Wastewater Collection and Treatment System
201 Facility Plan Update

City of Augusta & City of Brooksville and Northern Bracken County

Bracken County, Kentucky

October 2005



BURGESS & NIPLE

Rec 10-11-2005

WASTEWATER COLLECTION AND TREATMENT SYSTEM

201 FACILITY PLAN UPDATE

Bracken Co Health Dept - most onsite systems work fine
failing ones get repaired
no large areas of failing systems that need
community or cluster system

303(d) - Snag Creek impaired for pathogens
- Locust creek impaired, unknown source
- Goose Creek impaired, unknown source

Can failing septics be cause/contributor to impairments?

October 2005

Alt 1 - 2 new/replacement WWTPs
Augusta - new site, same capacity
Brooksville - same site, same capacity
sewers - no new except infill & growth
no KY9 Ind Pk, no KY 1159, KY 19

Alt 2 - 1 new WWTP @ Augusta - new site, inc. capacity
sewers - new customers along Fim
KY9 Ind Pk, KY19
need regional sewer district

Alt 3 - 1 new WWTP @ Wellsburg - new site, inc capacity
sewers - new customers along Fim, KY 1159
no Ind Pk

BRACKEN COUNTY, KENTUCKY
FACILITIES PLAN UPDATE

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CHAPTER 1 – EXECUTIVE SUMMARY

A 201 Wastewater Facilities Plan Update was requested by the Kentucky Division of Water for the Cities of Augusta and Brooksville IN Bracken County, KY. The Cities decided to work together along with Bracken County to look into a regional wastewater facility to collect and treat the wastewater in the area. Augusta and Brooksville are the only communities in Bracken County to have wastewater collection and treatment facilities. Both systems are in poor condition due to their age, noncompliance with today's standards and type of treatment plant. Augusta's plant is 25 years old and Brooksville's plant is 35 years old. Both plants are steel structures constructed above grade.

The planning area being considered is the northern portion of Bracken County which drains to the Ohio River. Interviews with Bracken County Health Department gave no indication of significant problem areas within the planning area due to onsite treatment systems; therefore, the main concentration of this report is Augusta, Brooksville and the area along the route of the force main to be constructed between the two communities.

Two regional solutions were reviewed along with local facilities at each community. The location of the regional treatment facility alternatives were selected along the Ohio River, one at Augusta and one near Wellsburg, west of Augusta. Wastewater effluent discharge into the Ohio River require less treatment since the effluent discharge will be to a larger stream. It was determined that a treatment plant in Augusta with pump station in Brooksville and a force main from Brooksville to Augusta along the State Route 19 was the most cost effective solution.

After the selection of the regional treatment plant location, three alternative treatment plant process were investigated. The recommended alternative is a single stage activated sludge plant with biological nitrogen removal. This plant includes grit removal, mechanical bar screen, (2) aeration tanks, (2) final clarifiers, return and waste sludge pumps, ultraviolet light disinfection, cascade aerator, sludge digester/ holding tank and control building. Sludge removal is by contract hauling to a larger plant with dewatering facilities. The estimated project cost for this treatment system is $7,800,000 with an annual O&M&R cost of $244,200 per year.

Various ratios of loan to grant amounts are presented to finance the recommended improvements. The resulting average monthly cost per typical residential user of 6000 gallons per month would range from $74.28 without grant participation to $32.16 with 80% grant participation.

It is recommended that the plan be approved and submitted to Kentucky Division of Water for review. During the time the plan is being reviewed by Division of Water, the Augusta and Brooksville should begin the process of exploring funding options and applying for grants to reduce the cost to the users.

As part of the facilities planning, a Sanitary Sewer Evaluation Survey (SSES) was completed. The collection system was found to receive 6 times the normal dry weather flow during rain events due to excessive inflow and infiltration (I&I). As part of the SSES, several deficiencies were discovered which require corrections. Most of the corrections were on private property and should be corrected by the property owners. Only 20 to 25% of the increase in flow could be accounted for by the found problems; therefore, additional investigation is required.

It is recommended the following collection system improvements be completed:

- Send out notices to property owners with known storm connections to sanitary sewer with a requirement for correction;
- Repair storm connections on City owned property;
- Develop a plan for finding additional storm connections;
- Increase user fee to pay for correction work and additional investigation work including internal TV inspection of sewer.

CHAPTER 2 – INTRODUCTION

2.1 Purpose

The planning area encompasses northern Bracken County, but the main focus of this report is the provision of reliable wastewater treatment and environmentally safe disposal of wastewater generated in the towns of Augusta and Brooksville. While doing this, if economically feasible, capacity should be provided to collect rural residential development wastewater and any new commercial, industrial, and residential wastewater for new development along KY 9, a recently constructed highway linking Ashland, Kentucky to the Northern Kentucky/Cincinnati Metropolitan Area.

The wastewater treatment plants in Augusta and Brooksville, although performing well, are in poor condition. This is due to their age (Augusta's plant is 25 years old and Brooksville's plant is 35 years old). Being of all metallic construction, they have reached the end of their useful lives. Also, these plants do not meet current design standards and regulations. For instance, single unit processes are provided and current standards require duplicate unit processes.

The basic purpose of this report is to determine how best to replace these two wastewater treatment plants. Should both treatment plants be replaced with new ones, or should one plant be constructed to treat the wastewater from the two towns at one location? Could other areas of the planning area be included in the design capacity of the new plant? Where should be plant be located?

After the number and location of the plant(s) is determined, the possible types of treatment plants to be constructed will be evaluated and the best one recommended. This will include consideration for cost effectiveness, environmental and other benefits.

Although the Bracken County Comprehensive Plan reports that the Kentucky State Data Center expects Bracken County to increase in population by only 1.6% to the year 2020, the current reality is that Bracken County's total estimated population growth from 1990 to 1999 was 9.2%. This is occurring because the County is close to the Cincinnati/Northern Kentucky Metropolitan Area and the new KY 9 makes the County more accessible for residential, commercial, and industrial development. Therefore, one purpose of this report is to propose wastewater collection and treatment facilities that could accept flow from such new development, treat it and dispose of it in an environmentally responsible manner.

The major part of the planning area is rural and quite hilly. Roads generally follow ridge tops and narrow valleys. There is dispersed residential housing along the roads. The greater concentration of housing is just northwest of Brooksville and along KY 19 from Brooksville to Augusta. The density is low and subsequent wastewater disposal problems, therefore, not serious. Where possible, capacity for these existing homes plus future new ones will be anticipated for a regional solution.

This report will determine whether it is beneficial to regionalize wastewater treatment for Brooksville and Augusta. It also will estimate the financial needs to accomplish this.

2.2. Background

Bracken County was founded in 1796. Augusta, located on the south bank of the Ohio River, was the original county seat. In 1839, the county seat was moved to Brooksville, which has continued as the county seat until today. The County is very much rural in character, as evidenced by its year 2000 population of 8,279 and a population density of 40.7 people per square mile.

The City of Brooksville had a population of 589 in the year 2000, which is less than its historic high of 980 in the year 1980. The City of Augusta has a population of 1,204 in the year 2000, which is less than its recent historic high of 1,455 in 1980. While this city population decrease is happening, the population of the county is rising modestly (7,738 in 1980 to 8,279 in 2000). Therefore, the existing wastewater systems of the two communities have a smaller customer base now as compared to when the treatment plants were constructed. Also, the number of rural on-lot systems has increased, and since soils are not very permeable, overall wastewater pollution of surface water should have increased. It is desirable to address both of these problems by enlarging the total service area.

At this time, Brooksville's wastewater treatment plant disposes effluent to a small tributary of Locust Creek and Augusta disposes treated wastewater to the Ohio River. Disposal of treated wastewater to the Ohio River is less damaging, environmentally, because of the large continual flow of this river.

2.3 Scope

This report recommends a strategy to best collect wastewater in the planning area and how to best treat it and dispose of it. The scope is basically as follows:

1. Description of existing treatment plants and conditions.

2. Tabulation of influent flows and loads of the Brooksville and Augusta Wastewater Treatment Plants.

3. Project future population to be served by the sewer systems.

4. Develop regional alternatives to transport and treat wastewater and recommend the best solution.

5. For the best regional solution, develop and compare wastewater treatment alternatives and recommend the best solution.

6. Description of the recommended project.

7. Estimate of financial needs of the recommended project.

8. Develop an implementation scheme.

CHAPTER 3 – PLANNING AREA

3.1 Description

The planning area is located in northern Bracken County and is shown in Exhibit 3-1. The northern boundary is the Ohio River. The southern boundary is generally the ridgeline and geographic divide of the natural surface drainage to the Ohio River, which generally runs along State Route 10 through the center of the County. The planning area is mostly rural and is hilly with generally narrow valleys and ridge lines. The largest stream in the area is Locust Creek, which generally runs east to west and discharges into the Ohio River 5 miles west of Augusta.

Two cities are in the planning area. Augusta is located on the south shore of the Ohio River. The town is an older picturesque Ohio River town with a year 2000 census population is 1,204. Brooksville, the county seat, is located on a ridge top in the south central part of the planning area. The year 2000 census population is 589. These two cities provide the only central sanitary sewer systems in the planning area.

The area is well served by a road network. The major highway in the planning area is KY 9. It is a high speed highway connecting northern Kentucky and Ashland, Kentucky and Interstate 64 in eastern Kentucky. KY 19 has recently been improved and it connects Augusta and Brooksville. KY 8, along with the CSX railroad, parallel the Ohio River. There are no bridges over the Ohio River in the planning area. A car ferry service to and from Ohio is located in Augusta.

It is a goal of the County to attract economic development with higher paying jobs. The best location for this is along KY 9, as it is the best transportation route through the county. As a matter of fact, to attract such development, an industrial park has been laid out on the north side of KY 9 in the eastern part of the planning area.

The planning area mostly consists of beautiful ridges and valleys. The sides of the hills are wooded, the valley plains and ridge tops are generally pasture or crop land. This appealing environment is most worthwhile to preserve.

3.2 Local Entities

The local entities include the following:

- Bracken County, including the Bracken County Planning Commission.
- City of Augusta, which also operates a municipal sanitary sewer district.
- City of Brooksville, which also operates a municipal sanitary sewer district.
- Buffalo Trace Area Development District, which aids communities in Bracken County and other nearby counties in obtaining funds for local community projects.



Location Map

NORTH BRACKEN COUNTY PLANNING AREA
FACILITIES PLAN UPDATE
CITIES OF AUGUSTA & BROOKSVILLE



Legend

Functional Classification

- Rural Interstate
- Rural Principal Arterial
- Rural Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- State-maintained Local
- Urban Interstate
- Urban Freeways & Expressways
- Urban Principal Arterial
- Urban Minor Arterial Street
- Urban Collector Street
- Urban Local
- CS-0000 Functionally Classified Road No.

Other Features

- Rivers, Streams or Creeks
- Railroad
- Bridge
- City/Town
- Incorporated Area Boundary
- FHWA Federal - Aid Urban Area
- Lake
- Planning Area Boundary

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EXHIBIT 3-1

NORTH BRACKEN COUNTY PLANNING AREA
FACILITIES PLAN UPDATE
CITIES OF AUGUSTA & BROOKSVILLE

3.3 Planning Area Characteristics

The natural features of the planning area were gathered from information obtained from the Bracken County Comprehensive Plan which was developed in 2003. The "Natural Features and Historic Sites" portion of the plan are attached in Appendix A. A summary of characteristics is provided below.

A few designated wetlands were found to be located in the planning area along the Ohio River. These wetlands are associated with ponding areas as a result of high water during flooding of the river. Other minor wetland areas may be present along tributary streams that are undesignated since the back waters of the river may extend up the stream beds and flood plains causing wetland areas. These wetland areas would be susceptible to river flooding therefore no construction is anticipated for these areas.

The 100 year flood plan areas within the planning area are generally along the Ohio River and lower elevation tributary streams to the river. The north portion of Augusta (north of the railroad tracks) is within the 100 year flood plain. The flood plain map is shown in appendix A as part of the Comprehensive Plan.

The topography of the planning area is generally hilly with narrow ridges and steep slopes to thin stream bed plains. A portion of the northeast and central portions of the planning area is comprised of slightly wider ridge tops with steep slopes to thin stream bed plains. There is a 450 feet elevation difference between the south portions of the planning area to the north portions. Ground elevations at the geographic divide in the southern portion of the planning area near Brooksville reach elevations around 950 and elevations to the north near the Ohio River in Augusta are 505.

Groundwater in the planning area is most prevalent along the Ohio River flood plain area. The water wells supplying the county water system are in this aquifer near Augusta. Generally to the south in the planning area, soil is covering limestone bedrock preventing a collection of ground water. The planning area generally slopes to the north and surface waters drain steeply to the Ohio River. Streams with steep slopes collect surface water and transport it to the Ohio River.

Soils in the planning area are generally three types, Wheeling-Nolin-Otwell, Lowell-Nicholson and Eden. The Wheeling-Nolin-Otwell soils are deep, very level, well drained and have loamy subsoils. This soil type is located adjacent to the Ohio River on the north side of the planning area. Lowell-Nicholson soils are deep to very deep, gently sloping to moderately steep, well to moderately drained with clayey or

loamy subsoils located on ridge tops and upper side slopes. The Lowell-Nicholson soils are located on ridge tops and upper side slopes. The Eden soils are moderately deep, sloping to very steep, well to moderately drained with clayey subsoils found on ridge tops and side slopes. The Eden soil is the most prevalent soil type in the planning area. Depending on the thickness of the soil and underlying subsoils on-site sewage disposal systems can and are being used to treat sanitary waste from individual homes which are outside the reach of the Augusta and Brooksville collection systems. If percolation tests show soils will be adequate for discharge of wastewater from septic tanks then leaching chambers are being used in Bracken County. If percolation tests show soils will be inadequate for discharge due to inability to percolate to subsoils either a residential package extended aeration treatment plants are used or additional soil is imported with good percolation rates and leaching chambers are used. These are the common methods used in Bracken County for small individual treatment systems.

CHAPTER 4 – EXISTING REGIONAL FACILITIES

4.1 Overview

The purpose of this chapter is to inventory the planning area's wastewater collection, treatment, and disposal facilities. The performance and condition of these facilities will be discussed along with the ability to continue to use the facilities in the future.

4.2 City of Augusta

4.2.1 Wastewater Treatment Plant

4.2.1.1 Description

The wastewater treatment plant is located on the west side of Augusta on a one acre lot. The wastewater is pumped to the plant by means of a wetwell/drywell canned pump station located at the intersection of Ferry Street and Augusta-Berlin Pike. The treatment plant is designed for an average wastewater flow of 330,000 gpd. Treated effluent is discharged to the Ohio River via a ten inch diameter outfall line.

The plant basically consists of one round package type plant, constructed above grade for the purpose of flood protection from the Ohio River. The package plant includes a raw wastewater screen and comminuter, an originally designed contact stabilization activated sludge aeration tank, final clarifier, effluent chlorination and dechlorination, effluent flow measurement, and aerobic digester. Two sand type sludge drying beds are also provided on the site. Basic design criteria is shown in Table 4-1.

One basic reason the plant does not meet current Kentucky regulatory requirements is that only one process train is provided and two are now required.

TABLE 4-1

City of Augusta
Existing Wastewater Treatment Plant
Basic Design Criteria

Item	Design Value
Flow	
Average	330,000 gpd
Peak Hourly (same as Influent Pump Station Capacity)	720,000 gpd
Influent Pump Station	
Type	Wetwell/Can Drywell
Number of Pumps	2
Type	Horizontal Centrifugal
Capacity, each	500 gpm
, firm	500 gpm
Or	720,000 gpd
Aeration Tank	
Inner Diameter	33' 3-1/2"
Outer Diameter	77' 0"
Quadrant	242° 30"
Sidewater Depth	15 feet
Volume	38,250 cubic feet
	286,000 gallons
Nominal Detention Time	
Average Design Flow	20.8 hours
Final Clarifier	
Number	1
Diameter	33' 3"
Sidewater Depth	12' 4"
Area	868 square feet
Surface Overflow Rate	
Flow	380 gpd/sq. ft.
Peak Hourly Flow	829 gpd/sq. ft.
Chlorine Contact Tank	
Inner Diameter	33' 3-1/2"
Outer Diameter	77' 0"
Quadrant	9°
Sidewater Depth	12.75 feet
Volume	1,207 cubic feet
	9,020 gallons
Nominal Detention Time	
Average Flow	39 minutes
Peak Hourly Flow	18 minutes
Aerobic Digester	

Inner Radius	33' 3-1/2"
Outer Radius	77' 0"
Quadrant	108° 30"
Sidewater Depth	15 feet
Volume	17,115 cubic feet
	128,000 gallons
Sludge Drying Beds	
Type	Sand
Number	2
Dimensions, each	
Length	100 feet
Width	30 feet
Area	
Each	3,000 square feet
Total	6,000 square feet

4.2.1.2 Physical Condition

Overall, the physical condition of the influent pump station and treatment plant is poor due to age and use.

Influent Pump Station. The condition of this pump station is poor, due to age and corrosion. The type of drywell provided, having only a narrow manhole type access, is a safety concern. Since the station is shut, and even provided sealing against flooding, moisture builds up and increased corrosion occurs. The station capacity is also not sufficient to pump peak hourly flow rates. Since the station is in poor condition and is a safety concern, it should be replaced. A new submersible type pump station would both greatly reduce the rate of corrosion and the safety concern.

The package treatment plant, being 25 years old, and constructed of steel, is in poor condition. One of its walls has even suffered a structural failure. This plant should be replaced with a new system. The blowers are located in an elevated building attached to the package plant. The blowers need replaced due to age. The building is functional in keeping equipment out of the weather and minimizing noise to the neighborhood from the blowers. However, the building is not of much monetary value and does not need to be retained.

4.2.1.3 Hydraulic and Organic Design Capacity

Table 4-2 shows the hydraulic and organic capacity of Augusta's wastewater treatment plant. The average flow was determined from the KPDES permit. The peak hourly flow matches the firm capacity of the influent pump station. The pollutant concentrations shown are for typical strength domestic wastewater. The masses are computed from the average flow and concentration.

TABLE 4 – 2

CITY OF AUGUSTA
Wastewater Treatment Plant
Hydraulic and Organic Design Capacity

Parameter	Design Value
Flow	
Average	330,000 gpd
Peak Hourly	720,000 gpd
Biochemical Oxygen Demand (BOD_5)	
Concentration	200 mg/l
Mass	550 lbs./day
Total Suspended Solids (TSS)	
Concentration	220 mg/l
Mass	605 lbs./day
Ammonia N	
Concentration	25 mg/l
Mass	68.8 lbs./day

4.2.1.4 Existing Flows and Loads

Influent flow and pollutant load data was tabulated for the period of January 2003 to October 2004. This information is shown in Table 4-3. In considering the two parameters of concentration and mass, the mass parameter is of primary concern. The data generally indicates the plant operates significantly less than its design capacity. Overall, it's running at about 50% or less of its design capacity. The maximum month flow is slightly over the 90% value of average design flow. This value was caused by Ohio River flooding and is considered non-typical.

TABLE 4-3

CITY OF AUGUSTA
Influent Flows and Pollutant Loads
(January 2003 to October 2004

Parameter	Data	Design Value	Percent of Design
Flow		0.330 mgd	
Annual Average	0.148 mgd		44.8%
Maximum Monthly Value	0.310 mgd		93.9%
Peak Daily	0.897 mgd	0.720 mgd	125%
BOD_5 Concentration		200 mg/l	
Annual Average	134 mg/l		
Maximum Month	254 mg/l		
BOD_5 Mass		550 lbs./day	
Annual Average	163 lbs./day		29.6%
Maximum Month	327 lbs./day		59.5%
TSS Concentration		220 mg/l	
Annual Average	132 mg/l		
Maximum Month	283 mg/l		
TSS Mass		605 lbs./day	
Annual Average	162 lbs./day		26.8%
Maximum Month	382 lbs./day		63.1%
Ammonia Concentration		25 mg/l	
Annual Average	17.2 mg/l		
Maximum Month	25.5 mg/l		
Ammonia Mass		68.8 lbs./day	
Annual Average	20.4 lbs./day		29.7%
Maximum Month	37.2 lbs./day		54.1%

4.2.1.5 Kentucky Discharge Elimination System Permit Limits

The Commonwealth of Kentucky issues Kentucky Pollutant Discharge Elimination System (KPDES) permits. Each permit limits the amount of pollutants that a wastewater treatment plant may discharge to a particular stream. The amount of pollutants that can be discharged to a waterway depends on the waterway's designated use and its low stream flow condition.

The Augusta, Kentucky WWTP discharges to the Ohio River. Since this river is so large as compared to Augusta's wastewater flow, secondary level permit limitations are provided in the permit (Permit No. KY0021261). These are shown in Table 4-4.

TABLE 4-4

CITY OF AUGUSTA WWTP
EXISTING NPDES PERMIT LIMITS

PARAMETER	MONTHLY LIMITS		WEEKLY LIMITS		DAILY LIMITS
	Concentration	Mass	Concentration	Mass	
Total Suspended Solids	30 mg/l	82.6 lbs./day	45 mg/l	124 lbs./day	
BOD_5	30 mg/l	82.6 lbs./day	45 mg/l	124 lbs./day	
Ammonia N	20 mg/l	55.0 lbs./day	30 mg/l	82.5 lbs./day	
Chlorine	0.019 mg/l		0.019 mg/l		0.019 mg/l
Dissolved Oxygen	-	-	-	-	$\geq$2.0 mg/l
Fecal Coliform	200/100 ml	-	400/100 ml	-	-
pH					
Minimum					6.0
Maximum					9.0

4.2.1.6 Wastewater Treatment Plant Performance

4.2.1.6.1 Process Flow

The plant data was tabulated and the results are summarized in Table 4-5. Generally the plant performed significantly better than required by its KPDES permit. The major exception occurred in November 2003, when the final clarifier could not contain the mixed liquor sent to it. The values of TSS and BOD_5 were so high, it caused the average data for the period to show non compliance, although this was a single event. The second column shows the data with the November 2003 data included. The third column shows the data with the November 2003 data excluded. Overall, this column shows fine performance.

The plant had one other compliance difficulty, and that was with chlorine. Chlorine is added to kill fecal coliform and other bacteria in the plant effluent. It is then removed from the effluent with sulfur dioxide, as chlorine is also toxic to aquatic life. Evidently, enough sulfur dioxide was not always applied to remove the chlorine. An increase in feed rate should correct this occasional marginal violation.

TABLE 4-5

CITY OF AUGUSTA
WASTEWATER TREATMENT PLANT
PERFORMANCE SUMMARY
(January 2003 through October 2004)

Parameter	Permit Requirement	Average of All Monthly Data	Average of Monthly Data Without November 2003
TSS			
Monthly Average Concentration (mg/l)	30	105	8.9
Number of Violations		1	0
Monthly Average Mass (lbs./day)	82.6	226	10.8
Number of Violations		1	0
BOD_5			
Monthly Average Concentration (mg/l)	30	34.3	5.1
Number of Violations		1	0
Monthly Average Mass (lbs./day)	82.6	35.0	5.9
Number of Violations		1	0
Ammonia N			
Monthly Average Concentration (mg/l)	20.0	0.92	0.82
Number of Violations		0	0
Monthly Average Mass (lbs./day)	55.0	1.2	1.0
Number of Violations		0	0
Dissolved Oxygen	>2.0 mg/l		
(Minimum reported)		7.2	7.2
Number of Violations		0	0
Fecal Coliform (#/100 ml)	200	24	21
Number of Violations		0	0
Chlorine (mg/l) 0.019	0.015	0.014	
Number of Violations		1*	1*

*Counting individual days, there are more violations than just 1.

4.2.1.6.2 Sludge Flow

At current plant loadings, the detention time of sludge in the aerobic digester should be in excess of 100 days. So, the sludge should be well stabilized.

The sludge drying beds are in poor condition and have not been used for some time.

4.2.1.7 Summary of Plant Deficiencies

The major plant deficiencies are two. One, duplicate aeration tanks and final clarifiers are now required by Kentucky's Division of Water and only one each are provided in the current plant. Second, and more importantly, the plant and its influent pump station have reached the end of their useful lives and are in poor condition. They must be replaced, because if not, they will fail and KPDES permit non-compliance will occur.

4.2.2 Augusta Collection System

4.2.2.1 Description

The City of Augusta sanitary sewer collection system was mostly constructed in the 1930's and originally discharged to the Ohio River without treatment. In 1980, a collection system extension was constructed on the east side of City and a treatment facility on the west side of the City to collect and treat all sanitary flows. The older portion of the sanitary sewer system is composed of 8" and 10" clay tile pipe with brick manholes. The portions of the sewer constructed in 1980 to the present consist of precast concrete manholes with clay or PVC pipe with gasket joints. The system has five small pump stations ranging in pumping capacities of 40 to 500 gallons per minute (gpm). The 500 gpm pump station is the main pump station that collects and pumps all wastewater to the treatment plant. The other pump stations collect low lying areas and pump to the main gravity collection system. The main pump station was constructed with an overflow pipe to the Ohio River. During high river levels, the main pump station is flooded by river water backflowing into the pump station and it is shut down until river level drops below overflow pipe elevation. At which time the pump station is turned on and pumping is resumed to the treatment plant.

An inventory of the collection system is shown in the table below. The collection system is separated into five subsystems as shown in Table 4-6.

TABLE 4-6

CITY OF AUGUSTA

SANITARY SEWER SYSTEM

Subsystem	Length of Pipe	Size of Pipe	# of Manholes	Pump Stations	# of Customers
1	710	10"	3	1	8
	6,080	8"	17	1 (apartments)	94
2	660	10"	4	0	11
	3,980	8"	14	0	111
3	4,190	8"	13	0	100
4	4,520	8"	12	0	110
5	6,990	8"	27	4 + 1 (private)	126
Total	27,130	10"& 8"	97	6	560

4.2.2.2 Inflow and Infiltration

Augusta experiences high flows during storm events with average daily flows up to 6 times the normal dry weather flow of 110,600 gallons per day (gpd). A Sewer System Evaluation Survey (SSES) was completed as part of the Facilities Plan Update and is included in the Appendix B. The water usage per capita in gpd in Augusta is 92 gpd based on the water billing records for a one year period. The average daily flow per capita based on treatment plant flow records is 123 gpd. The peak day flow per capita based on treatment plant flow data for the peak day in a twelve month period is 745 gpd. Kentucky Division of Water considers a collection system to have excessive inflow and infiltration (I&I) if the average day flow value is above 120 gpd per capita and the peak day flow value is above 275 gpd per capita. Augusta's peak day flow per capita flow is 2.7 times the 275 gpd standard, therefore I&I would be considered excessive.

During the month of April 2004 a flow monitoring program was completed as shown in the SSES Report. Three rain events occurred during the period for a total of 4.3 (1.75, .92 & 1.6) inches of rainfall. During this month it was estimated that 1.2 (.589, .165 & .449) million gallons on I&I entered the collection system.

As part of the SSES, an investigation of I&I sources were performed by smoke and dye testing of the sewer system. This investigation found sources of I&I which included building downspouts, area drains, storm sewer cross connections and open sewer laterals. It is estimated that 146,000 gallons of I&I per 1.75" rain event (first rain in the flow monitoring month) was contributed by the found deficiencies. This volume is approximately 20 to 25% of the measured I&I. A table of the items found is shown in the SSES Report.

4.2.2.3 Inflow and Infiltration Correction Project

The deficiencies found as part of the SSES should be corrected along with a continued search for additional I&I sources within the system. The majority of I&I sources found were on private property and therefore would be the responsibility of the property owner requiring no public money. Notifications should be sent to effected property owners with a time schedule on when the correction should be completed. Several items were located on public property such as storm sewer cross connections and abandoned open laterals on property the city has acquired through the FEMA property purchase program. These deficiencies will require correction by the City. Additional investigation will also be required on some of the properties that are suspect of being I&I contributors but without proof from the SSES investigation work. The SSES ranks the corrections as to volume of I&I removed per item with larger flow volumes given greater importance for removal. A repair cost is shown for all corrections that are the City's responsibility.

It is recommended the City establish a yearly budget that will allow for additional I&I sources to be discovered and corrected. The suspect problem areas found should be investigated first followed by additional investigation of each subsystem based on the subsystem ranking shown in the SSES Report.

The estimated cost to correct the identified City responsible deficiencies found is approximately $52,800. Additionally the City should include in the sewer system budget another $24,000 per year to cover the cost of additional investigation work to find and connect other sources of I&I. This cost was based on the cleaning and television inspection of 6,000 feet of sewer per year at $2.00 per foot and complete four spot repairs on the sewer system at $3,000 per repair. Once additional deficiencies are found, the City can prioritize the repairs based on the money available. Twenty manholes were found to be buried or miss labeled on the sewer system drawings. These manholes should be uncovered and raised to grade so they can be accessed. The cost of these repairs will vary depending on the work needed but in most cases should be approximately $2000 per manhole for a total of $40,000.

4.2.2.4 Projected Success of I&I Correction Project

The removal of I&I for the deficiencies found in the SSES Report should be successful since most of the sources found were direct connections to the sanitary sewer system. There were some suspect connections, which are thought to contribute I&I; but their correction may be less successful in removing I&I since the rain water may not actually go to the sanitary sewer. These sources should be further investigated prior to correction work being attempted. The drainage area for storm sewer cross connections were estimated since exact location of the cross connections is not known and the volume of water which would flow from the storm to the sanitary cannot be calculated accurately. It is anticipated that 75% of the I&I found in the study could be removed. The removal of this I&I would reduce the wet weather peaking factor from 6.0 to approximately 4.3 times the daily dry weather flow. The ideal wet weather peaking factor should be a maximum of 2.3 times the daily dry weather flow, therefore, additional I&I detection work is needed.

