2000

****

NOLANVILLE
****

Nolanville STP/L.S. (0.3 MGD)		$80,000	
SUBTOTAL		$80,000	
ENGINEERING/CONTINGENCIES (20%)		$16,000	
TOTAL (2000)		$96,000	
PRESENT WORTH (1990)	$96,000 (0.5083) =		$48,797
TOTAL PRESENT WORTH ALTERNATE 2 PHASE II			$1,449,347

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 2
PHASE III
BUILT BY 2010

KILLEEN:					
**********					
8" F.M.	L.F.	10,500	$20	$210,000	
18" F.M.	L.F.	26,400	$40	$1,056,000	
12" SWR	L.F.	9,600	$40	$384,000	
18" SWR	L.F.	9,900	$60	$594,000	
36" SWR	L.F.	5,900	$110	$649,000	
Trimmier Creek L.S. #1 (5.19 MGD)				$215,000	
Trimmier Creek L.S. #2 (5.19 MGD)				$215,000	
Hollow Drive L.S. (0.93 MGD)				$100,000	
Roy Rd. L.S. (11.4 MGD)				$380,000	
Onion Creek STP/L.S. (0.93 MGD)				$100,000	
SUBTOTAL				$3,903,000	
ENGINEERING/CONTINGENCIES (20%)				$780,600	
EASEMENT/R.O.W.		36,900 L.F. F.M.	$2.50	$92,250	
		19,500 L.F. SWR	$5.00	$97,500	
TOTAL (2010)				$4,873,350	
PRESENT WORTH (1990)	$4,873,350 (0.2584) =				$1,259,274

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 2
PHASE III (CONT'D.)
BUILT BY 2010

****

NOLANVILLE

Nolanville L.S. Phase II (0.6 MGD)		$90,000	
SUBTOTAL		$90,000	
ENGINEERING/CONTINGENCIES (20%)		$18,000	
TOTAL (2010)		$108,000	
PRESENT WORTH (1990)	$108,000 (0.2584) =		$27,907
TOTAL PRESENT WORTH ALTERNATE 2 PHASE III			$1,287,181

****

TOTAL PRESENT WORTH ALTERNATE 2 (1990)

PHASE 1	$4,512,800
PHASE 2	$1,449,347
PHASE 3	$1,287,181
	$7,249,328

TOTAL PRESENT WORTH ALTERNATE 2 BY AREA (1990):

KILLEEN	$5,049,336
HARKER HEIGHTS	$2,123,287
MISC. LAKE	$0
NOLANVILLE	$76,704
	$7,249,327

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 3
PHASE I
BUILT BY 1990

KILLEEN:					
**********					
10" F.M.	L.F.	10,500	$25	$262,500	
18" SWR	L.F.	10,200	$60	$612,000	
21" SWR	L.F.	19,800	$70	$1,386,000	
Stage Coach Rd. L.S. #1 (1.29 MGD)				$110,000	
SUBTOTAL				$2,370,500	
ENGINEERING/CONTINGENCIES (20%)				$474,100	
EASEMENT/R.O.W.		10,500 L.F. F.M.	$2.50	$26,250	
		30,000 L.F. SWR	$5.00	$150,000	
PRESENT WORTH (1990)					$3,020,850
HARKER HEIGHTS:					
**********					
12" SWR	L.F.	7,100	$40	$284,000	
SUBTOTAL				$284,000	
ENGINEERING/CONTINGENCIES (20%)				$56,800	
EASEMENT/R.O.W.		7,100 L.F. SWR	$5.00	$35,000	
PRESENT WORTH (1990)					$375,800
TOTAL PRESENT WORTH (1990) ALTERNATE 3 PHASE I					$3,396,650

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 3
PHASE II
BUILT BY 2000

KILLEEN:					
**********					
6" F.M.	L.F.	6,100	$16	$97,600	
Stage Coach Rd. L.S. #2 (0.18 MGD)				$80,000	
SUBTOTAL				$177,600	
ENGINEERING/CONTINGENCIES (20%)				$35,520	
EASEMENT/R.O.W.		6,100 L.F. F.M.	$2.50	$15,250	
TOTAL (2000)				$228,370	
PRESENT WORTH (1990)		$228,370 (0.5083) =			$116,080
HARKER HEIGHTS:					
**********					
4" F.M.	L.F.	1,980	$14	$27,700	
6" F.M.	L.F.	30,720	$16	$491,500	
8" F.M.	L.F.	11,200	$20	$224,000	
8" SWR	L.F.	2,200	$27	$59,400	
15" SWR	L.F.	4,800	$50	$240,000	
MATKIN L.S. (0.36 MGD)				$80,000	
C.H.U.D. L.S. (0.09 MGD)				$80,000	
C.HILLS L.S. #1 (0.27 MGD)				$80,000	
C.HILLS L.S. #2 (0.93 MGD)				$100,000	
Cedar Knob Road L.S. #1 (0.78 MGD)				$95,000	
Cedar Knob Road L.S. #2 (0.78 MGD)				$95,000	
Harker Heights STP/LS (0.92 MGD)				$100,000	
Trimmier L.S. # 3 (0.45 MGD)				$85,000	
SUBTOTAL				$1,757,600	
ENGINEERING/CONTINGENCIES (20%)				$351,520	

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 3
PHASE II (CONT'D.)
BUILT BY 2000

EASEMENT/R.O.W.	10,400 L.F. F.M.	$2.50	$109,750	
	7,000 L.F. SWR	$5.00	$35,000	
TOTAL (2000)			$2,253,870	
PRESENT WORTH (1990)	$2,253,870 (0.5083) =			$1,145,642

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 3
PHASE II (CONT'D.)
BUILT BY 2000

****

NOLANVILLE
****

Nolanville STP/L.S. Phase I (0.3 MGD)		$80,000	
SUBTOTAL		$80,000	
ENGINEERING/CONTINGENCIES (20%)		$16,000	
TOTAL (2000)		$96,000	
PRESENT WORTH (1990)	$96,000 (0.5083) =		$48,797
TOTAL PRESENT WORTH (1990) ALTERNATE 3 PHASE II			$1,310,519

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

ALTERNATE 3
PHASE III
BUILT BY 2010

KILLEEN:					
**********					
8" F.M.	L.F.	10,500	$20	$210,000	
15" F.M.	L.F.	9,600	$50	$480,000	
21" F.M.	L.F.	4,100	$70	$287,000	
18" SWR	L.F.	5,900	$60	$354,000	
30" SWR	L.F.	11,700	$90	$1,053,000	
Hollow Drive L.S. (0.93 MGD)				$100,000	
Ray Road L.S. (7.41 MGD)				$280,000	
Onion Creek STP/L.S. # (0.93 MGD)				$100,000	
Trimmier Creek STP/LS (2.5 MGD) (Killeen Share 66.53%)				$99,800	
SUBTOTAL				$2,963,800	
ENGINEERING/CONTINGENCIES (20%)				$592,760	
EASEMENT/R.O.W.		24,200 L.F. F.M.	$2.50	$60,500	
		11,700 L.F. SWR	$5.00	$58,500	
TOTAL (FUTURE)				$3,675,560	
PRESENT WORTH (1990)	$3,675,560 (0.2584) =				$949,765
HARKER HEIGHTS:					
**********					
18" SWR	L.F.	2,100	$60	$126,000	
Harker Heights STP/LS (1.35 MGD)				$110,000	
Trimmier Creek STP/LS (2.5 MGD) (Harker Heights Share 33.47%)				$50,200	
SUBTOTAL				$286,200	
ENGINEERING/CONTINGENCIES (20%)				$57,240	
EASEMENT/R.O.W.		2,100 L.F. SWR	$5.00	$10,500	
TOTAL (2010)				$353,940	

TABLE III-4

TRANSPORT FACILITIES PRESENT WORTH
CAPITAL COSTS

PRESENT WORTH (1990)	$353,940 (0.2584) =		$91,458

ALTERNATE 3
PHASE III (CONT'D.)
BUILT BY 2010

****

NOLANVILLE
****

Nolanville L.S. Phase I (0.6 MGD)	$90,000	
SUBTOTAL	$90,000	
ENGINEERING/CONTINGENCIES (20%)	$18,000	
TOTAL (2010)	$108,000	
PRESENT WORTH (1990) $108,000 (0.2584) =		$27,907
TOTAL PRESENT WORTH (1990) ALTERNATE 3 PHASE III		$1,069,130

****

TOTAL PRESENT WORTH ALTERNATE 3 (1990)	
PHASE I	$3,396,650
PHASE II	$1,310,519
PHASE III	$1,069,130
	$5,776,299

TOTAL PRESENT WORTH ALTERNATE 3 BY AREA:	
KILLEEN	$4,086,695
HARKER HEIGHTS	$467,808
MISC. LAKES	$0
NOLANVILLE	$76,704
	$4,631,207

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 1
****

	CONST. COST	LABOR & MATL'S.	POWER	TOTAL	
PHASE I P/A=(7.024)					
KILLEEN	$2,892,000	$507,835		$507,835	
STAGE COACH RD. #1			$10,635	$10,635	
					$518,470
HARKER HEIGHTS	$692,000	$121,515		$121,515	
HARKER HEIGHTS STP/LS				$15,600	
					$137,115
TOTAL PHASE I:					$655,585

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 1 (CONT'D.)
PHASE II P/A X P/F=(3.5703)

KILLEEN	$2,892,000	$258,133		$258,133	
	$222,000	$19,851		$19,851	
STAGE COACH RD L.S. #1			$19,033	$19,033	
STAGE COACH RD L.S. #2			$1,278	$1,278	
					$298,295
HARKER HEIGHTS	$692,000	$61,766		$61,766	
	$1,940,800	$173,231		$173,231	
CEDAR KNOB RD. L.S.			$3,957	$3,957	
TRIMMIER CREEK L.S. #3			$3,957	$3,957	
HARKER HEIGHTS STP/LS			$7,000	$7,000	
MATKIN L.S.			$653	$653	
C.H.U.D. L.S.			$34	$34	
C. HILLS L.S. #1			$480	$480	
C. HILLS L.S. #2			$2,693	$2,693	
					$253,771
MISC. LAKE	$1,665,000	$148,614		$148,614	
UNION GROVE L.S.			$10,747	$10,747	
SOUTHSIDE L.S.			$4,445	$4,445	
NORTHSIDE L.S.			$4,445	$4,445	
					$168,251
NOLANVILLE	$80,000	$7,141		$7,141	
			$10,000	$10,000	
					$17,141
TOTAL PHASE II					$737,458

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 1 (CONT'D.)
PHASE III P/A X P/F=(2.7375)

	CONSTRUCTION COST	LABOR & MATL	POWER	TOTAL	
KILLEEN	$2,892,000	$197,921		$197,921	
	$340,000	$23,269		$23,269	
	$4,375,600	$299,455		$299,455	
STAGE COACH RD. L.S. #1			$28,703	$28,703	
STAGE COACH RD. L.S. #2			$4,301	$4,301	
TRIMMIER CREEK L.S. #1			$35,570	$35,570	
TRIMMIER CREEK L.S. #2			$35,570	$35,570	
ROY RD. L.S.			$90,000	$90,000	
ONION CREEK STP/L.S.			$14,000	$14,000	
HOLLOW DR. L.S.			$7,000	$7,000	
TRIMMIER RD. L.S.			$14,000	$14,000	
ONION CREEK L.S.			$7,000	$7,000	
					$756,789
HARKER HEIGHTS	$692,000	$47,359		$47,359	
	$1,940,800	$132,824		$132,824	
CEDAR KNOB L.S.			$13,302	$13,302	
TRIMMIER CREEK L.S. #3			$13,302	$13,302	
HARKER HEIGHTS STP/LS			$10,600	$10,600	
MATKIN L.S.			$2,196	$2,196	
C.H.U.D. L.S.			$115	$115	
C. HILLS L.S. #1			$1,613	$1,613	
C. HILLS L.S. #2			$9,052	$9,052	
					$230,362
MISC. LAKE	$1,665,000	$113,948		$113,948	
UNION L.S.			$8,240	$8,240	
SOUTHSIDE L.S.			$3,409	$3,409	
NORTHSIDE L.S.			$3,409	$3,409	
					$129,006
NOLANVILLE	$80,000	$5,475		$5,475	
	$90,000	$6,159		$6,159	
NOLANVILLE L.S. PH. I			$8,000	$8,000	
NOLANVILLE L.S. PH. II			$3,000	$3,000	
					$22,634
TOTAL PHASE III:					$1,138,791
TOTAL BY SERVICE AREA:					
KILLEEN					$1,573,554
HARKER HEIGHTS					$390,886
MISC. LAKE					$297,257
NOLANVILLE					$39,775

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 2
****

	CONST. COST	LABOR & MATL'S.	POWER	TOTAL	
PHASE 1 (7.024)					
KILLEEN	$2,892,000	$507,835		$507,835	
STAGE COACH RD. #1			$10,635	$10,635	
					$518,470
HARKER HEIGHTS	$692,000	$121,515		$121,515	
HARKER HEIGHTS STP/LS			$15,600	$15,600	
					$137,115
TOTAL PHASE I:					$655,585

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 2 (CONT'D.)
PHASE II 3.5703

KILLEEN	$2,892,000	$258,133		$258,133	
	$222,000	$19,851		$19,851	
STAGE COACH RD. L.S. #1			$19,033	$19,033	
STAGE COACH RD. L.S. #2			$1,278	$1,278	
					$298,295
HARKER HEIGHTS	$692,000	$61,766		$61,766	
	$1,940,800	$173,231		$173,231	
CEDAR KNOB RD. L.S.			$3,957	$3,957	
TRIMMIER CREEK L.S. #3			$3,957	$3,957	
HARKER HEIGHTS STP/LS			$7,000	$7,000	
MATKIN L.S.			$653	$653	
C.H.U.D. L.S.			$34	$34	
C. HILLS L.S. #1			$480	$480	
C. HILLS L.S. #2			$2,693	$2,693	
					$253,771
NOLANVILLE	$80,000	$7,141		$7,141	
			$10,000	$10,000	
NOLANVILLE L.S. PH.1					
					$17,141
TOTAL PHASE II:					$569,207

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 2 (CONT'D.)
PHASE III 2.7375

KILLEEN	$2,892,000	$197,921		$197,921	
	$222,000	$15,193		$15,193	
	$4,873,350	$333,520		$333,520	
STAGE COACH RD. L.S. #1			$28,703	$28,703	
STAGE COACH RD. L.S. #2			$4,301	$4,301	
TRIMMIER CREEK L.S. #1			$22,123	$22,123	
TRIMMIER CREEK L.S. #2			$22,123	$22,123	
HOLLOW DR. L.S.			$6,741	$6,741	
ROY RD. L.S.			$90,000	$90,000	
ONION CREEK L.S.			$833		
					$720,625
HARKER HEIGHTS	$692,000	$47,359		$47,359	
	$1,940,800	$132,824		$132,824	
CEDAR KNOB RD. L.S.			$13,302	$13,302	
TRIMMIER CREEK L.S. #3			$13,302	$13,302	
HARKER HTS. STP/L.S.			$10,600	$10,600	
MATKIN L.S.			$2,196	$2,196	
C.H.U.D. L.S.			$115	$115	
C. HILLS L.S. #1			$1,613	$1,613	
C. HILLS L.S. #2			$9,052	$9,052	
NOLANVILLE	$80,000	$5,475		$5,475	
	$90,000	$6,159		$6,159	
NOLANVILLE L.S. PH. I			$8,000	$8,000	
NOLANVILLE L.S. PH. II			$3,000	$3,000	
					$22,634
TOTAL PHASE III:					$743,260
TOTAL BY SUB-AREA					
KILLEEN					$1,537,390
HARKER HEIGHTS					$137,115
NOLANVILLE					$39,775

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 3
****

	CONST. COST	LABOR & MATL'S.	POWER	TOTAL	
PHASE I P/F X P/A=7.024					
KILLEEN	$2,370,500	$416,260		$416,260	
STAGE COACH RD. L.S. #1			$15,632	$15,632	
					$431,892
HARKER HEIGHTS	$284,000	$49,870		$49,870	
HARKER HEIGHTS STP/L.S.			$0	$0	
					$49,870
TOTAL PHASE I:					$481,762

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 3 (CONT'D.)
PHASE II P/F X P/A=3.5703

KILLEEN	$2,370,500	$211,585		$211,585	
	$177,600	$15,852		$15,852	
STAGE COACH RD. L.S. #1			$6,994	$6,994	
STAGE COACH #2			$118	$118	
					$234,549
HARKER HEIGHTS	$284,000	$25,349		$25,349	
	$1,757,600	$156,879		$156,879	
CEDAR KNOB RD. L.S.			$3,705	$3,705	
TRIMMIER CREEK L.S. #3			$3,705	$3,705	
HARKER HTS. STP/L.S.			$7,000	$7,000	
HATKIN L.S.			$653	$653	
C.H.U.D. L.S.			$34	$34	
C. HILLS L.S. #1			$480	$480	
C. HILLS L.S. #2			$2,693	$2,693	
					$200,498
NOLANVILLE	$80,000	$7,141		$7,141	
NOLANVILLE L.S. PH. I			$10,000	$10,000	
					$17,141
TOTAL PHASE II:					$452,188

TABLE III-5

TRANSPORT FACILITIES PRESENT WORTH
O&M COSTS

ALTERNATE 3 (CONT'D.)
PHASE III P/F X P/A=2.7375

KILLEEN	$2,370,500	$162,231		$162,231	
----------	$177,600	$12,155		$12,155	
	$3,014,000	$206,271		$206,271	
STAGE COACH RD. L.S. #1			$0	$0	
STAGE COACH RD. L.S. #2			$398	$398	
HOLLOW DR. L.S.			$6,741	$6,741	
ROY RD. L.S.			$70,000	$70,000	
ONION CREEK STP/L.S.			$14,000	$14,000	
TRIMMIER STP/LS (Killeen Share 66.53%)			$50,000	$50,000	
					$521,795
HARKER HEIGHTS	$284,000	$19,436		$19,436	
----------	$1,757,600	$120,286		$120,286	
	$236,000	$16,151		$16,151	
CEDAR KNOB RD. L.S.			$0	$0	
TRIMMIER CREEK STP/L.S. (Harker Heights Share 33.47%)			$25,000	$25,000	
Harker Heights STP/L.S. - Out of Service			$0	$0	
MATKIN L.S.			$2,196	$2,196	
C.H.U.D. L.S.			$115	$115	
C. HILLS L.S. #1			$1,613	$1,613	
C. HILLS L.S. #2			$9,052	$9,052	
					$193,849
NOLANVILLE	$80,000	$5,475		$5,475	
----------	$90,000	$6,159		$6,159	
NOLANVILLE L.S. PH. I			$8,000	$8,000	
NOLANVILLE L.S. PH. II			$3,000	$3,000	
					$22,634
TOTAL PHASE III:					$738,279

TOTAL BY SERVICE AREA	
KILLEEN	$1,188,236
HARKER HEIGHTS	$49,870
NOLANVILLE	$39,775
TOTAL	$1,277,881

TABLE III-6

REQUIRED EFFLUENT QUALITY
WITH RELATED FLOWS BY DECADE

BOD/NH3-N/DO/TSS/(NO3-N) IN mg/l

ALTERNATIVE 1

YEAR	NCID #1 MAIN EQ	NCID #1 MAIN Q	NCID #1 STP #2 EQ	NCID #1 STP #2 Q	HARKER HEIGHTS EQ	HARKER HEIGHTS Q	NCID #3 NOLANVILLE EQ	NCID #3 NOLANVILLE Q	LAKE DAN STP EQ	LAKE DAN STP Q
1990	10/2/6/15/1	14.37	---	---	10/3/4/15/1	1.51	10/15/2/15/1	0.20	---	---
2000	5/2/5/5	16.53	---	---	10/3/4/15/1	1.93	10/15/2/15/1	0.26	20/15/2/20	0.65
2010	5/2/5/5	17.04	5/2/5/5	2.12	10/3/4/15/1	2.36	10/15/2/15/1	0.34	20/15/2/20	0.65
2020	5/2/5/5	19.16	5/2/5/5	3.84	10/3/4/15/1	3.00	10/15/2/15/1	0.44	20/15/2/20	0.65
2030	5/2/5/5	19.16	5/2/5/5	7.68	10/3/4/15/1	3.72	10/15/2/15/1	0.56	20/15/2/20	0.65

ALTERNATIVE 2

YEAR	NCID #1 MAIN EQ	NCID #1 MAIN Q	NCID #1 STP #2 EQ	NCID #1 STP #2 Q	HARKER HEIGHTS EQ	HARKER HEIGHTS Q	NCID #3 NOLANVILLE EQ	NCID #3 NOLANVILLE Q	ONION CREEK EQ	ONION CREEK Q	SOUTHSIDE STP EQ	SOUTHSIDE STP Q	UNION GROVE EQ	UNION GROVE Q	NORTHSIDE STP EQ	NORTHSIDE STP Q
1990	10/2/6/15/1	14.37	---	---	10/3/4/15/1	1.51	10/15/2/15/1	0.20	---	---	5/2/6/5/(3)1	---	5/2/6/5/(3)1	---	5/2/6/5/(3)1	---
2000	5/2/5/5	16.53	---	---	10/3/4/15/1	1.93	10/15/2/15/1	0.26	---	---	5/2/6/5/(3)1	0.275	5/2/6/5/(3)1	0.10	5/2/6/5/(3)1	0.275
2010	5/2/5/5	17.04	5/2/5/5	2.12	10/3/4/15/1	2.36	10/15/2/15/1	0.34	---	---	5/2/6/5/(3)1	0.275	5/2/6/5/(3)1	0.10	5/2/6/5/(3)1	0.275
2020	5/2/5/5	19.16	5/2/5/5	3.45	10/3/4/15/1	3.00	10/15/2/15/1	0.44	5/2/6/5/(3)1	0.25	5/2/6/5/(3)1	0.275	5/2/6/5/(3)1	0.10	5/2/6/5/(3)1	0.275
2030	5/2/5/5	19.16	5/2/5/5	7.11	10/3/4/15/1	3.72	10/15/2/15/1	0.56	5/2/6/5/(3)1	0.63	5/2/6/5/(3)1	0.275	5/2/6/5/(3)1	0.10	5/2/6/5/(3)1	0.275

ALTERNATIVE 3

YEAR	NCID #1 MAIN EQ	NCID #1 MAIN Q	NCID #1 STP #2 EQ	NCID #1 STP #2 Q	HARKER HEIGHTS EQ	HARKER HEIGHTS Q	NCID #3 NOLANVILLE EQ	NCID #3 NOLANVILLE Q	TRINNIER CREEK EQ	TRINNIER CREEK Q	ONION CREEK EQ	ONION CREEK Q	SOUTHSIDE STP EQ	SOUTHSIDE STP Q	UNION GROVE EQ	UNION GROVE Q	NORTHSIDE STP EQ	NORTHSIDE STP Q
1990	10/2/6/15/1	14.37	---	---	10/3/4/15/1	1.51	10/15/2/15/1	0.20	---	---	---	---	5/2/6/5/(3)1	---	5/2/6/5/(3)1	---	5/2/6/5/(3)1	---
2000	5/2/5/5	16.53	---	---	10/3/4/15/1	1.93	10/15/2/15/1	0.26	---	---	---	---	5/2/6/5/(3)1	0.275	5/2/6/5/(3)1	0.10	5/2/6/5/(3)1	0.275
2010	5/2/5/5	17.04	5/2/5/5	1.06	10/3/4/15/1	2.36	10/15/2/15/1	0.34	5/2/6/5/(3)1	0.08	---	---	5/2/6/5/(3)1	0.275	5/2/6/5/(3)1	0.10	5/2/6/5/(3)1	0.275
2020	5/2/5/5	19.16	5/2/5/5	2.22	10/3/4/15/1	2.44	10/15/2/15/1	0.44	5/2/6/5/(3)1	1.73	5/2/6/5/(3)1	0.25	5/2/6/5/(3)1	0.275	5/2/6/5/(3)1	0.10	5/2/6/5/(3)1	0.275
2030	5/2/5/5	19.16	5/2/5/5	4.16	10/3/4/15/1	2.70	10/15/2/15/1	0.56	5/2/6/5/(3)1	3.91	5/2/6/5/(3)1	0.63	5/2/6/5/(3)1	0.275	5/2/6/5/(3)1	0.10	5/2/6/5/(3)1	0.275

