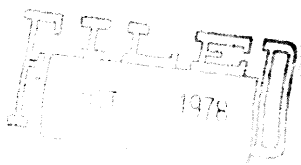
BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI



In the matter of: Application of Meramec Sewer Co. for a certificate of public convenience and necessity to construct, operate and maintain a sanitary sewage disposal system in a certain designated area in Jefferson County, Missouri.	)	Case No. SA-77-167

MOTION TO SET ASIDE DISMISSAL

Comes now Meramec Sewer Company and moves the Commission to set aside its order dated September 6, 1978, dismissing the instant proceeding, which order was to become effective on October 6, 1978, and in support thereof states as follows:

The dismissal was based upon applicant's inability to file a revised feasibility study by August 15, 1978. Contemporaneous with the filing of this motion, applicant is filing an engineering feasibility study by Harland Bartholomew and Associates, dated September, 1978, which became available to applicant on September 28, 1978. This filing fulfills the conditions precedent to further Commission action in the instant case.

Respectfully submitted,

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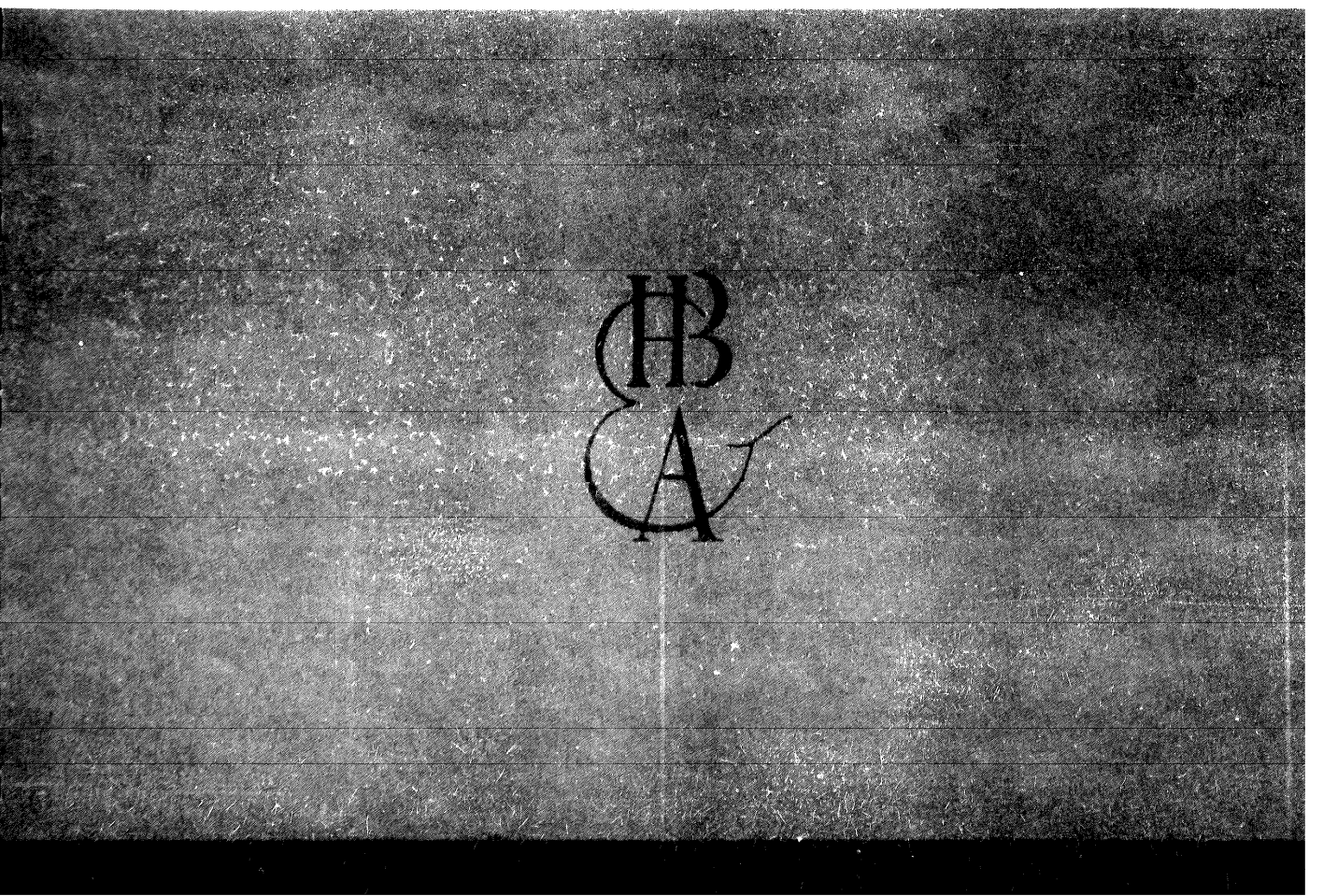
ENGINEERING FEASIBILITY STUDY

PROPOSED MERAMEC SEWER COMPANY

Jefferson County, Missouri



ENGINEERING FEASIBILITY STUDY

OF THE

PROPOSED MERAMEC SEWER CO.

Prepared for

Meramec Sewer Company

Jefferson County, Missouri

Prepared by

Harland Bartholomew and Associates

Planners, Engineers, Landscape Architects

Clayton, Missouri

September, 1978

TABLE OF CONTENTS

INDEX OF PLATES

INDEX OF TABLES

INTRODUCTION

Purpose

The purpose of this study is to evaluate the engineering and financial feasibility of the development of a sewer company in the northeastern part of Jefferson County, Missouri.

The study is divided into two parts, namely an examination of the requirements to design a system to serve the area and then an evaluation of the economic aspects (customers, revenues, expenses, rates) to finance the proposed company.