4.3 City of Brooksville

4.3.1 Wastewater Treatment Plant

4.3.1.1 Description

The wastewater treatment plant is located on the north side of Brooksville in a relatively deep valley. Wastewater flow from Brooksville, which is located on ridge tops, flows to the plant site via two gravity sewers. A wetwell/drywell canned pump station lifts the wastewater up into the wastewater treatment plant. The treatment plant is designed for an average wastewater flow of 200,000 gpd. The plant effluent discharges to a small tributary which flows north to Locust Creek.

The plant basically consists of one round package type plant, basically constructed above grade. The package plant includes a raw wastewater screen and comminuter, originally designed contact stabilization activated sludge aeration tanks, final clarifier, effluent chlorination and dechlorination, effluent flow measurement, effluent channel type post-aeration and aerobic digestion. Basic design criteria is shown in Table 4-7.

One basic reason the plant does not meet current Kentucky regulatory requirements is that only one process train is provided and two are now required.

The sizing of the aeration tanks, the final clarifier, and the chlorine contact tank is insufficient. The plant should be operated as extended aeration because of the ammonia limitation in the permit, and a 10 hour detention time is not sufficient. The peak overflow rate of the final clarifier is 40% higher than regulations permit. The chlorine contact tank does not have enough volume to allow the minimum detention time of 15 minutes.

TABLE 4-7

City of Brooksville
Existing Wastewater Treatment Plant
Basic Design Criteria

Item	Design Value
Flow	
Average	200,000 gpd
Peak Hourly (same as Influent Pump Station Capacity)	504,000 gpd
Influent Pump Station	
Type	Wetwell/Can Drywell
Number of Pumps	2
Type	Horizontal Centrifugal
Capacity, each	350 gpm
, firm	350 gpm
Or	504,000 gpd
Aeration Tank	
Inner Diameter	21' 5-1/2"
Outer Diameter	44' 3"
Quadrant	227°
Sidewater Depth	15 feet
Volume	11,126 cubic feet
	83,220 gallons
Nominal Detention Time	
Average Design Flow	10.0 hours
Final Clarifier	
Number	1
Diameter	21' 5"
Sidewater Depth	12' +/-
Area	360 square feet
Surface Overflow Rate	
Flow	556 gpd/sq. ft.
Peak Hourly Flow	1,400 gpd/sq. ft.
Chlorine Contact Tank	
Inner Diameter	21' 5-1/2"
Outer Diameter	44' 3"
Quadrant	12°
Sidewater Depth	14' 7"
Volume	571.8 cubic feet
	4,270 gallons
Nominal Detention Time	
Average Flow	30.7 minutes
Peak Hourly Flow	12.2 minutes

Aerobic Digester	
Inner Radius	21' 5-1/2"
Outer Radius	44' 3"
Quadrant	121°
Sidewater Depth	14' 11"
Volume	5,898 cubic feet
	44,110 gallons

4.3.1.2 Physical Condition

Overall, the physical condition of the influent pump station and treatment plant is poor due to age (36 years old) and use. The facilities are mostly constructed of steel, and such facilities generally have a useful life of 20 to 30 years. The facilities should be replaced with new.

4.3.1.3 Hydraulic and Organic Design Capacity

The treatment plant is not designed to treat the permitted wastewater flow rate to the permitted values. As an extended aeration plant, the original plant design value is presented as 125,000 gpd, on the title sheet of the 1969 plans. This is a reasonable value, as it provides 16 hours of nominal detention time in the aeration tank, which is sufficient to meet the permit limits. The peak hourly flow rate must be reduced so the final clarifier surface overflow rate will not exceed 1,000 gpd/square foot. Therefore, the design peak hourly flow rate is adjusted to 360,000 gpd.

Table 4-8 shows the hydraulic and organic capacity of Brooksville' wastewater treatment plant. The pollutant concentration shown are for typical strength domestic wastewater. The masses are computed from the average flow and concentration.

TABLE 4 – 8

CITY OF BROOKSVILLE
Wastewater Treatment Plant
Hydraulic and Organic Design Capacity

Parameter	Design Value
Flow	
Average	125,000 gpd
Peak Hourly	360,000 gpd
Biochemical Oxygen Demand (BOD_5)	
Concentration	200 mg/l
Mass	208 lbs./day
Total Suspended Solids (TSS)	
Concentration	220 mg/l
Mass	229 lbs./day
Ammonia N	
Concentration	25 mg/l
Mass	26.1 lbs./day

4.3.1.4 Existing Flows and Loads

Influent flow and pollutant load data was tabulated for the period of January 2003 to October 2004. This information is shown in Table 4-9. In considering the two parameters of concentration and mass, the mass parameter is of primary concern. The data indicates that on an annual basis, the plant operates at about 60 to 70% of its capacity. For the maximum month of the period, it operated at over 90% of its capacity.

TABLE 4-9

CITY OF BROOKSVILLE
Influent Flows and Pollutant Loads
(January 2003 to October 2004

Parameter	Data	Design Value	Percent of Design
Flow (mgd)			
Annual Average	0.068	0.125	54.4%
Maximum Monthly	0.105		84.0%
Peak Daily	0.341	0.360	94.7%
BOD_5 Concentration (mg/l)		200	
Annual Average	294		147%
Maximum Month	468		234%
BOD_5 Mass (lbs./day)		208	
Annual Average	165		79.3%
Maximum Month	260		125%
TSS Concentration (mg/l)		220	
Annual Average	234		106%
Maximum Month	537		244%
TSS Mass (lbs./day)		229	
Annual Average	127		55.5%
Maximum Month	219		95.6%
Ammonia Concentration (mg/l)		25	
Annual Average	22.6		90.4%
Maximum Month	48.8		195%
Ammonia Mass (lbs./day)		26.1	
Annual Average	12.5		47.9%
Maximum Month	24.0		92.0%

*Calculated from $CBOD_5$ value by dividing by a factor of 0.85.

4.3.1.5 Kentucky Discharge Elimination System Permit Limits

The Commonwealth of Kentucky issues Kentucky Pollutant Discharge Elimination System (KPDES) permits. Each permit limits the amount of pollutants that a wastewater treatment plant may discharge to a particular stream. The amount of pollutants that can be discharged to a waterway depends on the waterway's designated use and its low stream flow conditions.

The Brooksville, Kentucky WWTP discharges to the headwaters of a small tributary to Locust Creek. During a low flow period, the creek essentially starts at the wastewater treatment plant's discharge. Therefore, relatively strict effluent limits are provided in the permit (Permit No. KY0025232). These are shown in Table 4-10.

TABLE 4-10

CITY OF BROOKSVILLE WWTP
EXISTING NPDES PERMIT LIMITS

PARAMETER	MONTHLY LIMITS		WEEKLY LIMITS		DAILY LIMITS
	Concentration	Mass	Concentration	Mass	
Total Suspended Solids	30 mg/l	50 lbs./day	45 mg/l	75 lbs./day	
BOD_5	10 mg/l	16.7 lbs./day	15 mg/l	25.0 lbs./day	
Ammonia N					
Summer	4 mg/l	6.67 lbs./day	6 mg/l	10.0 lbs./day	
Winter	10 mg/l	16.7 lbs./day	15 mg/l	25.0 lbs./day	
Residual Chlorine	0.010 mg/l	-	0.019 mg/l	-	≥7.0 mg/l
Dissolved Oxygen	-	-	-	-	
Fecal Coliform	200/100 ml	-	400/100 ml	-	-
pH					
Minimum					6.0
Maximum					9.0

4.3.1.6 Wastewater Treatment Plant Performance

4.3.1.6.1 Process Flow

The plant data was tabulated and the results are summarized in Table 4-11. The plant's performance was very good. The performance usually was significantly better than what the permit required. One violation did occur. The October 2004 effluent ammonia concentration was 4.5 mg/l, exceeding the permit limit of 4.0 mg/l. The plant had higher flows and pollutant loadings than normal that month, and this probably contributed to this violation.

TABLE 4-11

CITY OF BROOKSVILLE
WASTEWATER TREATMENT PLANT
PERFORMANCE SUMMARY
(January 2003 through October 2004)

Parameter	Permit Requirement	Average of All Monthly Data
TSS		
Monthly Average Concentration (mg/l)	30	8.8
Number of Violations	0	0
Monthly Average Mass (lbs./day)	50	5.8
Number of Violations	0	0
$CBOD_5$		
Monthly Average Concentration (mg/l)	10	5.0
Number of Violations	0	0
Monthly Average Mass (lbs./day)	16.7	2.9
Number of Violations	0	0
Ammonia N		
Monthly Average Concentration (mg/l)	4.0 (Summer) 10.0 (Winter)	1.61
Number of Violations		1
Monthly Average Mass (lbs./day)	6.7 (Summer) 16.7 (Winter)	1.0
Number of Violations		0
Dissolved Oxygen (Minimum reported)	>7.0 mg/l	8.9
Fecal Coliform (#/100 ml)	200	22
Chlorine (mg/l)	0.010	0.010

4.3.1.6.2 Sludge Flow

At current plant loadings, the estimated 42 days detention time in the aerobic digester, is about 35 to 50 days. The sludge should be properly stabilized. Sludge disposal is by contract hauling to a larger wastewater treatment plant. The design and operation is proper for this disposal method.

4.3.1.7 Summary of Plant Deficiencies.

The major plant deficiencies are two. One, duplicate aeration tanks and final clarifiers are now required by Kentucky's Division of Water and only one each are provided in the current plant. Second, and more importantly, the plant and its influent pump station have reached the end of their useful lives and are in poor condition. They must be replaced, because if not, they will fail and KPDES permit non-compliance will occur.

4.3.2 Brooksville Collection System

4.3.2.1 Description

The City of Brooksville sanitary collection system was constructed in 1970. Only minor additions and extensions have been completed since that time. The sewer system is composed of 8" and 10" clay sewer pipe with gasket joints, precast concrete manholes and with later additions of PVC pipe. The system has 7 pump stations with pumping capacity ranging from 30 to 350 gpm. The 350 gpm pump station is the main pump station at the treatment plant. The other pump stations collect sanitary flows from the surrounding valleys and pump it to the gravity collection system that drains to the treatment plant located on the northeast side of the City. The majority of the pump stations have overflows constructed in them. The overflows are normally not active during rain events unless there are mechanical problems with the pumps preventing them from running.

There have been several additions to the sewer collection system since its original construction. An extension to the new high school, grade school and middle school on the northwest side of the City was completed at the time of the school constructions. Another extension was for an area to the east of the City that included a mobile home park, several homes and an apartment complex with a small pump station. Another extension on the north side of the City added a new apartment complex and on the south side of the City added Galloway Drive homes via collection sewer and pump station.

Recent work on the collection systems has been the upgrade of pump stations in Brooksville, a sewer and pump station replacement with roadway improvements on the west side of the City along KY 1159 and a sewer replacement adjacent to relocated KY 19 on the east side of the City.

An inventory of the collection system is shown in the Table 4-12. The collection system is separated into five subsystems.

TABLE 4-12
CITY OF BROOKSVILLE
SANITARY SEWER SYSTEM

Subsystem	Length of Pipe	Size of Pipe	# of Manholes	Pump stations	# of Buildings
1	7024	8"	35	2	101
2	2128	8"	13	2 + 2(schools)	37
3	3470	8"	15	0	69
4	3573	10" & 8"	20	1	92
5	3866	8"	17	1 (apartment)	47
Total	20061	10"& 8"	100	8	346

4.3.2.2 Inflow and Infiltration

Brooksville has experienced high flows as a result of storm events with average daily flows up to 5.8 times the daily dry weather flow of 66,000 gpd. A Sewer System Evaluation Survey (SSES) was completed as part of the Facilities Plan Update and is included in the appendix. The water usage per capita in gallons per day (gpd) in Brooksville is 112 gpd based on the water billing records for a one year period. The average daily flow per capita based on treatment plant flow records is 115 gpd. The peak day flow per capita based on treatment plant flow data for the peak day in a twelve month period is 579 gpd. Kentucky Division of Water considers a collection system to have excessive inflow and infiltration (I&I) if the average day flow value is above 120 gpd and the peak day flow value is above 275 gpd per capita. Brooksville's peak day flow per capita flow is 2.1 times the 275 gpd standard, therefore I&I would be considered excessive.

During the month of April 2004 a flow monitoring program was completed as shown in the SSES Report. Three rain events occurred during the period for a total of 4.7 (2.00, .95 & 1.75) inches of rainfall. During this month the treatment flow monitor was not working properly so actual flow volumes at the

treatment plant could not be compared to the flow meter data from the collection system. During the last rain period 5/02/04 a total I&I volume of 383,400 gallons was calculated to enter into the collection system.

As part of the SSES, an investigation of I&I sources were performed by smoke and dye testing of the sewer system. This investigation found sources of I&I which included building downspouts, area drains, and open sewer laterals. It is estimated that 100,000 gallons of I&I per a 2.0" rain event was contributed by the found deficiencies. A table of the items found is shown in the SSES Report.

4.3.2.3 Inflow and Infiltration Correction Project

The deficiencies found as part of the SSES should be corrected along with a continued search for additional I&I sources within the system. The majority of I&I sources found were on private property and therefore would be the responsibility of the property owner requiring no public money. Notifications should be sent to effected property owners with a time schedule on when the correction should be completed. Additional investigation will be required on some of the properties that are suspect to being I&I contributors but no proof was found as part of the SSES investigation work. The SSES ranks the corrections as to volume of I&I removed per item with larger flow volumes given greater importance for removal. A repair cost is shown for all corrections that are the City's responsibility.

It is recommended the City establish a yearly budget that will allow for additional I&I sources to be discovered. The suspect problem areas found should be investigated first followed by additional investigation of each subsystem based on the subsystem ranking shown in the SSES Report. The sewers along the creek should be televised first to detect defects which may be letting creek water into the sewer.

The estimated cost to correct the City responsible deficiencies found is $8,100. Additionally the City should include in the sewer system budget another $19,000 per year to cover the cost of additional investigation work to find and correct other sources of I&I. This cost was based on the cleaning and television inspection of 5,000 feet of sewer per year at $2.00 per foot and complete three spot repairs on the sewer system at $3000 per repair. Once additional deficiencies are found, the City can prioritize the repair based on the money available to correct the problem. Approximately ten manholes were found to be buried. These manholes should be uncovered and raised to grade so they can have proper access. The cost of these repairs will vary depending on the work needed but in most cases should be approximately $2000 per manhole for a total of $20,000. The manhole covers on most on the manholes were found to be

loose from the manhole. This could cause leaks in areas where water ponds or runs adjacent to the manhole. A program should be installed to start sealing the manhole frames to the cover. An estimated cost of $500 per manhole should be used for this work. Assuming 50 percent of the manholes frames need to be sealed a cost of $25,000 is estimated to complete this work.

4.3.2.4 Projected Success of I&I Correction Project

The removal of I&I for the deficiencies found in the SSES Report should be successful since most of the sources found were direct connections to the sanitary sewer system. There were some suspect connections, which were estimated to contribute I&I which may be less successful in removing I&I since the sources may not actually go to the sanitary sewer. These sources should be further investigated prior to correction work being attempted. It is anticipated that 60 to 70% of the I&I found in the study could be removed. This assumes that suspect deficiencies are not connected to the sanitary sewer. If a greater percentage of the suspect items are connected, the anticipated removal would be greater. The removal of this I&I would reduce the wet weather peaking factor from 5.8 to approximately 4.7 times the daily dry weather flow. The ideal wet weather peaking factor should be 2.3 times the daily dry weather flow; therefore, additional I&I detection work is needed.

4.4 Package Treatment Plants in Area

4.4.1 General

Several package plants are located within the planning area. The majority of the plants are small on individual residences. This type of plant is an alternative to septic tank-leaching chamber in areas where soil percolation rates are too low. The small individual home package treatment plant is usually an extended aeration plant with a sand filter and chlorination with final effluent discharge to a nearby stream. One such plant serves Augusta Health Care Center, a residential care facility, nine serve individual homes or businesses and one plant serves the Bracken County Industrial Park.

Each of the treatment plants have their own NPDES permit and required effluent sampling twice per year and reported to Division of Water Office in Florence, KY. Table 4-13 shows the address and location and size of each of the facilities. The majority of the plants have been constructed over the last ten years.

TABLE 4-13

North Bracken County

Package Treatment Plants

Name	Address	Treatment Capacity (gpd)
Augusta Health Care Center	Asbury Road, Augusta	8000
Bowman	Hilton Lane, Brooksville	500
Carl	Bladeston Drive, Brooksville	500
Clark	Justice Dr, Brooksville	500
Hall	Wellsburg-Walcott Rd, Foster	500
Hartman	Farmview Rd, Brooksville	500
Johnson	RR2 KY Hwy 1109, Foster	500
Perkins	RR 2, Foster	500
Stewarts Farm Supply	RR 3, Brooksville	500
Wilson	Salem Ridge Rd., Brooksville	500
KTC Garage	State Route 10, Brooksville	500

4.4.2 Bracken County Industrial Park Package Plant

The Industrial park package plant has been permitted since 1999 but does not have any wastewater flow entering the plant. The industrial park is located along KY Route 9 approximately 2 miles east of KY Route 19 intersection. There have been no sites developed at the industrial park to date. The treatment plant was manufactured by Pro-Water Systems and is an extended aeration system permitted to treat 5,000 gallons per day (gpd). The plant is two parallel tanks constructed of steel plates. The plant consists of the following treatment units.

- Influent bar screen;
- Flow control chamber with flow divisions;
- Equalization Chamber integral to WWTP 1 containing 5000 gallon capacity, flow control pumps (2@ 28 gpm submersible grinder type), pump level controls and blower system for mixing;
- Aeration chamber one per tank – 24 hour detention with air diffusers longitudinal along one side to prevent short circuiting.

- Final clarifier – 2 units - 835 gallons useable volume, surface overflow rate 140 gpd/sq. ft. with air lift pumps in each clarifier;
- Tertiary filters – 2 units – 4 sq. ft. each for a total of 8 sq. ft. with air scour and automatic/manual backwash operation, filtration rate .87 gpm/sq. ft., clearwell size 600 gallons;
- Chlorine contact chamber – volume 260 gallons, hypo-chlorination solution feed metering pumps (2-50 gpd feed rate) and 30 gallon chlorine solution crock;
- Dechlorination unit – volume 239 gallons with tablet sodium sulfite feeder and aeration piping for post aeration;
- Flow meter – record and totalize flow passing over 22.5 deg v-notch weir with strip chart recorder.

No treatment data is available since there is no flow to the plant. Augusta maintenance staff routinely visits the plant and cycles equipment to maintain proper working order.

4.5 On-Site Systems

Developments outside the reach of the Augusta and Brooksville collection systems primarily use on-site treatment systems. An interview with the Bracken County Health Department found that existing on-site systems for the most part are working properly. When noncompliant systems are found, repair work orders are filed and the corrections are completed by the system owner. There are no areas where a large number of systems are noncompliant which would warrant a community collection and treatment system to correct problems.

The most common on-site treatment systems being used are septic tanks with leaching chambers. The leaching chamber length varies depending on the soil evaluation and the volume of wastewater to be discharged. A minimum lot size of 1 acre is required for an on-site treatment system. If the soil evaluation finds a high concentration of clay which will not allow sufficient percolation, leaching chambers are sometimes raised and fill materials are imported to the site that is more permeable than the on-site soils and will percolate to underlying subsoils. If importing soil becomes too expensive, a small package treatment plant is usually used as discussed in Section 4.4.1.

CHAPTER 5 – POPULATION AND FLOW PROJECTIONS

5.1 Existing Conditions

5.1.1 Population

Table 5-1 exhibits the historic population from US Census data from 1970 to 2000. Included are the whole county, Augusta and Brooksville. Table 5-2 exhibits house count data and estimated population for the KY 19 route from Brooksville to Augusta, KY 1159 from Brooksville to Wellsburg and KY 8 from Augusta to Wellsburg. The average number of persons per household in Bracken County, according to the Comprehensive Plan, is 2.55, and this is used to develop a population estimate. This information will be used for regional alternatives.

Table 5-1 shows the county population growing and the population of the two cities decreasing. The trend occurs because individuals moving to Bracken County evidently prefer rural living as compared to living in town. Other reasons may also explain this situation. Augusta is subject to Ohio River flooding, with a particularly severe event occurring in 1996. Individuals often leave such an area and some homes in the lower areas have been removed. This naturally results in the lowering of population. Flooding is not a problem in Brooksville. The loss of population is probably a result of more individuals selecting newer housing in rural areas rather than the older housing located in Brooksville.

TABLE 5-1

Bracken County

Historic Population

Entity	Year			
_____	1970	1980	1990	2000
Bracken County				
Population	7,227	7,738	7,766	8,279
Decade % Change		+7.1%	+0.4%	+6.6%
Augusta				
Population	1,434	1,455	1,336	1,204
Decade % Change		+1.5%	-8.2%	-9.9%
Brooksville				
Population	609	980	670	589
Decade % Change		+60.9%	-31.6%	-12.2%

TABLE 5-2

Rural Home Count and
Population Estimate
(Year 2005)

Area	Residential Home Count	Population Estimate*
KY 19 from Brooksville to Augusta	83	212
KY 1159 from Brooksville to Wellsburg	95	242
KY 8 from Augusta to Wellsburg	2	5

*Based on 2.55 persons per household

5.1.2 Customers

There are two central sanitary sewer systems in the planning area, that for the cities of Augusta and Brooksville. Augusta has a total of 559 customers, of which 509 are residential and 50 are commercial/governmental/industrial/institutional. Brooksville has a total of 322 customers, of which 250 are residential and 72 are commercial/governmental/industrial/institutional.

5.2 Future Conditions

5.2.1 Land Use

The "Bracken County Comprehensive Plan" presents proposed land use. The proposed land use plan for the whole county on page 121 does not show large growth. It does show two locations on the KY 9 corridor for development locations. These are at the KY 9 – KY 1159 and the KY 9 - KY 19 intersections. The existing industrial park site on the north side of KY 9 east of KY 19 is also shown. Although not desired by the Comprehensive Plan, dispersed residential growth will probably continue in the rural areas.

The Comprehensive Plan shows the existing and future land use of Augusta. There is little growth projected for the land area of the City. Some 'mixed use' growth is shown. Low density residential land use is shown to be decreasing. Strictly commercial land use is shown to be constant. A small amount of growth for industrial land use is shown.

The Comprehensive Plan also shows the existing and future land use of Brooksville. A modest amount of commercial, low and high density residential growth is shown.

5.2.2 Population

The Comprehensive Plan shows Bracken County's population increasing from 8,487 in year 2005 to 8,630 in 2020. This is only a 1.7% growth in 15 years and this is much lower than projected for the state of Kentucky (7.1%) and northern Kentucky (10.3%). This low growth rate was projected by the Kentucky State Data Center, University of Louisville and Kentucky Cabinet for Economic Development, Kentucky State Data Center, Kentucky Population Research, "University of Louisville, "How Many Kentuckians," 1999 Edition. The Comprehensive Plan does not really agree with this projection, as it

states on Page 17, "the actual growth rate for the county could be greater than this projection due to regional impacts and other factors unknown at this time.....The projected regional growth rate around Bracken County and other factors such as new road construction and housing development could spur growth rates for the year 2020." We believe growth rates will be higher because of the new KY 9 and Bracken County's proximity to the Northern Kentucky area. Therefore, this report projects the growth rate of Bracken County to mirror the Northern Kentucky area, or approximately 3% growth every 5 years. Table 5-3 shows the estimated population of Bracken County from year 2005 through 2025 assuming this growth rate. The year 2007 population projection is also shown for the purpose of complying with Kentucky's Division of Water Facilities Plan regulations.

Table 5-4 shows an estimate of population growth of selected areas of interest in the planning area. These areas are provided to estimate the needs of the three regional wastewater collection and treatment alternatives.

Augusta, according to the proposed land use plan in the Comprehensive Plan, will not add any net land for residential development. It is actually shown decreasing. Therefore, the population for Augusta is projected to remain constant.

According to the proposed land use plan found in the Comprehensive Plan for Brooksville, some growth in land used for residential development is expected. Therefore, the population for Brooksville is projected to grow at the overall county expected rate of 3% in 5-year increments.

KY 19, from Brooksville to Augusta, currently has 83 homes, including a 30 home subdivision near Augusta. This area is projected to have 180 homes by year 2025, but this is only projected for the case of laying a sanitary sewer force main along this road. It is anticipated that new rural residential development would occur more quickly along this road if sanitary sewer service were available.

There is an industrial park now located on the north side of KY 9 east of the KY 9 and KY 19 intersection. It is reported that the owners of this park want to develop about 160 acres of land next to the park for residential development. If this land were provided a central sanitary sewer system, it would support about 2 homes per acre, or about 320 homes. This growth is not expected immediately as some time would be needed before such sanitary sewer service would be available. It is anticipated that this development could start after the year 2010.

One regional alternative would construct a new regional wastewater treatment plant near Wellsburg. A force main would be laid along KY 1159 from Brooksville to Wellsburg and another would be laid along KY 8 from Augusta to Wellsburg. There are currently 95 homes along these routes. The number of homes along these two routes, if a sanitary sewer force main were constructed, is projected to a total of 200 in the year 2025.

TABLE 5-3

Bracken County Population Projection

Year 2005 to 2025

Year	Estimated Population
2005	8,487
2007	8,589
2010	8,742
2015	9,004
2020	9,274
2025	9,552

TABLE 5-4

Facilities Planning Selected Areas Population Projections

Years 2005 to 2025

Entity of Area	2005	2007	2010	2015	2020	2025
Augusta	1,204	1,204	1,204	1,204	1,204	1,204
Brooksville	589	596	607	625	644	663
KY 19, Brooksville to Augusta						
Number of Homes	83	93	107	132	156	180
Population	212	237	273	337	398	459
Industrial Park Area on KY 9						
Number of Homes	0	0	0	100	200	320
Population	0	0	0	255	510	816
KY 1159 Brooksville to Wellsburg & KY 8 Augusta to Wellsburg						
Number of Homes	95	106	121	148	174	200
Population	242	270	309	377	444	510

5.2.3 Wastewater Flow Projection

Wastewater flow projections are developed for three regionalization alternatives. The first regionalization alternative is separate treatment plants in Augusta and Brooksville, which is what is occurring now. The current KPDES permitted flow is larger than the existing flow plus growth. Therefore, the permitted flow will govern. For Augusta, the existing average flow is 148,000 gpd and the maximum month flow is 249,000 gpd. The maximum month flow is the appropriate value to consider as the permit must be complied with every month. The KPDES permitted value is 330,000 gpd. Therefore, the plant would be designed for the 330,000 gpd value. This would be sufficient for the additional mixed land use and industrial land use shown in the Comprehensive Plan.

For Brooksville, the existing average flow is 68,000 gpd and the current maximum monthly flow is 103,000 gpd. Once again, the maximum monthly flow is the appropriate flow to consider. Table 5-4 shows Brooksville's population increasing by 74 to the year 2025. Assuming a wastewater flow of 100 gallons per day per person, the additional flow computes to 7,400 gpd. The maximum monthly flow would increase to about 110,000 gpd. The existing KPDES permitted flow is 200,000 gpd, and being larger, governs.

The second regionalization alternative is regional treatment in Augusta, with flows from Augusta, Brooksville, KY 19 from Brooksville to Augusta and the industrial park area. This calculation is shown in Table 5-5. The design flow for this alternative is 690,000 gpd.

The third regionalization alternative is regional treatment near Wellsburg. It includes flow from Augusta, Brooksville, KY 1159 from Brooksville to Wellsburg and KY 8 from Augusta to Wellsburg. This is shown in Table5-8. The design flow for this alternative is 595,000 gpd.

TABLE 5-5

Year 2025 Wastewater Flow Projection for an Augusta Regional Wastewater Treatment Plant

Entity	Estimated Wastewater Flow (gpd)
Augusta	330,000
Brooksville	200,000
Existing and New Homes along KY 19 and near the Industrial Park on KY 9 (500 homes x 300 gpd/home)	150,000
Industrial Park	10,000
Total Estimated Wastewater Flow	690,000

TABLE 5-6

Year 2025 Wastewater Flow Projection for
A Wellsburg Regional Wastewater Treatment Plant

Entity	Estimated Wastewater Flow (gpd)
Augusta	330,000
Brooksville	200,000
Existing and New Homes Along KY 1159 and KY 8 (200 homes x 300 gpd/home)	60,000
Commercial Development at Intersection of KY 9 and KY 1159	5,000
Total Estimated Wastewater Flow	595,000

CHAPTER 6 – METHOD OF ALTERNATIVES AND COMPARISONS

6.1 General

An economic analysis is useful in selecting the best alternative. It determines a measure of total money spent to implement any particular alternative. Of course, it is not the only criteria that is used to recommend a particular alternative. Other factors, such as impact to water quality, implementation schedule, land consumption, primary and secondary environmental impacts, energy consumption, reliability, etc. are also considered.

