

E. **Operation and Maintenance of Planned Facilities**

The operation and maintenance costs of the regional storm drainage detention facilities incurred by the City of Ceres could be funded by park maintenance fees, school maintenance fees, or City-wide (including spheres of influence) special assessment districts.

F. **Phasing of Planned Facilities**

The detention facilities described above will be constructed as development occurs and funding becomes available. Individual site-specific detention facilities will also be constructed as development occurs and may or may not coincide with the construction of regional ponds.

7.1 **SEWER FACILITIES**

A. **Introduction**

Background: Currently, the City of Ceres and the City of Modesto collectively provide sewage collection, treatment and disposal services to the residents and businesses within the City limits. The City of Ceres provides these services to the area of the City generally south of Hatch Road with the exception of the southern "Don Pedro" area (east of Farris, north of Service, and southwest of Southern Pacific Railroad) which relies primarily on septic tank systems. Wastewater collected by the City of Ceres is transported to the existing City treatment plant, where it is treated and subsequently discharged to percolation/evaporation ponds and infiltration wells. The City of Modesto's service area currently lies generally north of Hatch Road and west of Central Avenue. The wastewater is collected by the City of Ceres and flows into the City of Modesto's trunk line at Hosmer Road and Ninth Street. The flow is transported across the Tuolumne River to the existing Modesto treatment plant, where it is treated and subsequently discharged.

Capital Facilities Financing: The City of Ceres' current policy on financing the expansion of the wastewater treatment plant and construction of new trunk line sewers is to utilize what is termed a "mainline fee". At this time, the City of Ceres is committed to relying upon this fee to finance 100 percent of the anticipated system expansion costs, and will not use other City funds to finance those improvements. Additionally, the City will not participate in any other reimbursement mechanism such as benefit districts, etc. The sewer mainline fee is assessed at two different rates, residential and industrial/commercial.

1. The residential "mainline" fee is currently charged to single family residences at a rate of \$1,350.12 per lot and multifamily residences at a rate of \$1,115.69 per unit.

2. The industrial/commercial "mainline" fee is currently charged to small developments (less than 1 acre) at a rate of \$1,350.12 for the first 7,500 sf and \$0.05711 for each additional sf. Large developments (over 1 acre) are charged at a rate of \$3,988.19 for the first acre and \$3,186.51 for each additional acre.

B. Existing Sewage Facilities

Conveyance Facilities: All of the four areas included in the City of Ceres Public Facilities Study, designated as A through D, are currently without sewer service. The entire acreage encompassed by the four areas lies outside the City limits, but are within the City's "sphere of influence". The Sewer System Study for the City of Ceres by Dewante & Stowell, produced in July 1983, included all of study areas A, B and C in their interim and future analysis. However, to date none of the proposed improvements contained in the 1983 Dewante & Stowell Study which would benefit the "spheres of influence" areas have been constructed, and none of these areas have participated in the cost of any sewage treatment, transmissions, or collection facility improvements.

The four areas included in this study would rely primarily on newly constructed trunk sewers to convey the wastewater generated by new development in those areas. The existing sewer systems would not be utilized by the four study areas, with the exception of Area "D" which would connect to existing 21" line flowing north to the City of Modesto.

Treatment Facilities: The City of Ceres Wastewater Treatment Plant, located southeast of the intersection of Morgan Road and Service Road, treats wastewater conveyed to the plant and discharges the treated effluent into 6 percolation/evaporation ponds and 2 "infiltration well" areas. Recently, two new percolation/evaporation ponds have been constructed to bring the total number of ponds to six, thus increasing the total disposal area to approximately 111 acres. The plant currently has an average dry weather flow capacity of approximately 1.9 mgd and reliable disposal capacity of approximately 2.5 mgd. The City of Ceres is currently preparing an Environmental Impact Report to expand the wastewater treatment plant and plans to convert the plant to an oxidation ditch facility.

C. Prior Sewage Planning Efforts

A sewer system study to evaluate the existing and future needs of the City of Ceres was prepared by Dewante and Stowell, Consulting Engineers, in July, 1983. Additionally, Dewante and Stowell prepared a wastewater treatment facility expansion study in June, 1984, to develop an overall, long range plan for staged expansion of the treatment plant as demand increased. Further, an

updated wastewater treatment plant expansion study was prepared in August 1988, by Dewante and Stowell. This updated revised costs and alternatives previously presented based on changed conditions and more current price levels.