Location

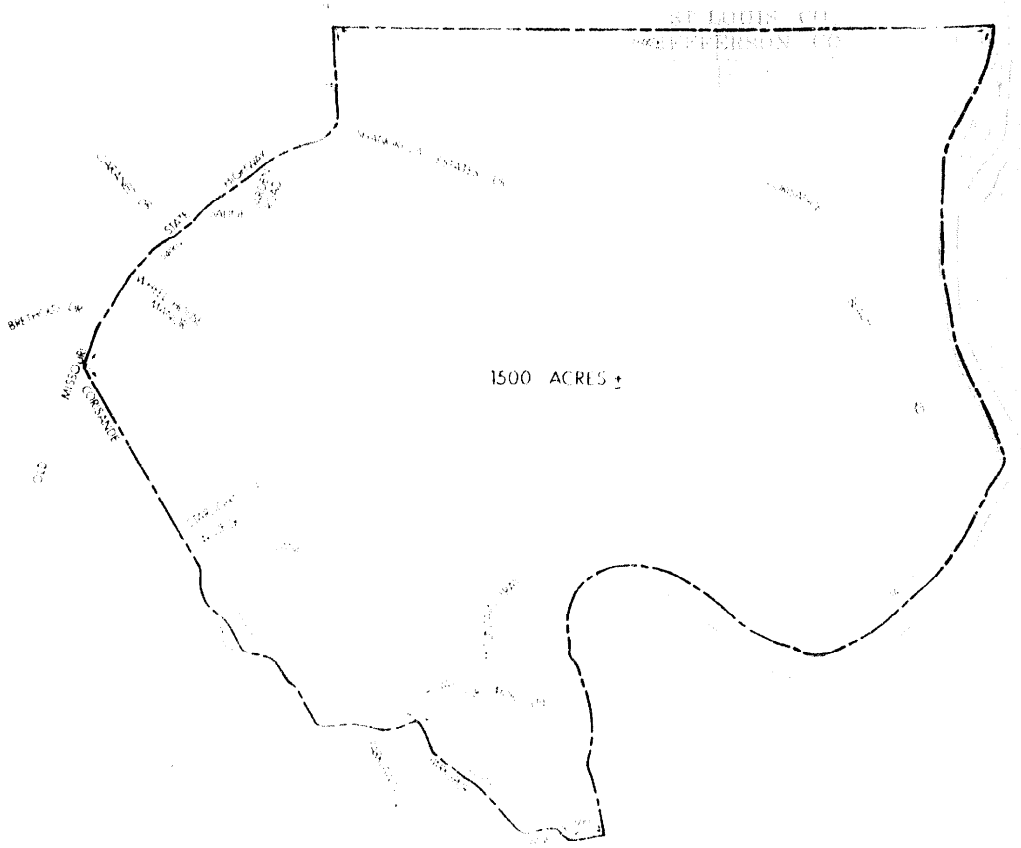
The proposed company is located in the most northeastern corner of Jefferson County, abutting the south line of St. Louis County, about 0.8 mile south of the City of Fenton. (See Plate 1.) The service area encompasses approximately 1,500 acres and is more specifically located by the following major boundaries (described in a clockwise manner):

The St. Louis County Line
The Meramec River
Corisande Hills Rd.
Missouri Highway 141

Metes and Bounds Description of the Area

An area in U.S. Surveys 2014, 1987, 3012, 3013, and 3011 in Township 43 North, Range 5 East in Jefferson County, Missouri more particularly described as follows:

Beginning at the point of intersection of the centerline of Old Missouri State Hwy. 141 (also known as Brock Road) and the centerline of Corisande Hills Road, thence southeastwardly and eastwardly along the centerline of said Corisande Hills Road a distance of 6,300 feet more or less to the intersection of the centerline of Corisande Hills Road and Parkspur Lane, thence southeastwardly along the centerline of said Parkspur Lane a distance of 2,200 feet more or less to the approximate end of said road, thence due East to the West bank of the Meramec River a distance of 500 feet more or less, thence following the West bank of the Meramec River in a northeastwardly direction 14,100 feet more or less to a point, said point being on the



MERAMEC SEWER COMPANY BOUNDARY

PLATE 1

North line of Jefferson County and the South line of St. Louis County, thence following said County line westwardly for a distance of 7,600 feet more or less to the centerline of the aforenoted Old Missouri State Hwy. 141, thence southeastwardly along the centerline of said State Highway 141 a distance of 5,400 feet more or less to the centerline of Corisande Hills Road, being also the point of beginning and containing 1,500 Acres more or less. (See Plate 1.)

ENGINEERING FEASIBILITY

This section of the report examines the engineering factors of the proposed company. It includes an inventory of the existing conditions, building development and their sewage facilities, as well as an estimate of the growth of the area and the sewage facilities needed to serve the existing population and the projected growth.

Existing Conditions

Geographic Area

The 1,500 acres ($\pm$) comprising the area of the proposed company are served primarily by Old Missouri Hwy. 141 on its western side with additional access provided on its southwestern side by Corisande Hills Road. No public roads traverse the area, although private farm roads do penetrate the interior parts of the district. (See Plate 2.)

The area is approximately 0.8 mile south of the City of Fenton (in St. Louis County) and is immediately south of George Winter Park (operated by St. Louis County).