NOTES: EQ - EFFLUENT QUALITY IN mg/l
Q - AVERAGE DAILY FLOW IN MGD
BOD - BIOCHEMICAL OXYGEN DEMAND
NH3-N - AMMONIA NITROGEN
TSS - TOTAL SUSPENDED SOLIDS
DO - DISSOLVED OXYGEN
(NO3-N) - NITROGEN NITRATE

TABLE III-7

ALTERNATE TREATMENT PLANT POPULATIONS AND FLOWS BY DECADE

I. ALTERNATE 1

****

PLANT	YEAR	POPULATION	AVG DAILY FLOW (ANNUAL BASIS)	MAX. MONTH FLOW
WCID #1 - MAIN STP	1990	86300*	14.37 MGD	19.8 MGD
	2000	99600*	16.53 MGD	23.16 MGD
	2010	116700*	19.16 MGD**	26.98 MGD***
	2020	116700*	19.16 MGD	27 MGD
	2030	116700*	19.16 MGD	27 MGD
WCID #1 - STP #2 (ROY REYNOLDS)	1990	0	0 MGD	0 MGD
	2000	0	0 MGD	0 MGD
	2010	12900	2.12 MGD	3 MGD
	2020	24300	3.64 MGD	5.24 MGD
	2030	51700	7.68 MGD	11.06 MGD
HARKER HEIGHTS STP	1990	8900	1.51 MGD	2.23 MGD
	2000	11400	1.93 MGD	2.82 MGD
	2010	14300	2.36 MGD	3.47 MGD
	2020	18600	3.00 MGD	4.40 MGD
	2030	23500	3.72 MGD	5.42 MGD
MATKIN STP	1990	500	0.08 MGD	0.12 MGD
C.H.U.D.	1990	100	0.02 MGD	0.03 MGD
WCID #3 STP - (NOLANVILLE)	1990	1600	0.20 MGD	0.30 MGD
	2000	2100	0.26 MGD	0.39 MGD
	2010	2700	0.34 MGD	0.51 MGD
	2020	3500	0.44 MGD	0.66 MGD
	2030	4500	0.56 MGD	0.84 MGD
LAKE DAM STP	2000 - 2030	5200	0.65 MGD	1.00 MGD

*INCLUDES 31,200 POPULATION FROM FT. HOOD

**FLOWS REDUCED BY 2.12 MGD TO 17.04 MGD IMMEDIATELY UPON DIVERSION OF SAME TO STP #2 IN YR. 2010 1/2

***FLOWS REDUCED BY 3.00 MGD TO 23.98 MGD IMMEDIATELY UPON DIVERSION OF SAME TO STP #2 IN YR. 2010 1/2

TABLE III-7

ALTERNATE TREATMENT PLANT POPULATIONS AND FLOWS BY DECADE

ALTERNATE 2
****

PLANT	YEAR	POPULATION	AVG DAILY FLOW (ANNUAL BASIS)	MAX. MONTH FLOW
WCID #1 - MAIN STP	1990	86300*	14.37 MGD	19.8 MGD
	2000	99600*	16.53 MGD	23.16 MGD
	2010	116700*	19.16 MGD**	26.98 MGD***
	2020	116700*	19.16 MGD	27 MGD
	2030	116700*	19.16 MGD	27 MGD
WCID #1 - STP #2 (ROY REYNOLDS)	1990	0	0 MGD	0 MGD
	2000	0	0 MGD	0 MGD
	2010	12900	2.12 MGD	3.00 MGD
	2020	22540	3.45 MGD	4.89 MGD
	2030	47180	7.11 MGD	10.16 MGD
HARKER HEIGHTS STP	1990	8900	1.51 MGD	2.23 MGD
	2000	11400	1.93 MGD	2.82 MGD
	2010	14300	2.36 MGD	3.47 MGD
	2020	18600	3.00 MGD	4.40 MGD
	2030	23500	3.72 MGD	5.42 MGD
MATKIN STP	1990	500	0.08 MGD	0.12 MGD
C.H.U.D.	1990	100	0.02 MGD	0.03 MGD
WCID #3 (NOLANVILLE) - STP	1990	1600	0.20 MGD	0.30 MGD
	2000	2100	0.26 MGD	0.39 MGD
	2010	2700	0.34 MGD	0.51 MGD
	2020	3500	0.44 MGD	0.66 MGD
	2030	4500	0.56 MGD	0.84 MGD
ONION CREEK STP	2020	1760	0.25 MGD	0.35 MGD
	2030	4520	0.63 MGD	0.90 MGD
UNION GROVE STP	2000 - 2030	800	0.10 MGD	0.15 MGD
SOUTHSIDE STP	2000 - 2030	2200	0.275 MGD	0.41 MGD
NORTHSIDE STP	2000 - 2030	2200	0.275 MGD	0.41 MGD

*INCLUDES 31,200 POPULATION FROM FT. HOOD
**FLOWS REDUCED BY 2.12 MGD TO 17.04 MGD IMMEDIATELY UPON DIVERSION OF SAME TO STP #2 IN YR. 2010 1/2
***FLOWS REDUCED BY 3.00 MGD TO 23.98 MGD IMMEDIATELY UPON DIVERSION OF SAME TO STP #2 IN YR. 2010 1/2

TABLE III-7

ALTERNATE TREATMENT PLANT POPULATIONS AND FLOWS BY DECADE

ALTERNATE 3

****

PLANT	YEAR	POPULATION	AVG DAILY FLOW (ANNUAL BASIS)	MAX. MONTH FLOW
WCID #1 - MAIN STP	1990	86300*	14.37 MGD	19.8 MGD
	2000	99600*	16.53 MGD	23.16 MGD
	2010	116700*	19.16 MGD***	26.98 MGD***
	2020	116700*	19.16 MGD	27 MGD
	2030	116700*	19.16 MGD	27 MGD
WCID #1 - STP #2 (ROY REYNOLDS)	1990	0	0 MGD	0 MGD
	2000	0	0 MGD	0 MGD
	2010	6450	1.06 MGD	1.5 MGD
	2020	14160	2.22 MGD	3.22 MGD
	2030	26480	4.16 MGD	6.01 MGD
HARKER HEIGHTS STP	1990	8900	1.51 MGD	2.23 MGD
	2000	11400	1.93 MGD	2.82 MGD
	2010	14300	2.36 MGD	3.47 MGD
	2020	14750	2.44 MGD	3.56 MGD
	2030	16380	2.7 MGD	3.92 MGD
MATKIN STP	1990	500	0.08 MGD	0.12 MGD
C.H.U.D.	1990	100	0.02 MGD	0.03 MGD
WCID #3 (NOLANVILLE) - STP	1990	1600	0.20 MGD	0.30 MGD
	2000	2100	0.26 MGD	0.39 MGD
	2010	2700	0.34 MGD	0.51 MGD
	2020	3500	0.44 MGD	0.66 MGD
	2030	4500	0.56 MGD	0.84 MGD
TRIMMIER CREEK STP	1990	0	0 MGD	0 MGD
	2000	0	0 MGD	0 MGD
	2010	600 **	0.08 MGD	0.12 MGD
	2020	12230 (1)	1.73 MGD (3)	2.51 MGD (5)
	2030	27820 (2)	3.91 MGD (4)	5.65 MGD (5)
NORTHSIDE STP	2000 - 2030	2200	0.275 MGD	0.41 MGD
SOUTHSIDE STP	2000 - 2030	2200	0.275 MGD	0.41 MGD
UNION GROVE STP	2000 - 2030	800	0.10 MGD	0.15 MGD
ONION CREEK STP	2020	1760	0.25 MGD	0.35 MGD
	2030	4520	0.63 MGD	0.90 MGD

*INCLUDES 31,200 POPULATION FROM FT. HOOD

**FROM H2010 - T-A GROWTH AREA IN HARKER HEIGHTS

***FLOWS REDUCED BY 2.12 MGD TO 17.04 MGD IMMEDIATELY UPON DIVERSION OF SAME TO STP #2 IN YR. 2010 1/2

****FLOWS REDUCED BY 3.00 MGD TO 23.98 MGD IMMEDIATELY UPON DIVERSION OF SAME TO STP #2 IN YR. 2010 1/2

(1) INCLUDES 3850 POP. FROM HARKER HEIGHTS, AND 8380 POP. FROM KILLEEN

(2) INCLUDES 7120 POP. FROM HARKER HEIGHTS, AND 20700 POP. FROM KILLEEN

(3) INCLUDES 0.56 MGD FROM HARKER HEIGHTS, AND 1.17 MGD FROM KILLEEN

(4) INCLUDES 1.02 MGD FROM HARKER HEIGHTS, AND 2.89 MGD FROM KILLEEN

(5) INCLUDES 0.84 MGD FROM HARKER HEIGHTS, AND 1.67 MGD FROM KILLEEN

(6) INCLUDES 1.50 MGD FROM HARKER HEIGHTS, AND 4.15 MGD FROM KILLEEN

TABLE III-8

SUMMARY OF FLOW RELATED TREATMENT PLANT CAPITAL COSTS
1988 DOLLARS

PLANT SIZE (MGD)	0.1	1	5	10	30
1. BASE PLANT					
INFLUENT PUMPING*	NA	NA	NA	NA	NA
SCREENING	$3,000	$59,000	$79,000	$99,000	$187,000
GRIT REMOVAL	---	47,000	68,000	91,000	219,000
SECONDARY CLARIFICATION	55,000	345,000	905,000	1,810,000	5,064,000
CHLORINATION/DECHLORINATION	25,000	82,000	269,000	443,000	1,300,000
YARD PIPING @ $100000/MGD	10,000	100,000	500,000	1,000,000	3,000,000
ROADS/SITEWORK @ $30000/MGD	3,000	30,000	150,000	300,000	900,000
BUILDINGS @ $150000/MGD UP TO 10 MGD $75000/MGD OVER 10 MGD	15,000	150,000	750,000	1,500,000	3,000,000
SUBTOTAL	$111,000	$813,000	$2,721,000	$5,243,000	$13,670,000
ELECTRICAL @ 15% OF TOTAL PLANT	$17,000	$122,000	$408,000	$786,000	$2,051,000
SUBTOTAL - CONSTRUCTION COST	$128,000	$926,000	$3,083,000	$6,029,000	$15,721,000
ENGINEERING/CONTINGENCIES/LEGAL/FISCAL @ 20%	$26,000	$185,000	$617,000	$1,206,000	$3,144,000
TOTAL BASE PLANT CAPITAL COST	$154,000	$1,111,000	$3,700,000	$7,235,000	$18,865,000
PRICE PER GALLON	$1.54	$1.11	$0.74	$0.72	$0.63
2. TERTIARY SOLIDS REMOVAL					
EFFLUENT FILTRATION	$42,000	$242,000	$468,000	$936,000	$2,624,000
3. HIGHER EFFLUENT D.O.					
POST AERATION	$14,000	$30,000	$81,000	$114,000	$230,000

*CONSIDERED SEPARATELY AS TRANSPORT FACILITY LIFT STATION

TABLE III-9

SUMMARY OF BOD/TKN RELATED TREATMENT PLANT CAPITAL COSTS
1988 DOLLARS

PLANT SIZE (CAPITA)	700	7,000	36,000	72,000	215,000
LB. BOD/DAY	147	1,470	7,560	15,120	45,150
LB. TKN/DAY	23	230	1,188	2,376	7,095
1. BASE PLANT					
AERATION BASINS (45 LB. BOD/1000 CF)	$51,000	$298,000	$1,012,000	$1,912,000	$5,329,000
GRAVITY THICKENING	$29,000	$90,000	$294,000	$607,000	$1,657,000
AEROBIC DIGESTER	$29,000	$143,000	$378,000	$849,000	$2,373,000
DEWATERING	$8,000	$83,000	$415,000	$831,000	$2,491,000
ROADS/SITEWORK	$2,000	$20,000	$50,000	$100,000	$300,000
BUILDINGS	$5,000	$50,000	$250,000	$500,000	$1,000,000
SUBTOTAL	$124,000	$684,000	$2,399,000	$4,799,000	$13,150,000
ELECTRICAL @ 15% OF TOTAL PLANT	$19,000	$103,000	$360,000	$720,000	$1,973,000
SUBTOTAL - CONSTRUCTION COST	$143,000	$787,000	$2,759,000	$5,519,000	$15,123,000
ENGINEERING/CONTINGENCIES/LEGAL/FISCAL @ 20%	$29,000	$157,000	$552,000	$1,104,000	$3,025,000
TOTAL BASE PLANT COST	$172,000	$944,000	$3,311,000	$6,623,000	$18,148,000
PRICE PER CAPITA	$246	$135	$92	$92	$84
2. NITRIFICATION ADDITIONAL AERATION BASINS TO LOWER LOADING TO (35 LB BOD/1000 CF)	$20,000	$110,000	$376,000	$710,000	$1,980,000
3. DENITRIFICATION	$109,000	$572,000	$1,672,000	$3,283,000	$9,163,000

TABLE III-10

ANNUAL POWER COSTS

FLOW RELATED PROCESSES	PLANT SIZE				
	0.1 MGD (@ $.056/KWH)	1.0 MGD (@ $.044/KWH)	5.0 MGD (@ $.042/KWH)	10.0 MGD (@ $.042/KWH)	30.0 MGD (@ $.042/KWH)
INFLUENT PUMPING					
SCREENING	N/A	0.25 BHP = 2,200 KWH = $96.80	1 BHP = 8,800 KWH = $369.60	2 BHP = 17,500 KWH = $735.00	3 BHP = 26,300 KWH = $1,104.60
GRIT REMOVAL	N/A	0.5 BHP = 4,400 KWH = $193.60	2 BHP = 17,500 KWH = $735.00	4 BHP = 35,000 KWH = $1,470.00	8 BHP = 70,000 KWH = $2,940.00
SECONDARY CLARIFIER	1 BHP = 8,800 KWH = $490.56	1 BHP = 8,800 KWH = $387.20	2 BHP = 17,500 KWH = $735.42	4 BHP = 35,000 KWH = $1,470.00	12 BHP = 105,100 KWH = $4,414.20
CHLORINATION/ DECHLORINATION	0.5 BHP = 4,400 KWH = $245.28	1 BHP = 8,800 KWH = $385.44	2 BHP = 17,500 KWH = $735.84	3 BHP = 26,290 KWH = $1,103.76	5 BHP = 43,800 KWH = $1,839.60
TERTIARY FILTRATION	0.25 BHP = 2,200 KWH = $123.20	0.5 BHP = 4,400 KWH = $193.60	1 BHP = 8,800 KWH = $369.60	2 BHP = 17,500 KWH = $735.00	4 BHP = 35,000 KWH = $1,470.00
POST AERATION (2% OF AERATION)	0.25 BHP = 2,200 KWH = $122.64	2 BHP = 17,500 KWH = $770.88	8 BHP = 70,080 KWH = $2,943.36	15 BHP = 131,400 KWH = $5,512.80	45 BHP = 394,200 KWH = $16,556.40
BOD/TKN RELATED PROCESSES	700 CAPITA	7,000 CAPITA	36,000 CAPITA	72,000 CAPITA	215,000 CAPITA
AERATION BASINS	18 BHP = 158,000 KWH = $848.00	100 BHP = 876,000 KWH = $38,544.00	400 BHP =3,504,000 KWH = $147,168.00	720 BHP = 6,307,000 KWH = $264,894.00	2250 BHP = 19,710,000 KWH = $827,820.00
GRAVITY THICKENING	0.25 BHP = 2,200 KWH = $123.20	0.5 BHP = 4,400 KWH = $219.12	1 BHP = 8,800 KWH = $367.92	2 BHP = 17,500 KWH = $735.00	4 BHP = 35,000 KWH = $1,470.00
AEROBIC DIGESTER	7 BHP = 61,320 KWH = $53,433.92	50 BHP = 438,000 KWH = $19,272.00	180 BHP =1,576,800 KWH = $66,225.60	300 BHP = 2,628,000 KWH = $110,376.00	700 BHP = 6,132,000 KWH = $257,544.00
DEWATERING	0.5 BHP = 4,400 KWH = $246.40	0.5 BHP = 4,900 KWH = $193.60	1.5 BHP = 13,100 KWH = $550.20	3.0 BHP = 26,300 KWH = $1,104.60	9 BHP = 78,800 KWH = $3,309.60
NITRIFICATION	9 BHP = 78,840 KWH = $4,415.04	50 BHP = 438,000 KWH = $19,272.00	200 BHP =1,752,000 KWH = $73,584.00	360 BHP = 3,153,600 KWH = $132,451.20	1125 BHP = 9,855,000 KWH = $413,910.00
DENITRIFICATION					
ANOXIC	1 BHP	6 BHP	22 BHP	45 BHP	150 BHP
REAER	0.5 BHP	1 BHP	3 BHP	5 BHP	10 BHP
CLARIFIERS	0.5 BHP	1 BHP	2 BHP	4 BHP	12 BHP
	2 BHP = 17,500 KWH = $981.00	8 BHP = 70,000 KWH = $3,100.00	27 BHP = 236,500 KWH = $9,900.00	54 BHP = 473,000 KWH = $19,900.00	172 BHP = 1,506,700 KWH = $63,300.00

TABLE III-11a

SUMMARY OF ANNUAL FLOW RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS** ($)
0.1 MGD					
1. BASE PLANT					
INFLUENT PUMPING*	NA	NA	NA	NA	NA
BAR SCREENING & GRIT REMOVAL	650	$8,900	NA	NA	$100
SECONDARY CLARIFIERS	550	$7,600	NA	$500	$1,400
CHLORINATION	140	$1,900	$1,600	$200	$600
DECHLORINATION	NA	NA	NA	NA	NA
ADMINISTRATION	55	$800	NA	NA	$200
LABORATORY	1,130	$15,500	NA	NA	$200
SITEWORK/PIPING/ELEC.	250	$3,400	NA	NA	$800
TOTAL BASE O&M COST	2,775	$38,100	$1,600	$700	$3,300
COST PER 1000 GALLONS		$1.04	$0.04	$0.02	$0.09
2. TERTIARY SOLIDS REMOVAL EFFLUENT FILTRATION	136	$1,900	NA	$100	$1,000
3. HIGHER EFFLUENT D.O. POST AERATION	100	$1,400	NA	$100	$400

*CONSIDERED SEPARATELY AS TRANSPORT FACILITY LIFT STATION
**INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-11b

SUMMARY OF ANNUAL FLOW RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS** ($)
1 MGD					
1. BASE PLANT					
INFLUENT PUMPING*	NA	NA	NA	NA	NA
BAR SCREENING & GRIT REMOVAL	950	$13,100	NA	$300	$2,600
SECONDARY CLARIFIERS	780	$10,700	NA	$400	$8,600
CHLORINATION	450	$6,200	$6,300	$400	$2,000
DECHLORINATION	110	$1,500	$900	$100	$100
ADMINISTRATION	230	$3,200	NA	NA	$1,900
LABORATORY	1,405	$19,300	NA	NA	$1,900
SITEWORK/PIPING/ELEC.	350	$4,800	NA	NA	$6,200
TOTAL BASE O&M COST	4,275	$58,800	$7,200	$1,200	$23,300
COST PER 1000 GALLONS		$0.16	$0.02	$0.003	$0.06
2. TERTIARY SOLIDS REMOVAL EFFLUENT FILTRATION	793	$10,900	NA	$200	$6,000
3. HIGHER EFFLUENT D.O. POST AERATION	200	$2,800	NA	$800	$800

*CONSIDERED SEPARATELY AS TRANSPORT FACILITY LIFT STATION
**INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-11c

SUMMARY OF ANNUAL FLOW RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS** ($)
5 MGD					
1. BASE PLANT					
INFLUENT PUMPING*	NA	NA	NA	NA	NA
BAR SCREENING & GRIT REMOVAL	1,800	$24,800	NA	$1,100	$3,700
SECONDARY CLARIFIERS	2,100	$28,900	NA	$700	$22,600
CHLORINATION	1,050	$14,400	$31,700	$700	$6,200
DECHLORINATION	300	$4,100	$4,600	$100	$500
ADMINISTRATION	800	$11,000	NA	NA	$9,400
LABORATORY	1,700	$23,400	NA	NA	$9,400
SITEWORK/PIPING/ELEC.	650	$8,900	NA	NA	$26,300
TOTAL BASE O&M COST	8,400	$115,500	$36,300	$2,600	$78,100
COST PER 1000 GALLONS		$0.06	$0.02	$0.001	$0.04
2. TERTIARY SOLIDS REMOVAL EFFLUENT FILTRATION	1,397	$19,200	NA	$400	$11,700
3. HIGHER EFFLUENT D.O. POST AERATION	300	$4,100	NA	$2,900	$2,000

*CONSIDERED SEPARATELY AS TRANSPORT FACILITY LIFT STATION
**INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-11d

SUMMARY OF ANNUAL FLOW RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS** ($)
10 MGD					
1. BASE PLANT					
INFLUENT PUMPING*	NA	NA	NA	NA	NA
BAR SCREENING & GRIT REMOVAL	2,850	$39,200	NA	$2,200	$4,800
SECONDARY CLARIFIERS	3,200	$44,000	NA	$1,500	$45,200
CHLORINATION	2,470	$34,000	$58,400	$1,100	$10,000
DECHLORINATION	830	$11,400	$9,100	$200	$1,000
ADMINISTRATION	1,285	$17,700	NA	NA	$18,800
LABORATORY	2,030	$27,900	NA	NA	$18,800
SITEWORK/PIPING/ELEC.	1,000	$13,800	NA	NA	$51,800
TOTAL BASE O&M COST	13,665	$188,000	$67,500	$5,000	$150,400
COST PER 1000 GALLONS		$0.05	$0.02	$0.001	$0.04
2. TERTIARY SOLIDS REMOVAL EFFLUENT FILTRATION	1,543	$21,200	NA	$700	$23,400
3. HIGHER EFFLUENT D.O. POST AERATION	600	$8,200	NA	$5,500	$2,800

*CONSIDERED SEPARATELY AS TRANSPORT FACILITY LIFT STATION
**INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-11e

SUMMARY OF ANNUAL FLOW RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS** ($)
30 MGD					
1. BASE PLANT					
INFLUENT PUMPING*	NA	NA	NA	NA	NA
BAR SCREENING & GRIT REMOVAL	7,100	$97,600	NA	$4,000	$10,200
SECONDARY CLARIFIERS	6,100	$83,900	NA	$4,400	$126,600
CHLORINATION	3,020	$41,500	$160,700	$1,800	$30,000
DECHLORINATION	1,000	$13,800	$27,400	$300	$2,500
ADMINISTRATION	2,975	$40,900	NA	NA	$37,500
LABORATORY	2,695	$37,100	NA	NA	$37,500
SITEWORK/PIPING/ELEC.	2,400	$33,000	NA	NA	$148,000
TOTAL BASE O&M COST	25,290	$347,800	$188,100	$10,500	$392,300
COST PER GALLON		$0.03	$0.02	$0.001	$0.04
2. TERTIARY SOLIDS REMOVAL EFFLUENT FILTRATION	1,659	$22,800	NA	$1,500	$65,600
3. HIGHER EFFLUENT D.O. POST AERATION	1,100	$15,100	NA	$16,500	$5,800

