

SEWAGE DISPOSAL PLAN

HISTORICAL PERSPECTIVE

In 1884, the City of Owensboro began construction of its first sewer system. This system was primarily a combination system (sewage and storm water) using brick and clay pipes. By 1929, growth and expansion required a major renovation to the system. The main sewer trunk lines constructed by 1931 make up the backbone of today's system. By 1955, subdivision expansions and new housing developments began to grow, thus even a greater need for a planned sewage disposal program was realized. Further construction of combined sewers with widespread development has yielded today's combined sewer system.

In 1976, an expansion of the West Sewage Treatment Plant located on Ewing Road was completed in an effort to upgrade the primary treatment facility to include secondary waste treatment and comply with all EPA regulations. Prior to this project, the City had operated a primary treatment plant constructed in 1956. The 1956 sewage system renovation involved construction of the primary treatment facility plus three major pump stations, force mains, and interceptor sewers.

In the late 1970s and early 1980s, Owensboro and Daviess County completed a *201 Facilities Plan* for the entire county, excluding the facilities planning boundary of Whitesville (*Whitesville 201 Facilities Plan* also completed in 1977). This document was a study to determine the community's needs and to provide for long-range planning for wastewater services. The plan was prepared in 1977, revised in 1982, and approved by the Kentucky Division of Water. A portion of the Plan was funded by a grant from the Environmental Protection Agency (EPA). The funding was used to construct the East Wastewater Treatment Plant, along with the pump stations and interceptor sewers necessary to convey flow from the south portion of Owensboro.

The East Wastewater Treatment Plant was constructed near the East Industrial Park and was completed in 1985. As part of the EPA grant, the Owensboro Sewer Commission extended service to the former Sanitation District #1, and incorporated its facilities into the existing Owensboro Sewer Commission's system.

In 1982 and 1983, the City of Whitesville constructed a wastewater treatment plant, and completed the construction of a sewage collection system. In the early 1980s, Consolidated Management Services, Inc. (CMS) consolidated several small, privately owned treatment facilities along the KY 54 Corridor into a single, more efficient system.

In an effort to regionalize wastewater services in the Owensboro and Daviess County area, the Kentucky Division of Water placed a moratorium on the creation and expansion of privately held wastewater facilities within Daviess County. This action resulted in the formation of Kentucky's first joint sewer agency, created under KRS 76.231. The Regional Water Resource Agency (RWRA) was established by identical enabling ordinances of the City of Owensboro and Daviess County Fiscal Court, and became operational in February 1995.

Since the formation of RWRA, an interceptor sewer and master pump station were constructed to provide sewer service to the KY 54 Corridor along Horse Fork Creek. This allowed for the

elimination of six privately owned treatment plants including the Consolidated Management Services, Inc. system.

In 1999, RWRA received approval for a \$27-million Capital Improvements Program, funded by the Kentucky Infrastructure Authority (KIA). This program includes the upgrade and expansion of the West Wastewater Treatment Plant, two (2) major pump stations within the downtown area of Owensboro, extension of wastewater services along the US 60 W and US 60 E corridors and within the Yellow Creek Basin. These projects have eliminated 18 privately held treatment facilities.

The expansion and extension of service into the Mid-America Industrial Park allowed for the elimination of the Millionaire package treatment plant. Projects in West Daviess County have eliminated two additional private treatment facilities (Gardenside and Holy Angels Elementary). The Riverside interceptor in the Highway 60 East corridor eliminated the Owensboro Municipal Utilities package treatment plant in 2005.

Since the creation of RWRA, a major portion of the original *201 Facilities Plan* has been completed or is currently in the process of being completed. Since its inception, RWRA has served as a model for regionalization for the Kentucky Division of Water.

INVENTORY OF EXISTING FACILITIES AND RESIDENTS SERVED

Facilities Within Owensboro's Corporate Limits & the Urban Service Area

Approximately 2,692,800 feet of wastewater conveyance lines lie within the Urban Service Area. This total includes:

- ◆ 1,082,400 feet of sanitary sewers
- ◆ 712,800 feet of combined sewers (storm & sanitary)
- ◆ 237,600 feet of force mains
- ◆ 660,000 feet of laterals within the public right of way

The Regional Water Resource Agency's (RWRA) service area has two wastewater treatment facilities. The East Treatment Plant is located just east of the US 60 Bypass off Pleasant Valley Road, while the Max N. Rhoads West Treatment Plant is located at the north end of Ewing Road along the Ohio River. According to David Hawes, RWRA Executive Director, gravity sewers provide service to all areas within the corporate limits of the City of Owensboro. Upon completion of the RWRA *1997 & 1999 Capital Improvements Program* in late 2000, gravity sewers will be available to most urban areas within the boundary of the 201 Facilities Planning Area with the exception of Philpot and Masonville. These sewers range in size from small collector sewers (8-inch diameter) up to large combined tunnel sewers (96-inch diameter). There are a total of 54 pump stations, which augment the gravity system; they are listed in Exhibit 672-T2. Exhibit 673-M1 illustrates the general locations of pump stations, force mains, trunk sewers and treatment plants.