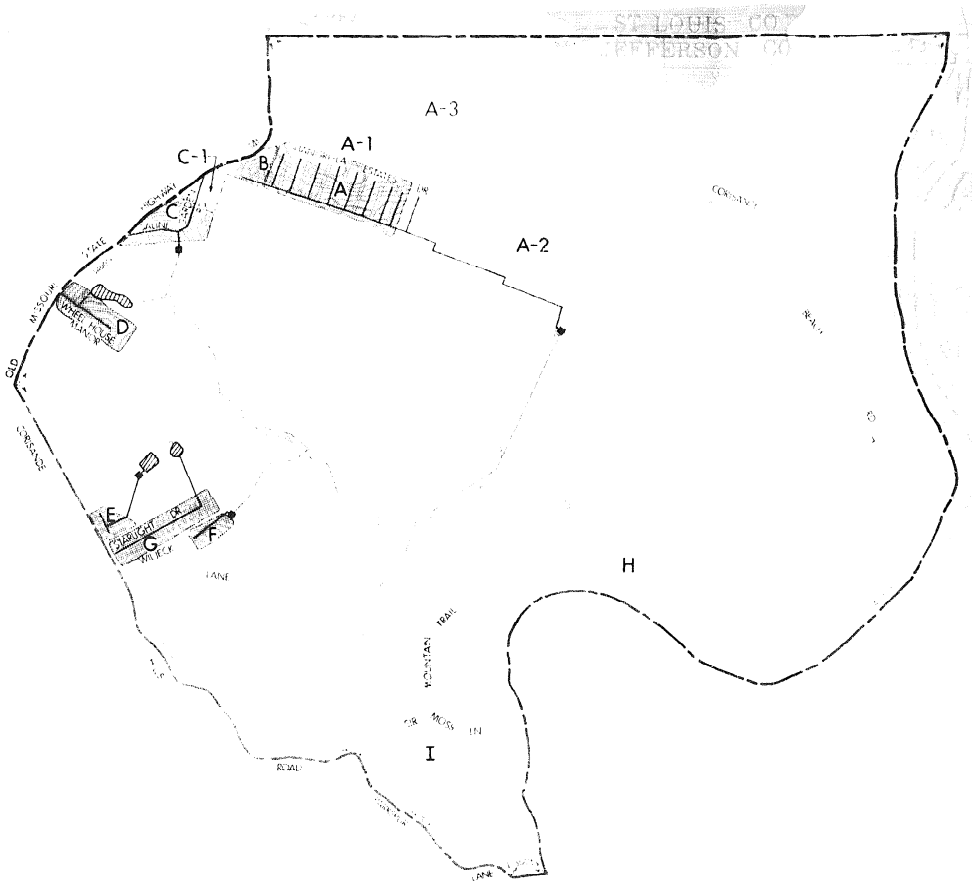
Topographic Conditions

The topography of the proposed service area of the proposed company is quite diverse, ranging from a series of hills and valleys in the western half to a very flat flood plain in its eastern half.

Elevations of the higher points are from 550 to 600 feet above mean sea level along Old Missouri Hwy. 141 and Corisande Hills Road, dropping to 400 feet above sea level along the west bank of the Meramec River (See Plate 2).

Soil and geologic conditions include thin layers of clay overlying limestone deposits in the hilly western portion, with alluvial silts over gravel comprising the flatter eastern portion.

There are no perennial streams through the area although an intermittant stream meanders from the high point near Old Missouri Hwy. 141 and Corisande Hills Road generally eastward until it dissapates its occasional flow on the flatter flood plain area (See Plate 2). The Meramec River abutting the east side of the district is a perennial stream of considerable flow.



MERAMEC SEWER COMPANY

EXISTING DEVELOPMENT AND PROPOSED SEWER SYSTEM

LEGEND

- SEWER DISTRICT BOUNDARY
- EXISTING WASTEWATER TREATMENT PLANTS
- EXISTING WASTEWATER TREATMENT LAGOONS
- EXISTING SANITARY SEWER LINES
- PROPOSED WASTEWATER TREATMENT PLANTS
- PROPOSED SANITARY SEWERS
- EXISTING DEVELOPMENTS WITH SEWERS
- A DEVELOPMENT AS NOTED ON TABLE 1

PLATE 2

Existing Development - 1977

Development in the area consists of nine residential locations which include single family home subdivisions, mobile home parks, and two apartment complexes. Some twenty randomly located residential units also are scattered throughout the area.

In 1977 the area had nearly 1,800 lots or mobile home pads of which 559 were built on with homes or occupied by mobile homes. All of this development was along Old Missouri Hwy.141 or Corisande Hills Road. (See Table 1 and Plate 2)

Over 40 percent of the undeveloped lots or mobile home pads in the area are located in Shangri-La Estates, Plats 2 and 4. (See Table 2.) In addition, another 387 lots in the flood plain area are undeveloped and are expected to remain that way due to flooding of the Meramec River. (See Area marked H on Plate 2.)

Population

A review of previous land use surveys and aerial mapping provided historical data for the area for the year 1967. This was fortunate, as it provided data 10 years prior to this study and therefore permits a meaningful comparison for population estimates 10 years hence, as is required by the Missouri Public Service Commission for studies of areas considering establishment of sewer service areas.

Population data has been shown along with information relating to the lots or mobile home pads available, as well as the number of those units occupied (See Table 1). This data was used to estimate populations for 1967, 1977 and 1987 as no official census information exists for the proposed boundaries of the sewer company.

A summary of that information shows the area to have grown from 587 persons in 1967 to 1,773 persons in 1977. This growth represents a 302 percent increase in that ten year period.

While the area has experienced a very sizeable growth in a short time period, there nevertheless are a substantial number of lots still available for future development.

Table 1
PROPOSED AREA'S DEVELOPMENT-1967, 1977, 1987*
Meramec Sewer Company

**	Name of Development	Type of Development	1967 No. of Lots Or Units	1967 Number Occupied	1967 Estimated Population	1977 No. of Lots Or Units	1977 Number Occupied	1977 Estimated Population	1987 No. of Lots Or Units(b)	1987 Number Occupied	1987 Estimated Population
A.	Shangri-La Est.-Plat 1	Mobile Home Park	(a)	-	-	151	151	453	151	151	453
A1	Shangri-La Est.-Plat 3	Single Family Subd.	(a)	-	-	66	0	0	66	66	244
A2	Shangri-La Est.-Plat 2	Mobile Home Park	(a)	-	-	326	53	159	326	326	978
A3	Shangri-La Est.-Plat 4	Single Family Subd.	(a)	-	-	0	0	0	450	400	1,480
B.	Kruse Apartments	Multiple Family	(a)	-	-	60	60	180	120	120	360
C.	Fenton Hills	Mobile Home Park	43	43	129	38	38	114	158	158	474
C1	McReynolds	Mobile Home Park	(a)	-	-	5	5	15	25	25	75
D.	Wheel House Manor	Mobile Home Park	1	1	4	43	43	129	79	79	237
	Gaslight Village Market	Commercial Market	(a)	-	-	1(c)	1	5	1(c)	1	5
E.	Corisan Apartments	Multiple Family	16	16	48	68	68	204	568	500	1,500
	Corisan Commercial	Laundry, Tavern, Rest.	(a)	-	-	3(c)	3	15	3(c)	3	15
F.	Hyde Away Park	Mobile Home Park	11	11	33	11	11	33	11	11	33
G.	Corisande Hills Subd.#2	Single Family Subd.	40	39	144	40	39	144	54	54	200
H.	Corisande Beach Subd.	Single Family & Rec.	417	30	111	417	30	111	417	30	111
I.	Sir Moss Estates area	Single Family Subd.	98	16	59	98	37	137	98	50	185
-	randomly located buildings	Single Family Bldgs.	16	16	59	20	20	74	30	30	111
			642	172	587	1,347	559	1,773	2,557	2,004	6,461