*CONSIDERED SEPARATELY AS TRANSPORT FACILITY LIFT STATION
**INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-12a

SUMMARY OF ANNUAL BOD/TKN RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS* ($)
700 CAP. 147 LB. BOD/DAY 23 LB. TKN/DAY					
1. BASE PLANT					
AERATION BASINS	1,150	$15,800	NA	$8,800	$1,300
GRAVITY THICKENING	560	$7,700	NA	$100	$700
AEROBIC DIGESTER	1,050	$14,400	NA	$3,400	$700
DEWATERING	620	$8,500	600	$200	$400
ADMINISTRATION	55	$800	NA	NA	$100
LABORATORY	1,130	$15,500	NA	NA	$100
SITEWORK/PIPING/ELEC.	250	$3,400	NA	NA	$500
TOTAL BASE O&M COST	4,815	$66,100	$600	$12,500	$3,800
COST PER CAPITA		$94.43	$0.86	$17.86	$5.43
2. NITRIFICATION ADDITIONAL AERATION BASINS	750	$10,300	NA	$4,400	$500
3. DENITRIFICATION ANOXIC/REAER BASINS/CLARIFIERS	1,000	$13,800	$600	$1,000	$2,700

*INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-12b

SUMMARY OF ANNUAL BOD/TKN RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS* ($)
7000 CAP. 1470 LB. BOD/DAY 230 LB. TKN/DAY					
1. BASE PLANT					
AERATION BASINS	1,750	$24,000	NA	$38,500	$7,400
GRAVITY THICKENING	550	$7,600	NA	$200	$2,200
AEROBIC DIGESTER	1,100	$15,100	NA	$19,300	$3,600
DEWATERING	1,680	$23,100	$5,400	$200	$4,200
ADMINISTRATION	230	$3,100	NA	N/A	$600
LABORATORY	1,405	$19,300	NA	N/A	$600
SITEWORK/PIPING/ELEC.	350	$4,800	NA	N/A	$3,000
TOTAL BASE O&M COST	7,065	$97,000	$5,400	$58,200	$21,600
COST PER CAPITA		$13.86	$0.77	$8.31	$3.09
2. NITRIFICATION ADDITIONAL AERATION BASINS	1,100	$15,100	N/A	$19,300	$2,800
3. DENITRIFICATION ANOXIC/REAER BASINS/CLARIFIERS	2,031	$27,900	$2,800	$3,100	$14,300

*INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-12c

SUMMARY OF ANNUAL BOD/TKN RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS* ($)
36000 CAP. 7560 LB. BOD/DAY 1188 LB. TKN/DAY					
1. BASE PLANT					
AERATION BASINS	3,800	$52,200	NA	$147,200	$25,300
GRAVITY THICKENING	660	$9,100	NA	$400	$7,400
AEROBIC DIGESTER	2,120	$29,200	NA	$66,200	$9,400
DEWATERING	3,700	$50,900	$22,000	$600	$20,800
ADMINISTRATION	800	$11,000	NA	N/A	$3,100
LABORATORY	1,700	$23,400	NA	N/A	$3,100
SITEWORK/PIPING/ELEC.	650	$8,900	NA	N/A	$10,000
TOTAL BASE O&M COST	13,430	$184,700	$22,000	$214,400	$79,100
COST PER CAPITA		$5.13	$0.61	$5.96	$2.20
2. NITRIFICATION ADDITIONAL AERATION BASINS	1,800	$24,800	N/A	$73,600	$9,400
3. DENITRIFICATION ANOXIC/REAER BASINS/CLARIFIERS	5,190	$71,400	$14,000	$9,900	$41,800

*INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-12d

SUMMARY OF ANNUAL BOD/TKN RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS* ($)
72000 CAP. 15,120 LB. BOD/DAY 2,376 LB. TKN/DAY					
1. BASE PLANT					
AERATION BASINS	5,600	$77,000	NA	$264,900	$47,800
GRAVITY THICKENING	920	$12,600	NA	$700	$15,200
AEROBIC DIGESTER	3,100	$42,600	NA	$110,400	$21,200
DEWATERING	5,600	$77,000	$44,000	$1,100	$41,600
ADMINISTRATION	1,285	$17,700	NA	N/A	$6,200
LABORATORY	2,030	$27,900	NA	N/A	$6,200
SITEWORK	1,000	$13,800	NA	N/A	$20,000
TOTAL BASE O&M COST	19,535	$268,600	$44,000	$377,100	$158,200
COST PER CAPITA		$3.73	$0.61	$5.24	$2.20
2. NITRIFICATION ADDITIONAL AERATION BASINS	2,400	$33,000	N/A	$132,500	$17,800
3. DENITRIFICATION ANOXIC/REAER BASINS/CLARIFIERS	6,945	$95,500	$28,000	$19,900	$82,000

*INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE @ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-12e

SUMMARY OF ANNUAL BOD/TKN RELATED TREATMENT PLANT
OPERATION & MAINTENANCE COSTS
1988 DOLLARS

PLANT SIZE	LABOR (MH)	LABOR COST ($) (@ $13.75/HR)	CHEMICAL COSTS ($)	POWER COSTS ($)	OTHER COSTS* ($)
215000 CAP. 45,150 LB. BOD/DAY 7,095 LB. TKN/DAY					
1. BASE PLANT					
AERATION BASINS	10,600	$145,800	NA	$827,800	$133,200
GRAVITY THICKENING	1,830	$25,200	NA	$1,500	$41,400
AEROBIC DIGESTER	5,700	$78,400	NA	$257,500	$59,300
DEWATERING	11,500	$158,100	$131,500	$3,300	$124,600
ADMINISTRATION	2,975	$40,900	NA	N/A	$12,500
LABORATORY	2,695	$37,100	NA	N/A	$12,500
SITEWORK/PIPING/ELEC.	2,400	$33,000	NA	N/A	$55,700
TOTAL BASE O&M COST	37,700	$518,500	$131,500	$1,090,100	$439,200
COST PER CAPITA		$2.41	$0.61	$5.07	$2.04
2. NITRIFICATION					
ADDITIONAL AERATION BASINS	3,700	$50,900	N/A	$413,900	$49,500
3. DENITRIFICATION ANOXIC/REAER BASINS/CLARIFIERS	10,760	$148,000	$84,000	$63,300	$229,000

*INCLUDES MISC. MATERIALS AND SUPPLIES, AND CAPITAL MAINTENANCE
@ 2.5% OF ALL CONSTRUCTION COSTS, WITH EXCEPTION OF DEWATERING @ 5%.

TABLE III-13a

HARKER HEIGHTS
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATES 1, 2 AND 3: PHASE I, (1990 - 2000)

YR. 1990 Qa = 1.51 MGD, Qm = 2.23 MGD
YR. 2000 Qa = 1.93 MGD, Qm = 2.82 MGD
YR. 1990 CAPITA = 9,500
YR. 2000 CAPITA = 11,400

-REQUIRED EFFLUENT = 10 BOD, 3 NH3-N, 4 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION

-EXISTING FACILITIES = 3 MGD Qm, 23,800 CAPITA BASE PLANT, WITH NITRIFICATION, POST AERATION, NO EFFLUENT FILTRATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 1990	YR. 2000
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$175,000	$175,000
BOD/TKN RELATED BASE	$210,000	$210,000
FILTRATION	NA	NA
POST AERATION	$5,000	$5,000
NITRIFICATION	$28,000	$28,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,400	$1,500
BOD/TKN RELATED BASE	$72,000	$90,000
FILTRATION	NA	NA
POST AERATION	$1,200	$1,400
NITRIFICATION	$25,000	$32,000
DENITRIFICATION	NA	NA

TABLE III-13a

CHEMICALS:		
*********		
FLOW RELATED BASE	$13,000	$17,000
BOD/TKN RELATED BASE	$6,600	$8,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$537,200	$567,900

GRADIENT = ($567,900 - $537,200)/10 = $3,070/YR.

YR. 1990 O&M P.W. = ($543,600 X 7.024) + ($3,070 X 27.716) = $3,858,000

TOTAL YR. 1990 HARKER HEIGHTS STP P.W. (CAPITAL + O&M) = $3,858,000

TABLE III-13a

HARKER HEIGHTS
TREATMENT PLANT PRESENT WORTH COSTS

II. ALTERNATES 1 AND 2: PHASE II, (2000 - 2010)

YR. 2000 Qa = 1.93 MGD, Qm = 2.82 MGD
YR. 2010 Qa = 2.36 MGD, Qm = 3.47 MGD
YR. 2000 CAPITA = 11,400
YR. 2010 CAPITA = 14,300

-REQUIRED EFFLUENT = 10 BOD, 3 NH3-N, 4 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION

-EXISTING FACILITIES = 3 MGD Qm, 23,800 CAPITA BASE PLANT, WITH NITRIFICATION, AND POST AERATION

-REQUIRED NEW FACILITIES = 2.4 MGD Qm EXPANSION OF FLOW RELATED FACILITIES TO 5.4 MGD Qm

-TOTAL PLANT CAPACITY PROVIDED IN 2000 = 5.4 MGD Qm, 23,800 CAPITA

1. CAPITAL COSTS

(a)	YR. 2000 - 2.4 MGD - BASE PLANT EXP. (FLOW RELATED) =	$2,300,000	
	YR. 2000 - 2.4 MGD - POST AERATION =	$54,000	
	SUBTOTAL - CAPITAL	$2,354,000	
	YR. 1990 P.W. = $2,354,000 X 0.5083		$1,197,000

2. O&M COSTS

	YR. 2000	YR. 2010
LABOR & MATERIALS:		
**********		
FLOW RELATED BASE	$240,000	$240,000
BOD/TKN RELATED BASE	$210,000	$210,000
FILTRATION	NA	NA
POST AERATION	$6,400	$6,400
NITRIFICATION	$28,000	$28,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,500	$1,700
BOD/TKN RELATED BASE	$90,000	$108,000
FILTRATION	NA	NA
POST AERATION	$1,400	$1,600
NITRIFICATION	$32,000	$39,000
DENITRIFICATION	NA	NA

TABLE III-13a

CHEMICALS:		
*********		
FLOW RELATED BASE	$17,000	$20,000
BOD/TKN RELATED BASE	$8,000	$10,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$634,300	$664,700

GRADIENT = ($664,700 - $634,300)/10 = $1,520/YR.

YR. 1990 O&M P.W. = 0.5083[($634,300 X 7.024) + ($1,520 X 27.716)] = $2,286,000

TOTAL YR. 1990 HARKER HEIGHTS STP P.W. (CAPITAL + O&M) = $3,483,000

TABLE III-13a

HARKER HEIGHTS
TREATMENT PLANT PRESENT WORTH COSTS

III. ALTERNATES 1 AND 2: PHASE III, (2010 - 2030)

YR. 2010 Qa = 2.36 MGD, Qm = 3.47 MGD
YR. 2030 Qa = 3.72 MGD, Qm = 5.42 MGD
YR. 2010 CAPITA = 14,300
YR. 2030 CAPITA = 23,500

-REQUIRED EFFLUENT = 10 BOD, 3 NH3-N, 4 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION

-EXISTING FACILITIES = 5.4 MGD Qm, 23,800 CAPITA BASE PLANT, WITH NITRIFICATION, NO EFFLUENT FILTRATION AND POST AERATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$240,000	$240,000
BOD/TKN RELATED BASE	$210,000	$210,000
FILTRATION	NA	NA
POST AERATION	$6,400	$6,400
NITRIFICATION	$28,000	$28,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,700	$2,100
BOD/TKN RELATED BASE	$108,000	$160,000
FILTRATION	NA	NA
POST AERATION	$1,600	$2,400
NITRIFICATION	$39,000	$56,000
DENITRIFICATION	NA	NA

TABLE III-13a

CHEMICALS:		
*********		
FLOW RELATED BASE	$20,000	$30,000
BOD/TKN RELATED BASE	$10,000	$15,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$664,700	$749,900

GRADIENT = ($749,900 - $664,700)/20 = $4,260/YR.

YR. 1990 O&M P.W. = 0.2584[($664,700 X 10.594) + ($4,260 X 77.509)] = $1,905,000

TOTAL YR. 1990 HARKER HEIGHTS STP P.W. (CAPITAL + O&M) = $1,905,000

TABLE III-13a

HARKER HEIGHTS
TREATMENT PLANT PRESENT WORTH COST

IV. ALTERNATE 3: PHASE II, (2000 - 2010)

YR. 2000 Qa = 1.93 MGD, Qm = 2.82 MGD
YR. 2010 Qa = 2.36 MGD, Qm = 3.47 MGD
YR. 2000 CAPITA = 11,400
YR. 2010 CAPITA = 14,300

-REQUIRED EFFLUENT = 10 BOD, 3 NH3-N, 4 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION

-EXISTING FACILITIES = 3 MGD Qm, 23,800 CAPITA BASE PLANT, WITH NITRIFICATION, AND POST AERATION

-REQUIRED NEW FACILITIES = 0.92 MGD Qm EXPANSION OF FLOW RELATED FACILITIES TO 3.92 MGD Qm

-TOTAL PLANT CAPACITY PROVIDED IN 2000 = 3.92 MGD; 23,800 CAPITA

1. CAPITAL COSTS

(a)	YR.2000 - 0.92 MGD - BASE PLANT EXP. (FLOW RELATED) =	$1,000,000	
	YR. 2000 - 0.92 MGD - POST AERATION =	$29,000	
	SUBTOTAL - CAPITAL	$1,029,000	
	YR. 1990 P.W. = $1,029,000 X 0.5083		$523,000

2. O&M COSTS

	YR. 2000	YR. 2010
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$200,000	$200,000
BOD/TKN RELATED BASE	$210,000	$210,000
FILTRATION	NA	NA
POST AERATION	$5,600	$5,600
NITRIFICATION	$28,000	$28,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,500	$1,700
BOD/TKN RELATED BASE	$90,000	$108,000
FILTRATION	NA	NA
POST AERATION	$1,400	$1,600
NITRIFICATION	$32,000	$39,000
DENITRIFICATION	NA	NA

TABLE III-13a

CHEMICALS:		
*********		
FLOW RELATED BASE	$17,000	$20,000
BOD/TKN RELATED BASE	$8,000	$10,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$593,500	$623,900

GRADIENT = ($623,900 - $593,500)/10 = $3,040/YR.

YR. 1990 O&M P.W. = 0.5083[($593,500 X 7.024) + ($3,040 X 27.716)] = $2,162,000

TOTAL YR. 1990 HARKER HEIGHTS STP P.W. (CAPITAL + O&M) = $2,685,000

TABLE III-13a

HARKER HEIGHTS
TREATMENT PLANT PRESENT WORTH COSTS

V. ALTERNATES 3: PHASE III, (2010 - 2030)

YR. 2010 Qa = 2.28 MGD, Qm = 3.35 MGD
YR. 2030 Qa = 2.70 MGD, Qm = 3.92 MGD
YR. 2010 CAPITA = 13,700
YR. 2030 CAPITA = 16,380

-REQUIRED EFFLUENT = 10 BOD, 3 NH3-N, 4 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION

-EXISTING FACILITIES = 3.92 MGD Qm, 23,800 CAPITA BASE PLANT, WITH NITRIFICATION, AND POST AERATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$200,000	$200,000
BOD/TKN RELATED BASE	$210,000	$210,000
FILTRATION	NA	NA
POST AERATION	$5,600	$5,600
NITRIFICATION	$28,000	$28,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,600	$1,800
BOD/TKN RELATED BASE	$100,000	$120,000
FILTRATION	NA	NA
POST AERATION	$1,600	$1,800
NITRIFICATION	$37,000	$43,000
DENITRIFICATION	NA	NA

TABLE III-13a

CHEMICALS:			
*********			
FLOW RELATED BASE	$19,000	$23,000	
BOD/TKN RELATED BASE	$9,500	$11,000	
FILTRATION	NA	NA	
POST AERATION	NA	NA	
NITRIFICATION	NA	NA	
DENITRIFICATION	NA	NA	
SUBTOTAL = O&M	$612,300	$644,200	

GRADIENT = ($664,200 - $612,300)/20 = $1,595/YR.

YR. 1990 O&M P.W. = 0.2584[($612,300 X 10.594) + ($1,595 X 77.509)] = $1,708,000

TOTAL YR. 1990 HARKER HEIGHTS STP P.W. (CAPITAL + O&M) = $1,708,000

TABLE III-13b

BELL CO. WCID #3 (NOLANVILLE)
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATES 1,2 AND 3: PHASE I, (1990 - 2000)

YR. 1990 Qa = 0.2 MGD, Qm = 0.3 MGD
YR. 2000 Qa = 0.26 MGD, Qm = 0.39 MGD
YR. 1990 CAPITA = 1,600
YR. 2000 CAPITA = 2,100

-REQUIRED EFFLUENT = 10 BOD, 15 NH3-N, 2 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT ONLY

-EXISTING FACILITIES = 0.25 MGD QM, 1985 CAPITA BASE PLANT

-REQUIRED NEW FACILITIES = 0.15 MGD Qm, 115 CAPITA BASE PLANT EXPANSION BY 1990

-TOTAL PLANT CAPACITY PROVIDED IN 1990 = 0.4 MGD Qm, 2,100 CAPITA

1. CAPITAL COSTS

(a)	YR. 1990 - 0.15 MGD - BASE PLANT EXP. (FLOW RELATED) =	$270,000	
(b)	YR. 1990 - 115 MGD - BASE PLANT EXP. (BOD/TKN RELATED) =	$50,000	
	SUBTOTAL - CAPITAL	$320,000	
	YR. 1990 P.W. = Capital		$320,000

2. O&M COSTS

	YR. 1990	YR. 2000
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$58,000	$58,000
BOD/TKN RELATED BASE	$90,000	$90,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$800	$900
BOD/TKN RELATED BASE	$22,000	$26,500
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		

TABLE III-13b

FLOW RELATED BASE	$2,600	$3,100	
BOD/TKN RELATED BASE	$2,300	$2,900	
FILTRATION	NA	NA	
POST AERATION	NA	NA	
NITRIFICATION	NA	NA	
DENITRIFICATION	NA	NA	
SUBTOTAL	$175,700	$181,400	

GRADIENT = ($181,400 - $175,700)/10 = $570/YR.

YR. 1990 O&M P.W. = ($175,700)(7.024) + $570(27.716) = $1,250,000

TOTAL YR. 1990 WCID #3 STP P.W. (CAPITAL AND O&M) = $1,570,000

TABLE III-13b

BELL CO. WCID #3, (NOLANVILLE)
TREATMENT PLANT PRESENT WORTH COSTS

II. ALTERNATES 1, 2 AND 3: PHASE II, (2000 - 2010)

YR. 2000 Qa = 0.26 MGD, Qm = 0.39 MGD
YR. 2010 Qa = 0.34 MGD, Qm = 0.51 MGD
YR. 2000 CAPITA = 2,100
YR. 2010 CAPITA = 2,700

-REQUIRED EFFLUENT = 10 BOD, 15 NH3-N, 2 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT ONLY

-EXISTING FACILITIES = 0.4 MGD Qa, 2100 CAPITA BASE PLANT

-REQUIRED NEW FACILITIES = 0.11 MGD Qa, 600 CAPITA BASE PLANT EXPANSION BY YR. 2000

-TOTAL PLANT CAPACITY PROVIDED IN 2000 = 0.51 MGD Qa, 2,700 CAPITA

1. CAPITAL COSTS

YR. 2000 - 0.11 MGD - BASE PLANT EXP. (FLOW RELATED) =	$180,000	
YR. 2000 - 600 CAPITA - BASE PLANT EXP. (BOD/TKN RELATED) =	$140,000	
SUBTOTAL - CAPITAL	$320,000	
YR.1990 P.W. = $320,000 X 0.5083		$163,000

2. O&M COSTS

	YR. 2000	YR. 2010
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$62,500	$62,500
BOD/TKN RELATED BASE	$95,000	$95,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$900	$1,000
BOD/TKN RELATED BASE	$26,500	$31,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA

TABLE III-13b

CHEMICALS:		
*********		
FLOW RELATED BASE	$3,100	$3,600
BOD/TKN RELATED BASE	$2,900	$3,400
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL, O&M	$190,900	$196,500

GRADIENT = ($196,500 - $190,900)/10 = $560/YR.

YR. 1990 O&M P.W. = 0.5083[($190,900 X 7.024) + ($560 X 27.716)] = $689,000

TOTAL YR. 1990 WCID #3 STP P.W. (CAPITAL AND O&M) = $852,000

TABLE III-13b

BELL CO. WCID #3, (NOLANVILLE)
TREATMENT PLANT PRESENT WORTH COSTS

III. ALTERNATES 1, 2 AND 3: PHASE III, (2010 - 2030)

YR. 2010 Qa = 0.34 MGD, Qm = 0.51 MGD
YR. 2030 Qa = 0.56 MGD, Qm = 0.84 MGD
YR. 2010 CAPITA = 2,700
YR. 2030 CAPITA = 4,500

-REQUIRED EFFLUENT = 10 BOD, 15 NH3-N, 2 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT ONLY

-EXISTING FACILITIES = 0.51 MGD Qm, 2700 CAPITA BASE PLANT

-REQUIRED NEW FACILITIES = 0.33 MGD Qm, 1,800 CAPITA BASE PLANT EXPANSION BY YR. 2010

-TOTAL PLANT CAPACITY PROVIDED IN 2010 = 0.81 MGD Qm, 4,500 CAPITA

1. CAPITAL COSTS

YR. 2010 - 0.33 MGD - BASE PLANT (FLOW RELATED) =	$520,000	
YR. 2010 - 1800 CAPITA - BASE PLANT (BOD/TKN RELATED) =	$445,000	
SUBTOTAL - CAPITAL	$965,000	
YR.1990 P.W. = $965,000 X 0.2584		$249,000

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
FLOW RELATED BASE	$75,000	$75,000
BOD/TKN RELATED BASE	$106,500	$106,500
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
POWER:		
FLOW RELATED BASE	$1,000	$1,100
BOD/TKN RELATED BASE	$31,000	$42,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA

TABLE III-13b

CHEMICALS:		
*********		
FLOW RELATED BASE	$3,600	$4,800
BOD/TKN RELATED BASE	$3,400	$4,500
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL	$220,500	$233,900

GRADIENT = ($233,900 - $220,500)/20 = $670/YR.