Facilities within the Balance of the Urban Service Area

Presently there are 7 privately owned and operated wastewater treatment plants (or point source discharges) within the balance of the Urban Service Area. RWRA has eliminated 28 private package treatment plants since its inception in 1995. Only one of

the remaining plants treats residential wastes; all of the remaining treat sanitary wastes and/or production wastes from commercial and industrial sources. Plant sizes ranges from a low of 525 gallons per day, Lloyd's Mechanical, to a high of 11,000 gallons per day, W.R. Grace. Exhibit 672-T2 lists each private treatment facility, gallons per day discharge and the receiving stream. Exhibit 673-M1 illustrates the general location of existing treatment plant facilities and the areas they serve.

In accordance with environmental and regulatory objectives established by the Kentucky Division of Water, an objective of RWRA has been to cost-effectively reduce the number of small privately owned wastewater treatment plants, replacing them with interceptors or pump stations tied to the collection system of RWRA.

Those areas within the Urban Service Area balance not served by a private package treatment plant primarily rely on septic tanks for wastewater disposal. All new construction within these areas requires the health department's approval of onsite sanitary sewage disposal.

**Exhibit 672-T1:
Pump Stations of the Regional Water Resource Agency**

Name	Location	Capacity (GPM)
Locust Street *	501 W 1st St @ Exec. Inn	5,500
Horse Fork *	833 Higdon Rd	4,200
Warehouse Road#	2916 Warehouse Rd	3,750
Center Street *	100 Center St	2,180
Dublin Lane *	3 Dublin La	1,490
Towne Square	1035 Southtown Blvd	1,100
O'boro Comm. College	5300 Veach Rd	1,000
Barron Drive	2381 Barron Dr	980
College View	5061 New Hartford Rd	880
Yellow Creek	5700 KY 144	820
Ragu	Grimes Av @ Alsop La	760
Landsdowne	3994 Yewells Landing W	550
Riverport West	2341 Harbor Road	550
Eastview	6030 Ky 405	520
Mid America Air Park	2901 Tamarack Rd	500
Sorgho Elementary	1750 Passway Dr	500
Detention Center	3321 U. S. 60 East	450
Southwest Park	5184 Todd Bridge Rd	445
Lafayette	3606 Frederica St off Lafayette Dr	400
Lewis Lane	1821 Scherm Rd	380
Hidden Hills	3500 Miller Falls Circle	350
Wrights Acres	1417 Chandler Ave.	320
Glenmore	2020 US 60 E @ Alsop La	300
Veach Road	3061 Veach Rd	300
Worthington Road	1520 Worthington Road	300
Audubon School	374 Worthington Rd	275
Ridgewood *	515 Ridgewood Dr	250
Tennyson	145 Tennyson Dr	250
Thompson Drive	1730 Thompson Dr	250
Time Drive	600 Time Dr	250
Lamplite	335 Oak Dr	250
Woodland Ridge	2128 Northwood Dr.	240
Gardenside #2	5420 Sturgeon Av	230
Burnett Fork	5059 KY 54	224
Target	5325 Frederica St	200
Ben Hawes Park	5125 Medley Rd	180
Riverport East	Ewing Rd @ RWRA west treatment plant	175
Chickasaw	3622 Chickasaw Dr	160

Town & Country	406	Reid Road	120
Avondale	1061	Avondale Dr	100
HWY 81	2697	KY 81	88
Sorgho #2	5726	KY 56	80
Downs	3560	Calumet Trace	68
Eastgate	4333	Eastgate Dr	50
Gardenside #1	5355	Sturgeon Av	50
Summit #1	1405	Kingsbrooke	50
Normandy Heights	3655	Bordeaux Loop N	50
Woodlands	4148	Wood Trace	50
Summit #3	1720	Sterling Valley	50
Hunters Ridge	4820	Hunters Ridge	45
Steeplechase	3161	Settles Rd	45
Jack Fisher Park	3810	W 5th St Rd	36
English Park	101	Hanning Lane	28
Summit #2	6516	Waterford	25
Golf View	420	Golf View Circle	25
# 2 pumps			
* Master Pump Stations			

Source: Regional Water Resource Agency Records 7/3/2006

**Exhibit 672-T2:
Private Point Source Discharges Within Urban Service Area**

Discharge Source	Discharge (GPD) &	Receiving Stream
1 Field Packing Co.	Cooling water only	Ohio River
2 LaFarge Corp.	Cooling water only	Ohio River
3 Ohio Valley Forgings	4,000	Ohio River
4 Owensboro Grain	Cooling water only	Ohio River
5 Owensboro Riverport Authority	Sediment basin	Ohio River
6 OMU Elmer Smith Power Plant	Cooling water & Ash pond	Ohio River
7 Ridgecrest Trailer Pk	6,000	Yellow Crk
8 "W.R. Grace" site	11,000	Ohio River
& Extended aeration system unless otherwise noted.		
GPD Gallons per day		