The July 1983 study of the sewage conveyance systems dealt primarily with analysis of the existing systems and preparation of several alternatives for interim and ultimate improvements. The alternatives for ultimate development included trunk lines to service the southeast portion of the current study Area A, Area B and the central portion of Area C. The study included a projected expenditure list, defining costs and timing of construction for the various improvements. The portions of the ultimate plan which would affect Areas A and C have not been constructed and are not scheduled until 1996.

The June 1984 study of the treatment plant expansion examined the existing and future needs of the City of Ceres "service area" which included current study Areas A, B and C. Area D was not included in the treatment plant expansion study because wastewater generated in this area would be conveyed to the City of Modesto for treatment. Based on the current capacity of the treatment plant and disposal ponds, and the aforementioned study, the treatment plant would have to be expanded prior to any significant development in three of the four current study areas A, B, and C.

D. Planning, Methodology and Design Criteria

The City of Ceres, Department of Public Works Improvement Standards contain the design criteria for sanitary sewer facilities which are constructed under the City of Ceres authority. These criteria, as well as the proposed land uses, have been used to determine design flows and to estimate required gravity sewer pipe diameters. Pump stations have been assumed to be duplex stations with submersible pumps in which each pump is capable of pumping the peak design flow. Force mains have been sized with flow velocities of 3.5 to 5.0 feet per second at peak design flow. Manholes were assumed to be spaced at an average of 400 foot intervals.

E. Planned Sewer Facilities

The sewage facilities proposed herein were sized in accordance with the City of Ceres improvement standards, and were based on land uses and densities proposed under the General Plan assumptions for the four study areas. The exact location of the land use entitlements have not been determined. Therefore, the final configuration of these facilities are likely to vary in size and alignment once the final land use entitlement locations are determined. Criteria used in estimating the proposed layout of the trunk sewer lines for each area include service to every parcel, least

amount of pipeline possible, existing sewer line locations, and location of the treatment plant with respect to the area in question. An illustrative map of the proposed sewer system is shown in Exhibit 7.2.

The proposed Area A trunk sewer system will consist of pipes ranging from 10" to 18" and would be located in Hackett, Crow's Landing, Service, and Morgan Roads. The layout, as shown in Exhibit 7.2, coincides with locations and sizes proposed in the 1983, Dewante & Stowell study. This trunk system conveys wastewater generally southeast to the City of Ceres treatment plant, located just east of Morgan Road.

The proposed Area B trunk sewer system will consist of pipes ranging in size from 10" to 30" and will be located mainly in Moffett, Central, Blaker and Service Roads. The proposed layout, shown in Exhibit 7.2, deviates somewhat from the 1983 Dewante & Stowell study with regard to location, however, the proposed sizes and general concept are consistent with the aforementioned study. The trunk system in this area will convey sewage from Area B as well as from Area C and new and existing development within the Moffett Road (North of Service Road) and Mitchell Road corridors to the City of Ceres wastewater treatment plant.

Area C, located east of the current City limits, will have a trunk sewer system consisting of pipes ranging in sizes from 10" to 24", and will generally convey sewage to the southwest to tie into the Area B trunk system. The 1983 Dewante & Stowell study addressed only the major trunks in Area C and the proposed layout shown in Exhibit 7.2 generally coincides with the study with regard to the trunk lines shown. The remainder of the proposed layout is not addressed in this study, but generally the proposed layout follows the concept and intent of previous studies with regard to conveying sewage southwesterly through Area B to the treatment plant.

The proposed Area D trunk sewer system will consist of pipes ranging in size from 10" to 12" and will be located primarily on River Road and Richland Avenue. The proposed layout, shown in Exhibit 7.2, will convey sewage generally to the west to the 21" diameter connection to the City of Modesto located at Richland and Holm Avenues. The waste generated by Area D will be transported to and treated by the City of Modesto treatment facilities. The proposed trunk sewer system in the area is consistent with the 1983 Dewante and Stowell Study in that the waste generated is conveyed to Modesto for treatment, although the specifics are unique to this study.