YR. 1990 O&M P.W. = 0.2584[($220,500 X 10.594) + ($670 X 77.509)] = $617,000

TOTAL YR. 1990 WCID #3 STP P.W. (CAPITAL AND O&M) = $866,000

TABLE III-13c

LAKE DAM STP
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATE 1: PHASE II, (2000 - 2010)

YR. 2000 Qa = 0.65 MGD, Qm = 1.00 MGD
YR. 2010 Qa = 0.65 MGD, Qm = 1.00 MGD
YR. 2000 CAPITA = 5,200
YR. 2010 CAPITA = 5,200

-REQUIRED EFFLUENT = 20 BOD, 15 NH3-N, 2 DO, 20 TSS

-REQUIRED PROCESSES = BASE PLANT ONLY

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = 1.0 MGD Qm, 5,200 CAPITA BASE PLANT BY YR. 2000

1. CAPITAL COSTS

YR. 2000 - 1.0 MGD - 5200 CAPITA - BASE PLANT (FLOW RELATED) =	$1,100,000	
YR. 2000 - 1.0 MGD - 5200 CAPITA - BASE PLANT (BOD/TKN RELATED) =	$810,000	
YR. 2000 - INFLUENT L.S. = NONE		
SUBTOTAL - CAPITAL	$1,910,000	
YR.1990 P.W. = $1,910,000 X 0.5083		$971,000

2. O&M COSTS

	YR. 2000	YR. 2010
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$82,000	$82,000
BOD/TKN RELATED BASE	$110,000	$110,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,100	$1,100
BOD/TKN RELATED BASE	$46,000	$46,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA

TABLE III-13c

CHEMICALS:		
*********		
FLOW RELATED BASE	$5,300	$5,300
BOD/TKN RELATED BASE	$4,800	$4,800
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL, O&M	$249,200	$249,200

GRADIENT = $0

YR. 1990 O&M P.W. = 0.5083 X ($249,200 X 7.024) = $890,000

TOTAL YR. 1990 LAKE DAM STP P.W. (CAPITAL AND O&M) = $1,861,000

TABLE III-13c

LAKE DAM STP
TREATMENT PLANT PRESENT WORTH COSTS

II. ALTERNATE 1: PHASE III, (2010 - 2030)

YR. 2010 Qa = 0.65 MGD, Qm = 1.00 MGD
YR. 2030 Qa = 0.65 MGD, Qm = 1.00 MGD
YR. 2010 CAPITA = 5,200
YR. 2030 CAPITA = 5,200

-REQUIRED EFFLUENT = 20 BOD, 15 NH3-N, 2 DO, 10 TSS

-REQUIRED PROCESSES = BASE PLANT ONLY

-EXISTING FACILITIES = 1.00 MGD Qa, 5,200 CAPITA BASE PLANT

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$82,000	$82,000
BOD/TKN RELATED BASE	$110,000	$110,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,100	$1,100
BOD/TKN RELATED BASE	$46,000	$46,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		
FLOW RELATED BASE	$5,300	$5,300
BOD/TKN RELATED BASE	$4,800	$4,800
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL	$249,200	$249,200

TABLE III-13c

GRADIENT = $0	
YR. 1990 O&M P.W. = 0.2584($249,200 X 10.594) =	$682,200
TOTAL YR. 1990 LAKE DAM STP P.W. (CAPITAL AND O&M) =	$682,200

TABLE III-13d

SOUTHSIDE
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATES 2 AND 3: PHASE II, (2000 - 2010)

YR. 2000 Qa = 0.275 MGD, Qm = 0.41 MGD
YR. 2010 Qa = 0.275 MGD, Qm = 0.41 MGD
YR. 2000 CAPITA = 2,200
YR. 2010 CAPITA = 2,200

-REQUIRED EFFLUENT = 5 BOD, 2 NH3-N, 6 DO, 10 TSS, 3 NO3-N

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, DENITRIFICATION, FILTRATION, POST AERATION

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = 0.41 MGD Qm, 2,200 CAPITA BASE PLANT BY YR. 2000
W/NITRIFICATION, DENITRIFICATION, FILTRATION, AND POST AERATION.

1. CAPITAL COSTS

YR. 2000 - 0.41 MGD - BASE PLANT (FLOW RELATED) =	$600,000	
YR. 2000 - 2,200 CAP. - BASE PLANT (BOD/TKN RELATED) =	$500,000	
YR. 2000 - 2,200 CAP. - NITRIFICATION =	$58,000	
YR. 2000 - 0.41 MGD - FILTRATION =	$155,000	
YR. 2000 - 0.41 MGD - POST AERATION =	$20,000	
YR. 2000 - 2,200 CAP. - DENITRIFICATION =	$320,000	
SUBTOTAL - CAPITAL	$1,653,000	
YR. 1990 P.W. = $1,653,000 X 0.5083		$840,000

2. O&M COSTS

	YR. 2000	YR. 2010
LABOR & MATERIALS:		
FLOW RELATED BASE	$59,000	$59,000
BOD/TKN RELATED BASE	$91,000	$91,000
FILTRATION	$10,000	$10,000
POST AERATION	$2,600	$2,600
NITRIFICATION	$13,500	$13,500
DENITRIFICATION	$27,000	$27,000
POWER:		
FLOW RELATED BASE	$900	$900
BOD/TKN RELATED BASE	$27,000	$27,000
FILTRATION	$100	$100
POST AERATION	$300	$300
NITRIFICATION	$7,000	$7,000

TABLE III-13d

DENITRIFICATION	$1,100	$1,100
CHEMICALS:		
*********		
FLOW RELATED BASE	$3,200	$3,200
BOD/TKN RELATED BASE	$3,000	$3,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	$1,700	$1,700
SUBTOTAL = O&M	$247,400	$247,400

GRADIENT = $0

YR. 1990 O&M P.W. = 0.5083 X ($247,400 X 7.024) = $883,000

TOTAL YR. 1990 SOUTHSIDE STP P.W. (CAPITAL + O&M) = $1,723,000

TABLE III-13d

SOUTHSIDE
TREATMENT PLANT PRESENT WORTH COSTS

II. ALTERNATES 2 AND 3: PHASE III, (2010 - 2030)

YR. 2010 Qa = 0.275 MGD, Qm = 0.41 MGD
YR. 2030 Qa = 0.275 MGD, Qm = 0.41 MGD
YR. 2010 CAPITA = 2,200
YR. 2030 CAPITA = 2,200

-REQUIRED EFFLUENT = 5 BOD, 2 NH3-N, 6 DO, 15 TSS, 3 NO3-N

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, DENITRIFICATION, FILTRATION, POST AERATION

-EXISTING FACILITIES = 0.41 MGD Qm, 2,200 CAPITA BASE PLANT, WITH NITRIFICATION, DENITRIFICATION, EFFLUENT FILTRATION, AND POST AERATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$59,000	$59,000
BOD/TKN RELATED BASE	$91,000	$91,000
FILTRATION	$10,000	$10,000
POST AERATION	$2,600	$2,600
NITRIFICATION	$13,500	$13,500
DENITRIFICATION	$27,000	$27,000
POWER:		
*********		
FLOW RELATED BASE	$900	$900
BOD/TKN RELATED BASE	$27,000	$27,000
FILTRATION	$100	$100
POST AERATION	$300	$300
NITRIFICATION	$7,000	$7,000
DENITRIFICATION	$1,100	$1,100

TABLE III-13d

CHEMICALS:			
*********			
FLOW RELATED BASE	$3,200	$3,200	
BOD/TKN RELATED BASE	$3,000	$3,000	
FILTRATION	NA	NA	
POST AERATION	NA	NA	
NITRIFICATION	NA	NA	
DENITRIFICATION	$1,700	$1,700	
SUBTOTAL = O&M	$247,400	$247,400	
GRADIENT = $0			
YR. 1990 O&M P.W. = 0.2584($247,400 X 10.594) =			$677,000
TOTAL YR. 1990 SOUTHSIDE STP P.W. (CAPITAL + O&M) =			$677,000

TABLE III-13e

NORTHSIDE
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATES 2 AND 3: PHASE III, (2000 - 2010)

YR. 2000 Qa = 0.275 MGD, Qm = 0.41 MGD
YR. 2010 Qa = 0.275 MGD, Qm = 0.41 MGD
YR. 2000 CAPITA = 2,200
YR. 2010 CAPITA = 2,200

-REQUIRED EFFLUENT = 5 BOD, 2 NH3-N, 6 DO, 10 TSS, 3 NO3-N

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, DENITRIFICATION, FILTRATION, POST AERATION

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = 0.41 MGD Qm, 2,200 CAPITA BASE PLANT BY YR. 2000 W/NITRIFICATION, DENITRIFICATION, FILTRATION, AND POST AERATION.

1. CAPITAL COSTS

YR. 2000 - 0.41 MGD - BASE PLANT (FLOW RELATED) =	$600,000	
YR. 2000 - 2,200 CAP. - BASE PLANT (BOD/TKN RELATED) =	$500,000	
YR. 2000 - 2,200 CAP. - NITRIFICATION =	$58,000	
YR. 2000 - 0.41 MGD - FILTRATION =	$155,000	
YR. 2000 - 0.41 MGD - POST AERATION =	$20,000	
YR. 2000 - 2,200 CAP. - DENITRIFICATION =	$320,000	
SUBTOTAL - CAPITAL	$1,653,000	
YR. 1990 P.W. = $1,653,000 X 0.5083		$840,000

2. O&M COSTS

	YR. 2000	YR. 2010
LABOR & MATERIALS:		
**********		
FLOW RELATED BASE	$59,000	$59,000
BOD/TKN RELATED BASE	$91,000	$91,000
FILTRATION	$10,000	$10,000
POST AERATION	$2,600	$2,600
NITRIFICATION	$13,500	$13,500
DENITRIFICATION	$27,000	$27,000

TABLE III-13e

POWER:		
*********		
FLOW RELATED BASE	$900	$900
BOD/TKN RELATED BASE	$27,000	$27,000
FILTRATION	$100	$100
POST AERATION	$300	$300
NITRIFICATION	$7,000	$7,000
DENITRIFICATION	$1,100	$1,100
CHEMICALS:		
*********		
FLOW RELATED BASE	$3,200	$3,200
BOD/TKN RELATED BASE	$3,000	$3,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	$1,700	$1,700
SUBTOTAL = O&M	$247,400	$247,400

GRADIENT = $0

YR. 1990 O&M P.W. = 0.5083 X ($247,400 X 7.024) = $883,000

TOTAL YR. 1990 SOUTHSIDE STP P.W. (CAPITAL + O&M) = $1,723,000

TABLE III-13e

NORTHSIDE
TREATMENT PLANT PRESENT WORTH COSTS

II. ALTERNATES 2 AND 3: PHASE III, (2010 - 2030)

YR. 2010 Qa = 0.275 MGD, Qm = 0.41 MGD
YR. 2030 Qa = 0.275 MGD, Qm = 0.41 MGD
YR. 2010 CAPITA = 2,200
YR. 2030 CAPITA = 2,200

-REQUIRED EFFLUENT = 5 BOD, 2 NH3-N, 6 DO, 15 TSS, 3 NO3-N

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, DENITRIFICATION, FILTRATION, POST AERATION

-EXISTING FACILITIES = 0.41 MGD Qm, 2,200 CAPITA BASE PLANT, WITH NITRIFICATION, DENITRIFICATION, EFFLUENT FILTRATION, AND POST AERATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$59,000	$59,000
BOD/TKN RELATED BASE	$91,000	$91,000
FILTRATION	$10,000	$10,000
POST AERATION	$2,600	$2,600
NITRIFICATION	$13,500	$13,500
DENITRIFICATION	$27,000	$27,000
POWER:		
*********		
FLOW RELATED BASE	$900	$900
BOD/TKN RELATED BASE	$27,000	$27,000
FILTRATION	$100	$100
POST AERATION	$300	$300
NITRIFICATION	$7,000	$7,000
DENITRIFICATION	$1,100	$1,100

TABLE III-13e

CHEMICALS:		
*********		
FLOW RELATED BASE	$3,200	$3,200
BOD/TKN RELATED BASE	$3,000	$3,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	$1,700	$1,700
SUBTOTAL = O&M	$247,400	$247,400

GRADIENT = $0

YR. 1990 O&M P.W. = 0.2584($247,400 X 10.594) =	$677,000
TOTAL YR. 1990 SOUTHSIDE STP P.W. (CAPITAL + O&M) =	$677,000

TABLE III-13f

UNION GROVE
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATES 2 AND 3: PHASE II, (2000 - 2010)

YR. 2000 Qa = 0.1 MGD, Qm = 0.15 MGD
YR. 2010 Qa = 0.1 MGD, Qm = 0.15 MGD
YR. 2000 CAPITA = 800
YR. 2010 CAPITA = 800

-REQUIRED EFFLUENT = 5 BOD, 2 NH3-N, 6 DO, 15 TSS, 3 NO3-N

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, DENITRIFICATION, FILTRATION, POST AERATION

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = 0.15 MGD Qa, 800 CAPITA BASE PLANT BY YR. 2000
W/NITRIFICATION, DENITRIFICATION, FILTRATION, AND POST AERATION.

1. CAPITAL COSTS

YR. 2000 - 0.15 MGD - BASE PLANT (FLOW RELATED) =	$270,000	
YR. 2000 - 800 CAP. - BASE PLANT (BOD/TKN RELATED) =	$210,000	
YR. 2000 - 800 CAP. - NITRIFICATION =	$24,000	
YR. 2000 - 0.15 MGD - FILTRATION =	$70,000	
YR. 2000 - 0.15 MGD - POST AERATION =	$15,000	
YR. 2000 - 800 CAP. - DENITRIFICATION =	$130,000	
SUBTOTAL - CAPITAL	$719,000	
YR. 1990 P.W. = $719000 X 0.5083		$365,000

2. O&M COSTS

	YR. 2000	YR. 2010
LABOR & MATERIALS:		
FLOW RELATED BASE	$45,000	$45,000
BOD/TKN RELATED BASE	$72,000	$72,000
FILTRATION	$4,700	$4,700
POST AERATION	$2,000	$2,000
NITRIFICATION	$12,000	$12,000
DENITRIFICATION	$18,000	$18,000
POWER:		
FLOW RELATED BASE	$700	$700
BOD/TKN RELATED BASE	$14,000	$14,000
FILTRATION	$100	$100
POST AERATION	$100	$100
NITRIFICATION	$4,500	$4,500

TABLE III-13f

DENITRIFICATION	$200	$200
CHEMICALS:		
*********		
FLOW RELATED BASE	$1,600	$1,600
BOD/TKN RELATED BASE	$900	$900
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	$700	$700
SUBTOTAL = O&M	$176,500	$176,500

GRADIENT = $0

YR. 1990 O&M P.W. = 0.5083 X ($176,500 X 7.024) = $630,000

TOTAL YR. 1990 UNION GROVE STP P.W. (CAPITAL + O&M) = $995,000

TABLE III-13f

UNION GROVE STP
TREATMENT PLANT PRESENT WORTH COSTS

II. ALTERNATES 2 AND 3: PHASE III, (2010 - 2030)

YR. 2010 Qa = 0.1 MGD, Qm = 0.15 MGD
YR. 2030 Qa = 0.1 MGD, Qm = 0.15 MGD
YR. 2010 CAPITA = 800
YR. 2030 CAPITA = 800

-REQUIRED EFFLUENT = 5 BOD, 2 NH3-N, 6 DO, 15 TSS, 3 NO3-N

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, DENITRIFICATION, FILTRATION, POST AERATION

-EXISTING FACILITIES = 0.15 MGD Qm, 800 CAPITA BASE PLANT, WITH NITRIFICATION, DENITRIFICATION, EFFLUENT FILTRATION, AND POST AERATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$45,000	$45,000
BOD/TKN RELATED BASE	$72,000	$72,000
FILTRATION	$4,700	$4,700
POST AERATION	$2,000	$2,000
NITRIFICATION	$12,000	$12,000
DENITRIFICATION	$18,000	$18,000
POWER:		
*********		
FLOW RELATED BASE	$700	$700
BOD/TKN RELATED BASE	$14,000	$14,000
FILTRATION	$100	$100
POST AERATION	$100	$100
NITRIFICATION	$4,500	$4,500
DENITRIFICATION	$200	$200

TABLE III-13f

CHEMICALS:		
*********		
FLOW RELATED BASE	$1,600	$1,600
BOD/TKN RELATED BASE	$900	$900
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	$700	$700
SUBTOTAL = O&M	$176,500	$176,500

GRADIENT = $0

YR. 1990 O&M P.W. = 0.2584($176500 X 10.594) =	$483,000
TOTAL YR. 1990 UNION GROVE STP P.W. (CAPITAL + O&M) =	$483,000

TABLE III-13g

ONION CREEK
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATES 2 AND 3: PHASE III, (2020 - 2030)

YR. 2020 Qa = 0.25 MGD, Qm = 0.35 MGD
YR. 2030 Qa = 0.63 MGD, Qm = 0.90 MGD
YR. 2020 CAPITA = 1760
YR. 2030 CAPITA = 4,520

-REQUIRED EFFLUENT = 5 BOD, 2 NH3-N, 6 DO, 10 TSS, 3 NO3-N

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, DENITRIFICATION, FILTRATION, POST AERATION

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = 0.9 MGD Qm, 4,520 CAPITA BASE PLANT, YEAR 2020
W/NITRIFICATION, DENITRIFICATION, FILTRATION, AND POST AERATION.

1. CAPITAL COSTS

YR. 2020 - 0.9 MGD - BASE PLANT (FLOW RELATED) =	$1,000,000
YR. 2020 - 4520 CAPITA - BASE PLANT (BOD/TKN RELATED) =	$750,000
YR. 2020 - 4520 CAPITA - NITRIFICATION =	$87,000
YR. 2020 - 4520 CAPITA -DENITRIFICATION =	$460,000
YR. 2020 - 0.9 MGD - FILTRATION =	$240,000
YR. 2020 - 0.9 MGD - POST AERATION =	$30,000
SUBTOTAL - CAPITAL	$2,567,000

YR.1990 P.W. = $2,567,000 X 0.1314 $337,000

2. O&M COSTS

	YR. 2020	YR. 2030
LABOR & MATERIALS:		
FLOW RELATED BASE	$78,000	$78,000
BOD/TKN RELATED BASE	$106,000	$106,000
FILTRATION	$15,400	$15,400
POST AERATION	$3,500	$3,500
NITRIFICATION	$16,000	$16,000
DENITRIFICATION	$35,000	$35,000
POWER:		
FLOW RELATED BASE	$900	$1,100
BOD/TKN RELATED BASE	$24,000	$42,000
FILTRATION	$100	$200

TABLE III-13g

POST AERATION	$300	$500
NITRIFICATION	$6,000	$12,000
DENITRIFICATION	$9,500	$21,500
CHEMICALS:		
*********		
FLOW RELATED BASE	$3,000	$5,200
BOD/TKN RELATED BASE	$2,500	$4,500
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	$1,500	$2,400
SUBTOTAL	$300,700	$343,300

GRADIENT = ($343,300 - $300,700)/10 = $4,260/YR.

YR. 1990 O&M P.W. = 0.1314[($300,700 X 7.024) + ($4,260 X 27.716)] = $293,000

TOTAL YR. 1990 ONION CREEK STP P.W. (CAPITAL AND O&M) = $630,000

TABLE III-13h

BELL CO. WCID #1 MAIN
TREATMENT PLANT PRESENT WORTH COSTS

1. ALTERNATES 1, 2 AND 3: PHASE I, (1990 - 2000)

YR. 1990 Qa = 14.37 MGD, Qm = 19.8 MGD
YR. 2000 Qa = 16.53 MGD, Qm = 23.16 MGD
YR. 1990 CAPITA = 86,300
YR. 2000 CAPITA = 99,600

-REQUIRED EFFLUENT = 10 BOD, 2 NH3-N, 6 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION, FILTRATION

-EXISTING FACILITIES = 21 MGD Qm, 90,800 CAPITA PLANT, WITH NITRIFICATION, EFFLUENT FILTRATION NO POST AERATION

-REQUIRED NEW FACILITIES = 6 MGD Qm, 26,000 CAPITA BASE PLANT EXPANSION BY '1993 W/NITRIFICATION, FILTRATION, AND POST AERATION. ADD POST AERATION TO EXIST. PLANT.

-TOTAL PLANT CAPACITY PROVIDED IN 1993 = 27 MGD Qm, 116,700 CAPITA

1. CAPITAL COSTS

(a)	YR. 1990 - 21 MGD POST AERATION		$178,000
(b)	YR. 1993 - 6 MGD - BASE PLANT EXP. (FLOW RELATED) =	$4,300,000	
	YR. 1993 - 26,000 CAP. - BASE PLANT EXP. (BOD/TKN RELATED) =	$2,600,000	
	YR. 1993 - 26,000 CAP. - NITRIFICATION =	$290,000	
	YR. 1993 - 6 MGD - FILTRATION =	$540,000	
	YR. 1993 - 6 MGD - POST AERATION - NEW =	$90,000	
	SUBTOTAL - CAPITAL	$7,820,000	
	YR. 1990 P.W. = $7,820,000 X 0.8163		$6,383,000
	TOTAL		$6,561,000

2. O&M COSTS

	YR. 1990	YR. 2000
LABOR & MATERIALS:		
**********		
FLOW RELATED BASE	$530,000	$650,000
BOD/TKN RELATED BASE	$495,000	$580,000
FILTRATION	$70,000	$82,000
POST AERATION	$18,000	$20,000
NITRIFICATION	$58,000	$65,000
DENITRIFICATION	NA	NA

POWER:

TABLE III-13h

*********		
FLOW RELATED BASE	$6,800	$7,600
BOD/TKN RELATED BASE	$450,000	$525,000
FILTRATION	$1,000	$1,100
POST AERATION	$8,000	$9,400
NITRIFICATION	$122,000	$130,000
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		
FLOW RELATED BASE	$96,000	$112,000
BOD/TKN RELATED BASE	$52,000	$60,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$1,906,800	$2,242,100

GRADIENT = ($2,242,100 - $1,906,800)/10 = $33,530/YR.

YR. 1990 O&M P.W. = ($1,906,800)(7.024) + $33,530(27.716) = $14,323,000

TOTAL YR. 1990 BELL CO. WCID #1 STP P.W. (CAPITAL + O&M) = $20,884,000

TABLE III-13h

BELL CO. WCID #1 MAIN
TREATMENT PLANT PRESENT WORTH COSTS

II. ALTERNATES 1, 2 AND 3: PHASE II, (2000 - 2010)

YR. 2000 Qa = 16.53 MGD, Qm = 23.16 MGD
YR. 2010 Qa = 19.16 MGD, Qm = 26.98 MGD
YR. 2000 CAPITA = 99,600
YR. 2010 CAPITA = 116,700

-REQUIRED EFFLUENT = 10 BOD, 2 NH3-N, 6 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION, FILTRATION

-EXISTING FACILITIES = 27 MGD Qa, 116,700 CAPITA BASE PLANT, WITH NITRIFICATION, EFFLUENT FILTRATION, AND POST AERATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2000	YR. 2010
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$650,000	$650,000
BOD/TKN RELATED BASE	$580,000	$580,000
FILTRATION	$82,000	$82,000
POST AERATION	$20,000	$20,000
NITRIFICATION	$65,000	$65,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$7,600	$8,200
BOD/TKN RELATED BASE	$525,000	$610,000
FILTRATION	$1,100	$1,200
POST AERATION	$9,400	$10,800
NITRIFICATION	$130,000	$160,000
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		
FLOW RELATED BASE	$112,000	$128,000
BOD/TKN RELATED BASE	$60,000	$68,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$2,242,100	$2,383,200

TABLE III-13h

GRADIENT = ($2,383,200 - $2,242,100)/10 = $14,110/YR.	
YR. 1990 O&M P.W. = 0.5083[($2,242,100 X 7.024) + ($14,110 X 27.716)] =	$8,204,000
TOTAL YR. 1990 BELL CO. WCID #1 MAIN STP P.W. (CAPITAL + O&M) =	$8,204,000

TABLE III-13h

BELL CO. WCID #1 MAIN
TREATMENT PLANT PRESENT WORTH COSTS

III. ALTERNATES 1 AND 2: PHASE III, (2010 - 2030)

YR. 2010 Qa = 17.04 MGD, Qm = 23.98 MGD
YR. 2030 Qa = 19.16 MGD, Qm = 27 MGD
YR. 2010 CAPITA = 103,800
YR. 2030 CAPITA = 116,700

-REQUIRED EFFLUENT =10BOD, 2 NH3-N, 6 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION, AND FILTRATION

-EXISTING FACILITIES = 27 MGD Qm, 116,700 CAPITA BASE PLANT, WITH NITRIFICATION, EFFLUENT FILTRATION, AND POST AERATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$650,000	$650,000
BOD/TKN RELATED BASE	$580,000	$580,000
FILTRATION	$82,000	$82,000
POST AERATION	$20,000	$20,000
NITRIFICATION	$65,000	$65,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$7,700	$8,200
BOD/TKN RELATED BASE	$550,000	$610,000
FILTRATION	$1,100	$1,200
POST AERATION	$9,800	$10,800
NITRIFICATION	$135,000	$160,000
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		
FLOW RELATED BASE	$115,000	$128,000
BOD/TKN RELATED BASE	$61,000	$68,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$2,276,600	$2,383,200

TABLE III-13h

GRADIENT = ($2,383,200 - $2,276,600)/20 = $5,330/YR.