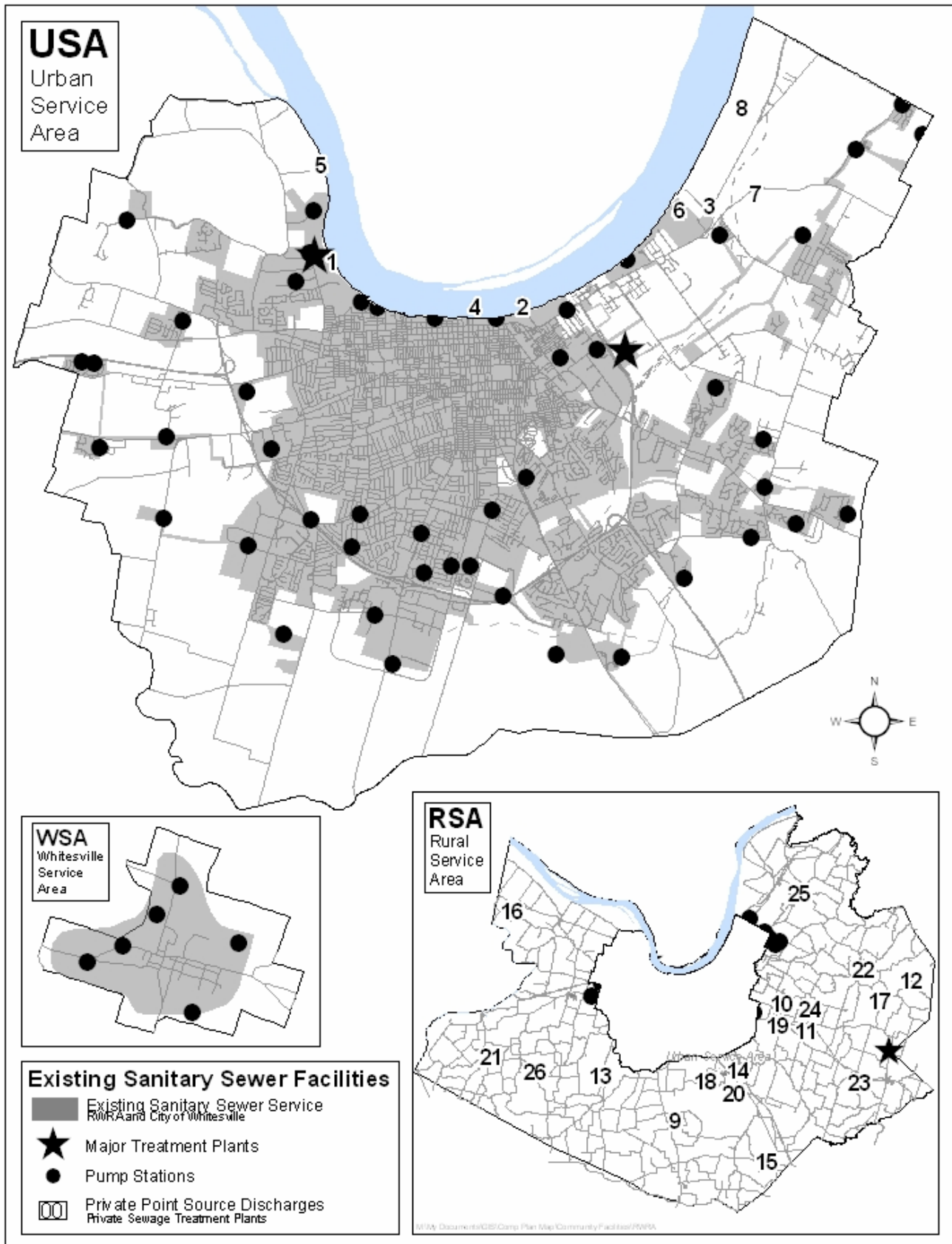
Source: Regional Water Resource Agency Records 6/23/2006

Facilities Within Whitesville's Corporate Limits

A sewage collection system was built in the City of Whitesville in 1982 and 1983 in conjunction with a treatment plant. Prior to the installation of this system, waste disposal was achieved by individual septic tank systems. The collection system comprises 6, 8 and 10-inch gravity sewers, one master pump station and 5 localized pump stations. Flow is collected at the master pump station which forces the wastewater to the treatment plant located on KY 764 on the north bank of the North Fork of Panther Creek.

The plant is an aerated lagoon type treatment system followed by filtration and chlorination. The plant capacity is 110,000 gallons per day. Exhibit 673-M1 illustrates the general location of existing force mains, pump stations and treatment facilities for Whitesville.

Exhibit 673-M1: Existing Sanitary Sewer Facilities



Facilities within the Balance of the Rural Service Area

Wastewater disposal in the RSA generally relies on septic tank systems. However, there are 18 private sewage treatment facilities located within the Rural Service Area. Nine of these plants treat residential or school wastes, while the remaining 9 plants treat sanitary wastes and/or production wastes from commercial or industrial sources. Exhibit 674-T1 lists each private treatment facility, gallons per day discharge, and the receiving stream. Exhibit 673-M1 illustrates the general locations of existing rural treatment plant facilities.