* 1967 - From Jefferson County Land Use Study by Harland Bartholomew and Associates

1977 - From field checks, aerial photos, maps.

1987 - Estimated. (Single Family 3.7 persons/dwelling unit, Apts. and mobile homes 3.0 persons/dwelling unit)

** Subdivision identification as shown on Plate 2.

(a) Not in existence in 1967

(b) Existing plus reported platting

(c) Commercial units

Table 2

POPULATION DATA*

Meramec Sewer Company

Year	No. of Lots Or Units	Lots or Units Occupied	Estimated Population	Ten Year Increase
1967	642	172	587	-
1977	1,347	559	1,773	302%
1987	2,557	2,004	6,461	364%

*Source (See Table 1):

1967 - From Jefferson County Land Use Study by Harland Bartholomew and Associates

1977 - From field investigations, aerial photos, maps.

1987 - Estimated, based on pending new development

Existing Utilities

All utilities are available to the area and are supplied by one public district, four private utility companies, and five subdivisions.

Water Supply. Water is distributed to the area by Public Water Supply District No. 3 and the St. Louis County Water Company (a private supplier). The public water district serves all of the area except a 500-foot wide strip along Old Missouri Hwy. 141, which is served by a 12-inch main of the St. Louis County Water Company. The public district has a large main along Corisande Hills Road.

Electric. The Union Electric Company (a private corporation) provides electrical service to the area with major service lines along Old Missouri Hwy. 141 with smaller lines extending into the various subdivisions and mobile home parks.

Natural Gas. Natural gas is available to the area from lines of the Laclede Gas Company (a private corporation). At the present time, this company has an eight-inch main along Old Missouri Hwy. 141 from Fenton southward to a point 500 feet southeast of Shangri-La Estates Drive.

Telephone. The area is served by the Southwestern Bell Telephone Company (a private corporation). Main cables are along Old Missouri Hwy. 141 with feeder service to the subdivisions and mobile home parks adjacent to this highway.

Sewer Systems and Wastewater Treatment. Six sewer systems and wastewater treatment facilities are presently in operation to serve the larger subdivisions and mobile home parks. These are all privately owned and operated for the benefit of individual subdivisions. Three of these systems are being operated over their design capacity, two are being operated at an estimated 75 percent of design capacity (this percentage may be higher due to commercial facilities also using these treatment facilities), and one (serving Shangri-La Estates) is being operated at 41 percent of its design capacity. (See Table [illegible]

With the exception of the treatment facility serving the Shangri-La/Kruse Apartments developments, it is doubtful if any of the other treatment facilities meet the current minimum treatment requirements of the State of Missouri (not less than secondary treatment producing an effluent not exceeding 30 mg/l of biochemical oxygen demand and 30 mg/l of suspended solids).

Table 3

EXISTING WASTEWATER TREATMENT FACILITIES*
Meramec Sewer Company Area

**	Development Served	Treatment Facility	Design Capacity (a)	Percent of Capacity Used
A-A3	Shangri-La	-Act. sludge plant	1,500 P.E.	41
B	Kruse Apartments			
C	Fenton Hills M.H.P.	-Two septic tanks followed by sand filter	98 P.E.	116
C-1	McReynolds M.H.P.	Septic Tanks	(b)	N.A.
D	Wheel House Manor M.H.P. Gaslight Village Mkt.	-Two cell lagoon	185 P.E.	75
E	Corisan Apts. and Corisan Commercial	-Primary sedimentation followed by single cell lagoon	308 P.E.	75
F	Hyde Away Park	-single cell lagoon	11 P.E.	300
G	Corisande Hills No.2	-single cell lagoon	135 P.E.	107
H	Corisande Beach Subdivision	-privies or septic tanks	(b)	N.A.
I	Sir Moss Estates area	septic tanks	(b)	N.A.
-	random located buildings	-privies or septic tanks	(b)	N.A.

*Source - Records of the Missouri Department of Natural Resources. Clean Water Commission, St. Louis Regional Office

**Subdivision identification as shown on Plate 2

(a) P.E. - Population equivalent

(b) Individual units for each house or mobile home

Projected Development

Areas of Potential Development

The topography of the area is expected to influence the location of development in the area of the proposed sewer company. The very flat portion of the eastern half of the area is subject to recurring flooding from the Meramec River and is not suitable for dwelling units. As a consequence, this land is expected to continue primarily in agricultural use.

The more hilly western half of the area contains virtually all of the present development, plus the various roads and utility services needed to meet growth needs. All of the projected growth is expected to occur in this half of the area, adjacent to present developments, mostly on the ridge tops. Little building is expected on the steeply sloping hillsides.

To estimate future growth and population, developers of the largest subdivisions and mobile home parks were contacted to determine planned construction. Briefly, the following construction is now planned for addition to present subdivisions.

Shangri-La Estates	450 Units
Kruse Apartments	60 Units
Fenton Hills	120 Units
McReynolds	20 Units
Wheel House Manor	35 Units
Corisan Apartments	500 Units
Corisande Hills Subdivision	14 Units

Population Estimate - 1987

The area is expected to continue the strong growth of the past ten years with an equally strong growth in the coming ten years. Based on reported subdivisions or mobile home parks planned to be built within the next few years, an estimated 760 lots or mobile home pads are expected to be added to the 1,797 now existing in the area. Even though only one third of the presently available sites are now being occupied, the number of sites available for occupancy indicates the large potential for development.