YR. 1990 O&M P.W. = 0.2584[($2,276,600 X 10.594) + ($5,330 X 77.509)] =	$6,339,000
TOTAL YR. 1990 BELL CO. WCID #1 MAIN STP P.W. (CAPITAL + O&M) =	$6,339,000

TABLE III-13h

BELL CO. WCID #1 MAIN
TREATMENT PLANT PRESENT WORTH COSTS

IV. ALTERNATE 3: PHASE III, (2010 - 2030)

YR. 2010 Qa = 18.1 MGD, Qm = 25.48 MGD
YR. 2030 Qa = 19.16 MGD, Qm = 27 MGD
YR. 2010 CAPITA = 110,200
YR. 2030 CAPITA = 116,700

-REQUIRED EFFLUENT = 7 BOD, 2 NH3-N, 6 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION, AND FILTRATION

-EXISTING FACILITIES = 27 MGD Qm, 116,700 CAPITA BASE PLANT, WITH NITRIFICATION, EFFLUENT FILTRATION, NO POST AERATION

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS $0

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$650,000	$650,000
BOD/TKN RELATED BASE	$580,000	$580,000
FILTRATION	$82,000	$82,000
POST AERATION	$20,000	$20,000
NITRIFICATION	$65,000	$65,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$8,000	$8,200
BOD/TKN RELATED BASE	$580,000	$610,000
FILTRATION	$1,100	$1,200
POST AERATION	$10,400	$10,800
NITRIFICATION	$150,000	$160,000
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		
FLOW RELATED BASE	$122,000	$128,000
BOD/TKN RELATED BASE	$65,000	$68,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$2,333,500	$2,383,200

TABLE III-13h

GRADIENT = ($2,383,200 - $2,333,500)/20 = $2,475/YR.	
YR. 1990 O&M P.W. = 0.2584[($2,333,500 X 10.594) + ($2,475 X 77.509)] =	$6,438,000
TOTAL YR. 1990 BELL CO. WCID #1 MAIN STP P.W. (CAPITAL + O&M) =	$6,438,000

TABLE III-13i

TRIMMIER CREEK STP
TREATMENT PLANT PRESENT WORTH COSTS

1. ALTERNATE 3: PHASE III, (2010 - 2030)

YR. 2010 Qa = 0.08 MGD, Qa = 0.12 MGD
YR. 2030 Qa = 3.91 MGD, Qa = 5.65 MGD
YR. 2010 CAPITA = 600
YR. 2030 CAPITA = 27,800

-REQUIRED EFFLUENT = 5 BOD, 2 NH3-N, 6 DO, 15 TSS, 3 NO3-N

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, DENITRIFICATION, FILTRATION, AND POST AERATION

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = BUILD 2.5 MGD Qa, 12,500 CAPITA BASE PLANT BY YR. 2010 W/NITRIFICATION, FILTRATION, AND POST AERATION. EXPAND TO 5.65 MGD IN YEAR 2020.

1. CAPITAL COSTS

(a)	YR. 2010 - 2.5 MGD - BASE PLANT (FLOW RELATED) =	$2,350,000	
	YR. 2010 - 12,500 CAP. - BASE PLANT (BOD/TKN RELATED) =	$1,500,000	
	YR. 2010 - 12,500 CAP. - NITRIFICATION =	$170,000	
	YR. 2010 - 2.5 MGD - FILTRATION =	$350,000	
	YR. 2010 - 2.5 MGD - POST AERATION =	$56,000	
	YR. 2010 - 12,500 CAP. - DENITRIFICATION =	$700,000	
	SUBTOTAL - CAPITAL	$5,126,000	
	YR. 1990 P.W. = $5,126,000 X 0.2584		$1,325,000
(b)	YR. 2020 - 3.15 MGD - BASE PLANT (FLOW RELATED) =	$2,700,000	
	YR. 2020 - 15,300 CAP. - BASE PLANT (BOD/TKN RELATED) =	$1,750,000	
	YR. 2020 - 15,300 CAP. - NITRIFICATION =	$200,000	
	YR. 2020 - 3.15 MGD - FILTRATION =	$390,000	
	YR. 2020 - 3.15 MGD - POST AERATION =	$63,000	
	YR. 2020 - 15,300 CAP. - DENITRIFICATION =	$800,000	
	SUBTOTAL - CAPITAL	$5,903,000	
	YR. 1990 P.W. = $5,903,000 X 0.1314		$776,000

TABLE III-13i

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$160,000	$245,000
BOD/TKN RELATED BASE	$150,000	$225,000
FILTRATION	$22,000	$32,000
POST AERATION	$4,800	$6,600
NITRIFICATION	$21,000	$30,000
DENITRIFICATION	$56,000	$91,000
POWER:		
*********		
FLOW RELATED BASE	$700	$2,100
BOD/TKN RELATED BASE	$12,000	$180,000
FILTRATION	$100	$400
POST AERATION	$100	$2,400
NITRIFICATION	$4,000	$62,000
DENITRIFICATION	$100	$8,200
CHEMICALS:		
*********		
FLOW RELATED BASE	$1,400	$31,000
BOD/TKN RELATED BASE	$500	$17,500
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	$500	$10,500
SUBTOTAL = O&M	$433,200	$943,700

GRADIENT = ($943,700 - $433,200)/20 = $25,525/YR.

YR. 1990 O&M P.W. = 0.2584[($433,200 X 10.594) + ($25,525 X 77.509)] = $1,697,000

TOTAL YR. 1990 TRIMMIER CR. STP P.W. (CAPITAL + O&M) = $3,798,000

TABLE III-13j

BELL CO. WCID #1 STP #2 (ROY REYNOLDS)
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATE 1: PHASE III, (2010 - 2030) (CONT'D).

YR. 2010 Qa = 2.12 MGD, Qm = 3.00 MGD
YR. 2030 Qa = 7.68 MGD, Qm = 11.06 MGD
YR. 2010 CAPITA = 12,900
YR. 2030 CAPITA = 51,700

-REQUIRED EFFLUENT = 7 BOD, 2 NH3-N, 6DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION AND FILTRATION

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = 5 MGD Qm, 23,400 CAPITA BASE PLANT BY YR. 2010 W/NITRIFICATION, FILTRATION, AND POST AERATION. EXPAND TO 11.06 MGD Qm AND 51,700 CAP. BY YR. 2020 WITH 6.06 MGD Qm AND 28,300 CAP. EXPANSION.

-TOTAL PLANT CAPACITY PROVIDED IN 2020 = 11.06 MGD Qm, 51,700 CAPITA

1. CAPITAL COSTS

(a)	YR. 2010 - 5 MGD - BASE PLANT (FLOW RELATED) =	$3,700,000	
	YR. 2010 - 23,400 CAP. - BASE PLANT (BOD/TKN RELATED) =	$2,400,000	
	YR. 2010 - 23,400 CAP. - NITRIFICATION =	$270,000	
	YR. 2010 - 5 MGD - FILTRATION =	$468,000	
	YR. 2010 - 5 MGD - POST AERATION =	$81,000	
	SUBTOTAL - CAPITAL	$6,919,000	
	YR. 1990 P.W. = $6,919,000 X 0.2584		$1,788,000
(b)	YR. 2020 - 6.06 MGD - BASE PLANT EXP. (FLOW RELATED) =	$4,300,000	
	YR. 2020 - 28,300 CAP. - BASE PLANT EXP. (BOD/TKN RELATED) =	$2,750,000	
	YR. 2020 - 28,300 CAP. - NITRIFICATION =	$305,000	
	YR. 2020 - 6.06 MGD - FILTRATION =	$550,000	
	YR. 2020 - 6.06 MGD - POST AERATION =	$90,000	
	SUBTOTAL - CAPITAL	$7,995,000	
	YR. 1990 P.W. = $7,995,000 X 0.1314		$1,051,000
	TOTAL		$2,839,000

TABLE III-13j

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
**********		
FLOW RELATED BASE	$230,000	$355,000
BOD/TKN RELATED BASE	$210,000	$345,000
FILTRATION	$30,000	$47,000
POST AERATION	$6,100	$12,200
NITRIFICATION	$28,000	$42,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,600	$3,800
BOD/TKN RELATED BASE	$100,000	$285,000
FILTRATION	$300	$600
POST AERATION	$1,500	$4,200
NITRIFICATION	$35,000	$91,000
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		
FLOW RELATED BASE	$18,500	$51,500
BOD/TKN RELATED BASE	$9,000	$32,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$670,000	$1,269,300

GRADIENT = ($1,269,300 - $670,000)/20 = $29,965/YR.

YR. 1990 O&M P.W. = 0.2584[($670,000 X 10.594) + ($29,965 X 77.509)] = $2,434,000

TOTAL YR. 1990 BELL CO. WCID #1, STP #2 P.W. (CAPITAL + O&M) = $5,273,000

TABLE III-13j

BELL CO. WCID #1 STP #2 (ROY REYNOLDS)
TREATMENT PLANT PRESENT WORTH COSTS

II. ALTERNATE 2: PHASE III, (2010 - 2030) (CONT'D).

YR. 2010 Qa = 2.12 MGD, Qm = 3.00 MGD
YR. 2030 Qa = 7.11 MGD, Qm = 10.16 MGD
YR. 2010 CAPITA = 12,900
YR. 2030 CAPITA = 47,180

-REQUIRED EFFLUENT = 7BOD, 2 NH3-N, 6DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION AND FILTRATION

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = 5 MGD Qm, 23,400 CAPITA BASE PLANT BY YR. 2010 W/NITRIFICATION, FILTRATION, AND POST AERATION. EXPAND TO 10.16 MGD Qm AND 47,180 CAP. BY YR. 2020 WITH 5.16 MGD Qm AND 23,780 CAP. EXPANSION.

-TOTAL PLANT CAPACITY PROVIDED IN 2020 = 10.16 MGD Qm, 47,180 CAPITA

1. CAPITAL COSTS

(a)	YR. 2010 - 5 MGD - BASE PLANT EXP. (FLOW RELATED) =	$3,700,000	
	YR. 2010 - 23,400 CAP. - BASE PLANT EXP. (BOD/TKN RELATED) =	$2,400,000	
	YR. 2010 - 23,400 CAP. - NITRIFICATION =	$270,000	
	YR. 2010 - 5 MGD - FILTRATION =	$468,000	
	YR. 2010 - 5 MGD - POST AERATION =	$81,000	
	SUBTOTAL - CAPITAL	$6,919,000	
	YR. 1990 P.W. = $6,919,000 X 0.2584		$1,788,000
(b)	YR. 2020 - 5.16 MGD - BASE PLANT EXP. (FLOW RELATED) =	$3,800,000	
	YR. 2020 - 23,780 CAP. - BASE PLANT EXP. (BOD/TKN RELATED) =	$2,400,000	
	YR. 2020 - 23,780 CAP. - NITRIFICATION =	$270,000	
	YR. 2020 - 5.16 MGD - FILTRATION =	$480,000	
	YR. 2020 - 5.16 MGD - POST AERATION - NEW =	$82,000	
	SUBTOTAL - CAPITAL	$7,032,000	
	YR. 1990 P.W. = $7,032,000 X 0.1314		$924,000
	TOTAL		$2,712,000

TABLE III-13j

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$230,000	$335,000
BOD/TKN RELATED BASE	$210,000	$325,000
FILTRATION	$30,000	$45,000
POST AERATION	$6,100	$11,100
NITRIFICATION	$28,000	$40,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,600	$3,500
BOD/TKN RELATED BASE	$100,000	$265,000
FILTRATION	$300	$500
POST AERATION	$1,500	$3,900
NITRIFICATION	$35,000	$86,000
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		
FLOW RELATED BASE	$18,500	$48,000
BOD/TKN RELATED BASE	$9,000	$29,500
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$670,000	$1,192,500

GRADIENT = ($1,192,500 - $670,000)/20 = $26,125/YR.

YR. 1990 O&M P.W. = 0.2584[($670,000 X 10.594) + ($26,125 X 77.509)] = $2,357,000

TOTAL YR. 1990 BELL CO. WCID #1, STP #2 P.W. (CAPITAL + O&M) = $5,069,000

TABLE III-13j

BELL CO. WCID #1 STP #2 (ROY REYNOLDS)
TREATMENT PLANT PRESENT WORTH COSTS

III. ALTERNATE 3: PHASE III, (2010 - 2030) (CONT'D).

YR. 2010 Qa = 1.06 MGD, Qm = 1.50 MGD
YR. 2030 Qa = 4.16 MGD, Qm = 6.01 MGD
YR. 2010 CAPITA = 6,450
YR. 2030 CAPITA = 26,480

-REQUIRED EFFLUENT = 7 BOD, 2 NH3-N, 6 DO, 15 TSS

-REQUIRED PROCESSES = BASE PLANT, NITRIFICATION, POST AERATION AND FILTRATION

-EXISTING FACILITIES = NONE

-REQUIRED NEW FACILITIES = 3.2 MGD Qm, 14,100 CAPITA BASE PLANT BY YR. 2010 W/NITRIFICATION, FILTRATION, AND POST AERATION. EXPAND TO 6.01 MGD Qm 26,480 CAP. BY YR. 2020 WITH 2.8 MGD Qm AND 12,380 CAP. EXPANSION.

-TOTAL PLANT CAPACITY PROVIDED IN 2020 = 6.01 MGD Qm, 26,480 CAPITA

1. CAPITAL COSTS

(a)	YR. 2010 - 3.2 MGD - BASE PLANT (FLOW RELATED) =	$2,750,000	
	YR. 2010 - 14,100 CAP. - BASE PLANT (BOD/TKN RELATED) =	$1,650,000	
	YR. 2010 - 14,100 CAP. - NITRIFICATION =	$190,000	
	YR. 2010 - 3.2 MGD - FILTRATION =	$390,000	
	YR. 2010 - 3.2 MGD - POST AERATION =	$64,000	
	SUBTOTAL - CAPITAL	$5,044,000	
	YR. 1990 P.W. = $5,044,000 X 0.2584		$1,303,000
(b)	YR. 2020 - 2.8 MGD - BASE PLANT (FLOW RELATED) =	$2,500,000	
	YR. 2020 - 12,380 CAP. - BASE PLANT (BOD/TKN RELATED) =	$1,450,000	
	YR. 2020 - 12,380 CAP. - NITRIFICATION =	$170,000	
	YR. 2020 - 2.8 MGD - FILTRATION =	$370,000	
	YR. 2020 - 2.8 MGD - POST AERATION - NEW =	$60,000	
	SUBTOTAL - CAPITAL	$4,550,000	
	YR. 1990 P.W. = $4,550,000 X 0.1314		$598,000
	TOTAL		$1,901,000

TABLE III-13j

2. O&M COSTS

	YR. 2010	YR. 2030
LABOR & MATERIALS:		
******************		
FLOW RELATED BASE	$180,000	$250,000
BOD/TKN RELATED BASE	$155,000	$220,000
FILTRATION	$24,000	$33,000
POST AERATION	$5,200	$6,900
NITRIFICATION	$22,000	$29,000
DENITRIFICATION	NA	NA
POWER:		
*********		
FLOW RELATED BASE	$1,100	$2,300
BOD/TKN RELATED BASE	$54,000	$170,000
FILTRATION	$200	$400
POST AERATION	$900	$2,500
NITRIFICATION	$17,000	$60,000
DENITRIFICATION	NA	NA
CHEMICALS:		
*********		
FLOW RELATED BASE	$7,000	$32,000
BOD/TKN RELATED BASE	$5,200	$17,000
FILTRATION	NA	NA
POST AERATION	NA	NA
NITRIFICATION	NA	NA
DENITRIFICATION	NA	NA
SUBTOTAL = O&M	$471,600	$823,100

GRADIENT = ($823,100 - $471,600)/20 = $17,575/YR.

YR. 1990 O&M P.W. = 0.2584[($471,600 X 10.594) + ($17,575 X 77.509)] = $1,643,000

TOTAL YR. 1990 BELL CO. WCID #1, STP #2 P.W. (CAPITAL + O&M) = $3,544,000

TABLE III-13k
MATKIN
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATE 1: PHASE I, (1990 - 2000)

YR. 1990 Qa = 0.08 MGD, Qm = 0.12 MGD

YR. 1990 CAPITA = 500

-REQUIRED EFFLUENT = 10 BOD, 15 TSS

-REQUIRED PROCESSES = BASE PLANT

-EXISTING FACILITIES =

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS

YR. 1990 - 0.03 MGD - BASE PLANT (FLOW RELATED) =	$0	
YR. 1990 - 100 CAP. - BASE PLANT (BOD RELATED) =	$0	
YR. 1990 - 100 CAP. - NITRIFICATION =	NA	
YR. 1990 - 0.03 MGD - FILTRATION =	NA	
YR. 1990 - 0.03 MGD - POST AERATION =	NA	
YR. 1990 - 100 CAP. - DENITRIFICATION =	NA	
SUBTOTAL - CAPITAL	$0	
YR. 1990 P.W. = CAPITAL		$0

2. O&M COSTS

	YR. 1990
LABOR & MATERIALS:	
******************	
FLOW RELATED BASE	$36,000
BOD RELATED BASE	$57,600
FILTRATION	NA
POST AERATION	NA
NITRIFICATION	NA
DENITRIFICATION	NA
POWER:	
*********	
FLOW RELATED BASE	$800
BOD RELATED BASE	$11,200
FILTRATION	NA
POST AERATION	NA
NITRIFICATION	NA

TABLE III-13k
CONT'D.

DENITRIFICATION	NA	
CHEMICALS:		
*********		
FLOW RELATED BASE	$1,300	
BOD RELATED BASE	$800	
FILTRATION	NA	
POST AERATION	NA	
NITRIFICATION	NA	
DENITRIFICATION	NA	
SUBTOTAL = O&M	$107,700	
GRADIENT = $0		
YR. 1990 O&M P.W. = CAPITAL		$107,700
TOTAL YR. 1990 MATKIN STP P.W. (CAPITAL + O&M) =		$107,700

TABLE III-131

COMANCHEE HILLS UTILITY DISTRICT
TREATMENT PLANT PRESENT WORTH COSTS

I. ALTERNATE 1: PHASE I, (1990 - 2000)

YR. 1990 Ea = 0.02 MGD, Gm = 0.03 MGD

YR. 1990 CAPITA = 100

-REQUIRED EFFLUENT = 10 BOD, 15 TSS

-REQUIRED PROCESSES = BASE PLANT

-EXISTING FACILITIES =

-REQUIRED NEW FACILITIES = NONE

1. CAPITAL COSTS

YR. 1990 - 0.03 MGD - BASE PLANT (FLOW RELATED) =	$0
YR. 1990 - 100 CAP. - BASE PLANT (BOD/TKN RELATED) =	$0
YR. 1990 - 100 CAP. - NITRIFICATION =	NA
YR. 1990 - 0.03 MGD - FILTRATION =	NA
YR. 1990 - 0.03 MGD - POST AERATION =	NA
YR. 1990 - 100 CAP. - DENITRIFICATION =	NA
SUBTOTAL - CAPITAL	$0

YR. 1990 P.W. = CAPITAL $0

2. O&M COSTS

	YR. 1990
LABOR & MATERIALS:	
**********	
FLOW RELATED BASE	$9,000
BOD RELATED BASE	$14,400
FILTRATION	NA
POST AERATION	NA
NITRIFICATION	NA
DENITRIFICATION	NA
POWER:	
********	
FLOW RELATED BASE	$200
BOD RELATED BASE	$2,800
FILTRATION	NA
POST AERATION	NA
NITRIFICATION	NA

TABLE III-131

DENITRIFICATION	NA	
CHEMICALS:		
*********		
FLOW RELATED BASE	$320	
BOD/TKN RELATED BASE	$180	
FILTRATION	NA	
POST AERATION	NA	
NITRIFICATION	NA	
DENITRIFICATION	NA	
SUBTOTAL = O&M	$26,900	
GRADIENT = $0		
YR. 1990 O&M P.W. = CAPITAL		$26,900
TOTAL YR. 1990 COMANCHEE HILLS U.D. STP P.W. (CAPITAL + O&M) =		$26,900

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

I. ALTERNATE 1

A. PHASE I (1990-2000)

1. CAPITAL COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$3,647,000
HARKER HEIGHTS SERVICE AREA		$866,000
NOLANVILLE SERVICE AREA		$0

b. TREATMENT FACILITIES

WCID #1, MAIN STP		$6,561,000
HARKER HEIGHTS STP		$0
NOLANVILLE STP		$320,000
MATKIN STP		$0
COMANCHEE HILLS U.D.		$0
	SUBTOTAL CAPITAL COSTS	$11,394,000

2. O&M COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$518,000
HARKER HEIGHTS SERVICE AREA		$137,000
NOLANVILLE SERVICE AREA		0

b. TREATMENT FACILITIES

WCID #1, MAIN STP		$14,323,000
HARKER HEIGHTS STP		$3,858,000
NOLANVILLE STP		$1,250,000
MATKIN STP		$108,000
COMANCHEE HILLS U.D.		$27,000
	SUBTOTAL O&M COSTS	$20,221,000
	SUBTOTAL PHASE I	$31,615,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

I. ALTERNATE 1 (CONT'D.)

B. PHASE II (2000-2010)

1. CAPITAL COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$143,000
HARKER HEIGHTS SERVICE AREA		$1,257,000
MISC. LAKE		$1,107,000
NOLANVILLE SERVICE AREA		$49,000

b. TREATMENT FACILITIES

WCID #1, MAIN STP		$0
HARKER HEIGHTS STP		$1,197,000
NOLANVILLE STP		$163,000
LAKE DAM STP		$971,000
	SUBTOTAL CAPITAL COSTS	$4,887,000

2. O&M COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$298,000
HARKER HEIGHTS SERVICE AREA		$254,000
MISC. LAKE		$168,000
NOLANVILLE SERVICE AREA		$17,000

b. TREATMENT FACILITIES

WCID #1, MAIN STP		$8,204,000
HARKER HEIGHTS STP		$2,286,000
NOLANVILLE STP		$689,000
LAKE DAM STP		$890,000
	SUBTOTAL O&M COSTS	$12,806,000
	SUBTOTAL PHASE II	$17,693,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

I. ALTERNATE 1 (CONT'D.)

C. PHASE III (2010-2030)

1. CAPITAL COSTS

a.	TRANSPORT FACILITIES		
	KILLEEN SERVICE AREA	$1,411,000	
	HARKER HEIGHTS SERVICE AREA	$0	
	MISC. LAKE	$0	
	NOLANVILLE SERVICE AREA	$28,000	
b.	TREATMENT FACILITIES		
	WCID #1, STP #2	$2,839,000	
	WCID #1, MAIN STP	$0	
	HARKER HEIGHTS STP	$0	
	NOLANVILLE STP	$249,000	
	LAKE DAM STP	$0	
	SUBTOTAL CAPITAL COSTS	$4,527,000	

2. O&M COSTS

a.	TRANSPORT FACILITIES		
	KILLEEN SERVICE AREA	$757,000	
	HARKER HEIGHTS SERVICE AREA	$230,000	
	MISC. LAKE	$129,000	
	NOLANVILLE SERVICE AREA	$23,000	
b.	TREATMENT FACILITIES		
	WCID #1, STP #2	$2,434,000	
	WCID #1, MAIN STP	$6,339,000	
	HARKER HEIGHTS STP	$1,905,000	
	NOLANVILLE STP	$617,000	
	LAKE DAM STP	$682,000	
	SUBTOTAL O&M COSTS	$13,116,000	
	SUBTOTAL PHASE III		$17,643,000
	GRAND TOTAL ALTERNATE 1		$66,951,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