Exhibit 674-T1: Private Point Source Discharges within the Rural Service Area

Discharge Source	Discharge (GPD)	Receiving Stream
9 Browns Valley Mobile Park	5,000	Shoemaker Branch*
10 Cedar Hills Subdivision	47,000	Panther Creek*
11 Custom Fabrication	500	Panther Creek *
12 East Daviess County Landfill	N/A	Panther Creek*
13 Friendly Park Subdivision	32,000	Panther Creek
14 Garden Heights Subd.	52,000	Panther Creek *
15 Kentuckiana Girl Scout Camp	5,000	Barnett Creek*
16 Kimberly-Clark Corp.	N/A	Green River
17 Lanham Mining Company	N/A	Joes Run Creek
18 Owensboro Landfill	N/A	Panther Creek
19 Premium Allied Tool	223,000	Panther Creek*
20 Saratoga Mobile Park	5,000	Panther Creek
21 St. Joseph's Academy	15,000	Knoblick Creek*
22 St. Wm. Church/School	12,000	Joey Branch*
23 St. Joseph Monastery	6,000	Panther Creek
24 Sun Co. Inc, The Pantry	9,900	Caney Creek*
25 Trail-Away Mobile Park	10,000	Allgood Ditch
26 West Daviess County Landfill	N/A	Knoblick Creek*
GPD Gallons per day * Via unnamed tributary		
Note: Consecutive plant numbering continued from Exhibit 672-T2		

Source: Natural Resources & Environmental Protection Cabinet, Department for Environmental Protection, Division of Water Records (2/16/2000), RWRA records 6/2006

PAST PLANNING EFFORTS

In 1977, Johnson, Depp & Quisenberry Consulting Engineers prepared a *201 Facilities Plan* for the Owensboro Metropolitan Region, and a separate *201 Facilities Plan* for the City of Whitesville. The Kentucky Division of Water approved these plans. The purpose of these two plans was to develop a wastewater management strategy that would fulfill requirements of *Section 201 of the Federal Water Pollution Control Act Amendments of 1972*. The major objective of these plans was directed toward the efficient control of present and future wastewater demands on receiving streams, including the identification and evaluation of significant point source discharges.

In 1981, the OMPC produced the *Eastside Master Plan* to plan for rapid population growth that was anticipated to accompany the development of a synfuels industry in the region. Although that did not come to fruition, the mater plan included a wastewater disposal plan for the full development of the Eastside

area out to the boundaries of the Urban Service Area. The above-mentioned *201 Facilities Plan* included most of the Eastside area, but it was based on a much smaller population increase and developed area than were projected by the *Eastside Master Plan*.

In April 1996, Quest Engineers, Inc. prepared for RWRA a draft *201 Facilities Plan Update for Owensboro/ Daviess County*. The document was written to provide a cost-effective strategy for improving regional wastewater collection and treatment systems to satisfy the anticipated 20-year needs of the Regional Water Resource Agency's Planning Area.

In the early to mid 1990s, two segment analyses were completed for areas within the Eastside Master Plan. A segment analysis is a document that defines the general wastewater strategy for a specific area. A segment analysis was completed for the KY 54 Corridor and one was completed for the US 60 E Corridor, including the Yellow Creek Basin. The Kentucky Division of Water has approved the segment-analysis approach for extension of sewer services, as part of Daviess County's local regionalization efforts. As segment analysis are completed, they are submitted to the Kentucky Division of Water.

The current direction of the RWRA is based upon their *1997 & 1999 Capital Improvements Program*. This document contains 10 construction projects within the 201 Facilities Planning Boundary, and is based upon segment analyses prepared in the early to mid 1990s. Upon completion of these projects, sewer service will be available to a vast portion of the Urban Service Area.

The following text reviews the proposals and recommendations as set forth by these plans.

201 Facilities Plan for the Owensboro Metropolitan Region (1977)

This plan provides six alternatives for handling sewage waste disposal needs through 1995. An evaluation of these alternatives reveals that Alternative Six achieved the best overall results. Alternative Six would require the following implementation phases:

- ◆ Phase I would require construction of a new treatment plant on the eastern side of the City near the East Industrial park. The plant would initially treat a waste load capacity of 3.6 million gallons per day, consisting of a domestic/ industrial sewage mixture, and have the capability of being expanded to 6.8 million gallons per day in the future. This phase included the rerouting of south Owensboro sewage from the older combined system to the new eastern plant.
- ◆ Phase II would require construction of a master pump station at the site of the new plant. Trunk sewers would extend along Yellow Creek to the Greenbriar Subdivision. Interceptor sewers would serve areas along US 60 East, outside of the city limits.
- ◆ Phase III would require construction of a master pump station on Horse Fork Creek adjacent to the U. S. 60 Bypass. Trunk sewers would extend along Horse Fork Creek to Dermont and along the abandoned Illinois Central Railroad to Oak Ridge.