At the present time (1977) an estimated 1,238 sites are available for homes or mobile homes; however, 387 of these are in the Corisande Beach subdivision on the Meramec River flood plain and are not considered suitable for

conventional residential development. (See Plate 2 and Table 1.) Accordingly, reduction of these sites from the total available sites still leaves 851 suitable sites now ready for development.

The 851 presently available sites in combination with the 760 planned sites will make available 1,611 buildable locations. It is expected that 1,445 of these available sites will be built upon or occupied by mobile homes over the next ten years, raising the estimated population from 1,773 to 6,461. (See Table 1.)

The expected growth by 1987 represents a 364 percent increase over that existing in 1977, an increase only slightly larger than the 302 percent increase occurring in the previous ten years (1967-1977). (See Tables 1 and 2.)

Proposed Sewer System to Serve the Area

Wastewater Treatment Facilities

As noted in the section describing existing sewer systems and wastewater treatment facilities, no overall system exists to serve the area. In fact all, except one treatment facility are quite small and have no capacity to serve other than their immediate needs. The one exception is the activated sludge (extended aeration) treatment facility now serving Shangri-La Estates and the Kruse Apartments. (See Plate 2.)

This wastewater treatment facility is planned to be used as the single, centrally located treatment facility serving the Meramec Sewer Company service area. Topographically, it is located lower than nearly all of the areas now existing or planned for development, thus enabling gravity sewers to carry the area's sewage to this treatment plant.

Capacity-wise, only 41 percent of the plant's capacity is currently being used, leaving 59 percent available for use immediately. The plant has a secondary treatment system meeting current State discharge requirements, and a design capacity to serve 1,500 persons, an amount large enough to serve all (1,451) now residing in the developments presently connected to central sewer systems. (Developments designated A through G on Table 1. Development C1 is included in this table.)

It is anticipated that it will take approximately two to three years to complete formation of the sewer company, prepare plans and specifications for the trunk

sewer connecting the existing developments to the areawide plant, advertise and receive construction bids, construct the improvements, and receive the necessary State approvals for certain steps. State approvals are required from the Missouri Public Service Commission for the certification of the area to be served, and from the Missouri Department of Natural Resources, Division of Environmental Quality, for approval of plans and specifications and issuance of construction and operating permits. Thus, the now existing wastewater treatment plant located near the center of the sewer company area is large enough to provide for the next three years of operations.

As new building occurs as outlined in the section on "Projected Development," additional homes and mobile homes will locate in the service area and begin to contribute sewage to the areawide wastewater treatment plant. This could occur within the first three to five years of operation, but probably no sooner, due to the need to construct sewer lines and obtain approval to connect to the areawide treatment plant. At that time an enlargement of the treatment capacity will be required to accommodate the growing population.

Enlargement of the treatment plant is planned in two stages in order that sufficient flow and organic matter will be available so that not less than 50 percent of the plant's capacity will be in use in each stage. This is important so that the plant can be properly operated to produce an effluent meeting current State requirements (not less than secondary treatment producing an effluent not exceeding 30 mg/l of biochemical oxygen demand and 30 mg/l of suspended solids).

These stages would be as follows:

Existing Plant	- 1,500 P.E. design cap.
First Stage Expansion	- 1,500 P.E. design cap.
Second Stage Expansion	- 3,000 P.E. design cap.

Both expansion stages would add extended aeration treatment similar to the existing plant. (See Table 7.)

The need for the two expansion stages noted above may never arise pending construction of the St. Louis Metropolitan Sewer District "Meramec Trunk Sewer." Under the terms of the current NPDES* permit issued to the Shangri-La Estates, the presently permitted discharge is to be eliminated by tying into the Meramec Trunk Sewer when it is available. However, in recognition of the time required to plan, design, acquire easements, fund, obtain state and federal approvals, bid, contract,

*National Pollution Discharge Elimination System

and construct, it is considered appropriate to have contemplated the need for such expansion. This is particularly true when it is likely that these actions by the Metropolitan Sewer District will probably take from 8 to 10 years.

Existing Sewer Lines

At the present time, no overall sewer system exists in this area, however, six collection systems are in operation serving ten developments (See Tables 1 and 3 and Plate 2.). It is planned to include these collection systems in the overall sewer system serving the Company's service area. They will be transferred to the ownership of the Meramec Sewer Company at the time they connect to the areawide system.

The line extending from Shangri-La Estates and the Kruse Apartments (Areas A and B on Plate 2) now carries sewage from the northwest part of the service area to the site of the areawide plant. This line is included in the assets of the Meramec Sewer Company. The flattest gradient on this line is 0.60 percent which produces a flow sufficient to serve 2,385 persons(1).

Proposed Sewer Lines

A major trunk line is planned to extend service to the western half of the sewer company area. The eastern half is expected to remain in agricultural use due to the periodic flooding that occurs in that flat portion of the service area. The proposed trunk line extends fron the high point of the area near Old Missouri State Hwy. 141 (point 6 on Plate 2) southeastward and then northeastward, along the intermittent stream draining this hilly portion, to the site of the proposed areawide treatment plant (point 1 on Plate 2).

This trunk line is approximately 6,700 feet in length and has been sized to serve all of the present development (Areas C, D, E, F, G and I on Plate 1 and Table 2), their presently planned growth, and some reserve for adjacent development that may occur in the future. In fact, this reserve equals an unalloted 2946 P.E.

These six developments presently (1977) house 708 persons (population equivalent) and are projected to be expanded to 2,735 P.E. in the next five to ten years. The flattest gradient section of this line has the capa-

(1) Sized in accordance with Missouri Clean Water Commission requirements of 250 gallons/capacity/day peak flow for trunk sewers.

city to serve 6,750 P.E.[1] or 146 percent more than now known to be planned for development in these six subdivisions and 9.5 times greater than the present development.