The cost of the alternatives is based on "present worth". The alternative with the smallest present worth value is the least costly alternative to implement. Present worth may be thought of as the sum, which, if invested now at a given rate, would provide exactly the funds required to make all necessary expenditures during the life of the project. The period of time considered in the analysis is 20 years. The analysis is dependent on the selection of an interest rate. For this analysis, an interest rate of 5% is used.

6.2 Construction Cost

Construction costs are the capital cost to purchase and install the facilities and equipment. The costs are based on 2005 dollar values. A breakdown of the estimated construction cost is presented.

6.3 Operation and Maintenance Cost

The costs are based upon the following unit rate estimates.

A. Labor costs are based on the number of estimated operating hours at a rate of $25 per hour, plus benefits, overhead, and other costs.

B. Power costs are based on an electric rate of 8 cents per kWh.

C. Fuel cost for vehicles is based upon $2.00 per gallon.

6.4 Equipment Replacement Costs

Where major equipment life is 20 years or less, a yearly replacement cost is estimated for the purpose of replacing major equipment once it's useful life is complete. The annual cost assigned is the cost of the particular piece of equipment divided by its estimated life.

6.5 Salvage Value

The economic analysis is based on a 20-year period. Salvage value is based on straight-line depreciation. A service life of 20 years is estimated for structural steel, 40 years of permanent buildings and concrete structures, and 50 years of piping.

6.6 Economic Analysis

The economic analysis consists of determining the total project and total present worth for each alternative. Total project costs include the following:

1. Construction Costs: Generally, construction cost includes a contractor's overhead and profit margin of 20 percent.

2. A project contingency of 10% for both design and construction of contingency is generally used.

3. Associated Project Cost: A cost factor of 25 percent is used to estimate costs to include design engineering, engineering construction services, legal and administrative services, and interest during construction.

6.7 Present Worth Analysis Method

The total present worth of an alternative is determined by summing the initial total project costs, present worth of the operation, maintenance and equipment replacement costs, then subtracting the present worth salvage value. The project period evaluated is 20 years and the interest rate utilized is 5.00 percent.

The present worth of the salvage value, which is tabulated for the Year 20 initially, is calculated by multiplying its value by 0.3769.

The present worth of the annual operation, maintenance and equipment replacement costs is calculated by multiplying its value by 12.462.

CHAPTER 7 – REGIONAL WASTEWATER COLLECTION AND TREATMENT ANALYSIS

7.1 General

The Cities of Augusta and Brooksville currently own and operate their own wastewater treatment plants. Homes and businesses in the rural part of the facilities planning area own and operate on-site systems, and a few package wastewater treatment plants. The industrial park on KY-9 owns and operates a small package wastewater treatment plant. The treatment plants in Augusta and Brooksville need to be replaced because of their age and condition. Instead of merely replacing these individual plants with new ones, it may be better to build one regional wastewater treatment plant. This chapter develops and compares separate treatment at the two cities versus two regionalization alternatives.

A common type of wastewater treatment plant plan was developed for all alternatives. The biological process chosen is the single stage activated sludge system with biological nitrogen removal. The common components include:

- Manual grit removal
- Mechanical screening
- Two activated sludge aeration tanks with an anoxic zone followed by a larger aerobic zone
- Two final clarifiers, each one sized to successfully process the peak flow rate
- Ultraviolet light disinfection
- Cascade effluent aeration
- Aerobic digester/sludge storage tank
- Contract removal and disposal of liquid digested sludge

The regionalization alternatives will be compared cost effectively, but on a unit flow basis. The three alternatives do not serve the same number of potential customers and are sized for three different flow rates. Therefore, to equitably compare the alternatives, the present worth value will be divided by the average design flow to produce the unit flow present worth value. The alternative with the lowest unit flow present worth value is considered to be the most cost effective.

7.2 No Action

This alternative would include the continued use of the existing wastewater treatment plants in Augusta and Brooksville, the various package plants including for the industrial park and rural on-site systems. The continued use of the existing treatment plants in Augusta and Brooksville is not feasible as these plants are not in good condition now and will further deteriorate with continued use. Because of their condition, they will not be able to continue to meet their effluent limits in a few years without increased maintenance and equipment replacement costs.

It is not necessary to connect the industrial park package wastewater treatment plant to a regional system at this time. The 5,000 gpd plant, already permitted, is not near capacity. However, it would be beneficial to have an option to connect to a regional system. This will make it more likely that industries would decide to locate at this industrial park, and would help Bracken County economically, which it needs.

There are failures of on-site treatment and disposal systems in the planning area. However, the homes are mostly next to ridge-top roads and not generally densely developed. The problems experienced appear to be localized. Although not a good situation, connecting these to a regional system is not considered necessary, but would be considered beneficial for public health and environmental quality.

In summary, the no-action alternative for the treatment plants in Augusta and Brooksville is not feasible. Improvements for rural on-site systems would be beneficial, but not necessary. Abandoning the package wastewater treatment plant at the industrial park and connecting the flow to the regional system would also be beneficial, but also not necessary at this time.

7.3 Alternative No. 1 – Separate Treatment

7.3.1 Augusta Wastewater Treatment Plant

The existing treatment plant is located on the north side of Berlin Pike on the south bank of the Ohio River, just west of Augusta. The elevation of this lot is about 12 feet below the 100-year flood elevation, although the plant is built so as to be protected from the 100-year flood. The lot is too small to both construct a new plant and keep the existing plant operational. Therefore, a new site is needed.

The site selected for the analysis is located just south of the railroad track and west of Ferry Street. It is located just behind the cemetery northeast of the water plant. Although the lot elevation is about the same as the existing lot, it is better protected from flood waters as it is behind the railroad embankment. The current lot is suffering from bank erosion and new site would not have this problem.

The existing wastewater treatment plant has a permitted capacity of 330,000 gpd. It does not use all of this permitted capacity and retains some capacity for growth. It is recommended that a new plant be constructed to conform to the existing permitted capacity. The design peak hourly flow rate is 695 gpm along with the previously described components, a new influent pump station, 8 inch diameter force main and 10 inch diameter outfall sewer would be constructed. The treatment plant is designed to comply with and consistently perform better than the existing KPDES permit limits. The estimate of costs for this new wastewater treatment plant is included in Table 7-1.

7.3.2 Brooksville Wastewater Treatment Plant

The existing wastewater treatment plant is located on the north side of Brooksville next to a small tributary to Locust Creek. This stream essentially starts at the wastewater treatment plant. There is room on this site to build a new wastewater treatment plant while keeping the existing plant in operation.

The existing wastewater treatment plant has a permitted capacity of 200,000 gpd. It does not use all of this permitted capacity and retains some capacity for growth. It is recommended that a new plant be constructed to conform to the existing permitted capacity. The treatment plant will comply with current permit limitations. The design peak hourly flow rate is 465 gpm. Along with the previously described components, a new influent pump station would be constructed. The estimate of costs for this new wastewater treatment plant is included in Table 7-1.

7.3.3 Ky 9 Area

This alternative does not provide capability to serve the industrial park on Route 9.

7.3.4 On-Site System Area

This alternative provides minimal ability to serve areas with on-lot systems. The only area that could be served is the area north of Brooksville along S.R. 1159, perhaps within a mile or two of town. This area

does have a concentration of residential development along the ridge top and there would be capacity at the treatment plant to serve it. The other homes north on KY-1159 and on KY-19 from Brooksville to Augusta would not be provided the opportunity for service with this alternative.

7.3.5 Cost Summary

Table 7-1 exhibits the estimate of costs. For Augusta, the estimated project cost is $2,890,000. The annual O&M&R cost for Augusta would increase from $128,000 per year to $165,200 per year. For Brooksville, the estimated project cost is $2,330,000. The annual O&M&R cost for Brooksville would increase from $120,000 per year to $156,300 per year. The O&M&R cost presented are for design flow.

TABLE 7-1

ALTERNATIVE NO. 1
SEPARATE TREATMENT
ESTIMATE OF COSTS

Construction and Project Costs

Item	Estimated Construction Cost	Year 20 Salvage Value
Augusta Wastewater Treatment Plant (300,000 gpd)		
Site Work and Control Building	$530,000	$180,000
Influent Pump Station	260,000	80,000
Screening and Grit Removal	145,000	18,000
Activated Sludge Aeration Tank	420,000	130,000
Final Clarifiers/RAS Pump Station	360,000	88,000
Ultraviolet Light Disinfection/Effluent Aeration	125,000	13,000
Aerobic Digester and Sludge Storage Tank	190,000	54,000
Subtotal	$2,030,000	$563,000
Mobilization (3%)	60,000	
Contingencies (10%)	200,000	55,000
Total Estimated Construction Cost	$2,290,000	$618,000
Pump Station Property	5,000	5,000
WWTP Property	25,000	25,000
Project Related Costs (25%)	570,000	
Augusta Estimated Project Cost	$2,890,000	$648,000

Brooksville Wastewater Treatment Plant		
Site Work and Control Building	$355,000	$92,000
Influent Pump Station	110,000	18,000
Screening and Grit Removal	145,000	18,000
Activated Sludge Aeration Tank	395,000	132,000
Final Clarifiers/RAS Pump Station	340,000	74,000
Ultraviolet Light Disinfection/Effluent Aeration	115,000	13,000
Aerobic Digester and Sludge Storage Tank	190,000	51,000
Subtotal	$1,650,000	$398,000
Mobilization (3%)	50,000	
Contingencies (10%)	165,000	40,000
Total Estimated Construction Cost	$1,865,000	$438,000
Project Related Costs (25%)	465,000	
Brooksville Estimated Project Cost	$2,330,000	$438,000
Total Estimated Augusta and Brooksville Project Cost	$5,220,000	
Total Estimated Salvage Value		$1,086,000
Total Estimated Augusta and Brooksville Cost per Gallon per Day Capacity ($5,220,000/(530,000 gpd))	= $9.85/GPD	

Annual Operating, Maintenance and Equipment Replacement Costs

Augusta	
Existing Annual Expense Without Bond Retirement	$128,000 /yr.
Additional Labor	4,900
Additional Power	3,000
Additional Materials and Supplies	2,700
Equipment Replacement Fund	9,800
Sludge Disposal (4¢/gallon)	16,800
Augusta Estimated Annual O&M&R	$165,200 /yr.

Brooksville		
Existing Annual Expense Without Bond Retirement	$120,000	/yr.
Additional Labor	4,900	
Additional Power	2,600	
Additional Materials & Supplies	2,500	
Equipment Replacement Fund	9,500	
Sludge Disposal (4¢/gallon)	16,800	
Brooksville Estimated Annual O&M&R	$156,300	/yr.
Total for Both Communities	$321,500	/yr.

7.4 Alternative No. 2 – Regional Treatment at an Augusta Wastewater Treatment Plant

7.4.1 Augusta Wastewater Treatment Plant

The treatment plant would be located as in Alternative No. 1. The plant would be sized to treat a wastewater flow of 690,000 gpd, which includes 330,000 gpd for Augusta, 200,000 gpd for Brooksville and 160,000 gpd for rural areas, including the industrial park. The outfall sewer to the Ohio River would be 15 inches in diameter.

7.4.2 Brooksville-Augusta Force Main

Exhibit 7-1 shows this alternative schematically. A new pump station would be constructed at the Brooksville WWTP site to start the transport of wastewater to Augusta. An 8 inch diameter force main would be laid north next to KY-19. Just south of Chatham, an intermediate pump station would be constructed to further push the wastewater up the hill. At KY-9, the force main would be enlarged to 10 inches in diameter so flow from the industrial park could be added to it. The force main would follow Little Turtle Creek Road to the new regional Augusta WWTP as this is a more direct and, therefore, less costly route.

Homes along KY-19 could be served by the new force main. However, since the force main is pressurized flow, the method of connecting to the force main must be considered on a case by case basis. To get flow from individual or small groups of homes into the force main, a pump for these homes would have to overcome the pressure present in the force main at that particular location.

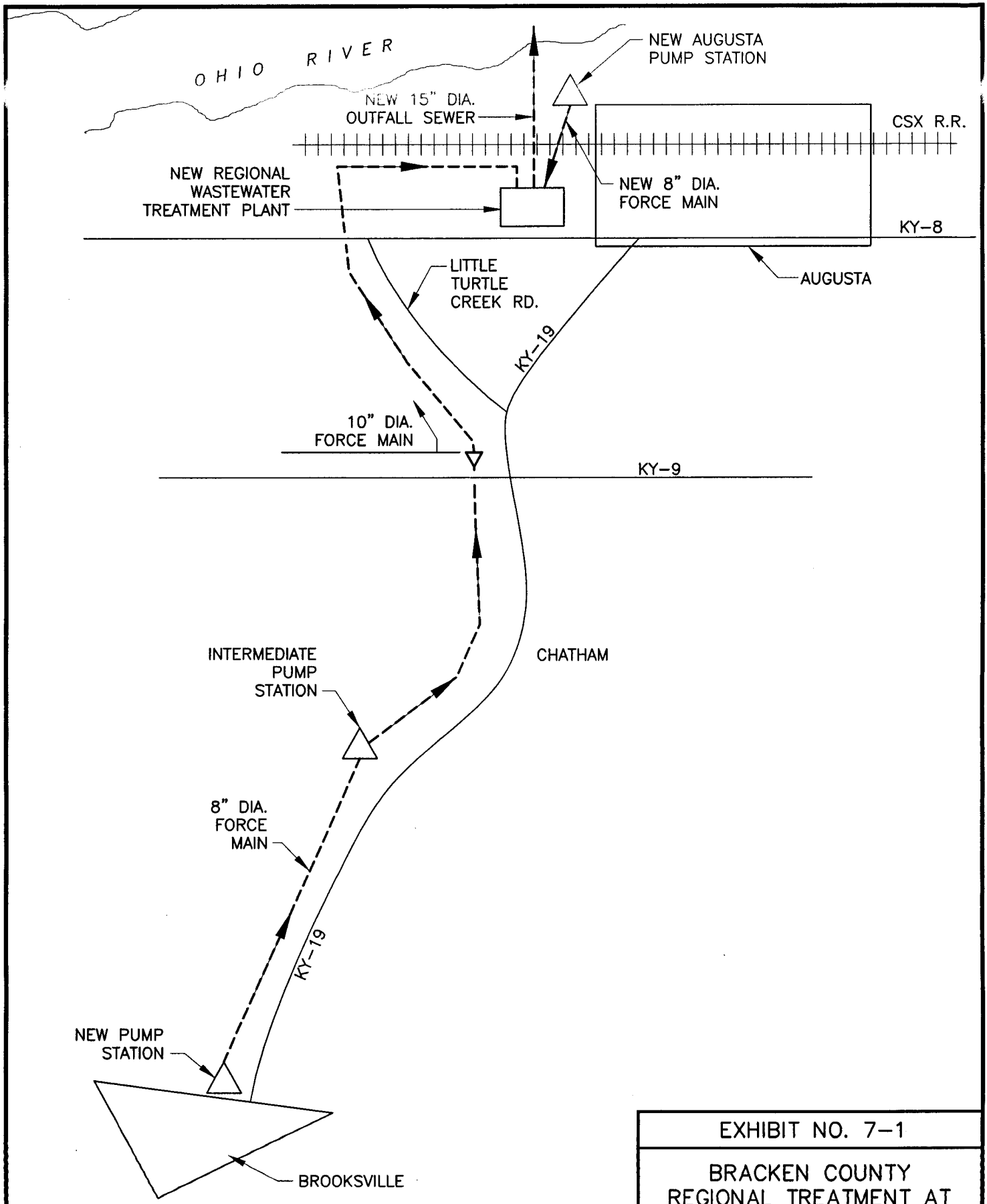


EXHIBIT NO. 7-1

BRACKEN COUNTY REGIONAL TREATMENT AT NEW AUGUSTA WWTP

BURGESS & NIPLE

7.4.3 KY-9 Area

This alternative does not include any pump station and force main to serve the industrial park. It is not justified at this time due to current low flows at the park. Also, it should be otherwise funded, since the purpose of such a pump station and force main would be job creation. If a residential development were proposed, it would be expected that the developer would contribute to, or even construct this pump station and force main.

7.4.4 Cost Summary

Table 7-2 exhibits the estimate of costs. The estimated total project cost is $7,800,000. The estimated design flow annual O&M&R cost is $303,100 per year, as compared to the current sum of $248,000 for both communities. Since new customers could be added to the system, this cost could be spread further so as to lessen the impact to existing customers. Of course, to implement this system, a regional type sewer district would have to be established.

TABLE 7-2

ALTERNATIVE NO. 2
REGIONAL TREATMENT AT AN AUGUSTA
WASTEWATER TREATMENT PLANT
ESTIMATE OF COSTS

Construction and Project Costs

Item	Estimated Construction Cost	Year 20 Salvage Value
Brooksville to Augusta Pump Stations and Force Main		
Force Main	$2,090,000	$1,110,000
Brooksville Pump Station	225,000	19,000
Intermediate Pump Station	180,000	19,000
Subtotal	$2,495,000	$1,148,000
Mobilization (3%)	75,000	
Contingencies (10%)	250,000	115,000
Total Estimated Construction Cost	$2,820,000	$1,263,000

Pump Station Property	5,000	5,000
Temporary Easements	60,000	
Permanent Easements	120,000	
Project Related Costs (25%)	705,000	
Estimated Project Cost	$3,710,000	$1,268,000
Augusta Regional Wastewater Treatment Plant (650,000 GPD)		
Site Work and Control Building	$800,000	$300,000
Influent Pump Station	260,000	80,000
Screening and Grit Removal	155,000	19,000
Activated Sludge Aeration Tank	700,000	225,000
Final Clarifiers/RAS Pump Station	480,000	130,000
Ultraviolet Light Disinfection/Effluent Aeration	175,000	17,000
Aerobic Digester and Sludge Storage Tank	305,000	92,000
Subtotal	$2,875,000	$863,000
Mobilization (3%)	85,000	
Contingencies (10%)	290,000	85,000
Total Estimated Construction Cost	$3,250,000	$948,000
Pump Station Property	5,000	5,000
WWTP Property	25,000	25,000
Project Related Costs (25%)	810,000	
Estimated Project Cost	$4,090,000	$978,000
Total Estimated Project Cost	$7,800,000	
Total Estimated Salvage Value		$2,246,000
Total Estimated Project Cost per Gallon per Day Capacity ($7,800,000/(690,000 gpd))	= $11.30/GPD	

Annual Operating, Maintenance and Equipment Replacement Costs

Existing Augusta System Cost	$128,000 /yr.
Reduce Brooksville Cost to Collection System Only	30,000 /yr.
Pump Stations – Force Main Costs	
Labor	9,400
Power	28,000
Materials and Supplies	4,500
Equipment Replacement Fund	7,000

Augusta Regional WWTP Cost	
Additional Labor	8,600
Additional Power	24,000
Additional Materials & Supplies	4,600
Equipment Replacement Fund	14,000
Sludge Disposal (4¢/gallon)	45,000
Total Estimated Annual O&M&R	$303,100 /yr.

7.5 Alternative No. 3 – Regional Treatment at a Wellsburg Wastewater Treatment Plant

The concept of this alternative is to allow for the construction of a force main north of Brooksville along KY-1159 to Wellsburg, to allow for the collection of wastewater from residences along that road.

7.5.1 Wellsburg Wastewater Treatment Plant

The treatment plant would be located east of Wellsburg. The plant site in this location, still below the 100-year flood elevation, is at a slightly higher elevation than the site west of Augusta. The plant would be sized to treat a wastewater flow of 595,000 gpd, which includes 330,000 gpd for Augusta, 200,000 gpd for Brooksville and 65,000 gpd for rural areas. The industrial park, being too distant from the proposed force main, is not included.

7.5.2 Force Mains

Exhibit 7-2 shows this alternative schematically. Four pump stations would be needed to transport wastewater from Brooksville to Wellsburg. One, at the old wastewater treatment plant, one up the hill and in the City limits to overcome the change in elevation, one at KY-9 and KY-1159 intersection to push the wastewater over the hill south of Wellsburg and one at Wellsburg to transport the wastewater to the plant. A section of gravity sewer is included at KY-9 and KY-1159, so a small amount of commercial growth could be supported.

Homes along KY-1159 could be served by the new force main, but on a case by case basis as described for Alternative No. 2. There are more homes along KY-1159 near Brooksville. There is good potential to serve these with this alternative as these homes are close to town and are clustered closer together here as compared to other parts of the planning area.

One pump station in Augusta would be adequate to transport the wastewater from Augusta to Wellsburg. There are few homes along this route. Construction would be difficult as Ky 8 is cut into a steep hillside on the south bank of the Ohio River.

7.5.3 KY-9 Area

This alternative does not provide the opportunity of service to the industrial park. It does provide service at the KY-9 and KY-1159 intersection. This could support a small amount of commercial growth.

7.5.4 Cost Summary

Table 7-3 exhibits the estimate of costs. The estimated total project cost is $9,630,000. The estimated annual O&M&R cost is $279,600 per year, as compared to the current sum of $248,000 for both communities. Since new customers could be added to the system, this cost could be spread further so as to lessen the impact to existing customers. Of course, to implement this system, a regional type sewer district would have to be established.

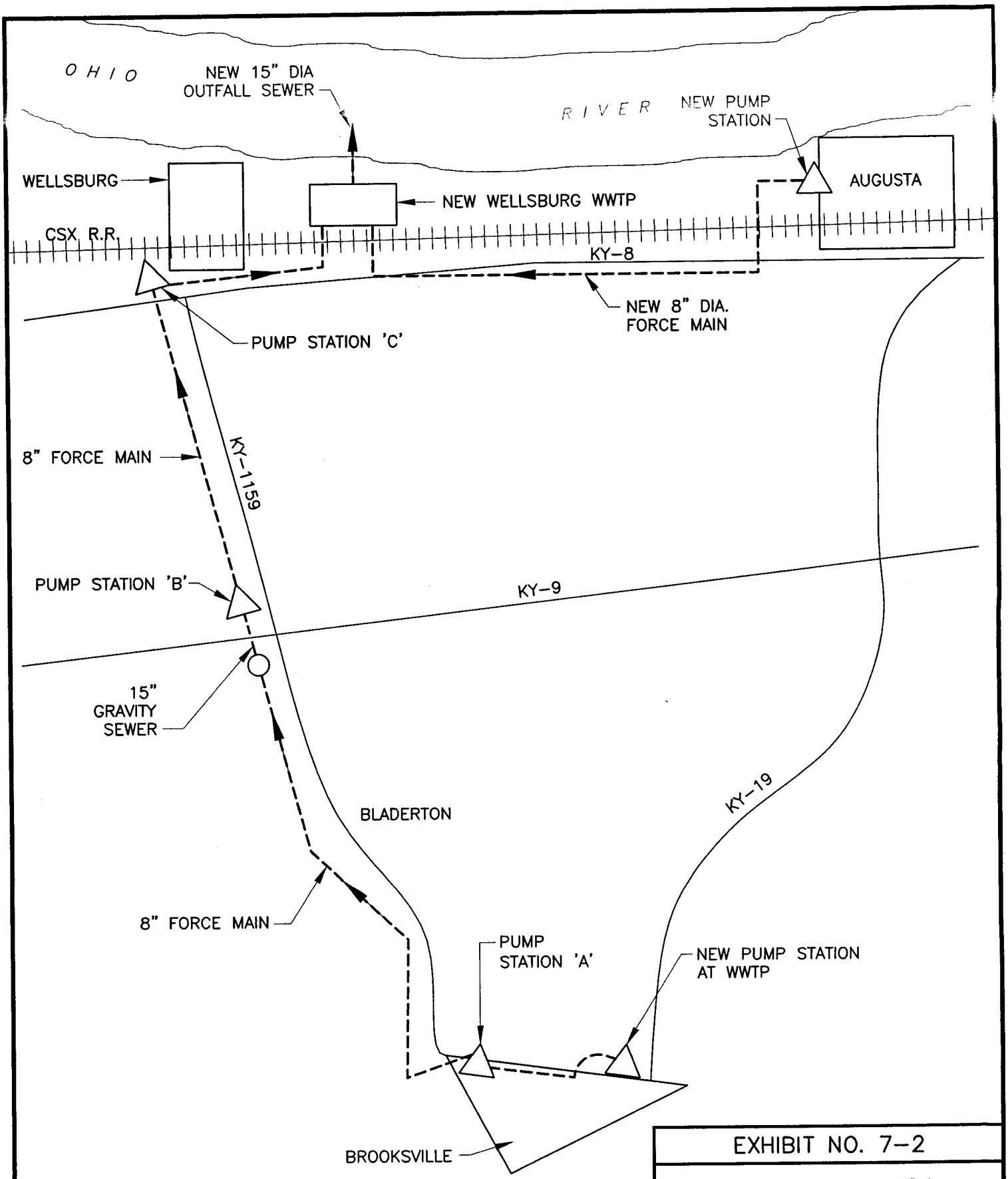


EXHIBIT NO. 7-2

BRACKEN COUNTY
REGIONAL TREATMENT AT
NEW WELLSBURG WWTP

BURGESS & NIPLE

TABLE 7-3

ALTERNATIVE NO. 3
REGIONAL TREATMENT AT WELLSBURG
WASTEWATER TREATMENT PLANT
ESTIMATE OF COSTS

Construction and Project Costs

Item	Estimated Construction Cost	Year 20 Salvage Value
Pump Stations and Force Mains		
Brooksville Force Main	$2,040,000	$1,115,000
Pump Stations (4)	675,000	75,000
Augusta Force Main	1,350,000	750,000
Pump Station (1)	300,000	80,000
Subtotal	$4,365,000	$2,020,000
Mobilization (3%)	130,000	
Contingencies (10%)	435,000	202,000
Total Estimated Construction Cost	$4,930,000	$2,222,000
Temporary Easements	70,000	
Permanent Easements	240,000	
Pump Station Properties	25,000	25,000
Project Related Costs	1,230,000	
Total Estimated Project Cost	$6,495,000	$2,247,000
Wellsburg Regional Wastewater Treatment Plant (595,000 gpd)		
Site Work and Control Building	$590,000	$185,000
Screening and Grit Removal	145,000	18,000
Activated Sludge Aeration Tank	595,000	195,000
Final Clarifiers/RAS Pump Station	445,000	115,000
Ultraviolet Light Disinfection/Effluent Aeration	155,000	15,000
Aerobic Digester and Sludge Storage Tank	270,000	78,000
Subtotal	$2,200,000	$606,000
Mobilization (3%)	65,000	
Contingencies (10%)	220,000	59,000
Total Estimated Construction Cost	$2,485,000	$665,000

WWTP Property	$25,000	$25,000
Temporary Easements	2,500	
Permanent Easements	2,500	
Project Related Costs (25%)	620,000	
Total Estimated Project Cost	$3,135,000	$690,000
Total Estimated Project Cost	$9,630,000	
Total Estimated Salvage Value		$2,937,000
Total Estimated Project Cost per Gallon per Day Capacity ($9,630,000/(595,000 gpd))	= $16.18/GPD	

Annual Operating, Maintenance and Equipment Replacement Costs

Reduce Augusta Cost to Collection System Only	$40,000	/yr.
Reduce Brooksville Cost to Collection System Only	30,000	/yr.
Pump Stations – Force Main Costs		
Labor	18,600	
Power	51,300	
Materials and Supplies	7,500	
Equipment Replacement Fund	12,400	
Wellsburg Regional WWTP Cost		
Labor	28,400	
Power	26,000	
Materials & Supplies	9,500	
Equipment Replacement Fund	17,900	
Sludge Disposal (4¢/gallon)	38,000	
Total Estimated Annual O&M&R	$279,600	/yr.

7.6 Economic Analysis

Table 7-4 shows the cost effective analysis of the three alternatives. Alternative No. 2, Regional Treatment at Augusta, is cost effective. Alternative No. 1, Separate Treatment (at Augusta and Brooksville) is 6.6% more expensive. It could be recommended if it were decided to be superior in a non-monetary way as compared to Alternative No. 2. Alternative No. 3, Regional Treatment at Wellsburg, is 29% more expensive. This is significant, and this alternative will not be further considered.

TABLE 7-4

ECONOMIC ANALYSIS AND COMPARISON
OF REGIONAL WASTEWATER COLLECTION AND TREATMENT ALTERNATIVES

Cost Item	Factor	Alternative No. 1 Separate Treatment	Alternative No. 2 Regional Treatment at Augusta	Alternative No. 3 Regional Treatment at Wellsburg
A. Total Project Cost	A	$5,220,000 ✓	$7,800,000	$9,630,000
B. Operation, Maintenance and Replacement Costs (Present Worth)	12.462	4,006,533	3,777,232	3,484,375
C. Salvage Value (Present Worth)	0.3769	(409,313)	(846,517)	(1,106,955)
D. TOTAL PRESENT WORTH	A + B – C	$8,817,220	$10,730,715	$12,007,420
E. Design Capacity (gpd)		530,000	690,000	595,000
F. Unit Flow Present Worth ($ per GPD)	(D ÷ E)	$16.64	$15.55	$20.18
G. Relative Percent Cost of Least Cost Alternative		+7.0%	Least Cost	+30%

7.7 Non-Monetary Effectiveness Criteria Comparison

7.7.1 Implementation

Alternative No. 1, Separate Treatment, is more easily implemented because no new legal entity needs to be established. Alternative No. 2 would require the formation of a sanitary sewer district of one form or another. However, because the treatment plants are currently in compliance, there is time to do this. Also, a required sewer district will be much more capable of solving the rural wastewater treatment and disposal problems than separate treatment.