Exhibit 675-M1: Sanitary Sewer Facilities Plan

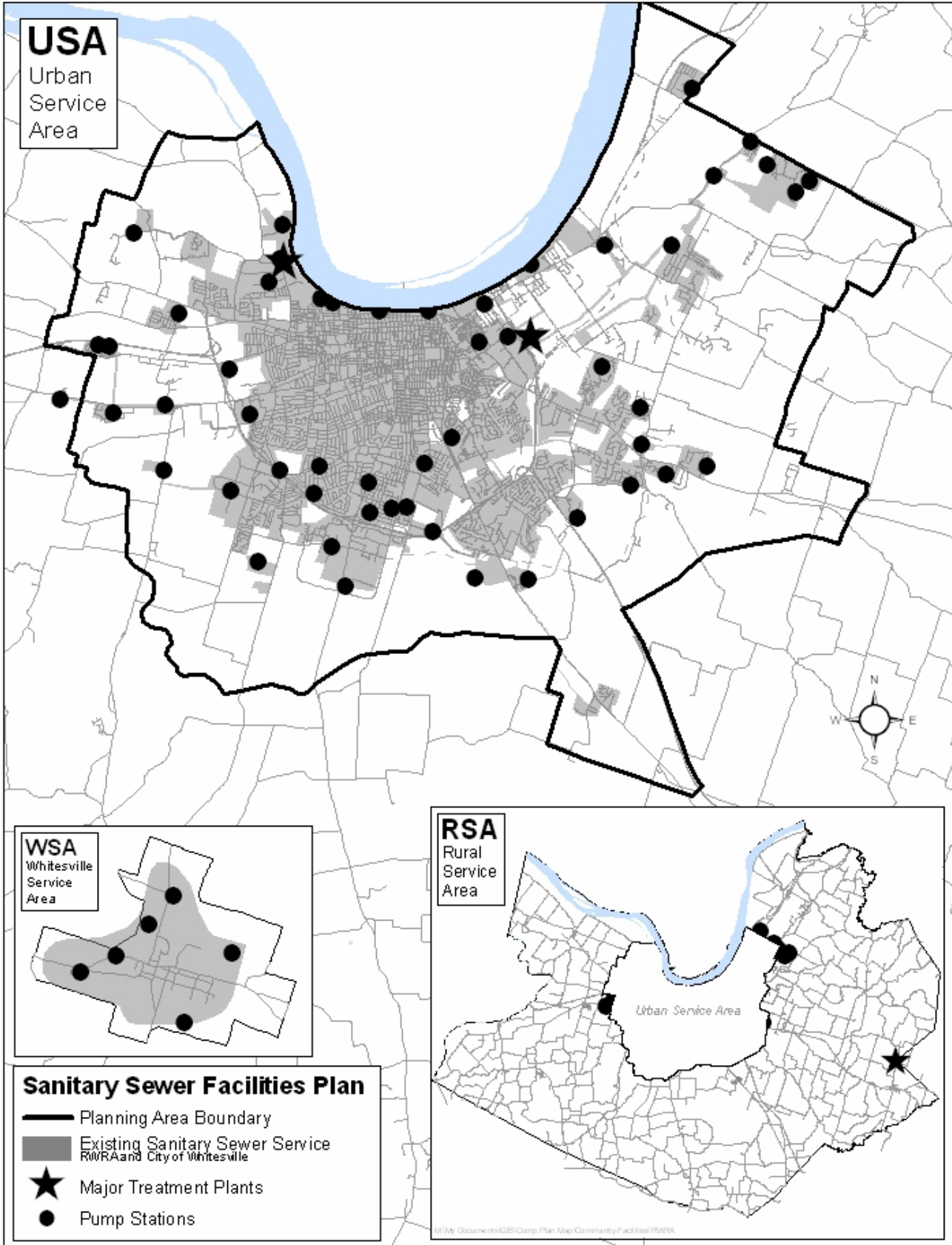


Exhibit 676-T1: Phased Costs for Implementation of the 201 Facilities Plan Update for Owensboro/Daviess County

Project	Total Project Capital Costs of Improvements *				
	1995-1997	1997-2002	2002-2007	2007-2012	2012-2017
KY 54 Corridor	\$8,499,240	\$268,630			
US 60 E Corridor		\$2,479,785	\$2,378,804		
US 60 W Corridor	\$563,909	\$3,477,076		\$133,410	\$139,049
KY 81 Corridor			\$212,224	\$903,084	
Philpot Area			\$1,872,667		
Masonville Area				\$1,620,419	
Yellow Creek Corridor		\$2,357,048	\$2,082,223		\$2,829,114
Central Owensboro Corridor	\$1,110,966				
East Wastewater Treatment Plant	\$4,784,598		\$9,006,900		
West Wastewater Treatment Plant		\$19,810,543			
Total Project Costs	\$14,958,713	\$28,393,082	\$15,552,818	\$2,656,913	\$2,829,114

* Figures in 1996 dollars

Source: 201 Facilities Plan Update for Owensboro/Daviess County

Completion of these first three phases would supply sewer services for the most populous regions of the urban area as well as provide service for the most rapidly growing urban areas around Owensboro. The next two phases of construction were for slowly developing areas and would not be needed in the near future.

Eastside Master Plan (1981)

The 201 Facilities Plan proposed a new East Owensboro sewage treatment plant with an ultimate capacity of 6.8MGD (million gallons per day) to supplement the City's existing 12 MGD plant in northwest Owensboro. The new plant was intended to serve existing unserved development, as well as anticipated new growth of 36,636 persons within a 20-year period. The *Eastside Master Plan* projected the fully developed Eastside would house an increase of 96,317 persons. At the time of study, 8,033 persons lived in the area. Therefore, it was apparent that additional sewage treatment capacity would be needed at the new plant, beyond the 6.8MGD proposed in the 201 Facilities Plan. The same consideration would apply to sewage lines and pump stations proposed by the plan. The *Eastside Master Plan* updated those proposals of the 201 Facilities Plan relating to the Eastside.