This trunk line is planned as the first project of the new Sewer Company. Connection of the existing developments will be made subsequent to the construction of the trunk line by sub-trunk lines extending from the trunk line to each development. These sub-trunk lines would connect at points 2, 3, 4, 5 and 6 on the trunk line and would require lengths of 600 to 2,300 feet (see Plate 2).

Estimated Cost to Develop Proposed System

The cost to develop the collection system and treatment facilities that will comprise the major parts of the Meramec Sewer Company system include both existing and proposed facilities. These are:

Existing Sewers- (See Table 4)	$135,000
Proposed Trunk Line- (See Table 5)	184,000
Proposed Sub-Trunk Lines- (See Table 5)	116,000
Existing Treatment Plant - 1,500 P.E. (See Table 6)	320,000
Treatment Plant Expansion (1st stage) - 1,500 P.E. (See Table 7)	300,000
Treatment Plant Expansion (2nd stage) - 3,000 P.E. (See Table 7)	475,000
	$1,530,000*

As existing subdivision sewers are connected to the areawide system, those systems will be made a part of the facilities and assets of the Meramec Sewer Company. Estimates of the value of those facilities will be made at the time of connection to the areawide system.

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[1] Sized in accordance with Missouri Clean Water Commission requirements of 250 gallons/capacity/day peak flow for trunk sewers.

*All costs based on 1977 construction and equipment prices.

Table 4

ESTIMATED COST EXISTING SEWER SYSTEMS [a]
Meramec Sewer Company

Existing Systems - Now serving Shangri-La Estates and Kruse Apartments (See Table 1 and Plate 2.)

4,020 L.F. of 6" VCP @ $6.00/ L.F.	=	$ 24,120
4,240 L.F. of 8" VCP @ $7.00/ L.F.	=	29,680
28 Manholes @ $600 Each	=	16,800
Sub Total		70,600
Construction Contingency (+15%)		10,400
Construction Cost		$ 81,000
Technical Services [b]		$ 16,000
Easements (8,260' x 20')		$ 38,000
		$135,000

Future Systems to be Connected - Fenton Hills, McReynolds, Wheel House Manor, Corisan Apartments, Hyde Away Park, Corisande Hills #2 sewers. (Date of connections variable.)

Estimates of replacement costs will be made at the time of connection to the areawide sewer system.

[a] Costs include all material, labor, equipment and installation to construct the specified item.

[b] Technical Services includes surveys, legal fees, appraisals, soil borings, engineering design, and construction inspection.

Table 5

ESTIMATED COST PROPOSED SEWER LINES [a]
Meramec Sewer Company

Trunk Sewer (± 1979)*	
2,460 L.F. of 8" VCP @ $7.00/L.F.	$ 17,220
4,220 L.F. of 15" VCP @ $19.00/L.F.	80,180
23 Manholes @ $600 Each	13,800
Sub Total	$111,200
Construction Contingency (+15%)	16,800
Construction Cost	$128,000
Technical Services [b]	25,600
Easements (6680' x 20'w)	30,400
TOTAL - TRUNK SEWER*	$184,000
Sub-Trunk Sewers (± 1979)**	
6,800 L.F. of 8" VCP @ $7.00/L.F.	$ 47,600
23 Manholes @ $600 Each	13,800
Sub Total	$ 61,400
Construction Contingency (+15%)	9,600
Construction Cost	$ 71,000
Technical Services [b]	14,000
Easements (6800' x 20'w)	31,000
TOTAL - SUB-TRUNK SEWERS**	$116,000
TOTAL ALL PROPOSED SEWERS	$300,000

*From Point 1 to Point 6 on Sewer (See Plate 2)
** From numbered points to letter designated developments (See Plate 2)

[a] Costs include material, labor, equipment, and installation to construct the specified item.

[b] Technical services include surveys, legal fees, appraisals, soil borings, engineering design, and construction inspection.

Table 6

ESTIMATED COST EXISTING WASTEWATER[a]
TREATMENT FACILITIES

Meramec Sewer Company

Existing Plant - 1,500 P.E. "Secondary" treatment plant (extended aeration) now serving Shangri-La Estates and Kruse Apartments

Estimated Cost

Concrete Tanks - 260 cubic yards @ $320	=	$83,200
Site Preparation - 25,400 cubic yards @ $3.00	=	76,200[b]
Equipment - (blowers, skimmers, pumps, etc.)L.S.	=	48,000
Equipment Installation & Connection - L.S.	=	30,000
Electrical - L.S.	=	2,900
Fence - 6' chain link, 340 L.F. @ $8.00	=	2,700
Sub Total		243,000
Construction Contingency (+10%)		25,000
Construction Cost		268,000
Technical Services[c]		42,000
Site - 2 acres @ $5,000		10,000
TOTAL COST		$320,000

[a] Costs include all material, labor, equipment, and installation to construct the specified item.

[b] Actual cost to excavate, blast, load, haul, spread, and compact material for site preparation

[c] Technical Services includes surveys, legal fees, appraisals, soil borings, engineering design and construction inspection.

Table 7

ESTIMATED COST
WASTEWATER TREATMENT PLANT EXPANSIONS
Meramec Sewer Company

1st Stage Expansion - (± 1980)	The addition of 1,500 P.E. capacity of extended aeration treatment similar to the existing plant.
Estimated Construction Cost	= $ 300,000*
2nd Stage Expansion - (± 1983-1985)	The addition of 3,000 P.E. capacity of extended aeration treatment.
Estimated Construction Cost	= $ 475,000*

*Estimated construction cost based on analysis of similar sized plants, quotation from equipment suppliers, and the use of U.S.E.P.A. cost data. All costs based on 1977 construction and equipment prices.

FINANCIAL FEASIBILITY

This section of the report analyzes the financial feasibility of the proposed company. Specifically, it examines the financial methods available, the proposed rates and charges, estimates the number of customers, and summarizes the revenues and expenses expected to occur during the first three years of operation.