7.7.2 Environmental Impact

Alternative No. 2, Regional Treatment at Augusta, is clearly the better environmental solution. It will remove treated wastewater from the small tributary to Locust Creek and Locust Creek. These streams have very low, low flow, and little to no pollutant assimilative capacity. This would be a most positive environmental impact. This alternative also provides the ability to correct on-lot sewage disposal problems by connecting homes along KY-19 to the regional system. The package plant discharge to a small tributary to Bracken Creek could also be eliminated in the future.

The construction of the new force main along KY-19 and Little Turtle Creek Road does have a modest environmental impact due to construction activities. However, this impact should be minimal as the line will follow existing roadways, and, therefore, impact previously disturbed land. Mitigative measures for erosion control will also take place.

7.7.3 Engineering Evaluation

Alternative No. 2, Regional Plant at Augusta, is superior. It removes the duplication of effort in treating wastewater at one plant instead of two. The complexity of the one plant is no different than each of the two plants. Also, this one plant located in Augusta, and discharging to the very large Ohio River, best protects surface water quality, which is the purpose of the project.

7.7.4 Public Support

The level of public support will be made known with the public hearing process.

7.7.5 Regionalization

Alternative No. 2, Regional Plant in Augusta, is a regional alternative whereas Alternative No. 1, Separate Treatment, is not. Therefore, Alternative No. 2 is preferable with respect to this criteria. Additionally, the Kentucky Natural Resources and Environmental Protection Agency, Division of Water, is strongly urging regionalization wherever it is feasible.

7.8 Recommendation

Alternative No. 2, Regional Plant at Augusta, is cost effective. The brief discussion of nonmonetary effectiveness criteria shows that Alternative No. 2 is superior with respect to these. Therefore, Alternative No. 2, Regional Plant at Augusta, is recommended.

Only one type of treatment plant was considered in this regionalization analysis, yet there are a number of treatment plant types that can be considered. These will be developed, compared and the best one recommended in Chapter 8.

CHAPTER 8 – WASTEWATER TREATMENT PLANT ALTERNATIVES

8.1 General

Chapter 7 established the best regional wastewater collection, transport and treatment alternative. The best solution is to build a new regional wastewater treatment plant near Augusta. It would serve Augusta, Brooksville, homes along Ky 19 from Brooksville to Augusta and also Ky 9 in the eastern part of the study area. This chapter will determine the best type of wastewater treatment plant to construct.

8.2 Selection of Feasible Alternatives to Consider

There are three generic types of treatment plants that could be considered for the new plant. These include lagoon based treatment plants, fixed film type biological treatment plants and activated sludge type treatment plants.

Lagoon type treatment plants can either be the aerated type or the non-aerated type. The aerated type would have to be large enough for a wastewater detention time of 30 days, whereas an unaerated type could have to be as large as needed for a wastewater detention time of 180 days. An aerated lagoon could be constructed at a sidewater depth of about 12 feet and would require about 10 to 15 acres to construct. Although the land exists west of Augusta, it would be very expensive to build as the land has an elevation about 15 feet below the 100-year flood elevation. For an unaerated lagoon, about 80 to 90 acres of land would be required. This amount of flat land does not exist in this location. All land located south of the valley bottomland is too hilly. Therefore, because of these considerations, a lagoon type wastewater treatment plant is not feasible for the Augusta Regional Wastewater Treatment plant.

Fixed film type biological treatment systems include trickling filters and rotating biological contactors (RBCs). These types of plants do not use much land area. They do have several drawbacks. Trickling filters and RBCs are less capable of treating wastewater to as high a degree of purification as compared to an activated sludge plant. They are not capable of biological nutrient removal to the degree and efficiency that an activated sludge plant is able to do. Also, a conventional type trickling filter plant and RBC plant use shallow tanks, and to protect these types of plants from a 100-year flood would require a lot of fill. This increases construction cost. In addition to this, RBC plants have had a bad track record, and this is a concern. For these reasons, fixed film biological treatment plants will not be further considered.

An activated sludge plant supports an active biomass held in suspension in the wastewater. This process is less temperature sensitive, with respect to treatment, as compared to a trickling filter process. Since the biomass is held in suspension, it is better able to adsorb pollutants and to stabilize them. Also, the process can be easily modified for enhanced nitrogen and phosphorous removal. There are a number of types of activated sludge plants that can be constructed. These include:

- Activated sludge plants preceded by primary treatment
- Metal type package activated sludge plants
- Single stage activated sludge plant
- Single stage activated sludge plants with biological nitrogen removal
- Single stage activated sludge plants with biological nitrogen and phosphorous removal
- Sequencing batch reactors
- Poured in place activated sludge plant equipped with package equipment
- Oxidation ditch type plant

These plants will be considered individually.

The activated sludge plant preceded by primary treatment is a cost effective method for large treatment plants and uses a lower amount of energy to treat the wastewater. However, this kind of plant is inappropriate for this plant because it is overly complex, requires too much manpower to operate and has a larger potential to produce odor. Therefore, it will not be further considered.

The metal type package activated sludge plant is the type of treatment plant the two cities have now. This type of plant is compact, but has a shorter design life as metal deteriorates more quickly than reinforced concrete. Also, being self contained with individual clarifiers dedicated to individual aeration tanks, makes this system less flexible. When either an aeration tank or a clarifier is shut down for maintenance, its corresponding clarifier and aeration tank, respectively, must also be taken out of service. The basic deficiency of this type of plant, however, is its lower expected lifespan, and it therefore will not be further considered.

The single stage activated sludge plant is often called an extended aeration plant and is often designed as a package plant. This type of plant typically uses blowers and submerged diffusers to supply oxygen to the biomass. This plant typically is designed as a plug flow reactor. This type of plant is feasible, but is now outdated by the following type of plant. Relatively speaking, it has higher energy consumption,

lower enhanced biological nutrient removal capability and more operating problems. For these reasons, it will not be further considered.

The single stage activated sludge plant with biological nitrogen removal is an improvement to the single stage activated sludge plant. It incorporates an unaerated anoxic zone prior to the aeration tank. It does have more equipment, but the total installed horsepower is usually less. This type of plant also relies upon diffused aeration in the aeration zone, and also uses a submersible mixer in the anoxic (unaerated) zone and a submersible pump to return mixed liquor from the end of the aeration tank to the anoxic zone. The tanks can be constructed with a deeper water depth, which saves construction cost in the floodplain as less fill, if any, is needed. This process has the advantages of lower energy consumption, removal of about 80% of the nitrogen in the wastewater, and better performance due to the improved condition of the biomass. It will be further considered.

The single stage activated sludge plant with enhanced biological nitrogen and phosphorous removal is even more capable than the previous plant. However, it is significantly more complicated to design, construct and to operate, as five sequential compartments are often used. Each compartment requires a different operational control strategy. Therefore, due to complexity and because it is not needed for permit compliance, it will not be further considered.

A sequencing batch reactor system uses at least two fill and draw reactors. Three should be provided for full standby capability. This system is very capable and can be set up to remove nitrogen and phosphorous biologically. This process requires automatic operation of motorized valves, gates and motors. This has been made possible due to modern electronic technology such as programmable logic controllers (PLCs). The system batch speed must be ramped up and down to match influent diurnal flow variation and storm flow conditions. The system works well when infiltration/inflow rates are not high. This is not the case for Augusta and Brooksville. Also, if the system controller malfunctions, such as may occur from a nearby lightning strike, the plant would have to be manually operated 24/7 until it was repaired. Therefore, for these reasons, it will not be further considered.

A poured in place activated sludge plant with package equipment is advantageous in that a longer lasting concrete structure is used, and a single source of equipment supply is obtained. Process design and enhancement is also obtained from the manufacturer. The system anticipated also has nitrogen removal capability incorporated within it. It also is provided a relatively deep basin, making it an economical structure to construct in the floodplain. It will be further considered.

An oxidation ditch activated sludge plant uses a race track design with surface aerators to both mix and aerate the tank contents. The rotors consist of many blades attached to a horizontal shaft. This system is simple to operate, handles peak loads well and can be operated to obtain some biological nitrogen removal. For a plant of this size, its water depth is less than what other activated sludge alternatives would have. Therefore, the plant will have to be built on fill. Nonetheless, due to its simplicity and effectiveness, it will be further considered.

In summary, the following alternatives will be developed and further considered:

- Single stage activated sludge plant with biological nitrogen removal
- Poured in place activated sludge plant with package equipment
- Oxidation ditches

8.3 Regional Wastewater Treatment Plant Alternatives

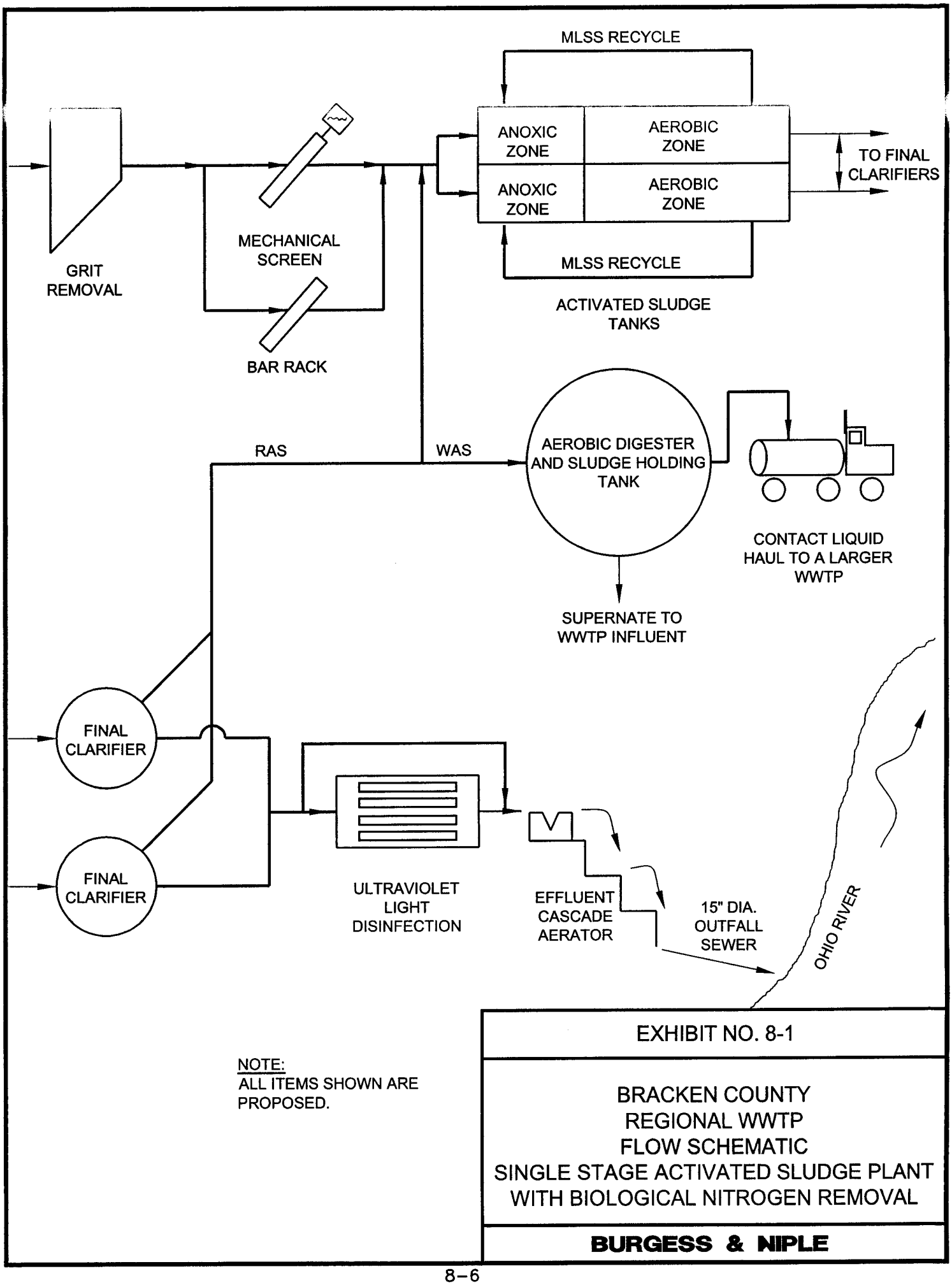
8.3.1 Single Stage Activated Sludge Plant with Biological Nitrogen Removal

Exhibit 8-1 shows the schematic of this alternative. This alternative includes the following features:

- New influent pump station for Augusta
- Gravity grit removal
- Mechanical screen with standby bar rack
- Two aeration tanks, each with an anoxic zone and an aerobic zone.
  Features include:
  - Anoxic zones with a 4-hour nominal detention time
  - Aerobic zones with a 19 hour nominal detention time
  - Two 880 gpm MLSS pumps
  - Two 450 scfm, 25 horsepower blowers
- Two 55 foot diameter final clarifiers
- Three 340 gpm RAS/WAS pumps
- Ultraviolet light disinfection
- Cascade aerator
- 195,000 gallon aerobic digester/sludge holding tank

- Tanker truck loading pad
- Control building on top of the aeration tank structure

Table 8-1 exhibits the construction, project and annual O&M&R costs.



NOTE:
ALL ITEMS SHOWN ARE PROPOSED.

EXHIBIT NO. 8-1

BRACKEN COUNTY
REGIONAL WWTP
FLOW SCHEMATIC
SINGLE STAGE ACTIVATED SLUDGE PLANT
WITH BIOLOGICAL NITROGEN REMOVAL

BURGESS & NIPLE

TABLE 8-1

ALTERNATIVE NO. 1
SINGLE STAGE ACTIVATED SLUDGE PLANT
WITH BIOLOGICAL NITROGEN REMOVAL

Construction and Project Costs

Item	Estimated Construction Cost	Year 20 Salvage Value
Site Work and Control Building	$800,000	$300,000
Influent Pump Station	260,000	80,000
Screening and Grit Removal	155,000	19,000
Activated Sludge Aeration Tank	700,000	225,000
Final Clarifiers/RAS Pump Station	480,000	130,000
Ultraviolet Light Disinfection/Effluent Aeration	175,000	17,000
Aerobic Digestion/Sludge Storage Tank	305,000	92,000
Subtotal	$2,875,000	$863,000
Mobilization (3%)	85,000	
Contingencies (10%)	290,000	85,000
Total Estimated Construction Cost	$3,250,000	$948,000
Pump Station Property	5,000	5,000
WWTP Property	25,000	25,000
Project Related Costs (25%)	810,000	
Estimated Project Cost	$4,090,000	$978,000

Annual Operating, Maintenance and Equipment Replacement Costs

Additional Labor	$8,600 /yr
Additional Power	24,000
Additional Materials & Supplies	4,600
Equipment Replacement Fund	14,000
Sludge Disposal	45,000
Total Estimated Annual O&M&R	$96,200

8.3.2 Poured in Place Activated Sludge Plant Equipped with Package Equipment

This treatment plant has all of the unit processes in or attached to one structure. The activated sludge, final clarifiers, activated sludge pumping and aerobic digester equipment would come from one manufacturer. The activated sludge system first includes a selector tank, to condition the sludge for better settling. The first stage aeration tank accomplishes most of the organic pollutant removal and nitrification. The second stage aeration tanks' air supply is on and off 50% of the time to accomplish denitrification. The final clarifiers are package units with an outlet orifice design to accomplish modest flow equalization. Materials used in the equipment are selected for long life. This alternative is shown schematically in Exhibit 8-2. This alternative includes the following features:

- New influent pump station for Augusta
- Gravity grit removal
- Mechanical screen with standby bar rack
- One 38,000 gallon aerated selector tank
- Two 138,000 gallon aerated first stage aeration tanks
- Two 134,000 gallon on/off aerated second stage aeration tanks
- Four 720 square feet final clarifier tanks, each with two package type clarifier units with sludge removal and pumping
- Ultraviolet light disinfection
- Cascade aerator
- Two 97,000 gallon aerobic digestor/sludge holding tanks
- Tanker truck loading pad
- Control building built on top of the aeration tank.

Table 8-2 exhibits the construction, project and annual O&M&R costs.

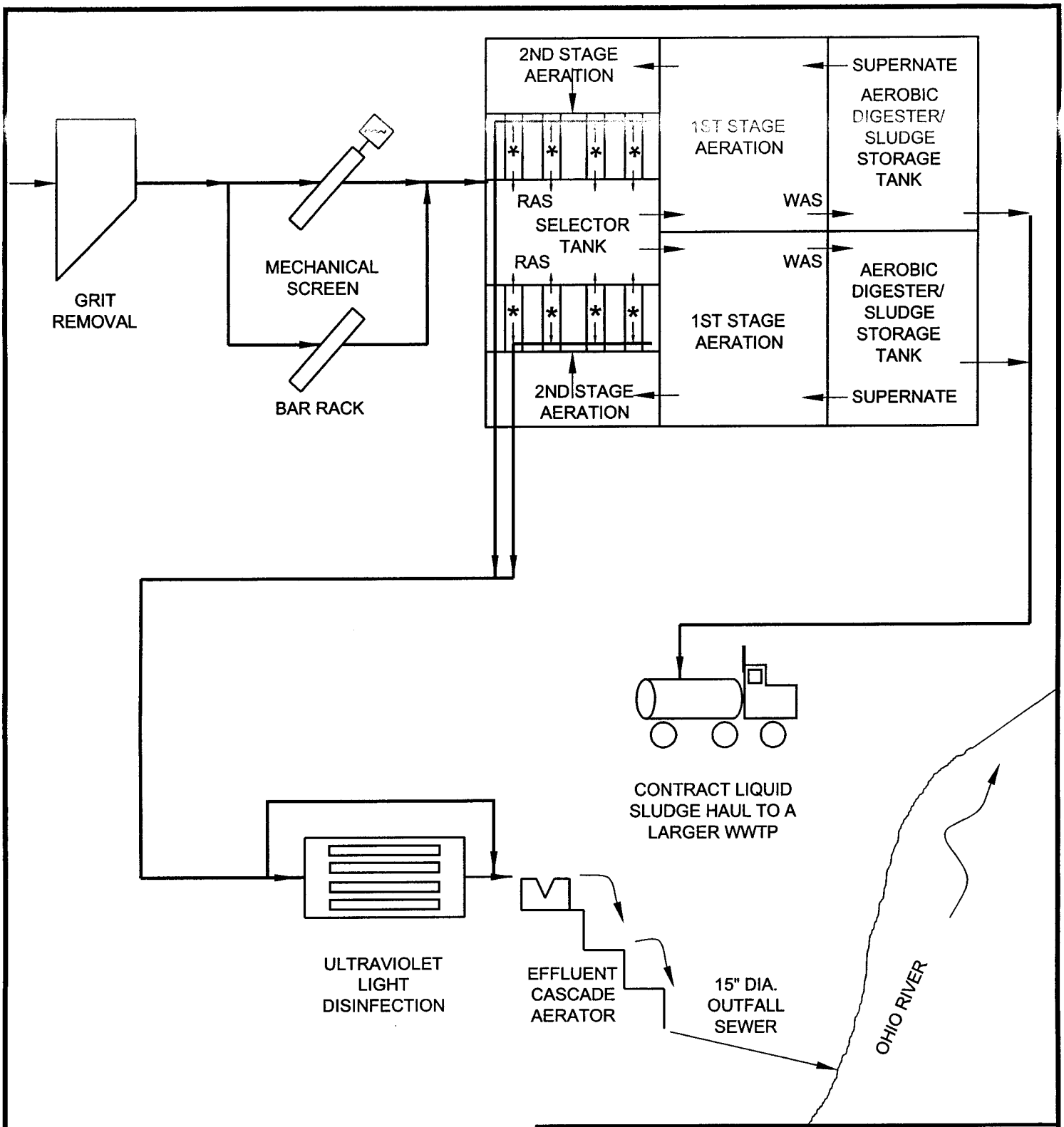


EXHIBIT NO. 8-2

BRACKEN COUNTY
REGIONAL WWTP
FLOW SCHEMATIC
POURED IN PLACE ACTIVATED SLUDGE
PLANT EQUIPPED WITH PACKAGE
EQUIPMENT

BURGESS & NIPLE

NOTE:
ALL ITEMS SHOWN ARE PROPOSED.

* PACKAGE CLARIFIER UNITS (8)

TABLE 8-2

ALTERNATIVE NO. 2
POURED IN PLACE ACTIVATED SLUDGE PLANT
WITH PACKAGE EQUIPMENT

Construction and Project Costs

Item	Estimated Construction Cost	Year 20 Salvage Value
Site Work and Control Building	$760,000	$290,000
Influent Pump Station	260,000	80,000
Screening and Grit Removal	155,000	19,000
Unit Clarifier Package Activated Sludge Plant	1,945,000	345,000
Ultraviolet Light Disinfection/Effluent Aeration	175,000	15,000
Subtotal	$3,295,000	$749,000
Mobilization (3%)	100,000	
Contingencies (10%)	330,000	76,000
Total Estimated Construction Cost	$3,725,000	$825,000
Pump Station Property	5,000	5,000
WWTP Property	25,000	25,000
Project Related Costs (25%)	930,000	
Estimated Project Cost	$4,685,000	$855,000

Annual Operating, Maintenance and Equipment Replacement Costs

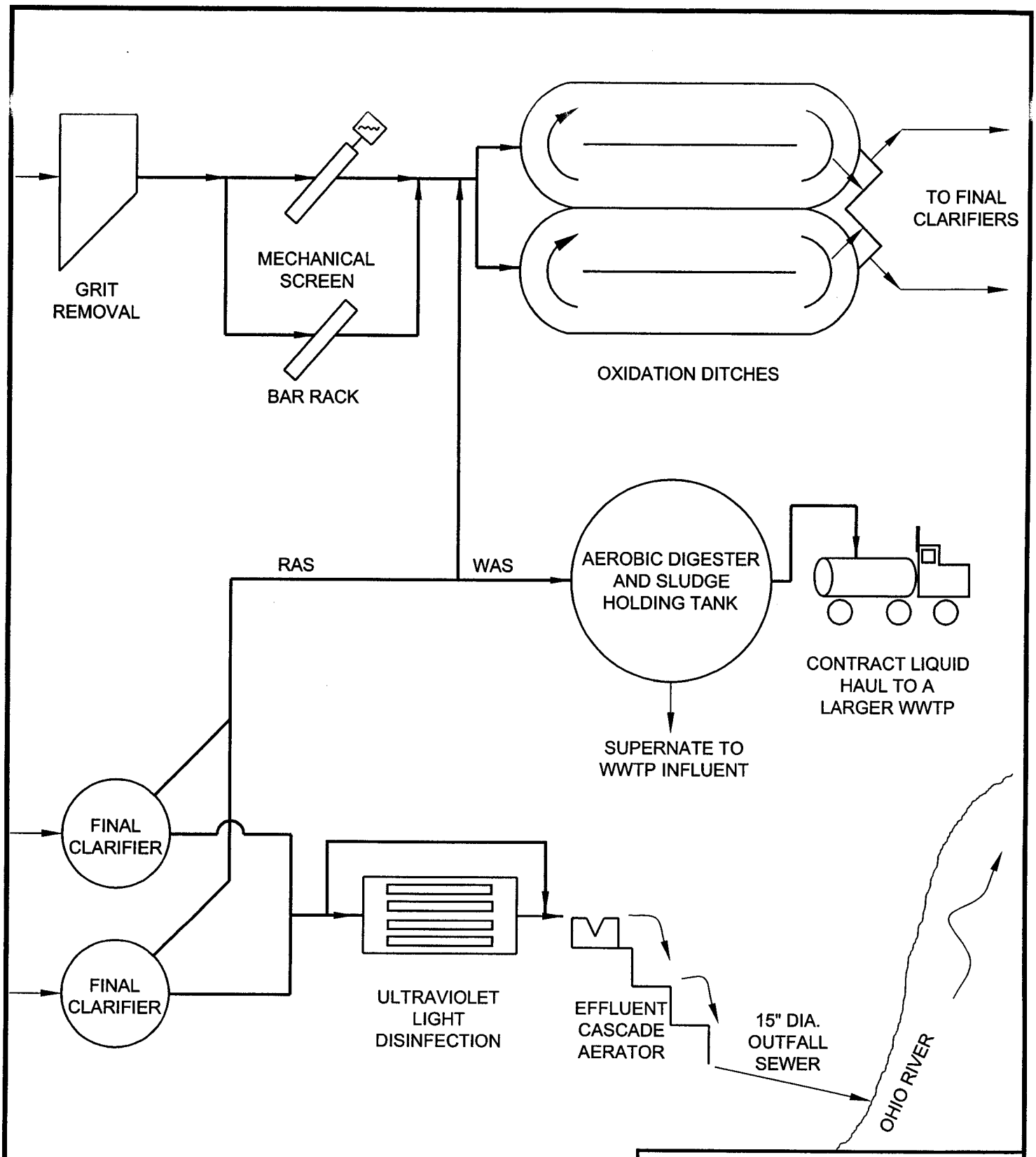
Additional Labor	$7,200 /yr
Additional Power	22,000
Additional Materials & Supplies	3,200
Equipment Replacement Fund	9,000
Sludge Disposal	45,000
Total Estimated Annual O&M&R	$86,400

8.3.3 Oxidation Ditch Activated Sludge Plant

This alternative is similar to Alternative No. 1, except that the biological reactors are oxidation ditches, instead of single stage aeration. Exhibit 8-3 shows the schematic of this alternative. This alternative includes the following features:

- New influent pump station for Augusta
- Gravity Grit Removal
- Mechanical screen with standby bar rack
- Two 325,000 gallon oxidation ditches, with a 9 foot sidewater depth.
- Each ditch would have two 40 horsepower rotor aerators
- Two 55 foot diameter final clarifiers
- Three 340 gpm RAS/WAS pumps
- Ultraviolet light disinfection
- Cascade Aerator
- 195,000 gallon aerobic digester/sludge holding tank
- Tanker truck loading pad
- Control building constructed at grade

Table 8-3 exhibits the construction and annual O&M&R costs.



NOTE:
ALL ITEMS SHOWN ARE PROPOSED.

EXHIBIT NO. 8-3

BRACKEN COUNTY
REGIONAL WWTP
FLOW SCHEMATIC
OXIDATION DITCHES PLANT

BURGESS & NIPLE

TABLE 8-3

ALTERNATIVE NO. 3

OXIDATION DITCH ACTIVATED SLUDGE TREATMENT PLANT

Construction and Project Costs

Item	Estimated Construction Cost	Year 20 Salvage Value
Site Work and Control Building	$835,000	$320,000
Influent Pump Station	260,000	80,000
Screening and Grit Removal	160,000	21,000
Oxidation Ditches	810,000	210,000
Final Clarifiers/RAS Pump Station	480,000	130,000
Ultraviolet Light Disinfection/Effluent Aeration	175,000	17,000
Aerobic Digestion/Sludge Storage Tank	305,000	92,000
Subtotal	$3,025,000	$870,000
Mobilization (3%)	90,000	
Contingencies (10%)	305,000	85,000
Total Estimated Construction Cost	$3,420,000	$955,000
Pump Station Property	5,000	5,000
WWTP Property	40,000	40,000
Project Related Costs (25%)	855,000	
Estimated Project Cost	$4,320,000	$1,000,000

Annual Operating, Maintenance and Equipment Replacement Costs

Additional Labor	$8,000 /yr
Additional Power	38,000
Additional Materials & Supplies	4,300
Equipment Replacement Fund	17,000
Sludge Disposal	45,000
Total Estimated Annual O&M&R	$112,300

8.4 Economic Analysis

Table 8-4 shows the cost effective analysis of the three alternatives. Alternative No. 1, the Single Stage Activated Sludge Plant is cost effective. The other two alternatives, being 10.6% and 8.6 % more costly, could be selected if found superior in a non-monetary way, as compared to Alternative No. 1.

TABLE 8-4

ECONOMIC ANALYSIS AND COMPARISON
OF THE AUGUSTA REGIONAL WASTEWATER TREATMENT PLANT ALTERNATIVES

Cost Item	Factor	Alternative No. 1 Single Stage Activated Sludge Plant with Biological Nitrogen Removal	Alternative No. 2 Poured-in-Place Activated Sludge Plant Equipped with Package Equipment	Alternative No. 3 Oxidation Ditches
A. Total Project Cost	A	$4,090,000	$4,685,000	$4,320,000
B. Operation, Maintenance and Replacement Costs (Present Worth)	12.462	1,198,844	1,076,717	1,399,483
C. Salvage Value (Present Worth)	0.3769	(368,608)	(322,250)	(376,900)
D. TOTAL PRESENT WORTH	A + B – C	$4,920,236	$5,439,467	$5,342,583
G. Relative Percent Cost of Least Cost Alternative		Least Cost	+10.6%	+8.6%

8.5 Non-Monetary Effectiveness Criteria Comparison

8.5.1 Implementation

All alternatives require the purchase of new property and construction of connecting lines and an outfall sewer. Alternative No. 3, Oxidation Ditches, may be slightly less implementable because it requires a little more land than the other two alternatives.

8.5.2 Environmental Impact

All three alternatives provide a good degree of protection to the environment as they all three produce a high quality effluent. Alternatives 1 and 2 offer more nutrient removal capability as compared to Alternative No. 3, and would have a slightly better environmental impact. The impact is considered 'slight' because the new plant's flow is insignificant as compared to the flow in the Ohio River, the receiving stream.