II. ALTERNATE 2:

A. PHASE I (1990-2000)

1. CAPITAL COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$3,647,000
HARKER HEIGHTS SERVICE AREA		$866,000
NOLANVILLE SERVICE AREA		$0

b. TREATMENT FACILITIES

WCID #1, MAIN STP		$6,561,000
HARKER HEIGHTS STP		$0
NOLANVILLE STP		$320,000
	SUBTOTAL CAPITAL COSTS	$11,394,000

2. O&M COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$518,000
HARKER HEIGHTS SERVICE AREA		$137,000
NOLANVILLE SERVICE AREA		$0

b. TREATMENT FACILITIES

WCID #1, MAIN STP		$14,323,000
HARKER HEIGHTS STP		$3,858,000
NOLANVILLE STP		$1,250,000
MATKIN STP		$108,000
COMANCHE HILLS U.D.		$27,000
	SUBTOTAL O&M COSTS	$20,221,000
	SUBTOTAL PHASE I	$31,615,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

II. ALTERNATE 2 (CONT'D.)

B. PHASE II (2000-2010)

1. CAPITAL COSTS

a. TRANSPORT FACILITIES			
KILLEEN SERVICE AREA		$143,000	
HARKER HEIGHTS SERVICE AREA		$1,257,000	
NOLANVILLE SERVICE AREA		$49,000	
b. TREATMENT FACILITIES			
WCID #1, MAIN STP		$0	
NORTHSIDE STP		$840,000	
UNION GROVE STP		$365,000	
SOUTHSIDE STP		$840,000	
HARKER HEIGHTS STP		$1,197,000	
NOLANVILLE STP		$163,000	
	SUBTOTAL CAPITAL COSTS	$4,854,000	

2. O&M COSTS

a. TRANSPORT FACILITIES			
KILLEEN SERVICE AREA		$298,000	
HARKER HEIGHTS SERVICE AREA		$254,000	
NOLANVILLE SERVICE AREA		$17,000	
b. TREATMENT FACILITIES			
WCID #1, MAIN STP		$8,204,000	
NORTHSIDE STP		$883,000	
UNION GROVE STP		$630,000	
SOUTHSIDE STP		$883,000	
HARKER HEIGHTS STP		$2,286,000	
NOLANVILLE STP		$689,000	
	SUBTOTAL O&M COSTS	$14,144,000	
	SUBTOTAL PHASE II		$18,998,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

II. ALTERNATE 2 (CONT'D.)

C. PHASE III (2010-2030)

1. CAPITAL COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$1,259,000
HARKER HEIGHTS SERVICE AREA		$0
NOLANVILLE SERVICE AREA		$28,000

b. TREATMENT FACILITIES

WCID #1, STP #2		$2,712,000
WCID #1, MAIN STP		$0
NORTHSIDE STP		$0
UNION GROVE STP		$0
SOUTHSIDE STP		$0
HARKER HEIGHTS STP		$0
NOLANVILLE STP		$249,000
ONION CREEK STP		$337,000
	SUBTOTAL CAPITAL COSTS	$4,585,000

2. O&M COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$721,000
HARKER HEIGHTS SERVICE AREA		$230,000
NOLANVILLE SERVICE AREA		$23,000

b. TREATMENT FACILITIES

WCID #1, STP #2		$2,357,000
WCID #1, MAIN STP		$6,339,000
NORTHSIDE STP		$677,000
UNION GROVE STP		$483,000
SOUTHSIDE STP		$677,000
HARKER HEIGHTS STP		$1,905,000
NOLANVILLE STP		$617,000
ONION CREEK STP		$293,000
	SUBTOTAL O&M COSTS	$14,322,000
	SUBTOTAL PHASE III	$18,907,000
	GRAND TOTAL ALTERNATE 2	$69,520,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

III. ALTERNATE 3

A. PHASE I (1990-2000)

1. CAPITAL COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$3,021,000
HARKER HEIGHTS SERVICE AREA		$376,000
NOLANVILLE SERVICE AREA		$0

b. TREATMENT FACILITIES

WCID #1, MAIN STP		$6,561,000
HARKER HEIGHTS STP		$0
NOLANVILLE STP		$320,000
	SUBTOTAL CAPITAL COSTS	$10,278,000

2. O&M COSTS

a. TRANSPORT FACILITIES

KILLEEN SERVICE AREA		$432,000
HARKER HEIGHTS SERVICE AREA		$50,000
NOLANVILLE SERVICE AREA		$0

b. TREATMENT FACILITIES

WCID #1, MAIN STP		$14,323,000
HARKER HEIGHTS STP		$3,858,000
NOLANVILLE STP		$1,250,000
MATKIN STP		$108,000
COMANCHE HILLS U.D.		$27,000
	SUBTOTAL O&M COSTS	$20,048,000
	SUBTOTAL PHASE I	$30,326,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

III. ALTERNATE 3 (CONT'D.)

B. PHASE II (2001-2010)

1. CAPITAL COSTS

a.	TRANSPORT FACILITIES		
	KILLEEN SERVICE AREA		$116,000
	HARKER HEIGHTS SERVICE AREA		$1,146,000
	NOLANVILLE SERVICE AREA		$49,000
b.	TREATMENT FACILITIES		
	WCID #1, MAIN STP		$0
	NORTHSIDE STP		$840,000
	UNION GROVE STP		$365,000
	SOUTHSIDE STP		$840,000
	HARKER HEIGHTS STP		$523,000
	NOLANVILLE STP		$163,000
		SUBTOTAL CAPITAL COSTS	$4,042,000

2. O&M COSTS

a.	TRANSPORT FACILITIES		
	KILLEEN SERVICE AREA		$235,000
	HARKER HEIGHTS SERVICE AREA		$200,000
	NOLANVILLE SERVICE AREA		$17,000
b.	TREATMENT FACILITIES		
	WCID #1, MAIN STP		$8,204,000
	NORTHSIDE STP		$883,000
	UNION GROVE STP		$630,000
	SOUTHSIDE STP		$883,000
	HARKER HEIGHTS STP		$2,162,000
	NOLANVILLE STP		$689,000
		SUBTOTAL O&M COSTS	$13,903,000
		SUBTOTAL PHASE II	$17,945,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

III. ALTERNATE 3 (CONT'D.)

C. PHASE III (2010-2030)

1. CAPITAL COSTS			
a. TRANSPORT FACILITIES			
KILLEEN SERVICE AREA		$950,000	
HARKER HEIGHTS SERVICE AREA		$89,000	
NOLANVILLE SERVICE AREA		$28,000	
b. TREATMENT FACILITIES			
WCID #1, STP #2		$1,901,000	
WCID #1, MAIN STP		$0	
NORTHSIDE STP		$0	
UNION GROVE STP		$0	
SOUTHSIDE STP		$0	
HARKER HEIGHTS STP		$0	
NOLANVILLE STP		$249,000	
ONION CREEK STP		$337,000	
TRIMMIER CREEK STP (KILLEEN SHARE 2010)		$882,000	
TRIMMIER CREEK STP (KILLEEN SHARE 2020)		$569,000	
TRIMMIER CREEK STP (HARKER HGHTS SHARE 2010)		$443,000	
TRIMMIER CREEK STP (HARKER HGHTS SHARE 2020)		$207,000	
	SUBTOTAL CAPITAL COSTS	$5,655,000	
2. O&M COSTS			
a. TRANSPORT FACILITIES			
KILLEEN SERVICE AREA		$522,000	
HARKER HEIGHTS SERVICE AREA		$194,000	
NOLANVILLE SERVICE AREA		$23,000	
b. TREATMENT FACILITIES			
WCID #1, STP #2		$1,643,000	
WCID #1, MAIN STP		$6,438,000	
NORTHSIDE STP		$677,000	
UNION GROVE STP		$483,000	
SOUTHSIDE STP		$677,000	
HARKER HEIGHTS STP		$1,708,000	
NOLANVILLE STP		$617,000	
ONION CREEK STP		$293,000	
TRIMMIER CREEK STP (KILLEEN SHARE 2010)		$645,000	
TRIMMIER CREEK STP (KILLEEN SHARE 2020)		$535,000	
TRIMMIER CREEK STP (HARKER HGHTS SHARE 2010)		$324,000	
TRIMMIER CREEK STP (HARKER HGHTS SHARE 2020)		$193,000	
	SUBTOTAL O&M COSTS	$14,972,000	
	SUBTOTAL PHASE III		$20,627,000
	GRAND TOTAL ALTERNATE 3		$68,898,000

TABLE III-14

SUMMARY OF PRESENT WORTH
COST FOR EACH ALTERNATIVE

SUMMARY

ALTERNATE NO. 1	$66,951,000
ALTERNATE NO. 2	$69,520,000
ALTERNATE NO. 3	$68,898,000

TABLE IV-1
SUMMARY OF ALTERNATIVE CAPITAL AND
O&M COSTS PER PHASE

		PHASE I	PHASE II	PHASE III	
ALTERNATIVE I	TRANS				
	CAP	$4,513,000	$2,556,000	$1,439,000	$8,508,000
	O&M	$655,000	$737,000	$1,139,000	$2,531,000
	TREAT				
	CAP	$6,881,000	$2,331,000	$3,088,000	$12,300,000
	O&M	$19,566,000	$12,069,000	$11,977,000	$43,612,000
					$66,951,000
ALTERNATIVE II	TRANS				
	CAP	$4,513,000	$1,449,000	$1,287,000	$7,249,000
	O&M	$655,000	$569,000	$974,000	$2,198,000
	TREAT				
	CAP	$6,881,000	$3,405,000	$3,298,000	$13,584,000
	O&M	$19,566,000	$13,575,000	$13,348,000	$46,489,000
					$69,520,000
ALTERNATIVE III	TRANS				
	CAP	$3,397,000	$1,311,000	$1,067,000	$5,775,000
	O&M	$482,000	$452,000	$739,000	$1,673,000
	TREAT				
	CAP	$6,881,000	$2,731,000	$4,588,000	$14,200,000
	O&M	$19,566,000	$13,451,000	$14,233,000	$47,250,000
					$68,898,000

TABLE IV-2a

SUMMARY OF ALTERNATIVE COSTS FOR THE CITY OF KILLEEN
(Costs Shown are Present Worth 1990)

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Phase I (Built by 1990):			
CAPITAL COSTS			
Treatment Plant	$6,561,000	$6,561,000	$6,561,000
Transport Facilities	$3,647,000	$3,647,000	$3,021,000
O&M COSTS			
Treatment Plant	$14,323,000	$14,323,000	$14,323,000
Transport Facilities	$518,000	$518,000	$432,000
Phase II (Built by 2000):			
CAPITAL COSTS			
Treatment Plant	$0	$0	$0
Transport Facilities	$143,000	$143,000	$116,000
O&M COSTS			
Treatment Plant	$8,204,000	$8,204,000	$8,204,000
Transport Facilities	$298,000	$298,000	$235,000
Phase III (Built by 2010):			
CAPITAL COSTS			
Treatment Plant	$2,839,000	$2,712,000	(1) $2,783,000
Transport Facilities	$1,411,000	$1,259,000	(2) $950,000
O&M COSTS			
Treatment Plant	$8,773,000	$8,696,000	(3) $8,726,000
Transport Facilities	$757,000	$721,000	(4) $522,000
(Built by 2020):			
CAPITAL COSTS			
Treatment Plant	N/A	N/A	(5) $569,000
Transport Facilities	N/A	N/A	$0
O&M COSTS			
Treatment Plant	N/A	N/A	(6) $535,000
Transport Facilities	N/A	N/A	$0
TOTAL	$47,474,000	$47,082,000	$46,977,000

TABLE IV-2a

Summary of Alternative Costs for the City of Killeen Cont'd.

NOTE: Costs include: Engineering/Contingencies (20%)
Easement/Right-of-Way

(1) Cost Associated with construction of Killeen's share (66.53%) of the Trimmier STP
(2) Cost Associated with Killeen's service area capital costs, Trimmier Creek STP/LS,
(3) Cost Associated with Killeen's STP O&M and 66.53% share of the Trimmier STP O&M
(4) Cost Associated with Killeen's service area O&M costs and 66.53% of the Trimmier STP/LS
(5) Cost Associated with construction of Killeen's share (73.45%) of the Trimmier STP expansion
(6) Cost Associated with Killeen's share (73.45%) of the Trimmier STP O&M

TABLE IV-2b

SUMMARY OF ALTERNATIVE COSTS FOR THE CITY OF HARKER HEIGHTS
(Costs Shown are Present Worth 1990)

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Phase I (Built by 1990):			
CAPITAL COSTS			
Treatment Plant	$0	$0	$0
Transport Facilities	$866,000	$866,000	$376,000
O&M COSTS			
Treatment Plant	$3,993,000	$3,993,000	$3,993,000
Transport Facilities	$137,000	$137,000	$50,000
Phase II (Built by 2000):			
CAPITAL COSTS			
Treatment Plant	* $1,197,000	$1,197,000	$523,000
Transport Facilities	$1,257,000	$1,257,000	$1,146,000
O&M COSTS			
Treatment Plant	$2,286,000	$2,286,000	$2,162,000
Transport Facilities	$254,000	$254,000	$200,000
Phase III (Built by 2010):			
CAPITAL COSTS			
Treatment Plant	$0	$0	(1) $443,000
Transport Facilities	$0	$0	(2) $89,000
O&M COSTS			
Treatment Plant	$1,905,000	$1,905,000	(3) $2,032,000
Transport Facilities	$230,000	$230,000	(4) $183,000
(Built by 2020):			
CAPITAL COSTS			
Treatment Plant	N/A	N/A	(5) $207,000
Transport Facilities	N/A	N/A	$0
O&M COSTS			
Treatment Plant	N/A	N/A	(6) $193,000
Transport Facilities	N/A	N/A	(7) $11,000
TOTAL	$12,125,000	$12,125,000	$11,608,000

TABLE IV-2b

Summary of Alternative Costs for the City of Harker Heights Cont'd.

NOTE: Costs include: Engineering/Contingencies (20%)
Easement/Right-of-Way

(1) Cost Associated with construction of Harker Heights share (33.47%) of the Trimmier STP
(2) Cost Associated with Harker Heights service area capital costs, Trimmier Creek STP/LS,
(3) Cost Associated with Harker Heights STP O&M and 33.47% share of the Trimmier STP O&M
(4) Cost Associated with Harker Heights service area O&M costs and 33.47% of the Trimmier STP/LS
(5) Cost Associated with construction of Harker Heights share (26.55%) of the Trimmier STP expansion
(6) Cost Associated with Harker Heights share (26.55%) of the Trimmier STP O&M
(7) Cost Associated with Harker Heights share (26.55%) of the Trimmier STP/LS O&M

TABLE IV-2c

SUMMARY OF ALTERNATIVE COSTS FOR THE CITY OF NOLANVILLE
(Costs Shown are Present Worth 1990)

	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Phase I (Built by 1990):			
CAPITAL COSTS			
Treatment Plant	$320,000	$320,000	$320,000
Transport Facilities	$0	$0	$0
O&M COSTS			
Treatment Plant	$1,250,000	$1,250,000	$1,250,000
Transport Facilities	$0	$0	$0
Phase II (Built by 2000):			
CAPITAL COSTS			
Treatment Plant	$163,000	$163,000	$163,000
Transport Facilities	$49,000	$49,000	$49,000
O&M COSTS			
Treatment Plant	$689,000	$689,000	$689,000
Transport Facilities	$17,000	$17,000	$17,000
Phase III (Built by 2010):			
CAPITAL COSTS			
Treatment Plant	$249,000	$249,000	$249,000
Transport Facilities	$28,000	$28,000	$28,000
O&M COSTS			
Treatment Plant	$617,000	$617,000	$617,000
Transport Facilities	$23,000	$23,000	$23,000
TOTAL	$3,405,000	$3,405,000	$3,405,000

NOTE: Costs include: Engineering/Contingencies (20%)
Easement/Right-of-Way

TABLE IV-2d

MISCELLANEOUS LAKESIDE DEVELOPMENTS

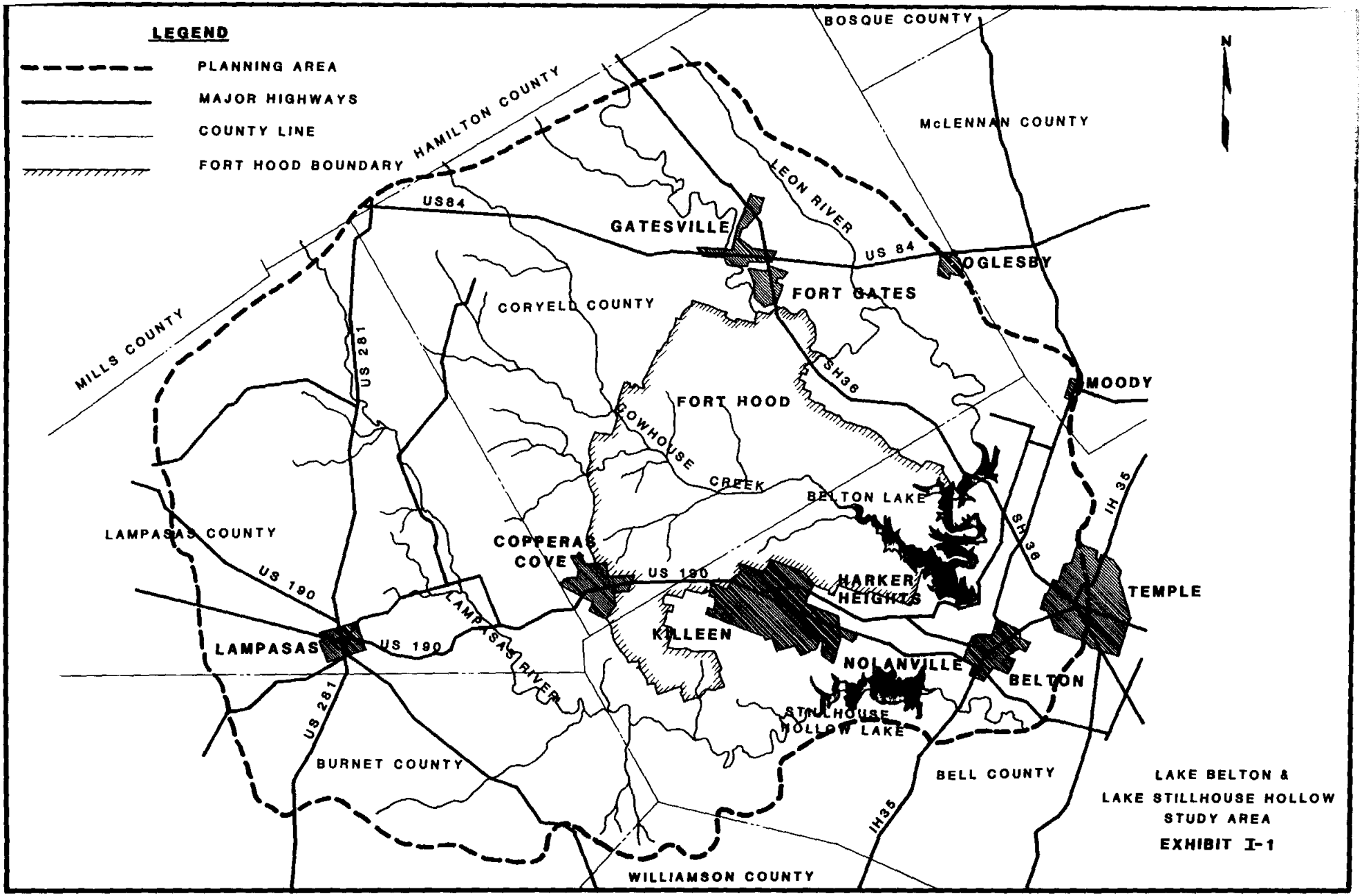
SUMMARY OF ALTERNATIVE COSTS FOR THE LAKESIDE DEVELOPMENTS
(Costs Shown are Present Worth 1990)

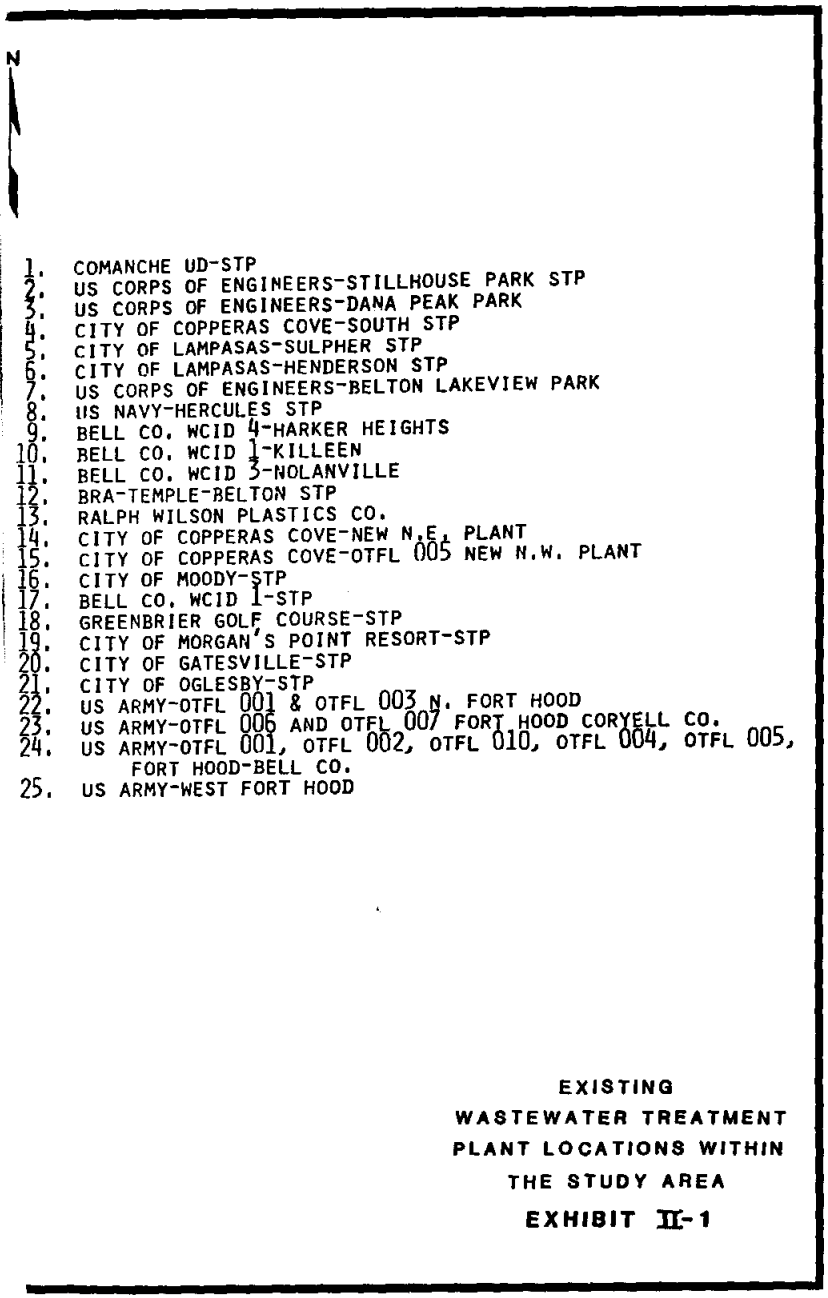
	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Phase I (Built by 1990):			
CAPITAL COSTS			
Treatment Plant	$0	$0	$0
Transport Facilities	$0	$0	$0
O&M COSTS			
Treatment Plant	$0	$0	$0
Transport Facilities	$0	$0	$0
Phase II (Built by 2000):			
CAPITAL COSTS			
Treatment Plant	$971,000	$2,045,000	$2,045,000
Transport Facilities	$1,107,000	$0	$0
O&M COSTS			
Treatment Plant	$890,000	$2,396,000	$2,396,000
Transport Facilities	$168,000	$0	$0
Phase III (Built by 2010):			
CAPITAL COSTS			
Treatment Plant	$0	$337,000	$337,000
Transport Facilities	$0	$0	$0
O&M COSTS			
Treatment Plant	$682,000	$2,130,000	$2,130,000
Transport Facilities	$129,000	$0	$0
TOTAL	$3,947,000	$6,908,000	$6,908,000