In order to serve a population of 104,350 persons when the Eastside is fully developed, the *Eastside Master Plan* estimated that the East Owensboro sewage treatment plant would have to be increased from 6.8 MGD to 13.5 MGD. This was based on a sewage flow of 100 gallons per capita per day, with certain peak factors added to determine future line sizes and other construction needs.

201 Facilities Plan Update for Owensboro/Daviess County (1996)

The objective of this plan update was to develop a cost-effective and environmentally sound strategy for expanding the wastewater collection and treatment system to accommodate existing needs and projected growth to the year 2017, in the following corridors of the 201 Facilities Planning Area:

- ◆ **KY 54 Corridor** – Construction of a gravity interceptor along Horse Fork with a pump station and force main transporting wastewater to the East Treatment Plant. The Countryside Treatment Plant would be replaced with a pump station pumping into the existing force main that goes to the Thorobred Pump Station. Other interceptors, pump stations,

and force mains would be constructed to provide service to the entire corridor.

- ◆ **US 60 E Corridor** – Phase A of the corridor improvements includes the construction of gravity sewers, pump station and force main, and an upgrade of the East Industrial Park Pump Station to serve areas along US 60 E. Phase B extends the gravity sewers to additional areas along US 60 E. Phase C is the construction of a gravity sewer to serve the Town and Country Mobile Home Park.
- ◆ **US 60 W Corridor** – Construction of a pump station located in the vicinity of US 60 W and Worthington Road with a force main terminating at the West Treatment Plant.
- ◆ **KY 81 Corridor** – Phase A of the improvements includes a pump station and force main to serve the Rome area. Phase B includes extending sewer service using gravity sewers along KY 81.
- ◆ **Philpot Area** – Construction of two pump stations with force mains and gravity sewers.
- ◆ **Masonville Area** – Construction of two pump stations with force mains and gravity sewers.
- ◆ **Yellow Creek Corridor** – Construction of four master pump stations located along Yellow Creek pumping into a common force main which extends from Yellow Creek at US 60 E to the East Treatment Plant. A series of gravity interceptors, pump stations, and force mains transmit flow to the master pump stations.
- ◆ **Central Owensboro Corridor** – Two projects: Construction of a new interceptor below the Thompson Drive Pump Station and an interceptor in the Veach Road area to divert flow from the combined sewer system.

In addition to these corridor improvements, upgrades to the East and West Wastewater Treatment Plants were proposed. Short-term improvements at the East Plant consisted of adding supplemental aeration capacity using surface aerators followed by new final clarification and sludge handling facilities. Long-term improvements for increasing the flow capacity of the plant to 10.2 million gallons per day (MGD) consisted of new preliminary treatment facilities, oxidation ditches, final clarifiers, and chlorination/dechlorination facilities. Improvements at the West Treatment Plant consisted of upgrading the capacity of the plant to 15 MGD using oxidation ditch technology.

The scope of this update included an evaluation of the existing environmental conditions, future land use and population; development and evaluation of wastewater system alternatives; selection of a cost-effective improvements plan; and development of an implementation schedule. Exhibit 677-T1 provides phased

costs for implementation of the *201 Facilities Plan Update for Owensboro/ Daviess County*.

RWRA's 1997 & 1999 Capital Improvements Program

In the mid 1990s, RWRA prepared a Segment Analysis for the KY 54 Corridor and the US 60 E Corridor that included the Yellow Creek Basin. To implement these plans, RWRA developed a \$37.6 million *1997 & 1999 Capital Improvements Program*, with \$27 million subsequently funded by the Kentucky Infrastructure Authority (KIA). As stated earlier in this report, the current direction of RWRA is based upon this program. The Program contains 10 construction projects within the 201 Facilities Planning Boundary. The projects include:

- ◆ **Eastside Wastewater Treatment Plant upgrade** – Expansion of the aeration of the oxidation ditches, which allows for better treatment of industrial waste. Two large external clarifiers are added to the treatment system.
- ◆ **Horse Fork Master Pump Station** – This station would replace the Horse Fork Intermediate Pump Station, which was included in the original 1985 EPA Grant Project. The Horse Fork Pump Station would be expanded to serve future needs of the Mid America Air Park and the upper and lower Horse Fork Basin.
- ◆ **Lower Horse Fork Interceptor Sewer** – Extension of this sewer from the Horse Fork Master Pump Station eastward to Brookhill Heritage Subdivision. This sewer would eliminate three pump stations along Horse Fork Creek.
- ◆ **Upper Horse Fork Interceptor Sewer** – Connection of this sewer to the Lower Horse Fork Interceptor, and extended eastward to Thorobred East and Old Mill Subdivisions. Construction of a pump station near the Countryside Subdivision, adjacent to Burnett Fork Creek. This project would allow for the connection and elimination of six privately owned treatment facilities within the KY 54 Corridor.
- ◆ **Max Rhoads West Treatment Plant upgrade** – Total renovation of the original 1956 and existing 1974 portions of the treatment plant, as well as construction of additional treatment capacity. When complete, the plant will treat an average daily flow of 15 million gallons per day (MGD), with a peak capacity of 35.7 MGD during a rain event. This project would improve RWRA's ability to treat additional combined sewage during rain events, and thus maximize treatment for CSO's.
- ◆ **Pump station renovations** – Renovation and upgrade of Owensboro's two largest downtown pump stations (Locust Street & Dublin Lane). These pump stations are connected to the tunnel sewers, and will convey the major portion of the combined sewage during a rain event. This project is also a part of RWRA's overall Combined Sewer Overflow (CSO) Abatement Program.
- ◆ **US 60 W Interceptor Sewer** – Replacement, upgrade, and extension of the Persimmon Ditch Interceptor Sewer. The project also includes the consolidation and elimination of three pump stations within the Persimmon Ditch Basin. This project will provide for future growth within the Persimmon Ditch area and US 60 W Corridor.
- ◆ **US 60 E Area-One Interceptor Sewer** – Extends sewer service to the north portion of US 60 E from Alsop Lane eastward to Pleasant Valley Road. This project also allows for the elimination of two package treatment facilities near Pleasant Valley Road, and elimination of the last known remaining "straight pipe" discharge within the metropolitan area of Daviess County.
- ◆ **US 60 E Area-Two & Area-Three Interceptor Sewers** – Extends sewer service to the remainder of the US 60 E Corridor, from the Wendell Ford Expressway eastward to KY