Alternatives 1 and 2 are also superior in that they would use less electrical energy than Alternative No. 3. Production of electrical energy in this area is mostly by coal-fired power plants, and using less energy reduces the environmental impact of operating coal-fired power plants.

8.5.3 Engineering Evaluation

The simplest system to operate would be Alternative No. 3 –Oxidation Ditches. The biological reactor is simpler and takes less operational skill to control. At the same time, though, it is not as capable in nutrient control as the other two alternatives. The equipment for Alternative No. 3 is reliable.

Alternatives Nos. 1 and 2 have more reactor compartments and equipment than Alternative No. 3. Each reactor compartment has a different purpose which the operator must recognize and then ensure that these conditions are present in each compartment. This level of operational skill can be readily obtained with training of personnel during start-up. For example, the small community of Aberdeen, Ohio, located just upstream on the Ohio River, owns and operates Alternative No. 2, Poured-in-Place Activated Sludge Plant with Package Equipment, successfully.

The alternatives are considered equal on an engineering evaluation basis. The more capable systems require more operator skill and the slightly less capable alternative (only on a nutrient removal basis) takes less operator skill. All alternatives are reliable and would provide long-term service.

8.5.4 Public Support

There likely would not be any difference in public support in any of the three alternatives from the viewpoint of their appearance or impact to the area. The public would likely support the alternative (or oppose less) that would have the smallest impact to their monthly sewer bill. Alternative No. 1, the Single Stage Activated Sludge Plant with Biological Nitrogen Removal, being cost effective, would probably have more public support than the other alternatives.

8.6 Recommendation

Alternative No. 1, the Single Stage Activated Sludge Plant with Biological Nitrogen Removal is cost effective. There are no over-riding non-monetary considerations that would place any one of the other two alternatives before this alternative. Therefore, Alternative No. 1, the Single Stage Activated Sludge Plant with Biological Nitrogen Removal is recommended.

CHAPTER 9 – FUTURE CAPITAL IMPROVEMENTS

The Division of Water requires facilities plans to also provide estimated costs for capital improvements for the next 20 years, broken down as to whether they will occur in the 0-2 year time frame, 3-10 time frame, or the 10-20 year time frame. Categories to be considered, include;

- Secondary Wastewater Treatment
- Advanced Wastewater Treatment
- Inflow and Infiltration Correction
- Major Sewer Rehabilitation
- New Collector Sewers
- Interceptor Sewers
- Combined Sewer Overflow Corrections
- Storm Water Pollution Corrections

Of these categories, the combined sewer overflow corrections category does not apply, as there are no combined sewers in the area.

There is only one known project planned in the 20 year period. It is the construction of the new Industrial Park pump station and force main to the KY 9 – KY 19 intersection. The estimated construction and project (capital) cost is shown in Table 9-1. This project is anticipated to occur in the 3-10 year time frame. It would not start until new or imminently planned development would result in the existing 10,000 gpd plant becoming overloaded. The appropriate category for this project would be "Interceptor Sewer."

There are no other projects planned. The location of other new development accessible to the new regional system is possible. The location of such developments is not presently known, so no projects are planned at this time.

TABLE 9-1

INDUSTRIAL PARK PUMP STATION
AND FORCE MAIN TO KY 19 – KY 19 INTERSECTION

Item	Estimated Construction Cost
Pump Station (300 gpm)	$210,000
6 Inch Diameter Force Main and Appurtenances	450,000
Subtotal	$660,000
Mobilization (3%)	20,000
Contingencies (10%)	65,000
Total Estimated Construction Cost	$745,000
Temporary Easements	20,000
Permanent Easements	40,000
Pump Station Property	5,000
Project Related Costs (25%)	185,000
Total Estimated Project Cost	$995,000

CHAPTER 10 – RECOMMENDED PLAN

10.1 Recommended Plan

Exhibit 10-1 shows the recommended regional solution for wastewater collection, transport and treatment for the planning area. The treatment plant for Brooksville should be abandoned and the wastewater pumped to Augusta to a new regional wastewater treatment plant. In Augusta, the existing influent pump station should be replaced with a new one and the existing wastewater treatment plant abandoned. A future project recommended is the pump station and force main from the industrial park to the regional system. This should be constructed when sufficient development occurs so that the industrial park's package plant would be of insufficient capacity to treat the wastewater generated. Features of the initial recommended project to implement include the following;

- A new 465 gpm pump station located on the current Brooksville Wastewater Treatment property.
- A new 500 gpm pump station located next to Ky 19, just south of Chatham.
- A new 8 inch diameter force main from Brooksville along Ky 19 to the Ky 19 - Ky 9 intersection.
- A new 10 inch diameter force main laid north from Ky 9 alongside Ky 19 and Little Turtle Creek Road and then to the new regional wastewater treatment plant.
- A new 765 gpm pump station to replace Augusta's main pump station and a new 8 inch diameter force main to the new regional wastewater treatment plant.
- A new 690,000 gpd regional wastewater treatment plant.
- A new 15 inch diameter gravity outfall sewer to the Ohio River from the new regional wastewater treatment plant.

The new regional wastewater treatment plant uses technology that will not only provide a high quality effluent, but also one that has had most nitrogen removed. The effluent produced from this treatment plant should consistently produce an effluent with a water quality of $CBOD_5 \leq 5$ mg/l, TSS ≤ 10 mg/l, Ammonia N ≤ 1 mg/l and total nitrogen ≤ 5 mg/l. Exhibit 10-2 shows a schematic of the proposed plant. Plant features include;

- Gravity Grit Removal
- Mechanical Screen with standby bar rack

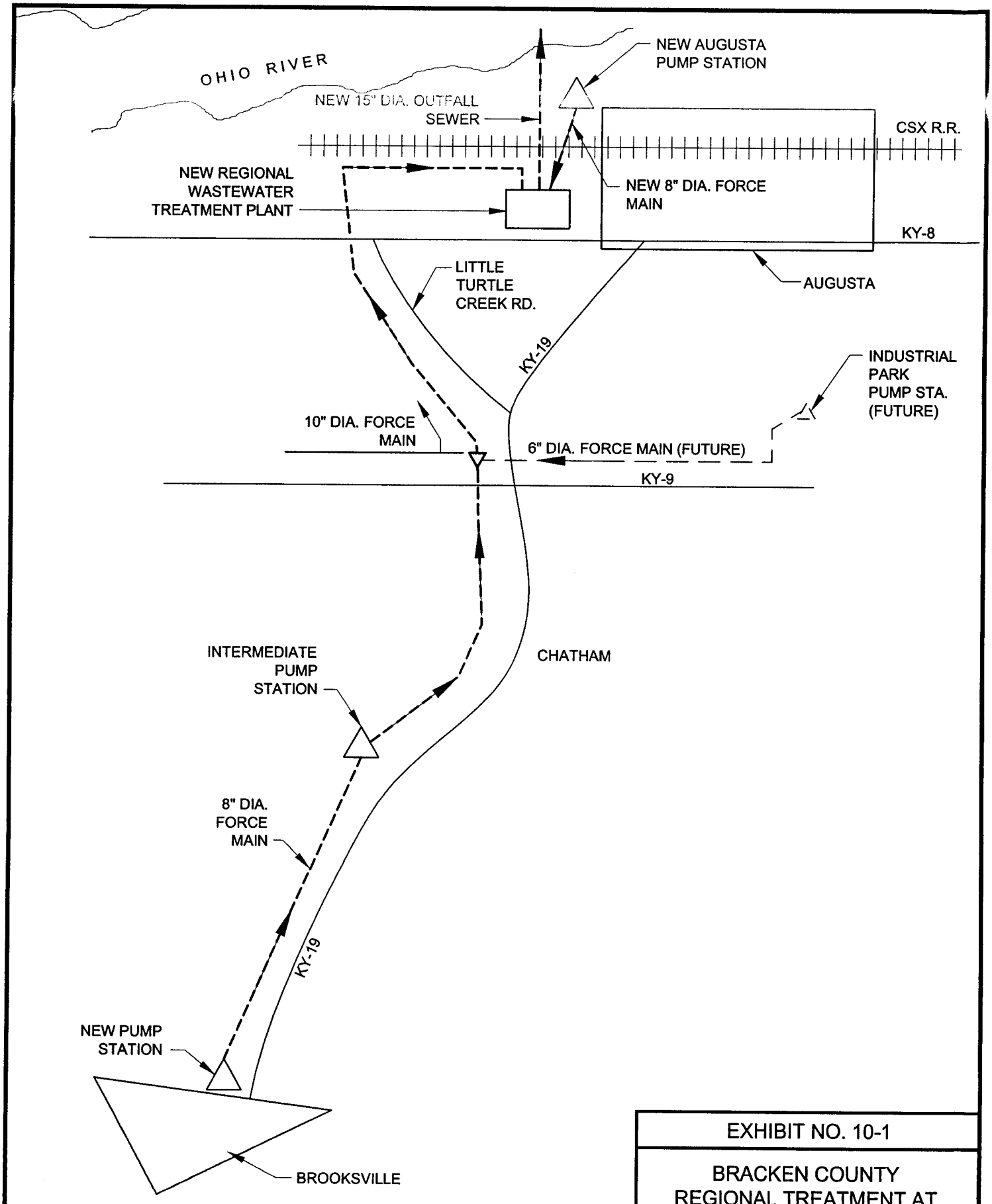
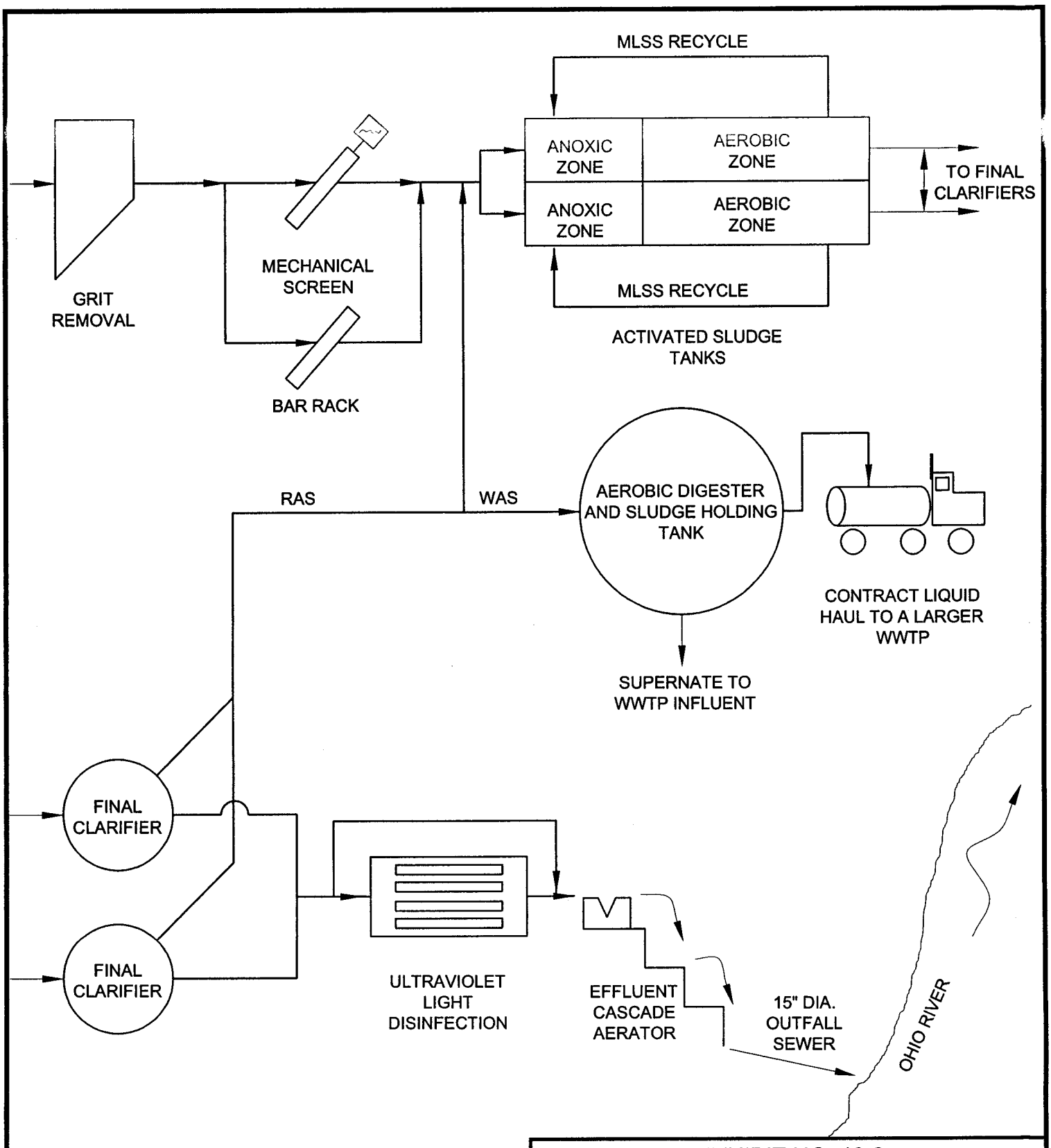


EXHIBIT NO. 10-1

BRACKEN COUNTY
REGIONAL TREATMENT AT
NEW AUGUSTA WWTP

BURGESS & NIPLE



NOTE:
ALL ITEMS SHOWN ARE PROPOSED.

EXHIBIT NO. 10-2

BRACKEN COUNTY REGIONAL WWTP
FLOW SCHEMATIC
SINGLE STAGE ACTIVATED SLUDGE PLANT
WITH BIOLOGICAL NITROGEN REMOVAL

BURGESS & NIPLE

- Two aeration tanks, each with an anoxic zone and an aerobic zone. Features include:
  - Anoxic zones having a nominal detention time of 4 hours
  - Aerobic zones having a nominal detention time of 19 hours
  - Two 880 gpm MLSS pumps
  - Two 450 scfm, 25 horsepower blowers
- Two 55 foot diameter final clarifiers
- Three 340 gpm RAS/WAS pumps
- Ultraviolet light disinfection
- Cascade aerator
- 195,000 gallon aerobic digester/sludge holding tank
- Tanker truck loading pad
- Control building built on top of the aeration tank structure

The construction cost for the new facilities are shown in previous report sections. The cost of pump stations and force mains from Brooksville to Augusta is $3,710,000 with an additional operation and maintenance cost of $48,900/yr. as shown in Table 7-2. The cost of the treatment plant, pump station and outfall sewer in Augusta is $4,090,000 with an additional operation and maintenance cost of $96,200/yr. as shown in Table 8-1.

10.2 Operation and Maintenance Requirements

Operation and Maintenance requirements will change. The operations of the Brooksville wastewater treatment will cease. Instead, the two pump stations to transport the wastewater to the regional treatment plant will have to be maintained. An operator would visit the pump stations once to three times weekly, depending on conditions, to record pump operating times, inspect the pump stations and perform housekeeping duties.

The proposed regional treatment plant in Augusta has more unit processes and pieces of equipment as compared to the current treatment plant. However, part time operation will still be sufficient at the plant. The plant should normally require about 4 hours of labor per day, 5 days per week. Work for that period of time would include record keeping, sampling, lab analysis for process control, equipment adjustments, inspection, housekeeping, sludge wasting, aerobic digester tank decanting and coordination with outside contractors. Additional time will have to be spent for periodic preventive maintenance activities and yard maintenance.

The cost effectiveness analysis in chapters 7 and 8 assumed design flows were occurring, which won't be the case during the first year of operation. Therefore, in computing revenue required to initially operate the system with fewer customers than full flow, the initial year O&M&R cost should be used. Table 10-1 is provided to show the expected initial year annual O&M&R cost.

TABLE 10-1

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
INITIAL YEAR ANNUAL O&M&R COST

Item	Design Flow Annual Cost	Factor for Initial Year	Initial Year Annual Cost
Existing Augusta Cost	-	-	$128,000 /yr.
Reduce Brooksville Cost for Collection System Only	-	-	30,000
Pump Stations – Force Main Costs			
Labor	$9,400	0.80	7,500
Power	28,000	0.40	11,200
Materials and Supplies	4,500	0.80	3,600
Equipment Replacement Fund	7,000	1.00	7,000
Regional WWTP Cost (Additional)			
Labor	8,600	0.80	6,900
Power	24,000	0.50	12,000
Materials and Supplies	4,600	0.80	3,700
Equipment Replacement Fund	14,000	1.00	14,000
Sludge Disposal	45,000	0.45	20,300
Estimated Initial Year Annual O&M&R Cost			$244,200 /yr.

The initial annual O&M&R cost to operate the system is estimated to be $244,200 per year. The current annual O&M&R cost to run Augusta and Brooksville systems now is about $248,000 ($128,000 and $120,000, respectively). Therefore, there is no impact to current customers with respect to funding the initial O&M&R.

10.3 Financial Requirements

The revenue now generated in the Augusta sanitary sewer system is approximately $155,000 per year and in the Brooksville sanitary sewer system is approximately $116,000, for a total of about $271,000 per year. In calculating financial requirements to fund the system, existing bond retirement is not considered as both cities should have their bonds retired in the year 2008, and this project's payments can start, therefore, in the year 2009.

Several tables are provided to show the impact of financing methods including loans and grants from various sources. Table 10-2 shows a simple loan type financing using Kentucky's State Revolving Fund. Bracken County qualifies for the standard rate loan, which is 3%. The annual payment also includes a 0.2% payment on the unpaid balance of the loan. The revenue required is estimated to be 2.89 times the current revenue. Clearly grant funds are needed to make this project feasible.

TABLE 10-2

FINANCIAL REQUIREMENTS WITH 3% LOAN FROM THE STATE REVOLVING FUND

Item	Cost
Total Project Cost	$7,800,000
Estimated Annual Debt Retirement at 3% for 20 years (0.06722 x $7,800,000)	524,316 /yr.
Annual Payment on Principle, First Year (0.002 x $7,800,000)	15,600 /yr.
Initial Year O&M&R	244,200 /yr.
Total Annual Revenue Required	$784,116 /yr.
Current Revenue	271,000 /yr.
Revenue Increase Required	513,116 /yr.
Percent Increase in Revenue Required	189%
Multiplier Factor as Compared to Existing Revenue	2.89

Table 10-3 shows the monthly user cost breakdown of the capital and yearly treatment plant operation, maintenance and replacement costs based on various grant to loan ratios. A comparison to the existing sewer use fee is also shown. The average monthly household in Augusta and Brooksville uses approximately 6000 gallons per month. The average user fee as shown in Table 10-3 would range from $72.88 with a 100% loan to $32.74 with an 80% grant and 20% loan. A new sewer rate study should be completed following establishment of funding to determine new rates based on water usage records and residential versus commercial user information. Table 10-3 scenarios are based on existing customers presently using the Augusta and Brooksville sewer systems.

TABLE 10-3

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
MONTHLY COST PER FUNDING OPTIONS

	100% Loan	50/50 Grant/Loan	75/25 Grant/Loan	80/20 Grant/Loan		
Loan Amount	7,800,000	3,900,000	1,950,000	1,560,000		
Debt Service	524,283	262,141	131,071	104,857		
.2% loan service fee	15,600	7,800	3,900	3,120		
Debt Service Income required	539,883	269,941	134,971	107,977		
Estimated OM & R	244,200	244,200	244,200	244,200		
Total Revenue Required	784,083	514,141	379,171	352,177		
					Existing Augusta	Existing Brooksville
Unit Cost/1,000 Gals	$12.15	$7.97	$5.87	$5.46	$12.07	$15.79
Min Bill < 2000 gal	$24.29	$20.00	$18.00	$16.00	$14.14	$15.79
Bill for 4,000 Gals	$48.59	$31.86	$23.50	$21.82	$18.28	$24.89
Bill for 5,000 Gals	$60.73	$39.83	$29.37	$27.28	$20.35	$29.44
Bill for 6000 Gals	$72.88	$47.79	$35.24	$32.74	$22.42	$33.99
Bill for 7,000 Gals	$85.03	$55.76	$41.12	$38.19	$24.49	$38.54
Bill for 8,000 Gals	$97.18	$63.72	$46.99	$43.65	$26.56	$43.09

Loan - percentage rate 3 % term = 20 yrs (Based on State Revolving Loan financing)

Flow Estimate – Number of users =	881	Households		
Avg. water usage =	200.5	Gal/day/household	6,015	Gal/mo
	365	Days		
	64,549,520	Gal/year		

The possible funding sources to aid in the financing of the project are listed below. The list shows the various funding limits and interest rates currently being offered by the various organizations. If a regional treatment solution is approved, a joint application for funding would need to be completed by Augusta and Brooksville.

- Kentucky Infrastructure Authority – KIA – Various funding levels for grants through special State Legislature appropriation funds similar to Tobacco Funds. Loans are administered through Kentucky Division of Water State Revolving Loan Fund. Loan rates are currently at 3% for 20 years for the Bracken County area. A .2% annual loan servicing fee on the unpaid balance is charged on all loans. Tobacco Fund appropriation grants are usually limited to a maximum amount of $500,000.
- Community Development Block Grant – CDBG – $1,000,000 maximum grant, requires an income survey to determine eligibility 51% of the homes must be in the low to moderate income levels to qualify for the funding.
- USDA Rural Development – Funding levels are based on the 2000 census. Augusta is eligible for up to 45% grant and Brooksville is eligible for up to 75% grant. Actual loan to grant ratios over the last few years have been 65:35 and 70:30. Loan interest rates are currently at 4.25% for 40 years with the first 2 years being interest only payments. Loans require a debt coverage of 20% of annual cost for loan only financing and 10% of annual cost for loan/grant financing until a reserve of one year's payment is accumulated.
- Federal Budget Appropriation Grants – Grants are administered by Division of Water and are applied for through the local congressman. The grants range from 0 to 55% of the project cost depending on Congressional appropriation.

10.4 Sanitary Collection Systems

Renovation work is required on the sanitary sewer collection system in Augusta and Brooksville to reduce I&I as discussed in Chapter 4, Sections 4.2.2 and 4.3.2 of this report and the SSES report. This repair work as well as future I&I detection and repairs will require a means of financing. Since the search for funding of the regionalization may take several years to complete, it is recommended that the sewer repairs and search for additional I&I sources begin immediately. The funding of this work could be completed by increase in sewer user fee. If each city would concentrate on I&I removal projects over the next several years, many I&I sources could be corrected prior to the construction of the new treatment plant saving pumping cost and treatment capacity. Table 10-3 shows a cost breakdown of the repair work

along with the cost for additional search for undetected I&I sources. Work is assumed to be completed over a four year period. The table provides an estimate of the increase in monthly user fee required to complete the investigation work and repairs.

Table 10-4

AUGUSTA AND BROOKSVILLE, KY
SANITARY SEWER SYSTEM CORRECTIONS

Augusta

Work Description	Cost	Cost per year
I&I corrections	$52,800	$13,200
Manhole lid raising	$40,000	$10,000
Investigation & Future work		$24,000

Total = $47,200 / year

User cost increase - $47,200 / 560 customers / 12 mo. = $7.00 / mo.

Brooksville

Work Description	Cost	Cost per year
I&I corrections	$8,100	$2,025
Manhole lid raising and anchoring	$45,000	$11,250
Investigation & Future work		$19,000

Total = $32,275 / year

User cost increase – $32,275 / 434 customers / 12 mo. = $6.20 / mo.

A benefit of completing the additional sewer investigation work as soon as possible is that if substantial repair work is found to be necessary during the investigation, this repair work could be included in the overall financing of the regional treatment facility.

10.5 Schedule

The project is needed soon as the treatment plants do need replaced. However, the plants are currently in compliance with their KPDES permit limits, so time should be spent in obtaining low interest loans and grants. Also, time is needed in forming the legal entity to own and operate the expanded sewer system. It would be best for the two cities if the new loan payment could start in the year 2009, so that the existing bonds could be retired before taking on new debt. Table 10-5 shows the recommended schedule for this project.

TABLE 10-5

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
PROPOSED SCHEDULE

Task	Completion Date
I&I Investigation and Corrections	2005 - 2008
Obtain low interest loan and grant funding	October 1, 2007
Complete Design	October 1, 2008
Obtain Division of Water Approval	December 1, 2008
Receive bids	February 1, 2008
Award contracts and start construction	March 1, 2009
Complete construction	March 1, 2010
Complete start-up	May 1, 2010

APPENDIX A

NATURAL FEATURES AND HISTORIC SITES – PART OF BRACKEN COUNTY COMPREHENSIVE PLAN

Introduction

Natural features data such as geology, topography and soils provide valuable information for land planning decision-making. The natural features of the outer bluegrass region shape the landscape of Bracken County and contribute to the county's scenic beauty.

In an ideal world, all land planning decisions would take into consideration the potential impacts on the natural environment and historic resources of a region. Although realistically, this does not occur. Oftentimes new development has a negative impact on surrounding environmental resources and consequently a detrimental affect on the ecosystem and aesthetic beauty of an area. Natural features often make certain lands more suitable for development than others. For instance, steep hillsides are more difficult to build on and floodplains present a threat to property value. Similarly, gently rolling hills and valleys may prove more suitable for farmland and ridge tops more suitable for housing construction. In considering the future of Bracken County, natural features and historic sites must be taken into account to produce more sustainable development, and protect the natural and scenic resources.

Natural Resources

The natural resources of a region determine the physical appearance as well as the economic revenue source for the region. Bracken County's most important natural resources are its soils, water, woodland, and minerals.



View of the Ohio River from Riverside Drive in Augusta.

The water in Bracken County comes from ground water, and rivers in and around the county. The Ohio and Licking Rivers provide water for the county and according to the *Bracken and Robertson Counties Soil Survey*, "also supply much of the water for ground water recharge and help control flooding through a series of locks, dams, and reservoirs." The Ohio River, which borders Bracken County to the north, has a secondary role as well. It is a prime recreational area for fishing, boating, and other related activities. The Licking River flows along the southern border of the county adjacent to Robertson County.

Woodland comprises a large portion of Bracken County; approximately 50,000 acres or 37 percent of the total acreage in the county is woodland. The major tree species are black walnut (Juglans nigra), white oak (Quercus alba), northern red oak (Quercus rubra), and white ash (Fraxinus americana).

The National Fish and Wildlife Service has identified two endangered species in the county; the first, the Fanshell (Cyprogenia stegaria), is a small subcircular shell with a green or yellow surface found in the Ohio and Licking Rivers and the second species, the Clubshell (Pleurobema clava), is similar in character to the Fanshell - it is approximately the same size and is yellow, brown, or bright green in color. Both species are from the Unionidae family, and share the same habitat in Bracken County. Both species are endangered because of degradation of their habitat. Increased runoff has polluted rivers and streams and destroyed the majority of the population of these shells.

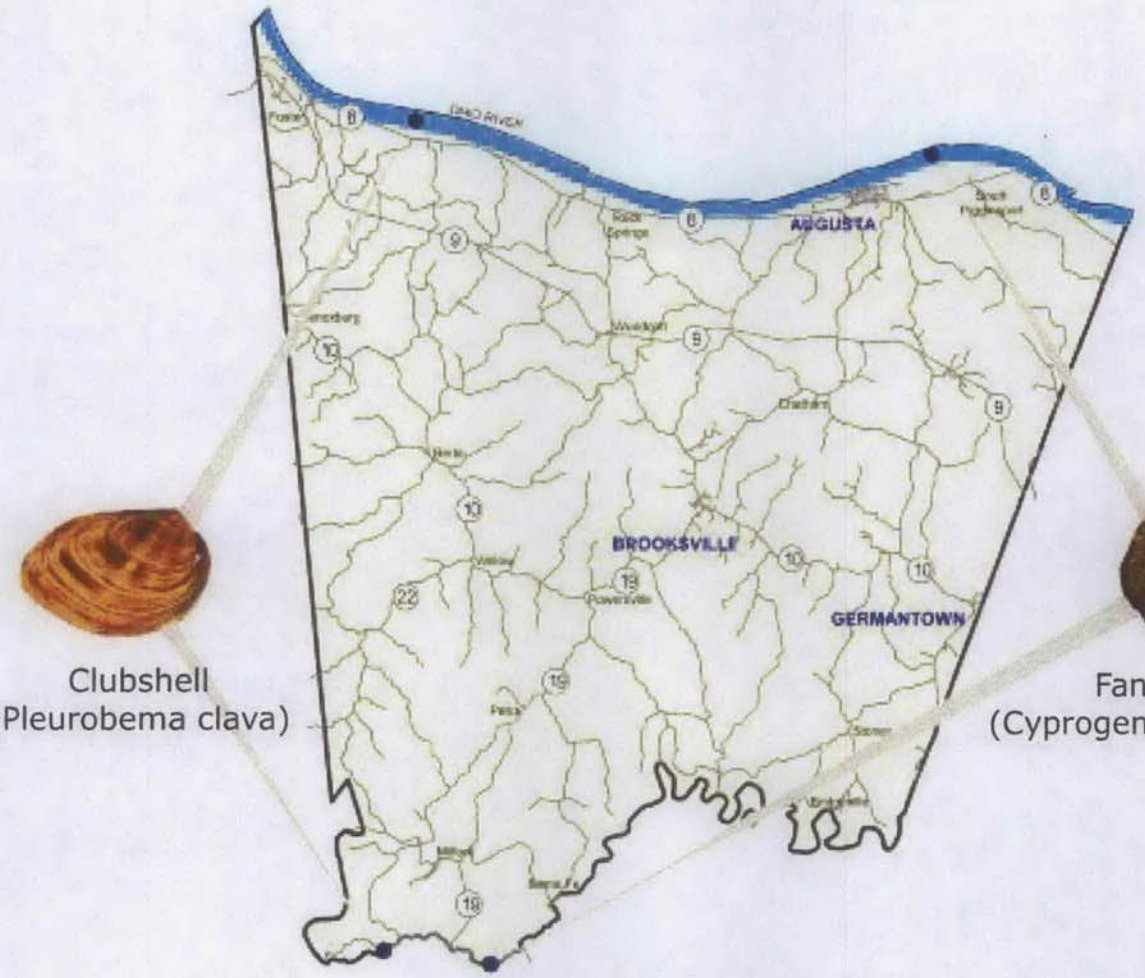
The geologic formations of Bracken County belong mostly to the Ordovician system with a small area along the Ohio and Licking Rivers belonging to the Alluvium system.