NOTE: Costs include: Engineering/Contingencies (20%)
Easement/Right-of-Way

TABLE IV-3
ALTERNATIVE COSTS PER PARTICIPANT

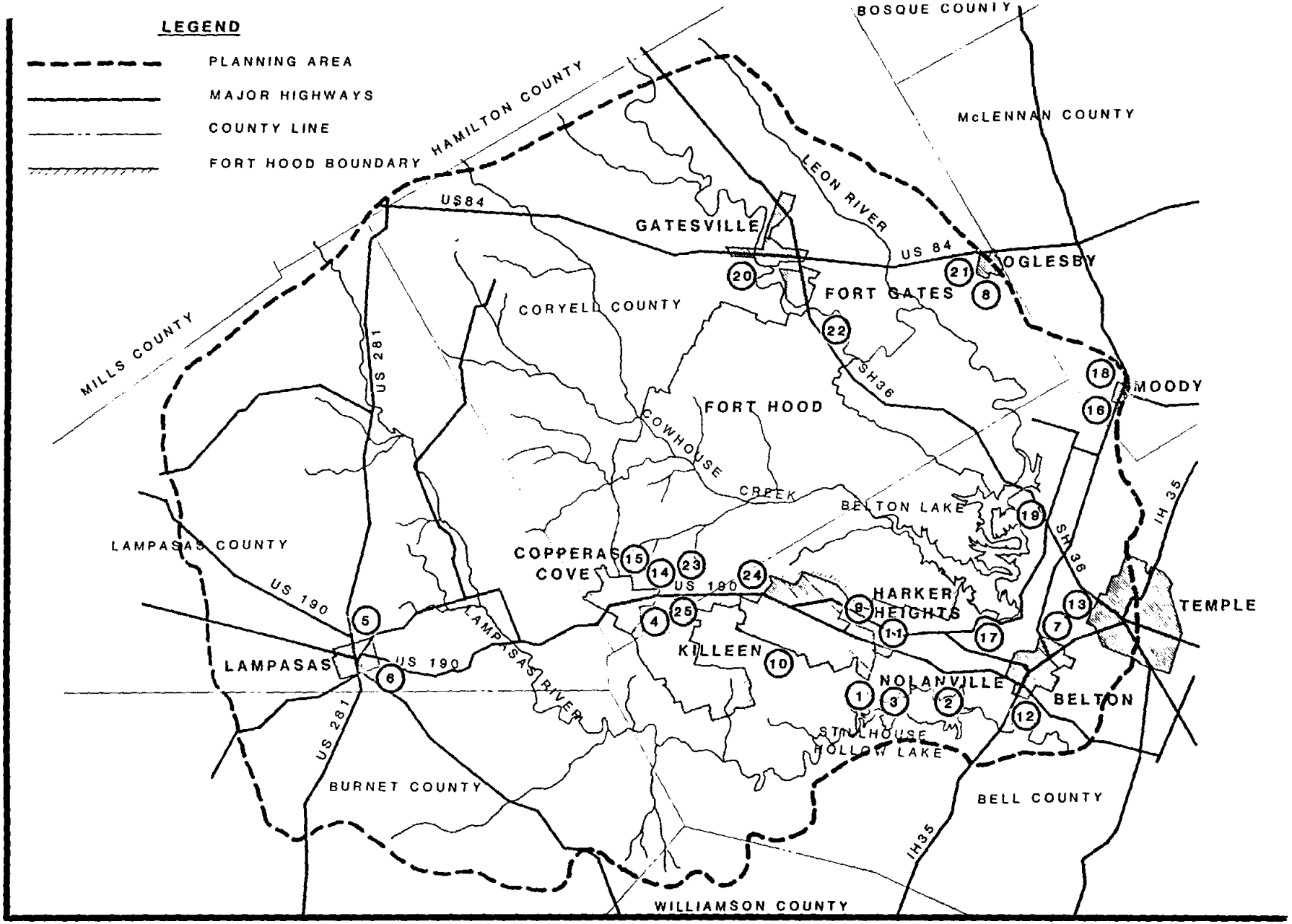
	ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
KILLEEN	$47,474,000	$47,082,000	$46,977,000
HARKER HEIGHTS	$12,125,000	$12,125,000	$11,608,000
NOLANVILLE	$3,405,000	$3,405,000	$3,405,000
MISC. LAKE DEVELOPMENTS	$3,947,000	$6,908,000	$6,908,000
	$66,951,000	$69,520,000	$68,898,000


LEGEND
PLANNING AREA
MAJOR HIGHWAYS
COUNTY LINE
FORT HOOD BOUNDARY
N
BOSQUE COUNTY
HAMILTON COUNTY
McLENNAN COUNTY
MILLS COUNTY
CORYELL COUNTY
LAMPASAS COUNTY
BURNET COUNTY
BELL COUNTY
WILLIAMSON COUNTY
US84
US 84
US 281
US 190
SH36
IH 35
LEON RIVER
COWHOUSE CREEK
LAMPASAS RIVER
GATESVILLE
FORT GATES
OGLESBY
FORT HOOD
MOODY
BELTON LAKE
COPPERAS COVE
HARKER HEIGHTS
TEMPLE
KILLEEN
LAMPASAS
NOLANVILLE
BELTON
STILLHOUSE HOLLOW LAKE
LAKE BELTON &
LAKE STILLHOUSE HOLLOW
STUDY AREA
EXHIBIT I-1



EXISTING
WASTEWATER TREATMENT
PLANT LOCATIONS WITHIN
THE STUDY AREA

EXHIBIT II-1


LEGEND
PLANNING AREA
MAJOR HIGHWAYS
COUNTY LINE
FORT HOOD BOUNDARY
BOSQUE COUNTY
McLENNAN COUNTY
HAMILTON COUNTY
MILLS COUNTY
CORYELL COUNTY
LAMPASAS COUNTY
BURNET COUNTY
BELL COUNTY
WILLIAMSON COUNTY
US84
US 84
US 281
US 190
SH36
IH 35
LEON RIVER
COWHOUSE CREEK
BELTON LAKE
LAMPASAS RIVER
STILLHOUSE HOLLOW LAKE
GATESVILLE
FORT GATES
OGLESBY
FORT HOOD
MOODY
COPPERAS COVE
HARKER HEIGHTS
KILLEEN
TEMPLE
NOLANVILLE
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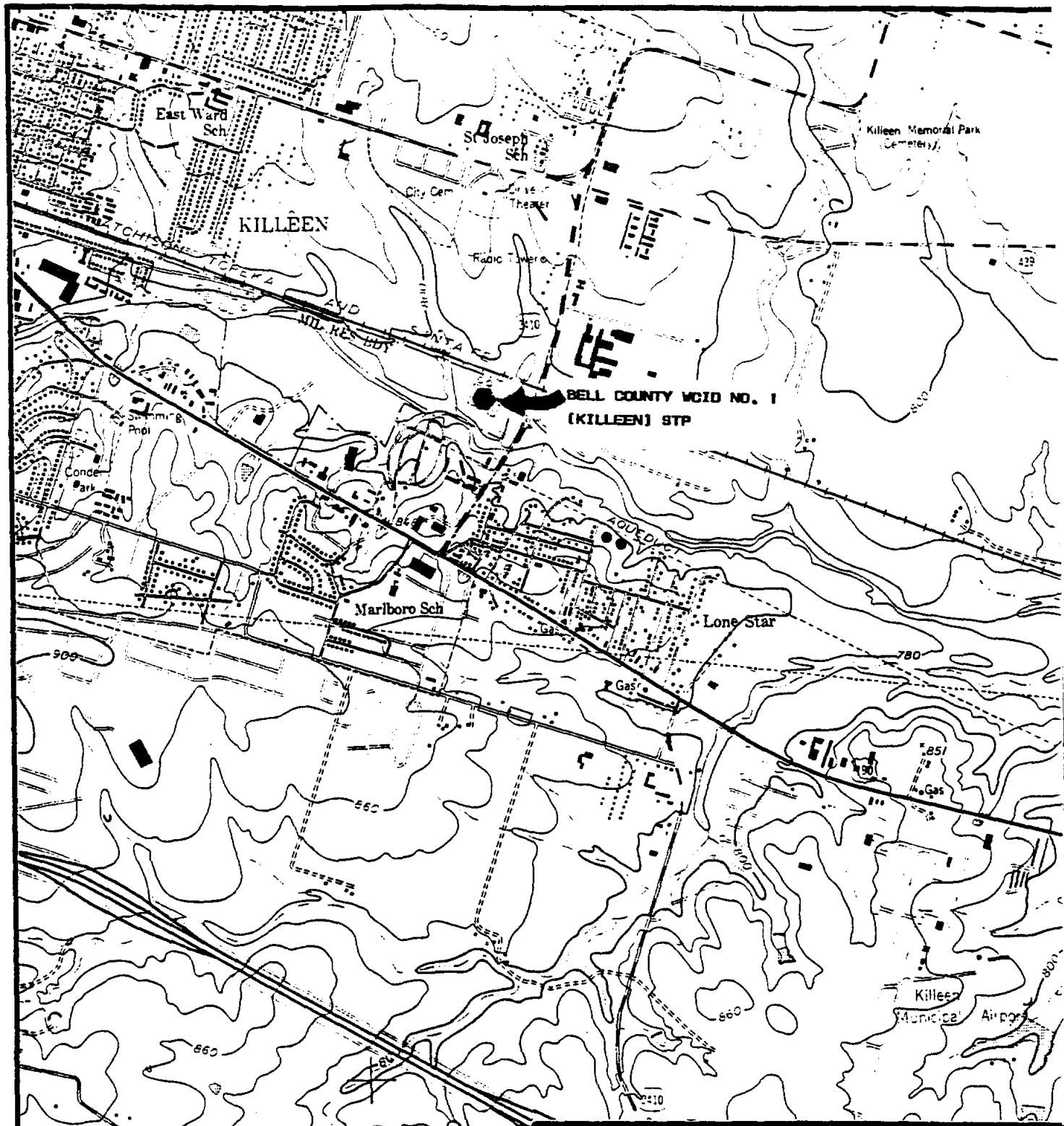
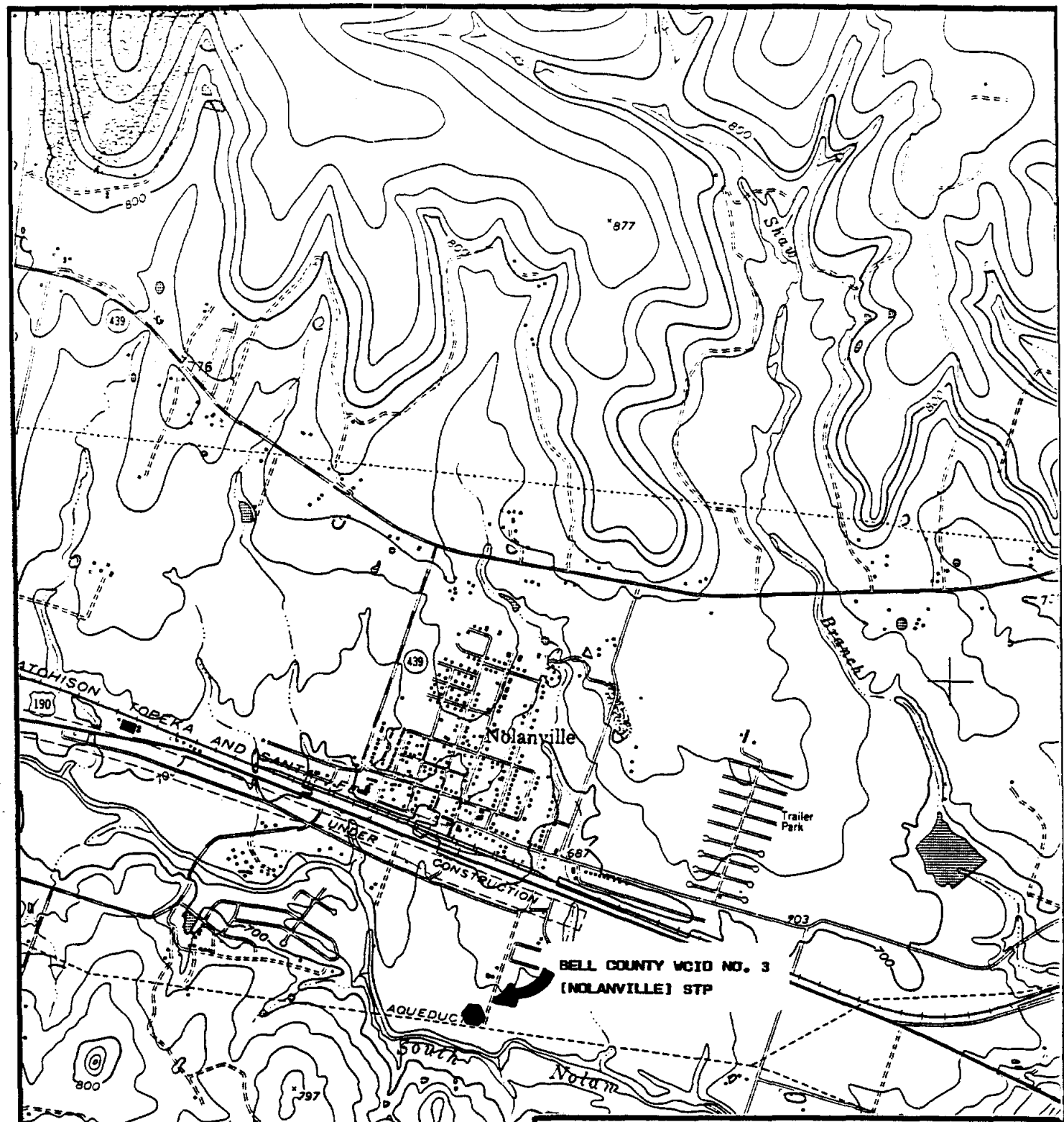


B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

BELL COUNTY W.C.I.D. No. 1
WASTEWATER TREATMENT PLANT
SERVING THE CITY OF KILLEEN

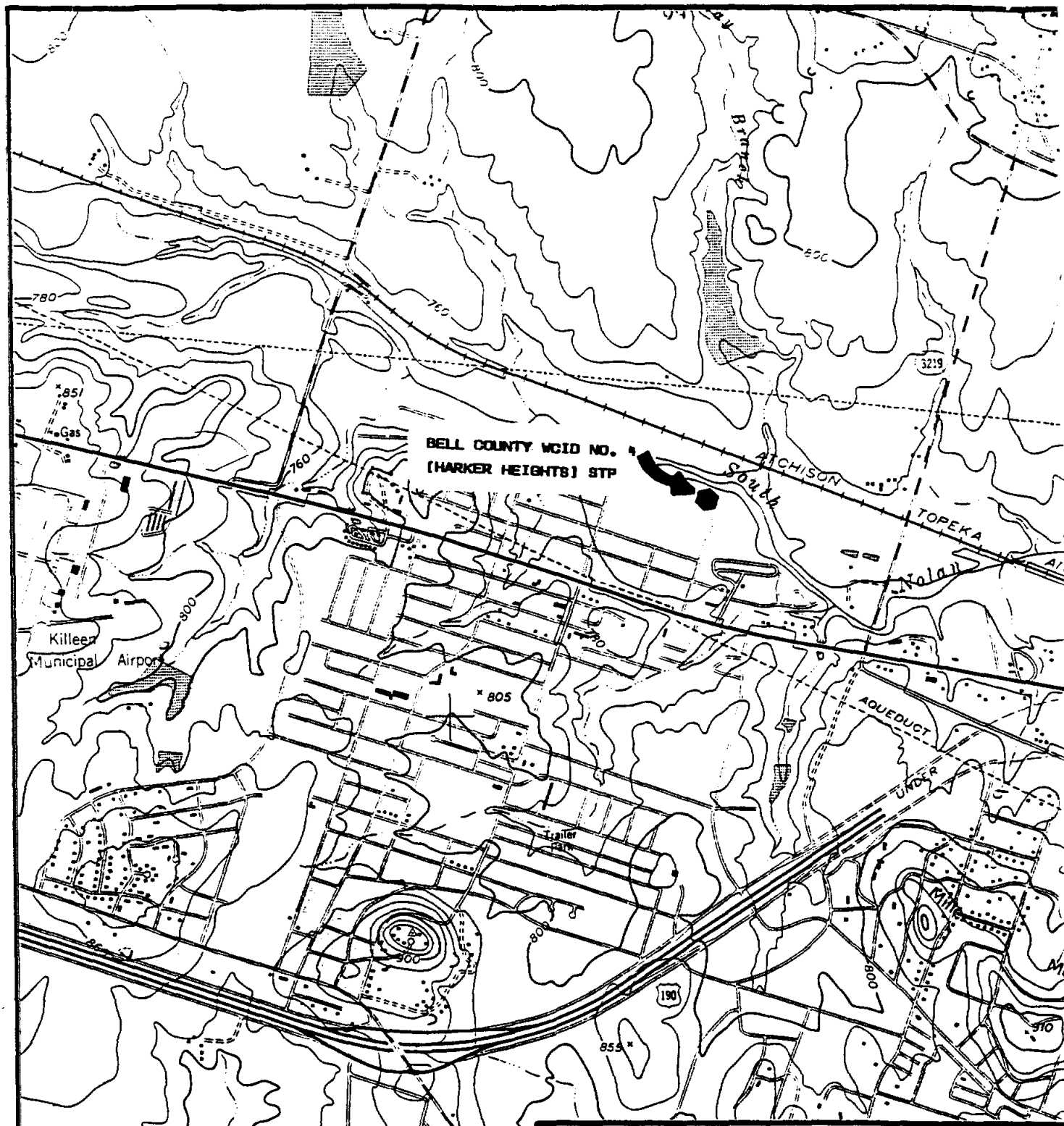
Job No 131-01	Date JAN. '89	EXHIBIT — II-2



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

BELL COUNTY W.C.I.D. NO. 3 WASTEWATER TREATMENT PLANT SERVING THE CITY OF NOLANVILLE

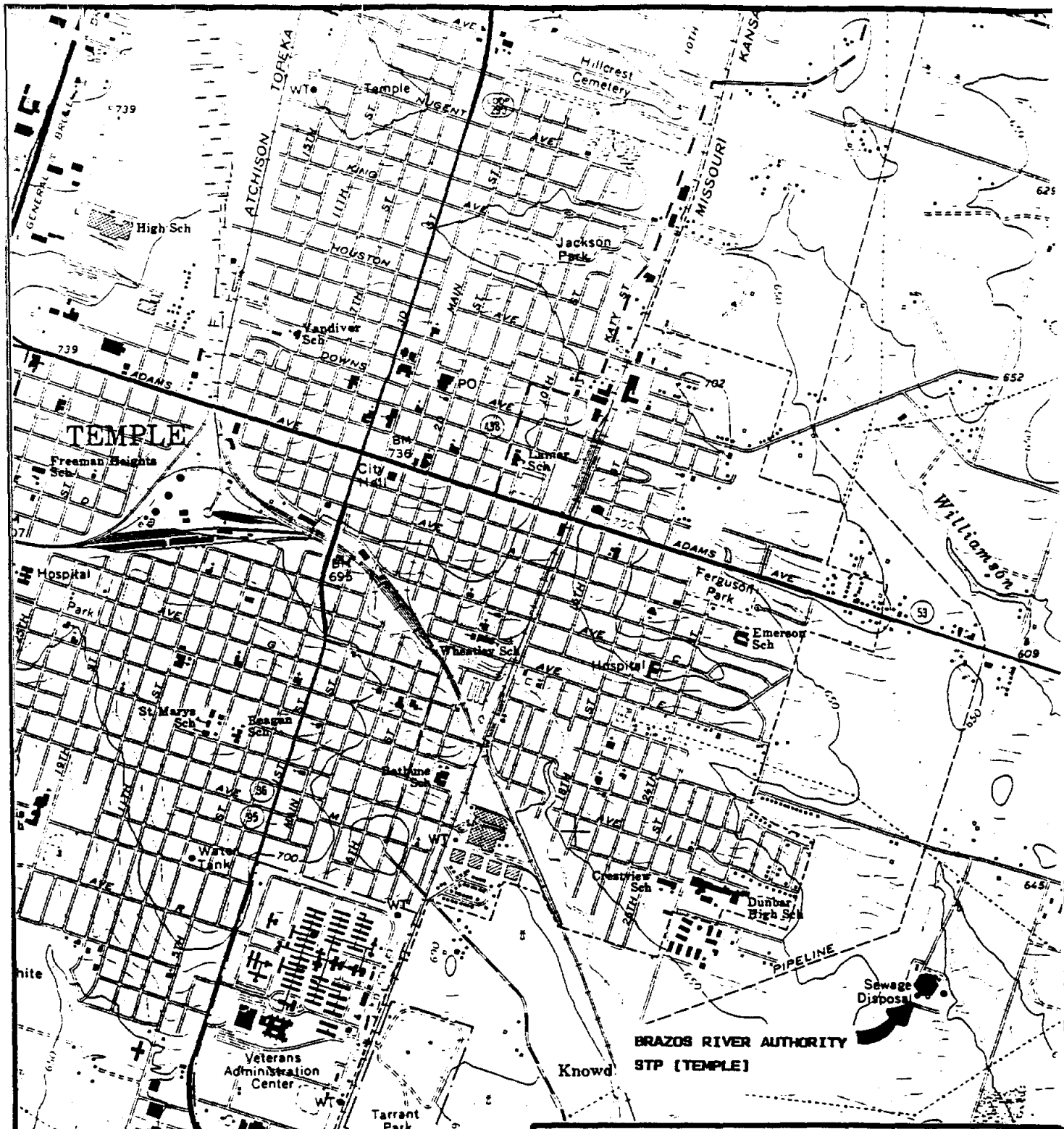
Job No 131-01	Date JAN. '89	EXHIBIT – II-3