144. This project will allow for the elimination of seven private package treatment facilities.

- ◆ **Yellow Creek improvements** – Construction of five pump stations, and interceptor sewers, extending eastward from the Wendell Ford Expressway to Wrights Landing Road south of the US 60 E Corridor. This project will allow for elimination of nine package treatment facilities.

Five Year Capital Planning

During the 2002 fiscal year, RWRA adopted a program to proceed with "Five-Year Capital Planning". RWRA develops and upgrades the five-year capital plan each fiscal year and uses this Plan as a budget guideline. This Plan is also available to the public as a guidance document (this document is subject to change based on community needs, growth and/or funding) for future extensions. Additional projects are completed and planned as a result of this effort, several of which are listed below:

- ◆ **Thruston Area Sewers (CDBG#1)** – Construction of sewers within the Reynolds, Greenbriar, Thruston Heights, and Andy Thoma Subdivisions. This project provided sewer services to approximately 350 properties. These properties were previously served by septic tanks.
- ◆ **Health Department Detention Basin** – This project was completed in conjunction with the Green River Area Health Department to provide both surface and CSS detention of stormwater during rain events. This basin is located behind the Health Department at Breckenridge and 17th Streets.
- ◆ **Upper Yellow Creek Interceptor** – This phased interceptor project provides services to the Eagle Crest and Hayden Park Subdivisions. A portion of this project was completed in conjunction with the Daviess County School Board to provide service to the Meadow Lands Elementary School. Future extension of sewers within this area will provide service to the Foxchase, Covent Gardens and Chatham Lane areas.
- ◆ **Sorgho-Woodland Ridge** - RWRA worked in conjunction with the developer of the Woodland Ridge Subdivision to coordinate the installation of sewers in the subdivision and to design the system to provide eventual service to the Sorgho area.
- ◆ **Riverside Drive Interceptor** – This sewer installation was completed in conjunction with OMU in order to extend services to the OMU Elmer Smith Plant to eliminate the package treatment plant for the facility and to make sewer services available to the north Highway 60 East area in the future.
- ◆ **Highway 60 East area/Westerfield Drive (CDBG#2)** - This project is to provide the extension of sewer services to properties within the Maple Heights, Glenn Court and Brown Addition Subdivisions on Highway 60 East and the Westerfield Drive area which is near Highway 54. This project will make sewer service available to approximately 175 properties.
- ◆ **Center Street Pump Station and Force Main** – This project involves the upgrade and rehabilitation of the Center Street Pump Station and the construction of a 26"/30" force main that extends service directly from the Center Street Pump Station to the Max Rhoads Treatment Plant. This project also provides redundancy for the Locust Street Force Main that provides services to the entire CSS system. This project is a major component of RWRA's efforts related to CSO abatement through the maximization of flow from the CSS to treatment facilities.

Upon completion of these projects, RWRA will have extended sewer service to a vast portion of the area within the 201 Facilities Planning Boundary. The Sorgho Area extension provides service to a small portion of Daviess County outside of

the 201 Boundary in the Sorgho RCOM. Future 201 upgrades will include the Sorgho area as part of RWRA's service area boundary.

A total of 28 package treatment facilities have been eliminated, and numerous existing subdivisions will have been incorporated into the RWRA system as a result of these projects. The construction of these facilities will also allow for the availability of sewer service to additional unsewered areas within the planning boundary, as well as address many environmental concerns within the community.

Exhibit 678-T1 provides cost estimates and completion dates for implementation of the RWRA 1997 & 1999 Capital Improvements Program. This Exhibit also includes projects that are associated with RWRA's Five Year Capital Program. Exhibit 675-M1 maps the current status of sewer service area plans as of April 2000.