The most abundant mineral in Bracken County is limestone followed by gravel and sand. The minerals are not currently being quarried in Bracken County, although several small abandoned limestone quarries can be found within the county and adjacent Robertson County. Limestone is commonly used as a building material in Kentucky because of its accessibility. Limestone is also used as a source of aglime fertilizer, and is used in concrete and aggregate beds for roads and walkways.



Locus Creek near the AA Highway is surrounded by woodland.

Endangered Species Map



Clubshell
(Pleurobema clava)



Fanshell
(Cyprogenia stegaria)

Prepared By:
PARSONS BRINCKERHOFF

Topography

Bracken County's northern and southern regions are part of the Bluegrass Physiographic Region. The Bluegrass Region's topography is comprised of, "long narrow ridge tops and short, moderately steep to very steep side slopes that are separated by long, narrow floodplains," according to the *Bracken and Robertson Counties Soil Survey*. The ridge tops are used for hay, pasture, and sometimes for smaller plots of tobacco and corn.

The Outer Bluegrass Physiographic Region makes up part of the northeastern and central parts of Bracken County. The soil survey describes the Outer Bluegrass Region's topography as, "broad rolling ridge tops and side slopes." The area is comprised of flat or slightly sloping hills which are used for farming tobacco, corn, or small grain.

Future development should be contingent upon careful examination of topography, among other considerations. The county is made up of a beautifully sloping landscape and certain areas may be very fragile to development, both physically and aesthetically. Erosion and runoff are two major concerns when considering development on sloping topography. Another consideration is protecting the aesthetic beauty of the rolling landscape. Identifying important view sheds in the county will help protect them from future development.

Soils

Soils determine the areas most suitable for development and certain land uses. Therefore, soils identification is an essential step in evaluating building suitability and should be analyzed any time you change the state of the soil.

Altering soil characteristics and forms can easily change the properties of the soil. Almost any soil can be altered to be made suitable for construction by utilizing different design techniques or construction skills, and through environmental damage mitigation. Rural residential developments are not usually part of a city water or sewer system, which means a majority of these developments use septic systems. The implications, or even repercussions, of using such systems on soils can be drastic if the systems are not maintained or used correctly. To avoid such consequences, a septic system must have an adequate depth of suitable soil and adequate space for a lateral field. If appropriate soil types are not used or available on a development site, purification of the effluent may not occur, thus allowing bacteria and other pollutants to enter the ground water. If the ground water has been contaminated this may not only effect a landowner's drinking water, but may also contaminate the water for numerous other consumers. The effect is exponential; one poor system can affect many people.

The soil survey for Bracken County has not yet been published to date, but all data collection has been finished and documented at the Bracken County US Department of Agriculture (USDA) office. Steve Jacobs and Richard Jones of the Natural Resource Conservation Service compiled the data for the *Bracken and Robertson Counties Soil Survey*. The approximate publishing date is 2005, at which time the data will be available to the public in a book format.

The five general soil associations in Bracken County are:

Elk-Otwell-Nolin

These soils are very deep, nearly level to sloping, well drained and moderately well drained soils that have loamy subsoil and are located on stream terraces and floodplains. This association is found along the Licking River and North Fork River Valley in the southern portion of Bracken County. The slope of this soil association is between 0 and 12% slope. The major uses of the soil are for cropland, hay, and pasture. This land has a seasonal high water table and hazard of erosion. If more development of this land occurs in the future, management measures may include flood control measures, drainage systems, and outlet ditches.

Wheeling-Nolin-Otwell

These soils are very deep, nearly level to very steep, well drained and moderately well drained soils that have loamy subsoil on stream terraces and floodplains. It is part of the Ohio River Valley and valleys of the tributaries that feed the Ohio River. This soil type is located along the majority of the Northern Border of the county.

The topography can be anywhere from 0 to 5% slope. Despite flooding concerns and steep sloped areas, this soil association can be used for cropland, hay, and residential development. Management measures for farming on this soil include flood control measures, drainage systems, outlet ditches, and planting moderately deep and deep rooted cover crops to maintain stream bank vegetation. Management measures for developing urban sites include proper site selection, adding fill material, grading, and proper design.

Lowell-Nicholson

These soils are deep and very deep, gently sloping to moderately steep, well drained and moderately well drained soils that have clayey or loamy subsoil and are located on ridge tops and upper side slopes. This soil type is located in the uplands at a 2 to 20% slope. The major uses for this land are cropland, hay, pasture, and residential development. Farmland management concerns include: seasonal high water table, slope, and hazard of erosion. The urban management concerns are as follows: slope, low strength, seasonal high water table, depth to bedrock, and slow permeability. Management measures for farmland in this soil association include: conservation tillage, forage management, and use of moderately deep

and deep-rooted cover crops. Management measures for the urban areas include: site selection, adding fill material, grading, and proper design.

Eden

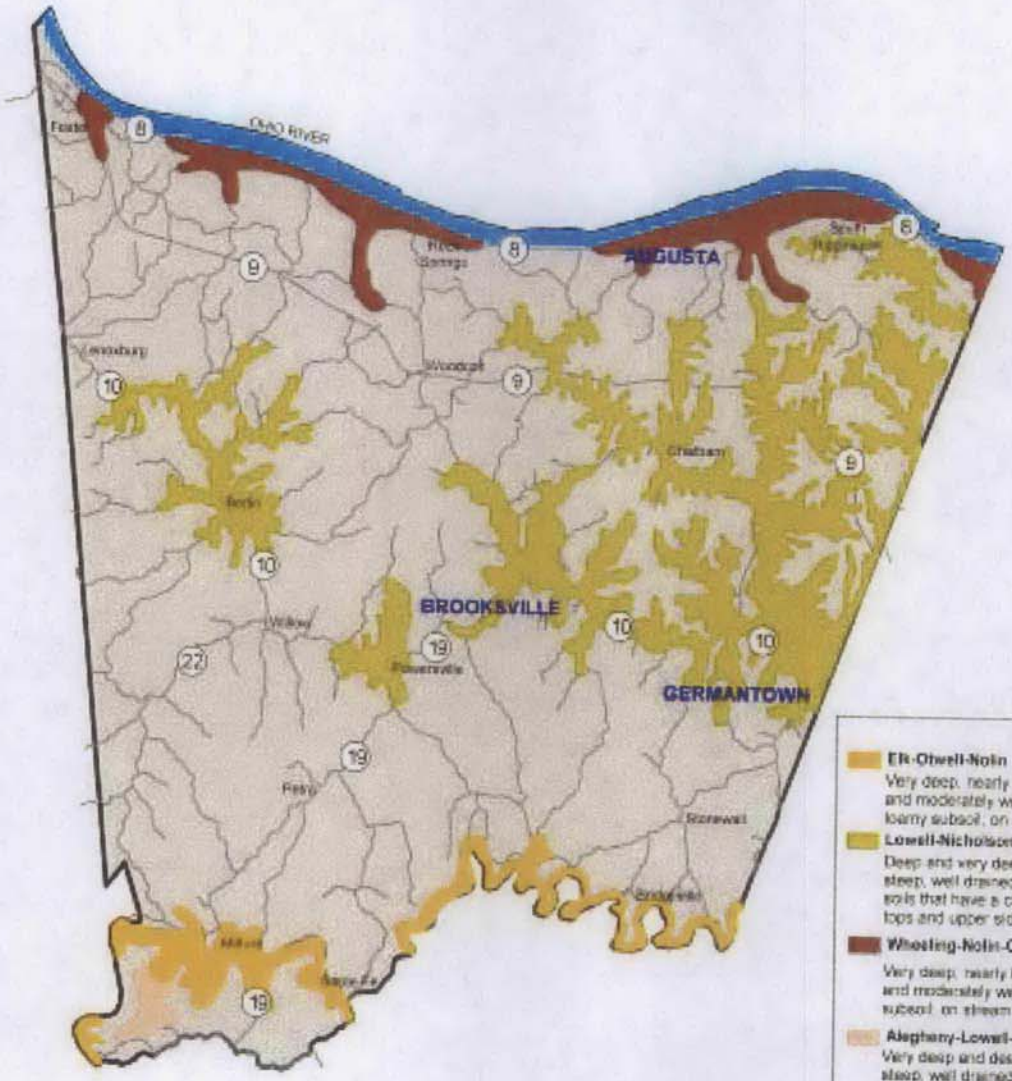
Eden soils are moderately deep, sloping to very steep, well-drained soils that have clayey subsoil and are found on ridge tops and side slopes. The slope on these soils ranges from 6 to 35% and they are located in the uplands throughout the county. Major uses of land with this soil type are woodland, pasture, and residential development. Managing farmland with this soil type includes issues such as: slope, flagstone, moderate depth to bedrock, and the hazard of erosion. The management concerns for the urban locations are: slope, low strength, depth to bedrock, and slow permeability. Management measures for farmland in this region include: rotational grazing, proper plant selection, and site selection for cultivated crops. Measures for management of urban areas include: site selection, adding fill material, grading, and proper design.

Allegheny-Lowell-Monongahela

This soil is very deep and deep, gently sloping to moderately steep, well drained and moderately well drained soils that have loamy or clayey subsoil. Allegheny-Lowell-Monongahela soil can be found on upland alluvial deposits, ridge tops, and side slopes. This soil association is part of the ancient Pliocene river channel. The location of this ancient river channel is on a small area in the uplands just south of the North Fork and Licking River. The land is used for cropland, hay, and pasture fields. These regions have a seasonal high water table, slope, and hazard of erosion. Farmers must use conservation tillage, grassed waterways, and the use of cover crops with moderately deep rooting systems to prevent erosion and excess runoff.

Note: Descriptions of soil types were taken from the *Bracken and Robertson Counties Soil Survey*, to be published by the Natural Resource Conservation Service, USDA.

Generalized Soils Map



LEGEND

ER-Otwell-Nolin
Very deep, nearly level to sloping, well drained and moderately well drained soils that may have a loamy subsoil, on stream terraces and flood plains.

Lowell-Nicholson
Deep and very deep, gently sloping to moderately steep, well drained and moderately well drained soils that have a clayey or loamy subsoil, on ridge tops and upper side slopes.

Wheeling-Nolin-Otwell
Very deep, nearly level to very steep, well-drained and moderately well drained soils that have a loamy subsoil, on stream terraces and flood plains.

Alleghany-Lowell-Monogaela
Very deep and deep, gently sloping to moderately steep, well drained and moderately well drained soils that have a loamy or clayey subsoil, on upland alluvial deposits, ridge tops, and side slopes.

Eden
Moderately deep, sloping to very steep, well drained soils that have a clayey subsoil, on ridge tops and side slopes.

SOURCE:
Bracken County USDA Natural Resource Conservation Service

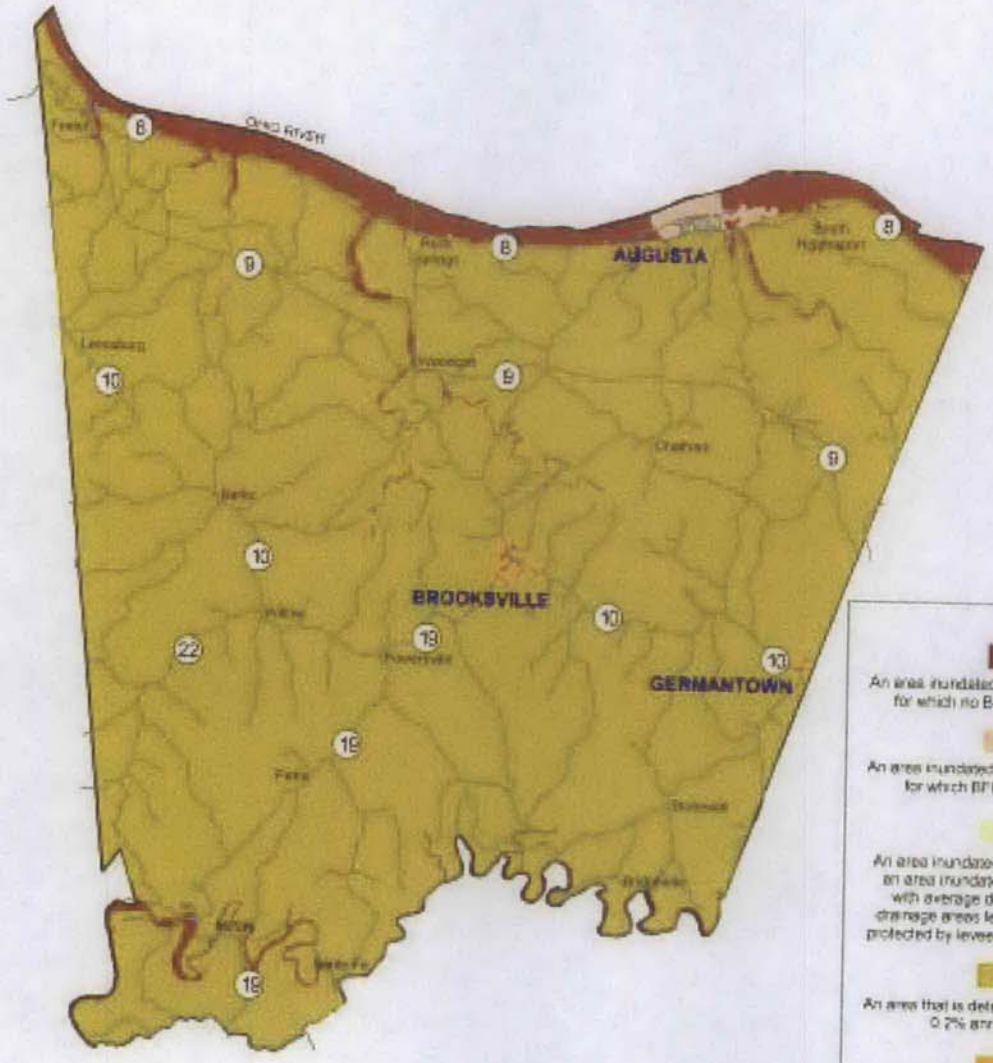
Prepared By:
PB PARSONS BRINCKERHOFF

Floodplain

The majority of the county lies outside of the 100-year and 500-year floodplains, although the small percentage of land area that is within the floodplain has historically been negatively affected by significant flooding. The affected areas are along the Licking River in southern Bracken County and along the Ohio River and its tributaries on the northern border of the county.

Augusta is almost completely located within the 100-year floodplain and has experienced several flood events of various intensities. Historic floods occurred in 1937 and 1997. Augusta does not currently have structural flood protection such as a levee or floodwall. The US Army Corps of Engineers has studied the feasibility of structural flood protection for Augusta and the analysis indicated that construction is not feasible. Augusta employs a Floodplain Coordinator and participates in the Federal Flood Insurance Program. The Federal Emergency Management Agency (FEMA) in coordination with the City of Augusta has purchased flood prone land, limited development within the floodway and have floodproofed housing.

Floodplain Map



LEGEND

Zone A

An area inundated by 1% annual chance flooding for which no BFEs have been determined

Zone AE

An area inundated by 1% annual chance flooding for which BFEs have been determined

Zone X500

An area inundated by 0.2% annual chance flooding an area inundated by 1% annual chance flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile, or an area protected by levees from 1% annual chance flooding

Zone X

An area that is determined to be outside the 1% and 0.2% annual chance floodplains

AN

An area that is located within a community or county that is not mapped on any published FIRM

SOURCE:
Buffalo Trace Area Development District

Prepared By:
PB PARSONS BRINCKERHOFF

Climate

The climate of a region is important because it affects all living organisms. Climate is especially important to some businesses and industries because different climates have risk factors that may affect business profits and daily life activities. The information in this section has been published by the US Department of Commerce, National Climatic Data Center, and Local Climatologically Data Center, 2000.

In Bracken County, the summers are warm with high levels of humidity and periodic thunderstorms. The average relative humidity rate is 70%. The relative humidity rises at night and the average high humidity rate is 80% around dawn. This is typical of areas in the United States around the same latitude. Prevailing winds are out of the southwest with an average wind speed of 11 miles per hour in the spring. The region experiences good precipitation rates to maintain crops and the average growing season lasts from April to October.

The average winter temperature is 32 degrees Fahrenheit, and the average summer temperature is 73 degrees Fahrenheit. The normal average annual temperature is 53.7 degrees Fahrenheit. The average yearly precipitation is 41.33 inches and 55% of the precipitation each year falls between April and September. The seasonal snowfall average is 11 inches. The sun shines 64% of the time during the summer and 45% of the time in the winter.

Air Quality

There are two types of air pollution, point source and non-point source. Both types of pollution are regulated in the Commonwealth of Kentucky by the Kentucky Division for Air Quality, therefore they are important to consider in land use planning. Point source pollution has a stationary or static source of emission; examples include factories and power plants. Non-point source pollution has a moving or changing source of emission such as automobile exhaust.

Currently, Bracken County has no major point sources for pollution. Harrison and Mason Counties are two of the surrounding four counties that do have point source pollution. Harrison County has the Dart Container Corporation and Mason County has East Kentucky Power and Green Tokai Company. According to the Kentucky Division for Air Quality, all of these industries are a source of air pollution because, "they are a major source of emissions of criteria and hazardous air pollutants."

Bracken County does have non-point sources of air pollution. Automobile exhaust is a primary contributor to the county's non-point source air pollution, although, the amount of automobile exhaust currently emitted in the county is minimal when compared with the Cincinnati/Northern Kentucky metropolitan area. The Northern Kentucky counties of Boone, Campbell, and Kenton suffer from poor air quality as a result of smog. Motorists in these counties are required to complete vehicle emissions testing.

Historic Resources

The Kentucky Heritage Council maintains a database of historic properties and sites throughout the Commonwealth of Kentucky; this database includes sites listed on the National Register for Historic Places and those that have been determined to be eligible for listing on the National Register.

Designation to the National Park Service's National Register of Historic Places requires significant research and, in some cases, the nomination and review process takes a significant amount of time. The Kentucky Heritage Council is a primary source of assistance and guidance in the nomination process. To be listed on the National Register, a nomination must be completed and presented to the Kentucky Heritage Council as well as the Kentucky Historic Preservation Review Board (KHPRB). If approved by the KHPRB, the nomination is forwarded to Washington D.C. to the offices of the National Register where the nomination will again be reviewed and considered for listing. If approved, the state is contacted by the National Park Service and notified of acceptance to the National Register.

A majority of National Register listings in Bracken County are located in or around the City of Augusta, although other historic buildings and places of significance are distributed throughout other portions of the county as well. Past floods have inflicted damage to the historic fabric of Augusta, but many of the historic buildings are still in excellent condition, especially along the Ohio River on Riverside Drive . The City of Augusta and individuals interested in historic preservation have made significant progress toward protecting and preserving existing landmarks within the community. The city continues to make historic preservation a priority. In October 2002, Augusta was awarded Bronze level status in the Renaissance Kentucky Program which recognizes and honors Kentucky cities that have maintained or restored their downtown areas as safe, vibrant, efficient and functional urban cores and have provided support and assistance regarding development strategies of the downtown areas.

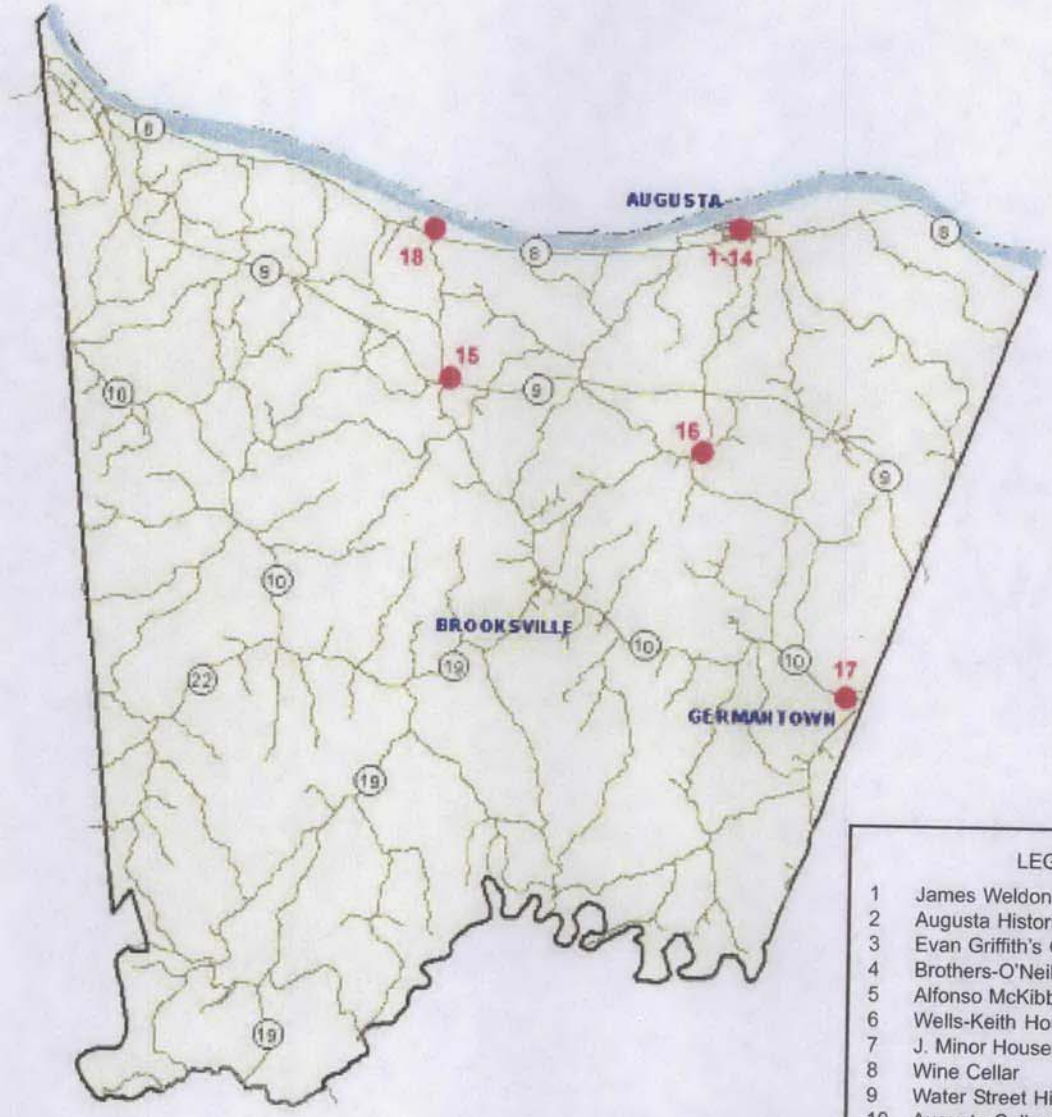
Currently, the Walcott Covered Bridge outside of Brooksville is the only National Register listing associated with the community. The bridge is currently undergoing extensive renovation to preserve its historic character and to make it available for pedestrian use. Similarly, the John Gregg Fee House is the only listing on the National Register in Germantown.

The Kentucky Heritage Council's complete list of structures, sites and districts listed on the National Register of Historic Places within Bracken County is as follows:

• Augusta College Historic Buildings	Augusta
• Augusta Historic District	Augusta
• Bracken County Infirmary	Chatham
• Brothers – O'Neil House	Augusta
• Mordecai Chalfant House	Augusta
• Confederate Monument	Augusta
• John Gregg Fee House	Germantown
• Evan Griffith's Grocery	Augusta
• Alfonso McKibben House	Augusta
• J.R. Minor House	Augusta
• Rock Spring Warehouse	Wellsburg
• Snag Creek Site	Willow Grove
• Stone House on Bracken Creek	Augusta
• Stroube House	Augusta
• Turtle Creek Site	Augusta
• Walcott Covered Bridge	Brooksville
• Water Street Historic District	Augusta
• James Weldon House	Augusta
• Wells – Keith House	Augusta
• Wine Cellar	Augusta

All structures found to be eligible by the Kentucky Heritage Council in Bracken County have been successfully listed on the National Register.

National Register Listings Map



LEGEND

1	James Weldon House
2	Augusta Historic District
3	Evan Griffith's Grocery
4	Brothers-O'Neil House
5	Alfonso McKibben House
6	Wells-Keith House
7	J. Minor House
8	Wine Cellar
9	Water Street Historic District
10	Augusta College Historic Buildings
11	Mordecai Chalfant House
12	Stroube House
13	Stone House on Bracken Creek
14	Confederate Monument in Augusta
15	Walcott Covered Bridge
16	Bracken County Infirmary
17	John Gregg Fee House
18	Rock Spring Warehouse

Note: The Turtle Creek and Snag Creek Sites have undisclosed addresses, therefore they have not been located on the National Register Listings Map.

Prepared By:
PB PARSONS BRINCKERHOFF

APPENDIX B

SEWER SYSTEM
EVALUATION SURVEY

Wastewater Collection and Treatment System
Sanitary SEwer Evaluation Study

City of Augusta & City of Brooksville

Bracken County, Kentucky

October 2005



BURGESS & NIPLE

WASTEWATER COLLECTION AND TREATMENT SYSTEM

SANITARY SEWER EVALUATION STUDY

FOR THE

CITY OF AUGUSTA
CITY OF BROOKSVILLE

October 2005

BURGESS & NIPLE, INC.
Engineers & Architects
312 Plum Street, 12th Floor
Cincinnati, OH 45202

Executive Summary

The Cities of Augusta and Brooksville, Kentucky are in the process of completing a Facilities Plan Update for the wastewater collection and treatment in their communities. Part of the process is to evaluate the volume of wastewater flow being treated at the wastewater treatment plants. The influent flow records at the treatment plants show the flow substantially increases above the normal water usage in the communities during rain events. Burgess & Niple, Inc (B&N) was contracted to assist the Cities in completing a Sanitary Sewer Evaluation Survey (SSES) to identify sources of wastewater flow beyond that of the normal water usage flows from buildings.

The water entering the sanitary sewer system beyond that of normal domestic water usage is labeled inflow and infiltration (I&I). Inflow is a clean water source entering the system through an illegal point connection. Infiltration is ground water seepage into the sewer system through joints or deficiencies in the sewer system pipes or manholes. Sanitary sewer systems are considered to have excessive inflow and infiltration if the per capita (person) flow rate per day for the average flow and peak flow are 120 and 275 gallons per day per capita (gpdpc). The City of Augusta has a per capita rate of 123 gpdpc for average flow and 745 gpdpc for peak flow. The City of Brooksville has a per capita rates of 115 gpdpc for average flow and 579 gpdpc for peak flows. From this data it can be seen that the average daily flow volume is within close tolerance with the standard but for the peak flow day rate is well above the standard. The peak flow rate for each community was recorded during rain induced wet weather conditions. This indicates that the additional water into the system is mainly a result of the storm induced water rather than continuous ground water infiltration from high ground water table.

B&N met with city personnel to discuss know problem areas and obtain available information on each system. This information included treatment plant records, system mapping and other pertinent data. System mapping and treatment plant records were reviewed to determine volumes of I&I entering the system as well as locations for installation of flow meters within each system. The sewer systems were subdivided into smaller systems and flow meters were installed to record flow in these areas.

Flow metering was completed in the month of April, 2004. Three rain events were recorded during the monitoring period using rain gauges at each treatment plant. These rain gauges were read daily by city personnel. Four flow meters were installed in Augusta and five flow meters were installed in Brooksville. These meters recorded flow in the sewer at fifteen minute intervals during the monitoring period. Flow monitoring at the treatment plants were also reviewed for the monitoring period. Unfortunately, City of

Brooksville meter was not working properly during this period so wet weather period in October, 2004 was used to estimate flows. It was estimated that 1.2 million gallons of I&I entered the Augusta system and gallons of I&I entered the Brooksville system during the one month monitoring period.

The volume calculated from the flow meter data in the sewer system established a method for ranking each subsystem as to its contributing I&I to the sewer system. I&I volumes were determined for each storm event and ranking completed. These rankings were then used to determine which subsystem within each City should be further investigated. Several flipflops of the ranking with each storm led B&N to believe that the full system should be reviewed for the next phase of testing.

Smoke testing of each system was completed in July, 2004 in Augusta and in August, 2004 in Brooksville. The purpose of this test is to detect direct connections to the sewer system by observing smoke emerging from illegal connections once the sewer system is pressurized with smoke using a blower. Illegal connections found were noted and are shown in Appendix B with blue highlighting. During the smoke testing, an inventory of downspouts and area drains for each property was completed. If smoke was not observed from one of these locations and the outlet to the surface could not be found additional testing was required to determine if the connection was entering the system. If the pipe from and illegal connection runs through a wet trap in the plumbing system smoke will not pass beyond the trap so the connection will not be discovered by smoke testing. Dye testing was then completed.