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

BELL COUNTY W.C.I.D. NO. 4 WASTEWATER TREATMENT PLANT SERVING THE CITY OF HARKER HEIGHTS

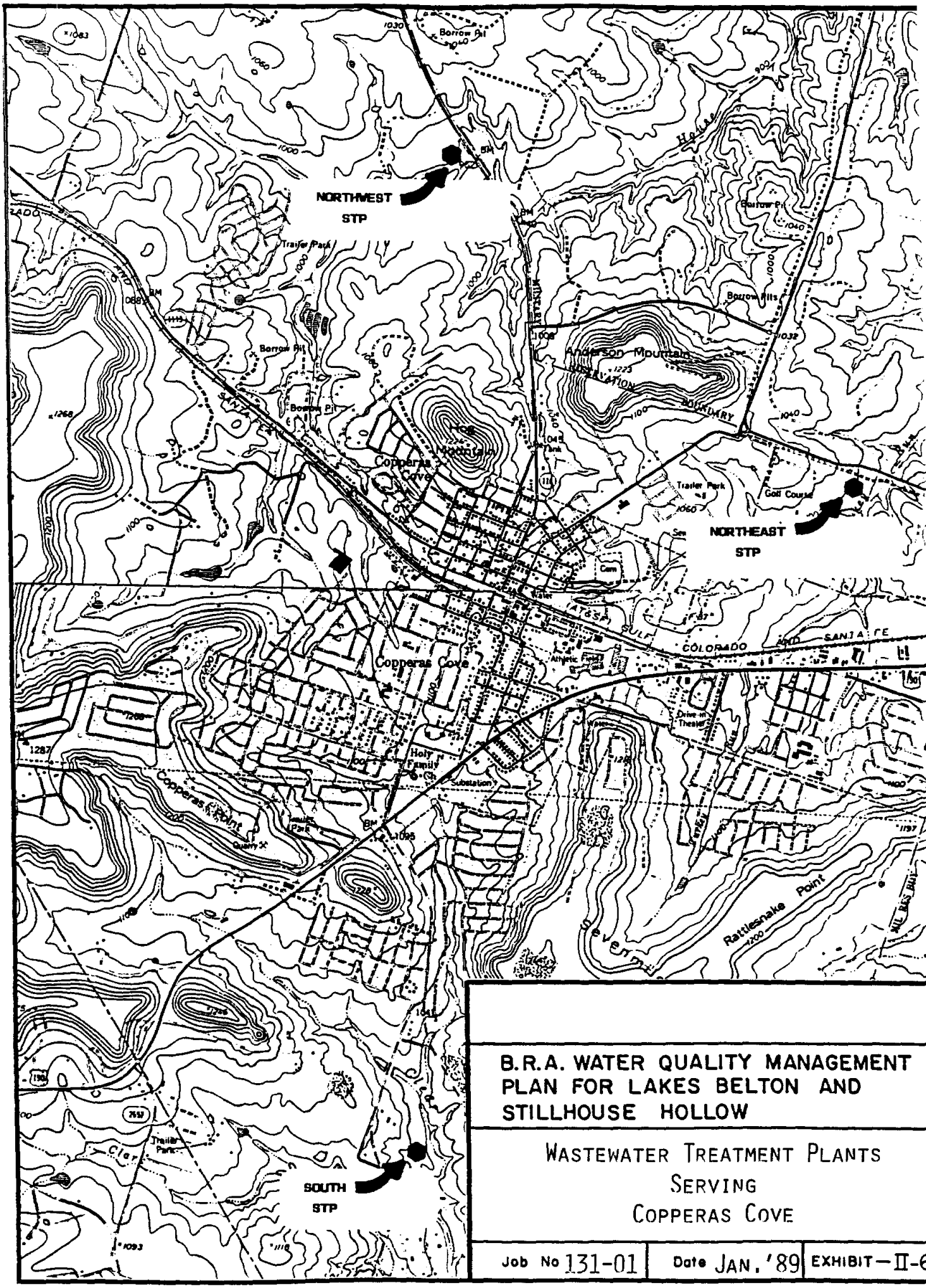
Job No 131-01	Date JAN. '89	EXHIBIT — II-4



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

BRAZOS RIVER AUTHORITY
REGIONAL WASTEWATER TREATMENT PLANT
SERVING TEMPLE AND BELTON

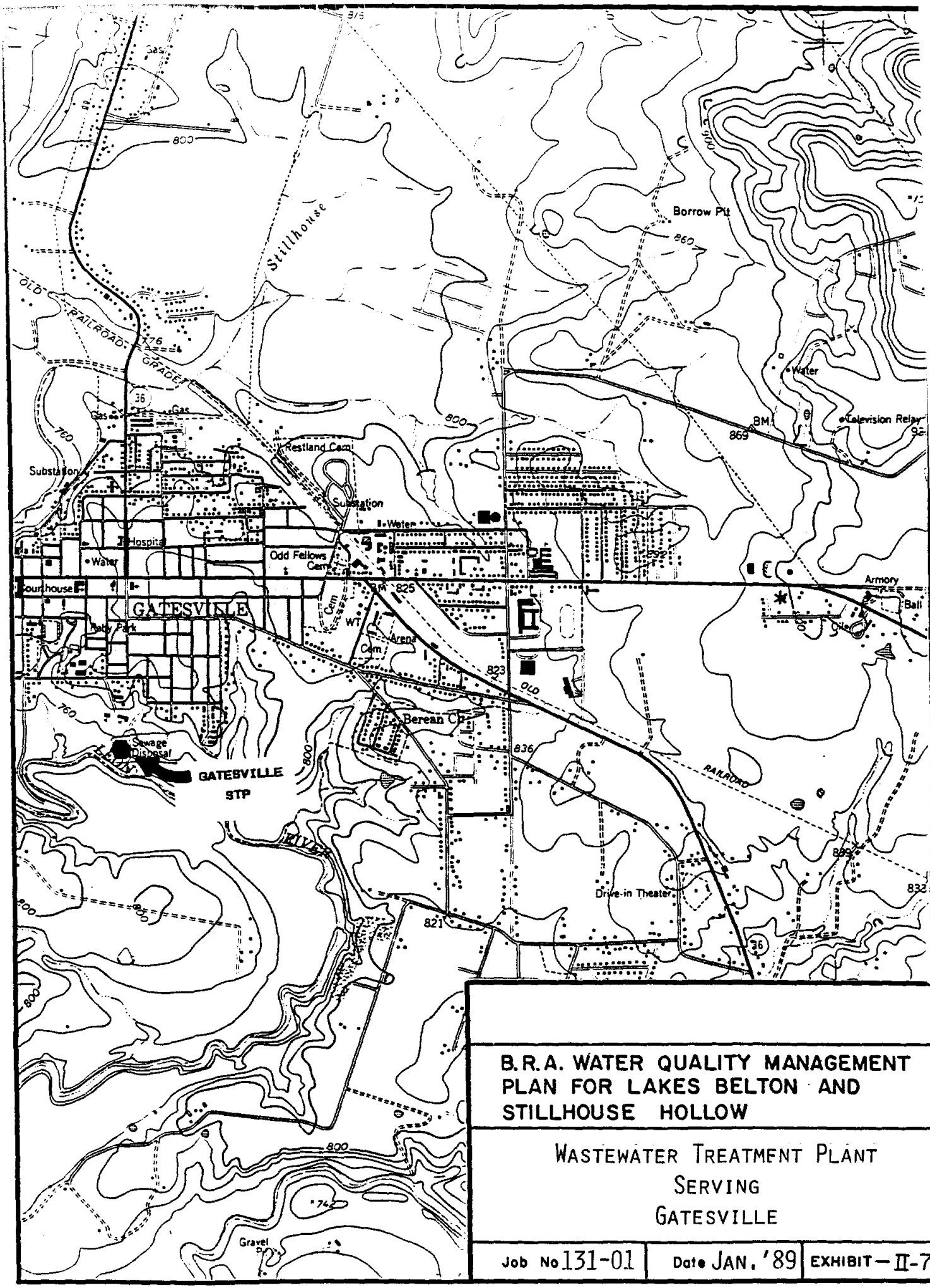
Job No 131-01	Date JAN. '89	EXHIBIT — II-5



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

WASTEWATER TREATMENT PLANTS SERVING COPPERAS COVE

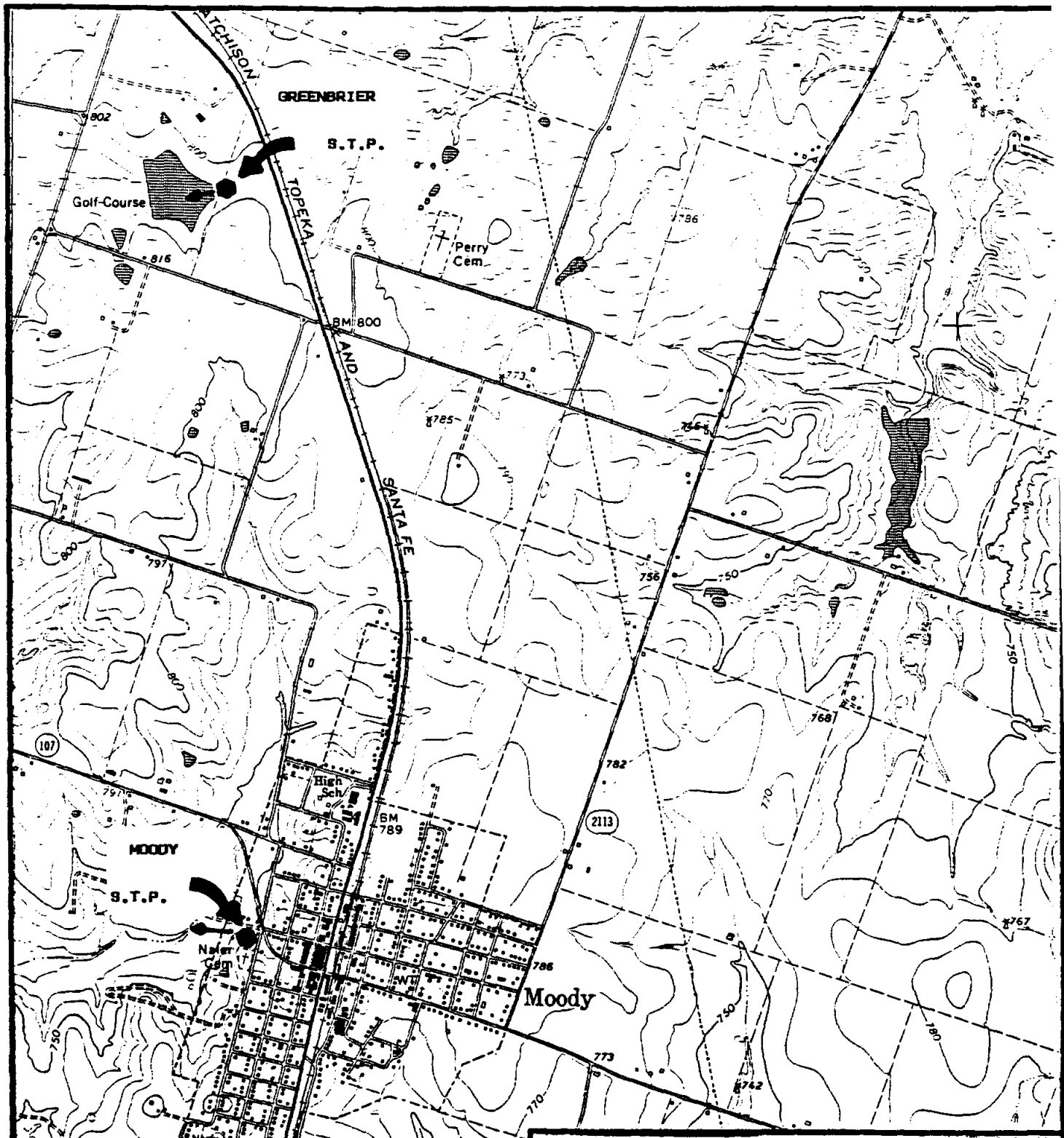
Job No 131-01	Date JAN. '89	EXHIBIT – II-6



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

WASTEWATER TREATMENT PLANT SERVING GATESVILLE

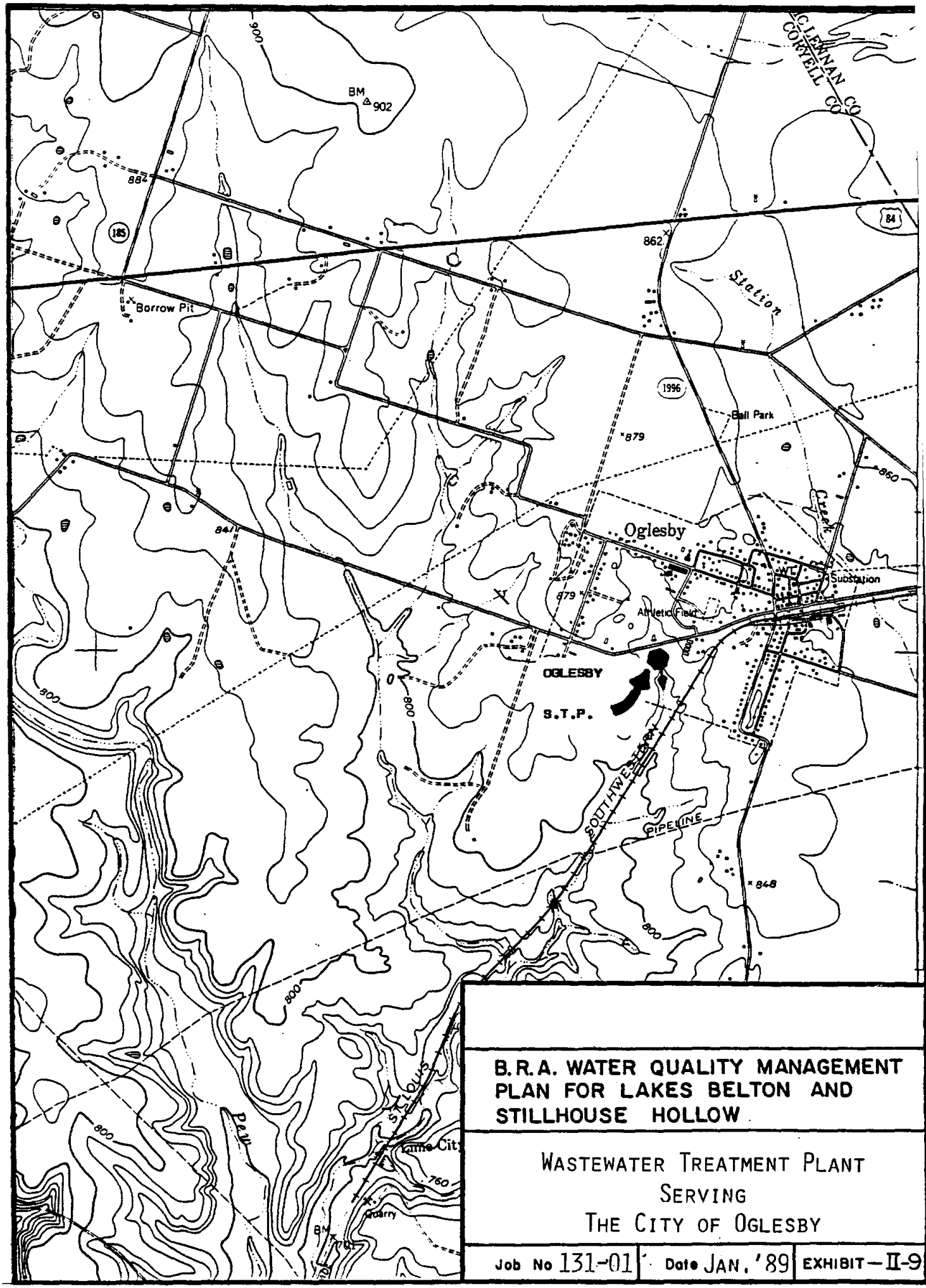
Job No 131-01	Date JAN. '89	EXHIBIT – II-7



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

WASTEWATER TREATMENT PLANTS
SERVING
THE CITY OF MOODY

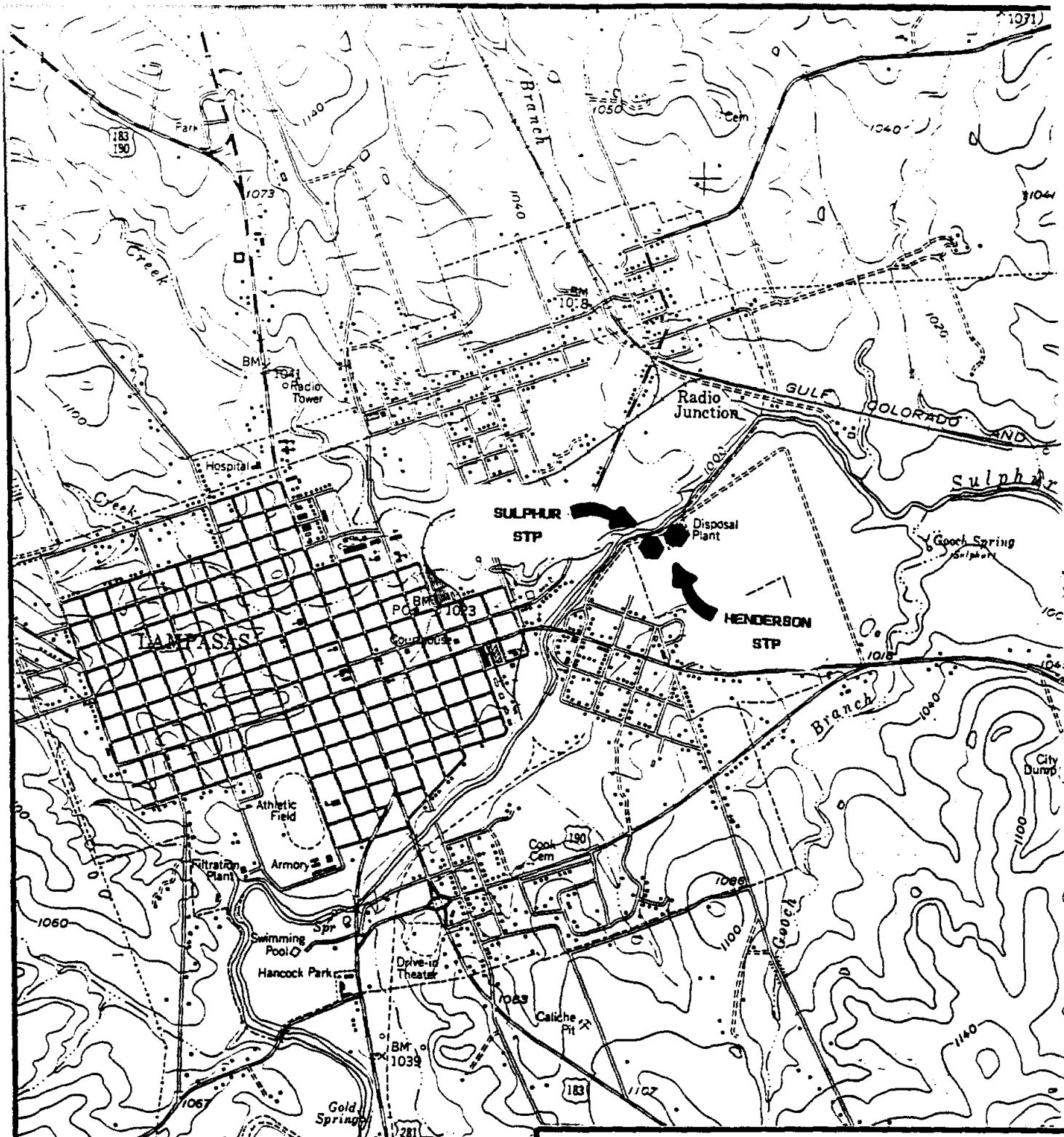
Job No 131-01	Date JAN. '89	EXHIBIT – II-8



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

WASTEWATER TREATMENT PLANT
SERVING
THE CITY OF OGLESBY

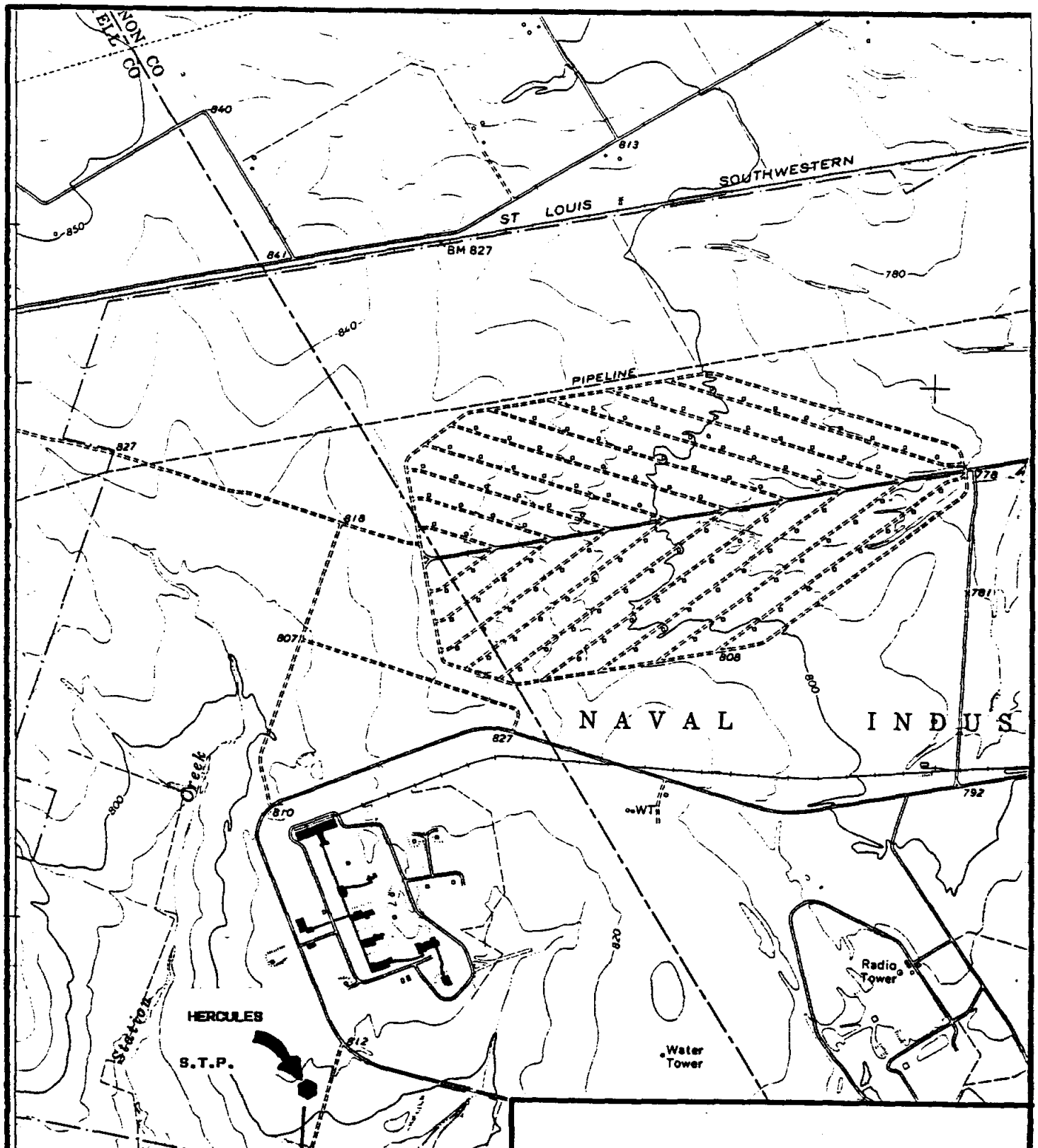
Job No 131-01	Date JAN. '89	EXHIBIT – II-9



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

WASTEWATER TREATMENT PLANTS SERVING THE CITY OF LAMPASAS

Job No 131-01	Date JAN. '89	EXHIBIT — II-C



B.R.A. WATER QUALITY MANAGEMENT PLAN FOR LAKES BELTON AND STILLHOUSE HOLLOW

WASTEWATER TREATMENT PLANT
SERVING
THE U.S. NAVY HERCULES PLANT

Job No. 131-01	Date JAN. '89	EXHIBIT—II-11

BRAZOS RIVER AUTHORITY
OF TEXAS

CONTRACT NO.8-483-508

THE FOLLOWING MAPS ARE NOT ATTACHED TO THIS REPORT. THEY ARE LOCATED IN THE OFFICIAL FILE AND MAY BE COPIED UPON REQUEST.

MAP NO.1 EXHIBIT 3-1
MAP NO.2 EXHIBIT 3-2
MAP NO.3 EXHIBIT 3-3

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