Exhibit 678-T1: Cost Estimates & Timetables for Implementation of the RWRA 1997 & 1999 Capital Improvements Program and Five-Year Capital Program

Project	Cost Estimate	Completion Date
Eastside Treatment Plant upgrade	\$3,800,000	Early 1998
Horse Fork Master Pump Station	\$2,700,000	Mid 1997
Lower Horse Fork Interceptor Sewer	\$2,800,000	Mid 1997
Upper Horse Fork Interceptor Sewer	\$1,400,000	Mid 1997
Max Rhoads West Treatment Plant upgrade	\$15,200,000	Early 2002
Pump stations renovations	\$1,700,000	Early 2001
US 60 W Interceptor Sewer	\$3,700,000	Late 2000
US 60 E Area One Interceptor Sewer	\$400,000	Late 2000
US 60 E Areas Two & Three Interceptor Sewers	\$2,200,000	Late 2000
Yellow Creek improvements	\$3,700,000	Late 2000
Thruston Area Sewers	\$1,600,000	2002
Health Department Detention Basin	\$200,000	2003
Sorgho-Woodland Ridge	\$200,000	2004
Riverside Drive Interceptor	\$250,000	2005
Highway 60 E/Westerfield	\$1,000,000	Late 2006
Center Street Pump Station and Force Main	\$8,000,000	Mid 2007
Total Project Costs	\$48,850,000	

Source: RWRA 1997 & 1999 Capital Improvements Program and RWRA Five-Year Capital Plan

201 Facilities Plan for Whitesville

The purpose of this wastewater treatment facilities study was to determine the most economically and environmentally effective course of action for the City of Whitesville to take regarding wastewater treatment. This study was required by the U. S. Environmental Protection Agency and was geared toward the identification and evaluation of available alternatives, which

would result in the design, and construction of the present sewerage system. Social data gathered for this study indicated the city to be experiencing a grave health hazard from septic tank wastes that were coming to the ground surface and flowing into ditches, therefore indicating a need for a public sewerage system.

The four alternatives evaluated within this study consisted of extended aeration, aerated lagoon, and overland flow and bio-surf systems. Cost, environmental impact, treatment capability and operational considerations were the points of evaluation. Based upon the evaluation, the aerated lagoon system was selected because it achieved the best overall results. This alternative required construction of a sanitary sewer collection system and an aerated lagoon type treatment facility at an estimated cost of \$975,265 (1975 dollars). Exhibit 673-M1 illustrates the general layout of the system as it was proposed.

COMPARISON OF EXISTING PLANS TO THE EXISTING SYSTEM

Phase I of the 201 Facilities Plan and the Eastside Master Plan have been implemented partially with the construction of the East Treatment Plant and several pump stations, force mains and trunk sewers. Since the inception of RWRA, a large portion of the remaining improvements contained in the original 201 Facilities Plan have been completed or are nearing completion. The projects contained in RWRA's 1997 & 1999 Capital Improvements Program have been completed as well as RWRA's progress toward completion of numerous projects contained in RWRA's Five-Year Capital Plan. With the completion of these projects, sewer service will be generally available to all areas within the 201 Facilities Planning Boundary, with the exception of Philpot and Masonville. Currently, RWRA is in discussion with a developer to coordinate the extension of services to the Masonville area. The plans for extension of service to the Philpot area by RWRA has not been determined at this time. It should be noted that although some minor expansion of sewer service has occurred within the 201 Facilities Planning Boundary that is inconsistent with the existing plans, the overall objectives of these plans are being met.

FUTURE NEEDS AND RECOMMENDATIONS

RWRA System

The East and Max Rhoads Plants have been expanded to allow for industrial, commercial, and residential growth within the community. The Rhoads Plant also has been designed to accommodate additional wet weather flow as part of RWRA's CSO abatement program. These two treatment plants are designed to be expandable to meet additional future needs.

The proposed Center Street Pump Station and Force Main Project allows for the conveyance of additional combined sewage to the Rhoads Plant thus, meeting the maximization of flow requirement under RWRA's CSO Program. RWRA has also had other CSO Program initiatives that remove sanitary wastewater from the combined system which improves water quality related to CSOs.

Sewer service is available to most areas within the 201 Facilities Planning Boundary; providing ample opportunity for urban development in the 201 boundary to avoid the need for onsite

sewage disposal (septic tanks) or private treatment systems (package plants). RWRA has also provided service availability in the Sorgho area which is currently outside the 201 Facilities Planning Boundary. As the 201 Facilities Plan is updated, the Sorgho area will be contained in such modifications.

Sewage disposal needs for areas outside the 201 Facilities Planning Boundary can best be met by onsite sewage disposal systems ranging from septic tanks to mini treatment plants. The Green River Area Health Department determines the type of system required after an onsite evaluation and review of building plans.

Local enabling ordinances empowered RWRA with countywide jurisdiction regarding wastewater facilities outside the 201 Facilities Planning Boundary, excluding Whitesville. This authority allows RWRA to coordinate and regulate wastewater activities, so that those activities are managed in a manner that will meet the overall future needs of the community.

The Owensboro Metropolitan Planning Commission and RWRA, along with the local legislative bodies, should develop policies governing future development and requirements related to the construction of sewers and connection to the RWRA wastewater system.

Whitesville System

The size of the Whitesville Treatment Plant should be adequate to meet the City of Whitesville's needs for many years unless there is a major change in growth patterns.