Missouri Clean Water Commission Review

The "Engineering Feasibility" portion of this study (the preceding pages) was submitted to the St. Louis Regional office of the Missouri Department of Natural Resources, Clean Water Commission by letter of December 12, 1977 and August 3, 1978 for their review in meeting sanitary and engineering requirements. That office responded by letter of August 10, 1978 approving the Engineering Feasibility portion of this report. (See Appendix A.)

Financial Plans

Sources of Funds

Funds to finance the proposed company in developing the unified facilities to serve the area are available from five sources as follows:

Company Purchase of the Existing Facilities - The purchase of existing sewer systems is expected to be made by partly issuing shares of stock in the Meramec Sewer Company and partly by use of borrowed funds equivalent to the market value of the facilities. Initially, this will include the wastewater treatment plant and sewers owned by Shangri-La Estates inasmuch as this plant will become the single, centrally located treatment plant serving the service area. (See Plate 2.)

Sale of Stock - To provide additional working capital, stock will be sold in the Meramec Sewer Company.

Contributions in Aid of Construction - As future developments connect to the "Sewer Company's" system, a contribution in aid of construction will be charged to finance or construct trunk lines or wastewater treatment plant expansion to serve the developments or properties to be serviced. This fee is paid as a function of the number of residential dwelling units

connected to the system or in the case of a commercial connection, as an equivalent number of dwelling units based on the volume and strength of the sewage in proportion to that of a standard single family dwelling unit.

User Charges - User charges serve to provide the Company with ongoing funds to meet the everyday expenses to maintain, operate and repair the treatment facilities and sewers. These changes are set at a level to cover all expense incurred in the operation, maintenance, and administration overhead of the Company's facilities and include a reserve for depreciation of equipment as well as a normal return on investment.

Borrowed Funds - Most private sewer companies finance construction and operation by sale of stock, contributions in aid of construction, and user service charges. However, during the initial development of the private sewer company, when cash flow is usually slow, it may be appropriate to borrow funds to construct certain facilities. An example of this could be the construction of the proposed trunk line serving developments not now connected to the activated sludge treatment facility to be used as the Sewer Company's treatment plant (see Plate 2).

Proposed Rates and Charges

The proposed rates and charges to customers in the service area of the Meramec Sewer Company are expected to encompass repayment of funds acquired by the five methods outlined in the preceding section entitled "Financial Plans." The expected dollar amounts and the rationale for their derivation is shown in the following.

Initial purchase of the existing sewer system and wastewater treatment plant of the Shangri-La Estates Park will be made by borrowing money and issuing stock to those owners who will become the major stockholders of the Meramec Sewer Company. These facilities are estimated to cost $455,000 (see Tables 4 and 6).

Following the initial organization of the corporate entity of the Sewer Company, steps will be undertaken to acquire additional funds for construction of the major trunk line southwestward and thence northwestward from

the existing wastewater treatment plant (from point 1 to point 6 on Plate 2). This trunk line is estimated to cost $184,000 (see Table 5). In addition, the sub-trunk lines will also be constructed from the trunk line to the several existing developments. Estimated cost of these sub-trunk sewers is $116,000 (see Table 5). These funds will be obtained by borrowing from local financial institutions and by commitment of other funds, equipment and personnel of the major stockholders, and by use of contributions in aid of construction.

Contributions in Aid of Construction

The amount of the contributions in aid of construction to be made by those connecting onto the system must be sufficient to finance and expand the system. This is estimated to total $600,000 based on the current costs for trunk and sub-trunk sewer lines and wastewater treatment plant expansion. This total is as follows:

Proposed trunk sewer (Table 5)	$184,000
Proposed sub-trunk sewers (Table 5)	116,000
First stage plant expansion (Table 7)	300,000
	$600,000

Immediate connections to the system are expected to include those 12 developments listed as A through I (excluding H) on Table 1, which total 786 lots or mobile home pads. This is expected to occur during the first three years of the Company's operation due to the presently inadequate and overloaded sewage treatment facilities serving many of the developments. In addition, the enforcement proceedings of the Missouri Clean Water Commission are expected to be a strong inducement for these developments to abandon such sewage treatment facilities and connect to the system.

Subsequent connections in years four through 10 are expected to include growth of presently projected subdivisions and mobile home development plus some additional development which will occur as a result of the availability of a central sewage collection and treatment system.

During this period, subdivision and mobile home growth is projected to add 1,158 units, plus additional generated development is estimated at nearly 20 percent of the known existing and projected development (approximately 356 units).

Total potential connections to the system are projected as follows:

First three years	-	786
Years 4 through 10	-	1,158
Other generated development, years 4-10	-	356
		2,300

Estimated Fee for Contributions in Aid of Construction (First Three Years)

The fee for contributions in aid of construction is determined by the costs to finance and expand the system divided by the number of units connected to that system. To calculate this fee for the initial years, the following costs were estimated:

$$\frac{\text{Development Costs}}{\text{Estimated Connectors}} = \frac{\$600,000}{786} = \$763/\text{connector}$$

To provide some hedge against unknown rapidity of development, fluctuating interest rates, the national economic picture, and other factors that could affect growth in this area, it is suggested that an $800 contribution in aid of construction by utilized.

No return of investment is included in this fee so as to avoid conflict with Internal Revenue Service definition of income.

User Service Charges

To provide for the annual costs to operate and maintain the sewers and sewage treatment facilities, it will be necessary to levy a user service charge against all units connected to the system. While recovery of the capital outlay (the "contribution" fee) is based on a predetermined number of units, the payment for operating and maintenance expenses will be for a varying total of costs and a varying number of customers each year. This will occur due to the several existing subdivisions and mobile home parks connecting to the system at different times as well as increasing operating and maintenance costs as the volumes of sewage grow.

The number or customers is estimated to vary from 286 connections the first year to 786 by the third year. During this same period, the annual operating and maintenance costs will grow from $48,048 to $103,752 (see Table 8).

Due to the variables involved in the costs and number of connected units, it is suggested that the user service charge for the first three years be set at $11.00 per dwelling unit per month. This charge represents a cost determined by totaling the estimated annual costs for the first three years divided by the total units expected to be connected to the system during this period.