The suspect sources were dye tested by running dyed water into the drain to find outlet location. Sanitary sewer system was observed through a nearby manhole as well as nearby drainage swales and storm sewers to determine if dye water was present. Drains found to be connected to the sanitary sewer were noted on the tables shown in Appendix B with blue highlighting along with the smoke test results. There were several locations which outlets to storm drains could not be determined. Additional investigation will be required to assure the outlet is to a legal discharge point. These locations are shown with yellow highlighting in Appendix B tables.

The field investigating work found 82 possible storm water connections to the sanitary in Augusta with an estimated I&I volume of 160,000 gallons and 71 possible connections in Brooksville for an estimated I&I volume of 100,000 gallons. The connections are called possible since the undetermined outlet sources are included in the list as well as the known connections.

B&N recommends the removal of all the known sources of illegal connections and the additional investigation of the undetermined connections. The storm water /clean water sources which are connected to the sanitary sewer system are illegal connections based on existing sewer ordnances established when the treatment plants were constructed. In most cases, it will be the property owner's responsibility to make the corrections. There are some connections such as storm sewer catch basins cross connections located in city right of way as well as abandoned laterals on public property which will be the city's responsibility.

As the corrections are being completed, flow monitoring at the treatment plant as well as recording rain events should continue so that the improvements can be tracked. If only minimal improvements are seen additional work may be required to locate other substantial sources of I&I. This work would include internal inspection of sewers in suspect areas which was not part of B&N scope of work.
The reduction of I&I is very important since it will reduce the capacity requirements of pumping stations and treatment plants thereby reducing the construction and operating cost of the improvement. This is extremely important since the time for new treatment facilities is approaching in both Augusta and Brooksville.

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1.0 INTRODUCTION

1.1 Project Purpose

The Cities of Augusta and Brooksville, Kentucky are in the process of completing a Facilities Plan Update for the wastewater collection and treatment in their communities. Part of the process is to evaluate the volume of wastewater flow being treated at the wastewater treatment plants. The influent flow records at the treatment plants show the flow substantially increases above the normal water usage in the communities during rain events. Burgess & Niple, Inc (B&N) was contracted to assist the Cities in completing a Sanitary Sewer Evaluation Survey (SSES) to identify sources of wastewater flow beyond that of the normal water usage flows from buildings.

Wastewater flow is composed several sources, water usage, infiltration and inflow. Water usage is water used in homes or businesses that is released into building plumbing systems. Infiltration is ground water that enters into the sewer system through the seepage of water from the ground through joints in the sewer pipe or damaged sections within the sewer system. Inflow water sources are illicit clean water sources draining to the sewer system which can include storm water connections such as building roof downspouts, storm catch basins or area drains, building perimeter foundation drains and sump pumps and overflows from pools, fountains or cooling towers. The infiltration and inflow (I&I) flows are clean water sources that are not supposed to be connected to the sanitary sewer collection system.

The purpose evaluation of the sanitary sewer system is to identify I&I sources and method of removal. B&N met with the sewer system staff to discuss know problem areas and obtain system mapping and treatment inflow information. Flow monitoring of subsystems within the collection system was performed along with smoke testing of the each system. An inventory of each building structure was completed to determine location of downspout or area drain discharge. If discharge locations could not be identified dye testing was completed to determine if the discharge points were to the sanitary sewer.

This report reviews the data collected and recommends the method of removal of found sources of I&I and provides recommendations for future investigations and improvements to the sanitary sewer collection system.

1.2 Background

The City of Augusta and Brooksville are rural communities located in Bracken County in northern portion of Kentucky. Augusta is located on the level river valley of the Ohio River in the northeastern portion of the county with a population of 1210. The main part of Augusta is flat with approximately 25 feet change in elevation from top of river bank on to the north to bottom of ridge slope to the south. Approximately half of the City is located below the 100 year flood elevation. This area is generally north of the railroad tracks which run east/west through the City. Augusta is mainly a residential community with light office/retail businesses in the downtown area along Main Street and two larger businesses, Clopay and FA Nieder, on the eastern side of City. Brooksville with a population of 590 is located in the center portion of Bracken County and is the county seat.

The City of Augusta sanitary sewer collection system was mostly constructed in the 1930's and discharged to the Ohio River without treatment. In 1980, a collection system extension was constructed on the east side of City and a treatment facility on the west side of the City to collect and treat all sanitary flows. The sanitary sewer system is composed of 8" and 10" clay tile pipe with brick manholes. The portions of the sewer constructed in 1980 to present are precast concrete manholes with clay or PVC pipe. The system has five small pump stations ranging in pumping capacities of 40 to 500 gallons per minute (gpm). The 500 gpm pump station is the main pump station that collects and pumps all wastewater to the treatment plant. The other pump stations collect low lying areas and pump to the main gravity collection system. The main pump station was constructed with an overflow pipe to the Ohio River. During high river levels the main pump station is flooded by river water backflowing into the pump station and it is shut down until river level drops below outlet pipe elevation. At which time the pump station is turned on and pumping is resumed to the treatment plant

The Brooksville was constructed along the ridge tops of the central Bracken County area with sever changes in elevation from the streets along the ridges to the rear of the properties. The building population is dense along the streets in town and consists of mostly residential with light office/retail businesses located in the center adjacent to the Bracken County Courthouse.

The City of Brooksville sanitary collection and treatment system was constructed in 1970. Only minor additions and extensions have been completed since that time. The sewer system is composed of 8" and 10" clay tile pipe with precast concrete manholes with later additions being PVC pipe. The system has 7 pump stations with pumping capacity ranging from 30 to 350 gpm. The 350 gpm pump station is the

main pump station at the treatment plant. The other pump stations collect sanitary flows from the surrounding valleys and pump it to the gravity collection system to the treatment plant located on the northeast side of the City.

The majority of the pump stations have overflows constructed in them. The overflows are normally not active during rain events unless there is a mechanical problem with the pumps preventing them from running.

Both cities have experienced high flows during storm events with average daily flows up to 6 times for Augusta and 5 times for Brooksville. No previous studies of I&I problems have been conducted in Augusta since the original Facilities Plan preparation in 1979. Brooksville has conducted smoke testing in the past to determine areas of I&I but not within recent years. Recent work on the collection systems has been the upgrade of pump stations in Brooksville and a sewer replacement adjacent to relocate KY 19 on the east side of the City. Augusta improvements have been routine maintenance of pump stations and the construction of a new sewer along Seminary Avenue.

The standard used for determining if a sewer system has excessive I&I is to compare the flow at the treatment plant based on the per capita (person) use. A system is considered to have excessive I&I if the per capita flow in the system exceeds 120 gpd per capita for average daily flows and 275 gpd per capita for peak day flows. Peak flow days in the two systems correspond to rain events (the higher the peak flow the greater the rainfall amount). Table 1.1 below shows the corresponding rates for Augusta and Brooksville:

TABLE 1.1
SANITARY SEWER FLOW

	Standard	Augusta	Brooksville
Water usage (gpd)		110,600	65,670
Water usage per capita (gpd)	70-100	92	112
WWTP average daily flow (gpd)		148,000	68,000
WWTP average daily flow per capita	120	123	115
WWTP peak day flow (gpd)		897,000	341,000
WWTP peak day flow per capita(gpd)	275	745	579

These flow rate numbers are based on the average daily flows for the 20 months from January 2003 to October 2004.

From the tabulation above every day infiltration is not excessive but rain induced I&I, as determined from the peak day flows, greatly exceeds the standard. Based on these flow numbers, additional sewer system evaluation work is necessary to determine locations of I&I sources.

2.0 – FLOW MONITORING

2.1 Flow Monitoring Procedures

The entire collection area of the sewer system in each city was broken down into subsystems to aid in ranking the areas as significant contributor to the I&I problem. Areas were selected based on the flow path to the wastewater treatment plant, the ability to install a monitor to record the flow and approximate drainage area. Five subsystems were established in each Augusta and Brooksville system.

Four monitors were installed in the Augusta and five monitors were installed in the Brooksville. Table 2.1 shows the location of each monitor.

TABLE 2.1
FLOW MONITOR LOCATIONS

Subsystem	Flow meter ID	Approx. Drainage Area (acres)	Location
Augusta			
A1	4	50.8	Second & Ferry
A2	3	33.8	Second & Parkview
A3	2	37.0	Second & Upper Alley
A4 & A5	1	112.6	Second and Frankfort
Brooksville			
B3	A	24.4	Mh3 to Mh4 Augusta Rd near WWTP
B4	B	24.1	Mh3 to Mh47 Augusta Rd near WWTP
B5	C	23.4	Mh72 Near WWTP along new Rte 19
B2	D	14.3	Mh8 to Mh9 Augusta & Miami
B1	E	64.7	Mh8 to Mh20 Augusta & Miami

Service areas for Brooksville are narrow and small due to the lay of the terrain. The sewers are mainly on the ridges so the drainage area is limited to a very narrow band along the ridges from the buildings to the sewer. Service areas for Augusta sewer are generally the opposite with wide areas draining in the direction of the sewer. Maps of each system are shown in Figure 1 and 2.

Prior to beginning the study, B&N interviewed the city staff to determine areas of concern. Augusta had established a list of buildings which were thought to have the building downspouts connected to the sanitary sewer and thought that areas draining to the small pump stations were not causing problems.

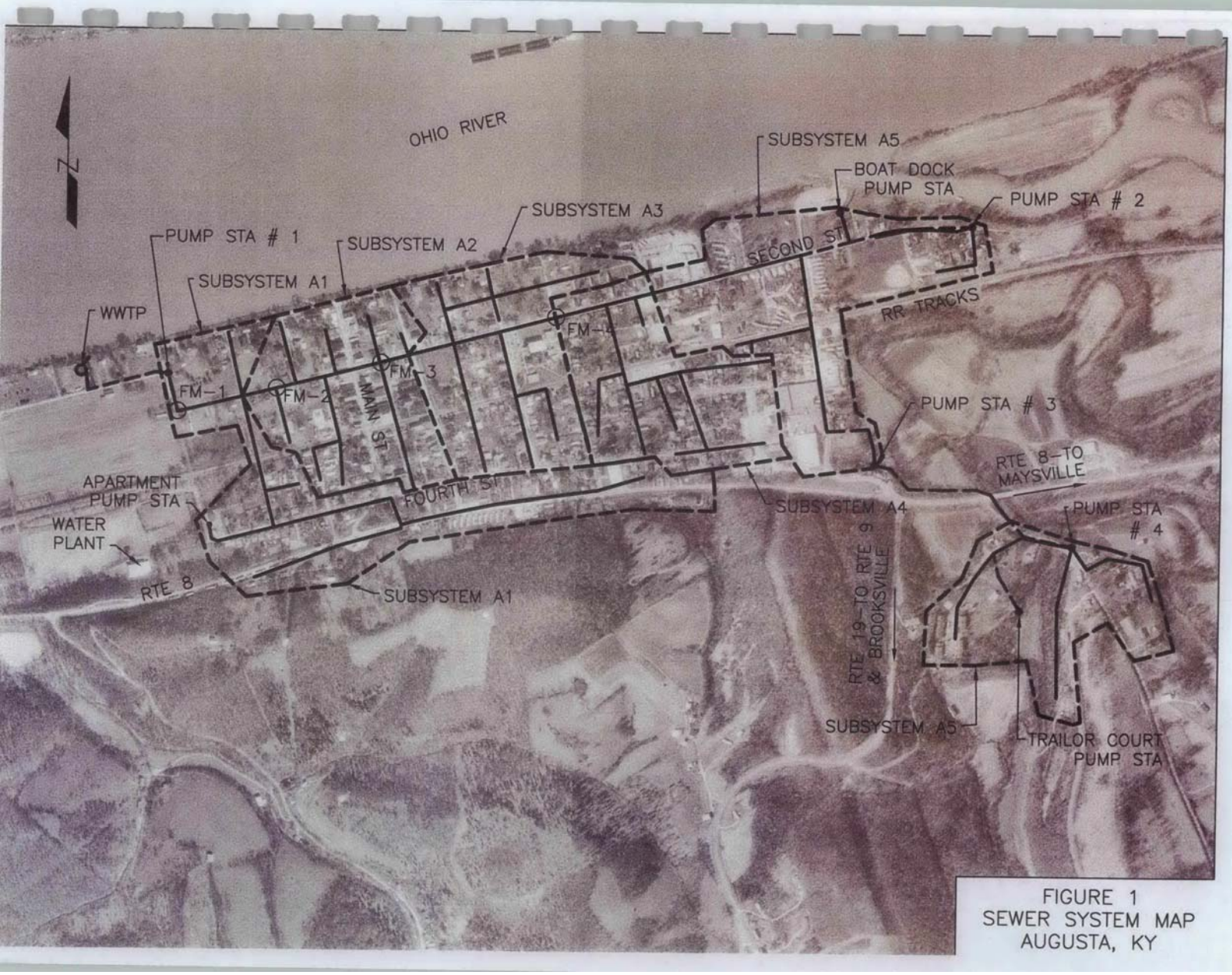

FIGURE 1
SEWER SYSTEM MAP
AUGUSTA, KY

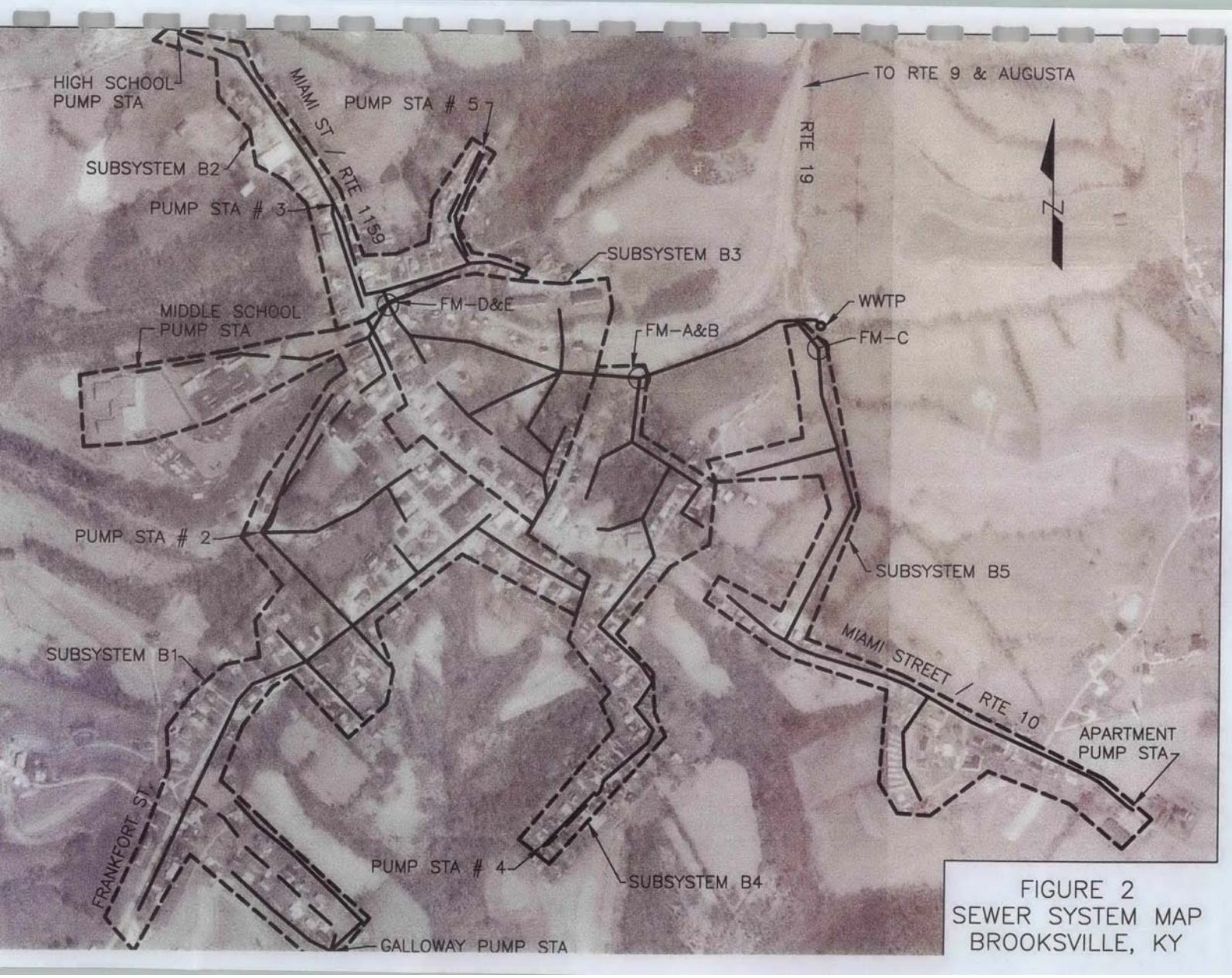

FIGURE 2
SEWER SYSTEM MAP
BROOKSVILLE, KY

Brooksville's previous studies had suggested that subsystems B1 and B3 were the cause of most of the I&I.

The flow meters used in this study were Sigma 910 flow meters as manufactured by American Sigma. The flow meter consists of a sensor attached to a mounting band which is placed inside the sewer pipe just upstream of a manhole. The small sensor that contains a pressure transducer and a velocity sensor is placed into the flow stream. The meter reads the pressure of the water and converts it to a level reading. The meter then calculates the wetted area of the flow stream using the user-entered pipe diameter. The area multiplied by the velocity equals the volume of flow. This data is then stored in a data logger which is connected to the sensor and hangs in the top of the manhole. Data was logged every 15 minutes during this study. Each meter was downloaded and checked weekly.

The sensor is equipped with a pressure transducer that measures the depth of water above the sensor. The pressure transducer contains a diaphragm that contacts the liquid. The amount of deflection on the diaphragm caused by the liquid is proportional to the pressure against the diaphragm, which is proportional to the depth of water over the sensor.

The sensor also measures the velocity of the passing water. The sensor emits sound waves which bounce off particles in the water and return to the sensor. The sensor then uses the Doppler method to calculate the velocity of the water.

Each sensor is installed in the invert of the pipe. The sound waves are directed into the direction of flow. The initial flow height is measured by hand and the pressure transducer is calibrated accordingly. The velocity does not require calibration. The transmit frequency is fixed by a highly accurate quartz crystal-controlled frequency generator. Each sensor was recalibrated for level and cleaned of debris weekly during this study.

Open channel flow meters such as the Sigma 910 meter are accurate to about +/- 5% in a laboratory setting. In the field there are many variables that influence accuracy. Older pipes are often times misshaped effecting area calculations. Silt and debris build up in the bottom of the pipe affect area calculation and flow characteristics. Transitions in manhole inverts also disrupt flow characteristics. Debris can also cover the sensor preventing velocity measurements. If large amounts of I/I exist, cleaner water will not provide as accurate velocity readings since there are fewer particles to reflect sound waves.

Due to the difficulties of each site, accuracies achieved in the field are often times much less than those achieved in the laboratory.

B&N completed weekly visits to recalibrate the monitor for flow level, remove debris and download data from the flow meters.

Flow monitoring was conducted between April 1, 2004 to May 4, 2004. During this period three rain events were picked up by the flow monitors (April 12-13, April 21-22 and May 2). Rain gauges were established at the WWTP in each City. The rain gauges were read daily and recorded with the normal record keeping procedures at the plant.

2.2 Flow Monitoring at Treatment Plants

B&N reviewed the wastewater treatment plant influent flow records for the one month period during the flow monitoring (April 1 through May 4, 2004). The data summary of daily wastewater flows is shown in figure 3. An increase in flow on the rain days is shown by the peaking factor in the table from non rainfall days. Unfortunately, the flow measuring equipment at the Brooksville Plant was not operating correctly during the month of the flow monitoring so there is not a good representation of the sewage flow at the plant. The Augusta plant also lost flow data at the treatment plant during the monitoring period from April 15 – 19 due to high river level which required the pump station to be shut down.

The base flow of the treatment plant is shown on the graphs. Two values are shown one for base flow using water consumption records and one using dry weather treatment plant flow data. Base flow from water consumption was calculated using the City water consumption records for a one year period. Daily water consumption calculated to be 110,000 gallons per day (gpd). Average dry weather flow was calculated by taking the average treatment plant flow for eleven days during the period (April1 – April 11). Average dry weather flow was calculated to be approximately 83,000 gpd. The total I&I volume for the month based on the difference between base flow and wet weather flow was 1.2 million gallons.

A similar calculation was completed for Brooksville. Since the flow monitoring at the plant was not accurate during the month of April, the month of October was used. A rainfall period did occur in the middle of the month but exact amount is not known. Weather service data showed a rain period from October 13 through October 20, 2004 with a total accumulation of 1.4 inches (.96 inches fell on October 19 & 20th). Daily water consumption calculated to be 66,000 gpd. Average dry weather flow for the

month was estimated to be 60,000 gpd. The total I&I volume for the month based on the difference between base flow and wet weather flow was 1.27 million gallons.

The difference in flow volume between the treatment plant flows during rain events is shown in table 2.2. These values give an estimate on the volume of I&I the treatment plant is processing during individual rain events.

2.3 Flow Monitoring in Sewer System

Monitors installed in the system produced data that showed an increase in flow during rain events. Graph of flow measured by the flow monitors are shown in Appendix A. The data shows an increase in flow (spike in line) during the rain event and then a drop back to normal flows soon after the rain stops. Two sets of graphs are presented. The first series show the continuous flow readings of each monitor throughout the monitoring program. The next series of graphs are the flows recorded during the one or two day rain events along with a graph of a typical dry weather day and the amount of rainfall for the period. The graphs are accompanied by an exhibit which shows the I&I volume added to the system for each rain event at the flow monitor location. These volumes are calculated by computing the difference in normal flow volume from flow volume during the rain event. Normal flow volume is based on the flow measurements of a non rain day (dry weather day). Table 2.3 summarizes the estimated I&I gallons of each subsystem as calculated from the monitor exhibits shown in Appendix A. Since some of the monitors recorded flow from more than one subsystem downstream flow monitor values were reduced to account for upstream flow.

Due to the differing field conditions the flow monitors were not producing uniform flow information; however, the I&I gallons calculated is a representation of how one subsystem ranks in contributing to I&I versus another subsystem. A comparison of the subsystems do show which areas are producing the greatest volume of I&I. Table 2.3 ranks each subsystem based on the volume of I&I measured.

The large peaks recorded immediately during a rain event represent inflow source or direct connections to the sanitary sewer. The extended portions of the elevated graph represent the infiltration sources or indirect connections to sanitary sewer such as seepage through joints or deficiencies in the pipes or manhole. The strong peaks immediately as the rain is occurring in both communities show a majority of the I&I to the sanitary system is related more to storm induced inflow than elevated ground water infiltration sources. In most cases the flow returns back to normal flow within 12 to 18 hours.

Figure 3a.
Augusta WWTP Flow
April 1- May4, 2004

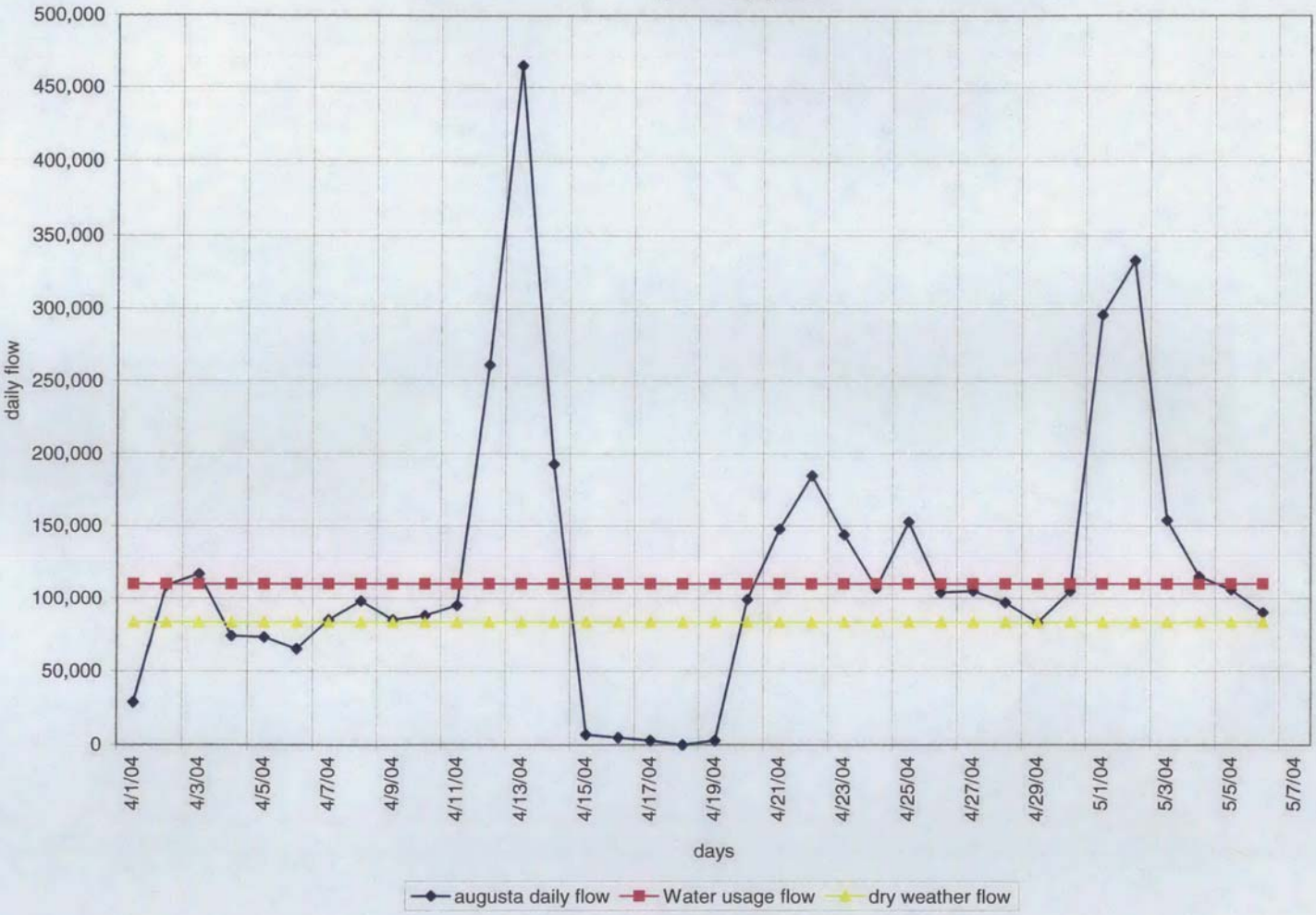

Figure 3b.
Brooksville WWTP Flow
October 1-31, 2004

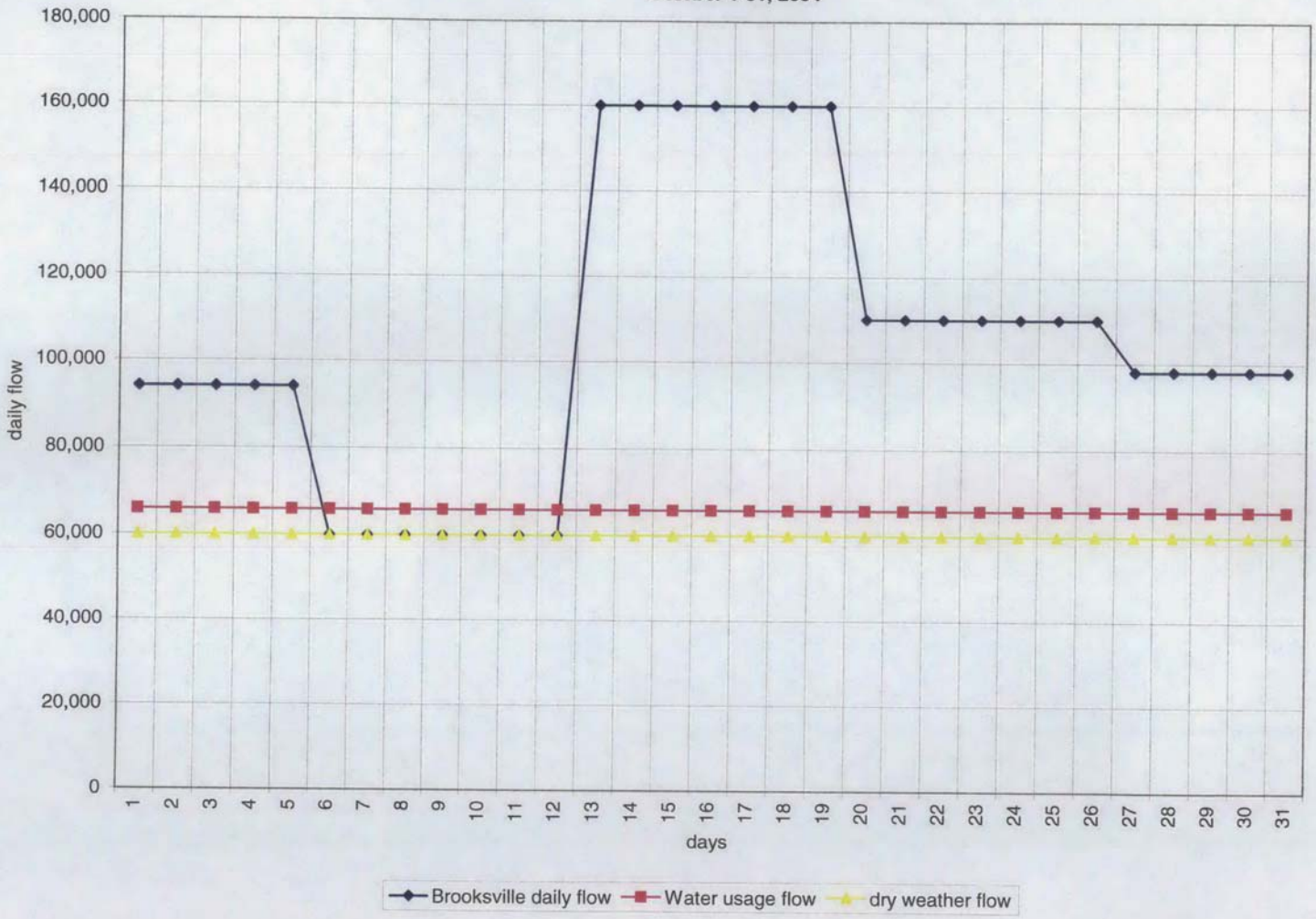

TABLE 2.3
I&I VOLUMES PER SUBSYSTEM

Augusta

Subsystem	Monitor	Storm (4/12-13/04)		Storm (4/21-22/04)		Storm (5/2/04)	
		I&I Gallons	Rank	I&I Gallons	Rank	I&I Gallons	Rank
A1	4-3	663,239	4	20,490	3	220,615	3
A2	3-2	134,052	2	15,458	2	224,760	4
A3	2-1	63,313	1	9,146	1	90,292	1
A4 & A5	1	224,500	3	35,854	4	126,604	2

Brooksville

Subsystem	Monitor	Storm (4/12-13/04)		Storm (4/21-22/04)		Storm (5/2/04)	
		I&I Gallons	Rank	I&I Gallons	Rank	I&I Gallons	Rank
B1	E	528,771*	4	87,448	4	170,625	4
B2 & B3	A-E	-31,583*	4	29,104	3	130,406	3
B4	B	56,740	2	2,667	1	54,177	2
B5	C	41,812	1	4,063	2	28,219	1

*Flow monitor E experienced erratic measurements causing errors in subsystem 1, 2 & 3 volume quantities.