There are four sanitary sewer pump stations proposed within the public facilities study area: one in Area A near Service and Morgan Roads; one in Area B near Service and Blaker Roads; two in Area C, one near Faith Home Road and Whitmore Avenue, and one near Service Road and the

Ceres Main Canal. The locations of these pump station are based on anticipated future development and may change as actual development occurs.

F. Capital Costs of Planned Sewer Facilities

The estimated capital costs of the sanitary sewer facilities depicted in Exhibit 7.2 are tabulated in Table 7.2. A 30% contingency, engineering and administration cost has been included. The costs are in 1989 dollars and do not reflect inflation or increases in future construction costs.

**TABLE 7.2
CERES SANITARY SEWER DISTRICT**

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1.	30" Dia. Sewer Pipe	2,650	LF	\$65.00	172,250
2.	27" Dia. Sewer Pipe	2,650	LF	60.00	159,000
3.	24" Dia. Sewer Pipe	3,350	LF	55.00	184,250
4.	18" Dia. Sewer Pipe	1,350	LF	45.00	60,750
5.	15" Dia. Sewer Pipe	14,550	LF	40.00	582,000
6.	12" Dia. Sewer Pipe	16,000	LF	35.00	560,000
7.	10" Dia. Sewer Pipe	20,250	LF	30.00	607,500
8.	60" Sanitary Sewer Saddle Manholes	13	EA	5,000.00	65,000
9.	48" Sanitary Sewer Manholes	140	EA	2,500.00	350,000
10.	12" Dia. Force Main	200	EA	40.00	8,000
11.	24" Dia. Force Main	200	EA	80.00	16,000
12.	1 MGD Pump Station	1	EA	100,000.00 100,000	100,000
13.	4.4 MGD Pump Station	1	EA	300,000.00	300,000
14.	6.3 MGD Pump Station	1	EA	500,000.00	500,000
15.	1.6 MGD Pump Station	1	EA	150,000.00	150,000
				Subtotal	\$3,814,750
				30% Contingency	1,144,425
16.	Treatment Plant Expansion*	L.S.	LS	29,605,000.00	29,605,000
					<u>\$34,564,175</u>

* Includes only those costs as the result of new development. (See 7.1 G)

G. Deficiencies

The cost estimates shown in Table 7.2 assume that the City of Ceres will change the method of sewage treatment in the near future. The conversion of the treatment plant to a mechanical system will significantly reduce future land requirements based on the current pond system. The treatment plant conversion and future expansion costs will involve four stages as follows:

Stage	Brief Description	Estimated Cost
1.	Treatment Plant Conversion and Addition of 1.0 MGD Capacity	\$14,620,000
2.	Treatment Plant Expansion 1.5 MGD	4,240,000
3.	Treatment Plant Conversion 2.0 MGD, addition of second effluent pipeline and additional pumps	9,650,000
4.	Treatment Plant Expansion 1.0 MGD	<u>4,240,000</u>
	Total	\$32,750,000

New development will be expected to pay, through fees, for expansion of the treatment facilities beyond the capacity of the existing treatment plant. The conversion of the treatment process will also change treatment capacity requirements. Existing reliable capacity is 2.0 MGD for current residents. The new treatment plant will use only 0.6 MGD of the 1.4 MGD capacity after conversion for existing flows. To determine the deficiency, or portion of the plant conversion to be paid through General Fund monies or some method other than development fees a ratio was developed. The ratio was determined using constructed capacity for the first two stages divided by the existing capacity requirements. The first two stages involve building a 3.6 MGD plant. The existing resident cost (deficiency) is 16.7% of 18,860,000 or \$3,149,620.

H. Operation and Maintenance of Planned Facilities

Operation and maintenance costs of sewage collection, treatment, and disposal facilities incurred by the City of Ceres are funded by a monthly service charge of \$5.50 per single family dwelling or multifamily unit.

I. Phasing of Planned Facilities

Sanitary sewer trunk systems will be phased as required by new development. Each new development will be adequately served by a sanitary sewer system which connects to the trunk system. The facilities will be built incrementally and oversized if necessary, to fit the Master Plan. Oversized facilities constructed by the developer will be eligible for reimbursement from the sewer connection fees collected when, and if, the money is available.

EXHIBIT 7-2
SANITARY SEWER SYSTEM

- PROPOSED SEWER
- - - EXISTING SEWER
- TREATMENT FACILITY
- PUMP STATION
- DIRECTION OF FLOW

CITY OF CERES
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