Estimated Customers, Revenues and Expenses (1978, 1979, 1980)

The basis for deriving the "contribution" fees and user service charges are contingent upon estimates of the customers, revenues and expenses. These have been briefly enumerated in the preceding section. For purposes of Missouri Public Service Commission review these are set out in the following:

Estimated Customers

First Year (1978) - The existing developments noted as A, A1, A2 and B (see Table 1 and Plate 2) which are now connected to the Shangri-La Estates wastewater treatment plant; which will constitute the centrally located treatment plant for the Sewer Company, total 286 connections (see Tables 1 and 8). Due to the time considerations for sewer line approval and construction, only those now connected to the system are expected to be first year customers.

Second Year (1979) - During the second year, additional connections are expected to be made by construction of the trunk sewer, thereby permitting developments C, C1, D, E, F, G and I (see Table 1 and Plate 2) to connect to the system. In addition to these new developments connecting to the system, growth of development A2 has been added to the previous year's connection. This is estimated to produce a second year total of 553 connected lots, apartments or mobile home pads. (See Tables 1 and 8.)

Table 8

ESTIMATED USER SERVICE CHARGE

Meramec Sewer Company

Year	Connected Units			Annual Operation and Maintenance Costs[b]	User Service Charge[c][d]
	Identification[a]	Number	Accumulative Total		
1	A,A1,A2,B	286	286	$ 48,048	$ 14.00
2	A,A1,A2,B) C,C1,D, E) F,G,I)	267	553	$ 72,996	$ 11.00
3	A,A1,A2,A3) B,C,C1,D,) E,F,G,I)	233	786	$103,752	$ 11.00
		786	1,625	$224,706	$ 11.53[e]

Estimated average service charge for a combination of costs and connectors for the first three years is estimated as follows:

$$\frac{\text{Total Costs}}{\text{Total Connectors}} = \frac{\$224,796}{1,625 \times 12} = \$11.53/\text{connector/month}$$

[a] From Table 1

[b] Annual maintenance, electricity, reserve for depreciation, and return on investment (see Table 9)

[c] Per dwelling unit per month

[d] Annual O & M Costs ÷ connected units x 12

[e] Average rate for the three-year period

Third Year (1980) - Only one new development (A3) is expected to connect to the system during the third year; however, total connections are expected to increase as previously connected developments A1, A2, C, C1, D, E and G expand. (See Table 1 and Plate 2.) By the end of the third year, total connections are expected to reach 786 (see Tables 1 and 8).

Estimated Revenues

Based upon previously stated "contribution" fees and user service charge and the aforenoted estimates of customers for the first three years of operation, the following revenues have been estimated.

First Year

"Contribution" fees 286 @ $800/connection	=	$228,800
User service charge 286 x $11/mo. x 12 mo.	=	37,752
		$266,552

Second Year

"Contribution" fees 267 @ $800/connection	=	$213,600
User service charge 553 @ $11/mo. x 12 mo.	=	72,996
		$286,596

Third Year

"Contribution" fees 233 @ $800/connection	=	$186,400
User service charge 786 @ $11/mo. x 12 mo.	=	103,752
		$290,152

The total estimated revenues for the first three years from these two sources is $843,300. Of this total $224,796 will be used to pay for annual operating and maintenance costs and $618,504 will go toward payment of the capital development costs (see "Contributions in Aid of Construction" under the section entitled "Proposed Rates and Charges").

If all growth, expenses and revenues occur as are now estimated, this will provide a modest surplus of $18,504 at the end of the first three years. This is approximately 2.2 percent over total estimated expenses.

Estimated Expenses

Total expenses for the first three years were estimated based on current maintenance, operation and administrative costs for the Shangri-La Estates sewage treatment plant with adjustments as the system expands and volumes of sewage increase. Expenses were estimated at $48,048, $72,996 and $103,752 respectively for years 1, 2 and 3. (See Tables 8 and 9.)

Table 9

ESTIMATED ANNUAL EXPENSES
(First Three Years)

Meramec Sewer Company

Item	First Year	Second Year	Third Year
Annual maintenance[a]	$ 11,209	$ 15,000	$ 17,000
Electricity[b]	3,300	5,148	7,425
Admin. and Billing[c]	6,000	14,183	16,080
Depreciation - 3% rate[d]	3,489	4,640	8,697
"Above the line" total	$ 23,998	$ 38,971	$ 49,202
Return on investment on depreciable assets[e]	$ 11,630	$ 15,465	$ 28,990
Return on investment on non-depreciable assets[f]	12,420	18,560	25,560
ANNUAL EXPENSE	$ 48,048	$ 72,996	$103,752

[a] Based on current annual costs

[b] Current monthly electrical costs average $275/month

[c] First year estimated at $500/month

[d] First year - $116,300 (net after C.I.A.C.) x .03 = 3,489
Second year - 154,650 x .03 = 4,640
Third year - 289,900 x .03 = 8,697

[e] First year - $116,300 x .10 = $11,630
Second year - 154,650 x .10 = $15,465
Third year - 289,900 x .10 = $28,990

[f] First year - $124,200 x .10 = $12,420
Second year - 185,600 x .10 = $18,650
Third year - 255,600 x .10 = $25,560

APPENDIX A

2.000 Jefferson County
Meramec Sewer Company

August 10, 1978

Stanley Dolecki, P.E.
Harland, Bartholomew & Associates
7745 Carondelet
St. Louis, MO 63105

Dear Mr. Dolecki:

The revised engineering report dated August, 1978, for sewage works to serve the Meramec Sewer Company service area has been reviewed by the staff of the Department of Natural Resources. The report was examined as to sanitary features which may affect the operation of the works, including size, capacities of units and factors which may affect the efficiency and ease of operation. Approval of the engineering report, as regards these points, is hereby given.

Sincerely,

Bob Zeman

Bob Zeman
Environmental Engineer III
St. Louis Regional Office
Department of Natural Resources

BZ/bh

cc: Central Office Water Pollution Control Program
Public Service Commission
Meramec Sewer Company