3.0 INVESTIGATION OF I&I SOURCES

3.1 Procedures

The initial phase of determining location of I&I sources was to smoke test the system of each City. The purpose of the test is to find locations where rainwater sources are directly connected to the sanitary sewer. During smoke testing a nontoxic smoke is blown into the sanitary sewer. The sewer is pressurized with a smoke blower and push smoke through the system. Field observers watch for smoke to emerge from plumbing system roof vents which show the house plumbing system is connected to the sanitary sewer. Observers also look for smoke from illegal connections including downspouts, area drains, catch basins, ground around building laterals, cleanouts and other possible storm water connections. The observance of smoke is noted on a tabulation sheet along with an estimated surface area for any of the illegal connections listed above. Usually, smoke testing can be completed by setting the smoke blower at a mid point manhole and smoke is blown in multiple directions from the manhole.

Smoke testing works well for direct connections to the sanitary sewer but illegal connections which are upstream of a plumbing trap will not be detected since the trap will block the smoke from moving beyond the trap location. Additional methods need to be used to detect this type of connection. One method would be to dye test the suspected drains. Dye testing is completed by adding dye to water while flooding the suspect drain with water. The outlet of the dyed water is observed to determine if it is in the sanitary, storm or to the surface. Another method is to use sound to follow the drainage path. Tapping on the drain or flushing a toilet inside the house may give effective results if the connection or outlet point is close to the sounding location.

Locations of suspect drains are also detected during the smoke testing program. When the observers are looking for smoke they also look for potential sources which may not be smoking but connected to the sanitary sewer. These include downspout leaders entering the ground and area drains without a visible discharge location. Suspect connections are logged and dye testing or sounding is completed to determine if the connection is illegal.

Once the illegal connection is found by one of the methods above, an estimate of inflow can be calculated based on the surface area draining to the connection and the amount of rainfall expected. Smoke testing, dye testing and sounding were methods used during the search for I&I sources in Augusta and Brooksville.

3.2 Summary of Field Investigation

Smoke testing was completed in Augusta and Brooksville in July and August, 2004. All areas of the cities were smoked and dye tested to detect I&I sources. A table showing the buildings by address and connections is shown in the Appendix B. Each building in Augusta and Brooksville was inventoried by observance of smoke or by a visual inspection of discharge location of downspouts or area drains. The blue highlighted addresses are known sources of I&I which were found to be connected to the sanitary sewer. The addresses not highlighted were found not to be connected to the sanitary sewer. The yellow highlighted addresses are locations where additional investigating will be required since outlets of storm water connections could not be detected. The I&I volume estimates were calculated for both the blue and the yellow highlighted addresses as shown in the Appendix B. The I&I volume estimates are based on an estimate of the surface area draining to the connection point. A 2" rainfall depth was used to determine volume.

Additional work will be necessary to determine if the yellow highlighted addresses actually drain to the sanitary sewer. It may require researching the building construction drawings to see if the drainage system was shown or additional dye testing with a larger volume of water than used in the during the above work. Some of the buildings were not dye tested due to the inability to access a point to add the water and dye. These locations will require negotiations with property owner for roof access. A first stem maybe to interview effected property owners concerning outlet locations. If not known, the Cities could make it the property owners responsibility to find the discharge location.

Table 3.1 list the number of clean water connections to the sanitary sewer system per subsystem for each city.

TABLE 3.1
SUMMARY OF I&I SOURCES

Augusta

Subsystem	Lateral/CO's	Downspouts	Area Drains	Storm Sewer	Volumes (gallons)
1	6	16	0	1	29,069
2	5	11	0	2	35,281
3	12	10	0	1	55,302
4	9	5	1	3	26,928
5	4	3	1	2	19,978

Augusta Total = 166,558

Brooksville

Subsystem	Lateral/CO's	Downspouts	Area Drains	Storm Sewer	Volumes (gallons)
1	6	16	2	0	66,941
2	6	3	2	0	2,743
3	3	3	4	0	10,966
4	6	9	5	0	18,744
5	3	1	2	0	998

Brooksville Total = 100,392

4.0 - Recommendations

The investigation work completed to date plus additional work to find the discharge locations for the undetermined addresses have established the location of the majority of the inflow sources. Correction of these inflow sources are usually the most inexpensive to correct. Downspouts and area drains can be redirected to natural swales or storm sewer in shallow trenches with small diameter pipe (usually 4" or 6" pipe). This work is also the responsibility of the property owner so no city funding will be required.

Notices should be submitted to effected property owners with a time table to complete the work. A requirement for a review by city personnel of the corrective action work plan should be specified. The intent would be to verify the action is not just redirecting the clean water flow to another location where it will end up in the sanitary sewer. If the clean water is drained to an area where the building sewer lateral is located, the clean water may reenter the sanitary by seeping through the ground and into joints in the building lateral pipe. The inflow source will just become an infiltration source with a net result of no reduction in flow to the wastewater treatment plant.

Some of the corrections will be very minor whereas others may be more extensive. Correcting open building sewer laterals is sometimes as simple as installing a new cleanout cap, raising a low lying cleanout or replacing or repairing a section of pipe. The open laterals at abandoned building lots may be more difficult since they should be plugged at the sewer main. This will eliminate any possible infiltration through joints in the pipe of the abandoned lateral. These lines can be traced using a camera inserted into the lateral with a locating device to find the connection point to the mainline sewer.

Storm sewer and sanitary sewer cross connections as detected by smoke from a catch basin will require additional research and city funding to complete. The location of the cross connection can be found by flooding of the storm sewer while the sanitary sewer is being internally televised. Flooding of the storm sewer should be completed by isolating the section of storm sewer and filling it with water. This will assure that the leak is detected if it is on the top of the pipe and only leaks when the storm sewer is full.

Removal of storm water sources from Brooksville in most locations should require less work since most of the city drains away from the sanitary sewer with plenty of elevation change.

Removal of storm water sources in Augusta may require more thought and possible more work since the area is flatter and it may require more piping to discharge the clean water sources to a natural draining swale or storm sewer.

Another source of inflow are manholes which have their frame and covers in a depressed area or if the joint between the frame are not properly sealed. The inventory of manholes in Augusta and Brooksville found only a handful of manholes which were low. Many of the lids were paved over in both cities which reduces the inflow but makes access very difficult. A program should be established to inspect the manholes and to raise the frame and covers and provide a proper seal around the frame. If it is not possible to raise the manhole enough to prevent storm water entering in the top, a waterproof frame and cover should be installed.

Exhibit 4.1 and 4.2 list the I&I sources found and rank them based on the calculate volume of I&I being contributed to the sewer system. This list should be used to prioritize the corrections with the largest volumes being removed as soon as possible.

The corrections should be completed and the sanitary sewer system should be reevaluated to determine the effectiveness of the corrections made. Corrections beyond those listed above will require substantially more cost to detect. Internal sewer inspections utilizing remote cameras and monitors will be required to find the additional sources of clean water. These sources will include a majority of infiltration leaks through joints in the pipe (building laterals and mainline sewers) or manholes. These corrections once detected will need to be categorized and a cost analysis completed to determine if it is more cost effective to treat or remove the I&I.

Removal of storm water sources will ultimately reduce the size of the collection and treatment system which will need to be constructed as well as future operating costs. It is important to remove as many sources prior to final design of a treatment system. Since the planning process does take time, as many I&I sources should be removed as possible during this period. Flow monitoring at the treatment plants can be used to track the success of the removals as the corrections are being completed. The volume of the rainfall (inches) as well as the daily flows during rain events should be tracked to define the progress, since smaller volumes of rain will produce less I&I.

A sanitary sewer evaluation study is not a one time process. It is just as important to it is to keep track of the I&I volumes entering the system as it is to maintain an inventory of water loss in the water distribution system. If sharp changes are observed it will be necessary to look for new leaks into the system just as you would for a water main leak. This may require the purchase or rent of a couple of flow meters which can be used to detect locations of I&I if a sharp increase is noticed from the treatment plant influent meter.

PRIORITIZED CORRECTIONS
AUGUSTA, KY

at MH# Smoker	Street	Address / Description	VENT HOUSE	LATERAL HOUSE	SPOUT DOWN	DRAIN AREA	DRAIN DRIVE	SEWER STORM	REMARKS	Area (sf) Drainage	Rain (") Inflow (gal)
											2
3-4	Second Street	Augusta School	S		S	check			D.S. smoked - need to further test school	18000	22440
3-5	Bracken Street	Vacant Lots East Side		S					(4) vent stacks or C.O. w/o houses	10000	12467
1-12	Route 8	128			No DS			S	Catch basin in front of house smoked	5000	6233
2-1	Second Street	CB west of 202						S	Smoke from CB (assume 50'x100' area)	5000	6233
2-1	West Park Street	CB West Park & 2nd						S	Smoke from CB (assume 50'x100' area)	5000	6233
3-5	Second Street	American Legion			IG			S	Abandoned bldg. - smoke in storm CB	5000	6233
4-4	Third Street	West Seminary near mh4-7						S	Smoke from CB	5000	6233
4-9	Seminary Street	304	S		Surf/IG			S	Front of 304 DS outlet to CB and daylight	5000	6233
4-9	Third Street	City Building						S	Smoke from CB on Seminary	5000	6233
5-2	Second Street	526	S		Surf			S	CB in front of house smoked	5000	6233
5-15	Hamilton	313	S		IG			S	C.B. across st. smoking	5000	6233
2-5	Elizabeth Street	White Hall			IG				DS outlet unknown	3600	4488
2-5	Elizabeth Street	VFW			IG				DS outlet unknown	3000	3740
2-13	Fourth Street (East)	101 Augusta Presb. Church			IG				DS on SW corner to storm others unknown	3000	3740
1-12	Fourth Street (East)	Augusta Baptist Church	N	S	IG				Exposed lateral	2500	3117
2-13	Fourth Street (East)	103			IG				DS outlet undetermined	2100	2618
1-12	Route 8	K's Bestway			IG				DS outlet not found	1875	2338
4-9	Third Street	416 Someplace Else	S		S/IG/Surf				D.S.	1800	2244
3-12	Fourth Street	301	NV		S/IG				D.S. smoke	1760	2194
3-9	Fourth Street	St. Augustine Church	N		IG				DS NW dye to mh 3-9	1600	1995
1-8	Williams Street	312	S		IG				D.S. connected to sewer sounding	1575	1964
2-5	Main Street	Anchor Inn			S				DS smoked in rear of building	1500	1870
5-17	St Rte 435	6522	S		IG					1350	1683
3-12	Bracken	210	S		S				Rear D.S.	1200	1496
3-12	Bracken	312	S		IG				D.S. smoke	1200	1496
4-6	Fourth Street	403			S/IG				D.S. smoke, front surf	1200	1496
5-2	Second Street	521			S/IG				DS Smoked front of house	1200	1496
1-8	Fourth Street (West)	203	S		S/IG				Rear downspout smoked	1125	1403
4-6	Fourth Street	411	S		S/IG				Front to surf, D.S. smoke	1125	1403
1-12	Fourth Street (East)	308	N		IG				DS below deck outlet not found	1050	1309
3-9	Second Street	216			S/D.S.				Downspout smoke	1050	1309
1-12	Fourth Street (East)	302 - bed & breakfast	N		IG				DS outlet not found	1000	1247
1-12	Route 8	212 ?	S		IG				DS outlet not found	1000	1247
1-8	Fourth Street (West)	314	S		IG				D.S. outlet not found	975	1216
2-7	Fourth Street (West)	107	S		S/IG				Smoke 2 rear D.S.	975	1216
1-8	Fourth Street (West)	212 ?	S		IG				D.S. outlet not found	900	1122
1-12	Fourth Street (East)	112	S		S/IG				Rear D.S. smoke	900	1122
2-7	Parkview (South)	302			S/IG				Smoke in D.S., south side	900	1122
2-7	Fourth Street (West)	105			IG				San. & storm @ some connection	900	1122

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SURF - DOWNSPOUT TO SURFACE

yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

PRIORITIZED CORRECTIONS
AUGUSTA, KY

at MH# Smoker	Street	Address / Description	VENT HOUSE	LATERAL HOUSE	SPOUT DOWN	DRAIN AREA	DRAIN DRIVE	SEWER STORM	REMARKS	Area (sf) Drainage	Rain (") Inflow (gal)
5-17	ST Rte 2370	Curtis Store	S		Surf/IG					900	1122
1-8	Fourth Street (West)	201	S		S/IG				Rear downspout smoked	825	1029
3-5	Second Street	209	NV		S/IG				DS smoke NE corner house	800	997
3-9	Fourth Street	St. Augustine School	N		S/IG				D.S. smoke rear of school	800	997
1-8	Fourth Street (West)	211	N		IG				D.S. outlet not found	750	935
1-12	Fourth Street (East)	208 - same house	N	S	S/Surf				Smoke at rear DS and below slab	750	935
1-12	Fourth Street (East)	210 - same house			S/Surf				Smoke at rear DS	750	935
4-9	Seminary Street	306	S		S/IG				DS smoke	750	935
5-12	Chapel Street	511	N		S/IG				DS smoke back west	750	935
5-17	ST Rte 2370	5168	S		IG					700	873
3-5	Riverside Drive	308	S	S					Smoke SW corner house	675	842
1-8	Fourth Street (West)	209	N		IG				D.S. outlet not found	600	748
2-10	Main Street	116	S		S				DS smoked	600	748
2-7	Parkview (South)	311			S/IG				Smoke rear D.S.	525	655
5-15	Hamilton	317	S		S/IG				D.S. smoke	525	655
3-9	Third Street	214			S/IG				D.S. smoke	500	623
1-8	Fourth Street (West)	110 - same house			IG				D.S. outlet not found	481	600
1-8	Fourth Street (West)	108 - same house			IG				D.S. outlet not found	481	600
1-8	Third Street	208 M-home			IG				D.S. outlet not found	480	598
2-7	Parkview (South)	313 ?			S/IG				Smoke rear D.S.	400	499
4-10	Fourth Street	508	N		IG				DS front to cistern back unknown	400	499
3-9	Third Street	216A	S		IG				DS outlet undetermined	375	468
4-2	Second Street	406			Surf/IG				back inside corner (1/2 house)outlet unknown	375	468
3-5	Frankfort Street	Vacant lot park		S					3 open C.O.	300	374
3-5	Frankfort Street	101	S	S	Surf				Broken C.O. 2 locations	200	249
3-5	Frankfort Street	101-1/2 - 2	S	S	Surf				2 open C.O.	200	249
4-6	Sycamore Street	318 No M-home		S					2 C.O. smoking	200	249
1-12	Fourth Street (East)	220	N	S	IG				C.O. w/o top	100	125
1-12	Route 8	Chevron			IG				Open C.O. in parking lot	100	125
1-20	Route 8	Citgo	S	S	Surf				Open C.O. in parking lot	100	125
2-1	Second Street	205	S	COS	No DS				Cleanout smoked open top	100	125
2-1	Second Street	Parkview Inn		C.O.S.	IG				DS to storm east side - west side unknown	100	125
2-7	Third Street (West)	104		S	Surf				Smoke from under house	100	125
2-7	Main Street (Southwes	302		S	Surf				Smoke along rear house lateral & under C.O.	100	125
2-5	Main Street	125 (Next to Anchor Inn)		S	Surf				Old - M-home site, smoke from lateral	100	125
2-10	Riverside Drive	108	S	S	Surf				Open clean out at Water Street	100	125
2-10	Second Street	103		S	IG				Smoke in bldg. seeping under door	100	125
2-10	Main Street	120 Augusta Pub	S	S	IG				Open C.O.	100	125
3-5	Riverside Drive	210	S	S	Surf				Crawl space smoking from under house	100	125
3-5	Tannery Street	SE corner Tannery & Cherry		S	Surf				C.O. smoked	100	125

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IG - DOWNSPOUT INTO GROUND
SURF - DOWNSPOUT TO SURFACE

yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

PRIORITIZED CORRECTIONS
AUGUSTA, KY

at MH# Smoker	Street	Address / Description	VENT HOUSE	LATERAL HOUSE	SPOUT DOWN	DRAIN AREA	DRAIN DRIVE	SEWER STORM	REMARKS	Area (sf) Drainage	Rain (") Inflow (gal)
3-5	Cherry Alley	NW corner MH		S	Surf				Cracked C.O.	100	125
3-9	Tannery Street	211		S	Surf				C.O. smoke	100	125
3-9	Third Street	203	S	S	Surf				C.O. smoking	100	125
3-9	Third Street	212	S	S	Surf				Smoke from basement plumbing problem	100	125
3-12	Fourth Street	309	S	S	Surf				Broken C.O.	100	125
4-2	Second Street	404	N	S	Surf				Open C.O. side & rear	100	125
4-2	Second Street	416	N	S	Surf				Open C.O. between 414 & 416	100	125
4-2	Sycamore	210		S	Surf				Smoke under M-home	100	125
4-4	Third Street	411	N	S	Surf				Smoke from under house	100	125
4-4	Third Street			S					Near MH 4-7 west side toward 402 3rd St	100	125
4-6	Sycamore Street	306		S	Surf				C.O. smoke south 308	100	125
4-10	Fourth Street	426	S	S	Surf				C.O. smoke west side	100	125
5-2	Second Street	516	S	S	IG				C.O. smoked	100	125
5-2	Second Street	524		S	Surf				C.O. smoke	100	125
5-4	Hamilton	205 #4	S	S	Surf					100	125
5-12	Third Street	510	NV		Surf	X			Area drain outlet unknown	100	125
5-12	Chapel Street	514	NV	S	Surf				Smoke hole w/concrete cap	100	125
5-17	St Rte 435	6523	S	S	Surf				Smoke above lateral near rear building	100	125
4-4	Third Street	421	N		Surf	NS			5' x 10' area	50	62
5-2	Second Street	531	NV		Surf				Elevated C.O. w/smoke in front		
5-4	Hamilton	212	N		Surf				Smoke in house at washer		
1-2	Second Street	312	NV		Surf				Smoke in house - bad interior plumbing?		
5-17	ST Rte 2370	Behind 5168							Crack in pipe needs repair		
											166558

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yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

Exhibit 4.2
PRIORITIZED CORRECTIONS
BROOKSVILLE, KY

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	rain(2") inflow gal
											2
28	Powell St.	Old school			surf/ig				Needs further investigation on roof drain discharge	19840	24734
32	Miami	Courthouse			surf/ig				Needs further investigation on roof drain discharge	7900	9849
20	Miami St.	136 (church)	S		S / surf				4 d.s. smoke	4560	5685
32	Madison	Bank of Gremantown	S		ig				Dye test inconclusive - need further investigation	4140	5161
53	Locust	Dean's Pharmacy			surf				Dye test rear ds to sanitary	3750	4675
53	Locust	Carbo's Café			ig				Dye test rear ds to sanitary	3000	3740
53	Locust	115 True Value	S		surf				Dye test rear ds to sanitary	3000	3740
53	Locust	Video Store			ig				Dye test rear ds to sanitary	3000	3740
61	Garrett Ave.	St. James Church	NV		ig	XX			DS south side daylight to rear	2800	3491
40A	Frankfort	405	S		ig	N			Ds outlet undetermined by dye testing - need further inve	2651	3305
67	Garrett Ave.	303	S		ig				DS outlet not found	2025	2525
61	Miami	Bestway	N		surf/ig				DS in rear need investigation septic area in rear	2000	2493
61	Garrett Ave.	Bracken Co. Day Care Center	NV		surf	X			Dye test did not reveal outlet	2000	2493
20	Miami St.	208	S		surf/ig	X			Apears that area drain and rear DS are connected to san	1800	2244
67	Garrett Ave.	323	S		ig				DS pipe clogged outlet not found	1600	1995
40	Frankfort	314			S / ig				Rear DS Smoke	1520	1895
61	Garrett Ave.	122	NV		S	S				1310	1633
32	Madison	Bldg. North of post office	S		ig				Dye test inconclusive - need further investigation	1295	1614
53	Locust	Country Loft			surf				Dye test rear ds to sanitary	1250	1558
94	Corliss	110	S		S				DS smoking	1200	1496
67	Garrett Ave.	212	2-S		ig				DS outlet not found	1050	1309
88	Miami St.	101	N		S	S				936	1167
67	Garrett Ave.	238	NV		ig				DS outlet not found	900	1122
60	Wallin St.	120	S		surf/ig	X			AD & DS on southside undetermined by dye testing	800	997
88	Lincoln St.	110	NV		S				Abandoned	700	873
35	Frankfort	244	S		surf/ig				Hole in ground next to vent stack smoking	400	499
40	Frankfort	338	S	S	surf/ig				Lateral smoke in grass DS drain to street	400	499
	Galloway Dr.	147	S	S	ig				previous test smoke @ phone trench and sewer main	400	499
	Galloway Dr.	139	S	S	ig				previous test smoke @ phone trench and sewer main	400	499
	Galloway Dr.	161	S	S	no d.s.				Smoke in grass by B-B goal post	400	499
11	Elizabeth	112	NV		surf				Smoke in yard X3	400	499
7	Augusta	225	S		surf				Hole in ground at rear of house keeps getting larger	400	499
77	Miami	326	S		surf				Manhole in front has loose frame and cover	400	499
	Jefferson	MH 31							Low mh frame	100	125
28	Powell St.	110	S	S	surf				Open Lateral	100	125
		MH 27							needs to be sealed at bottom of frame	100	125
16	Miami	305	S	S	surf				Open CO	100	125
16	Miami	335	S	S					CO open	100	125
16	Miami	326	S		surf	S			Area drain to basement smoke	100	125
16	Miami	314	N	S	Surf				Open lateral in back of house	100	125
94	Corliss	116	S		none				Service co smoke	100	125
94	Corliss	117			surf				open cleanout	100	125
83	Miami St.	123	N						F.D.@basement entrance-no exit found	100	125
83	Miami St.	137	NV		n/a				open service pipe	100	125
88	Miami St.	123	N		surf	X			Area dr.@ basement dye test inconclusive	100	125
88	Miami St.	119	S	see note	surf				open c/o with smoke	100	125

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YELLOW - Undertermined clean water connection
BLUE - Clean water connection to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	rain(2") inflow gal
49	Lincoln	Hargette's Deli./Empress Chili	N		ig				New lateral piping leaking Not covered	100	125
49	Lincoln	Right of Hargette's Deli	NV		surf				Smoke @end wall along lateral	100	125
61	Garrett Ave.	Right of church	S		surf				CO open	100	125
61	Church	131	N	S	surf				smoke along foundation wall	100	125
67	Garrett Ave.	322	N		surf				Smoke at foundation wall	100	125
77	Miami	3rd house west of 230	N	S	n/a				Abandoned 3 - lateral smoking in front	100	125
77	Grandview	137	N	S	surf				open c.o.	100	125
77	Grandview	119	NV	S	surf				open c.o.	100	125
53	Woodward	107	N		surf/ig	X			DS drains to cistern Area drain undetermined	50	62
67	Garrett Ave.	left of 238	NV		surf	X			Area Drain to basement	50	62
77	Miami	234	S		surf	X			possible at basement door DS daylights to rear	50	62
77	Miami	2nd house west of 230	S		ig	X			Abandoned 2 - Area drain for basement DS concreted	50	62
									Total estimated I&I =		100390

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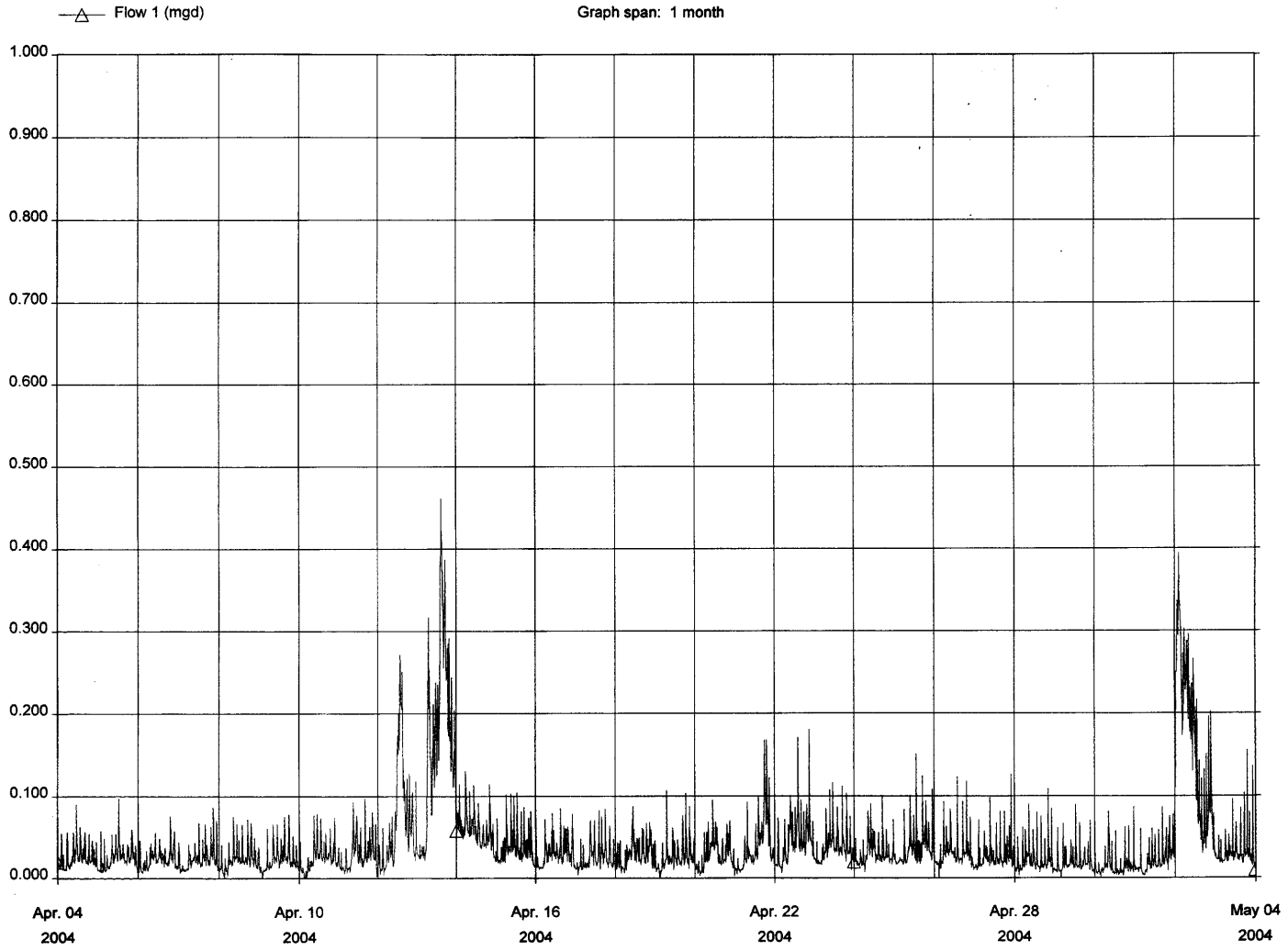
APPENDIX

APPENDIX A
Flow Metering Results
Augusta, KY

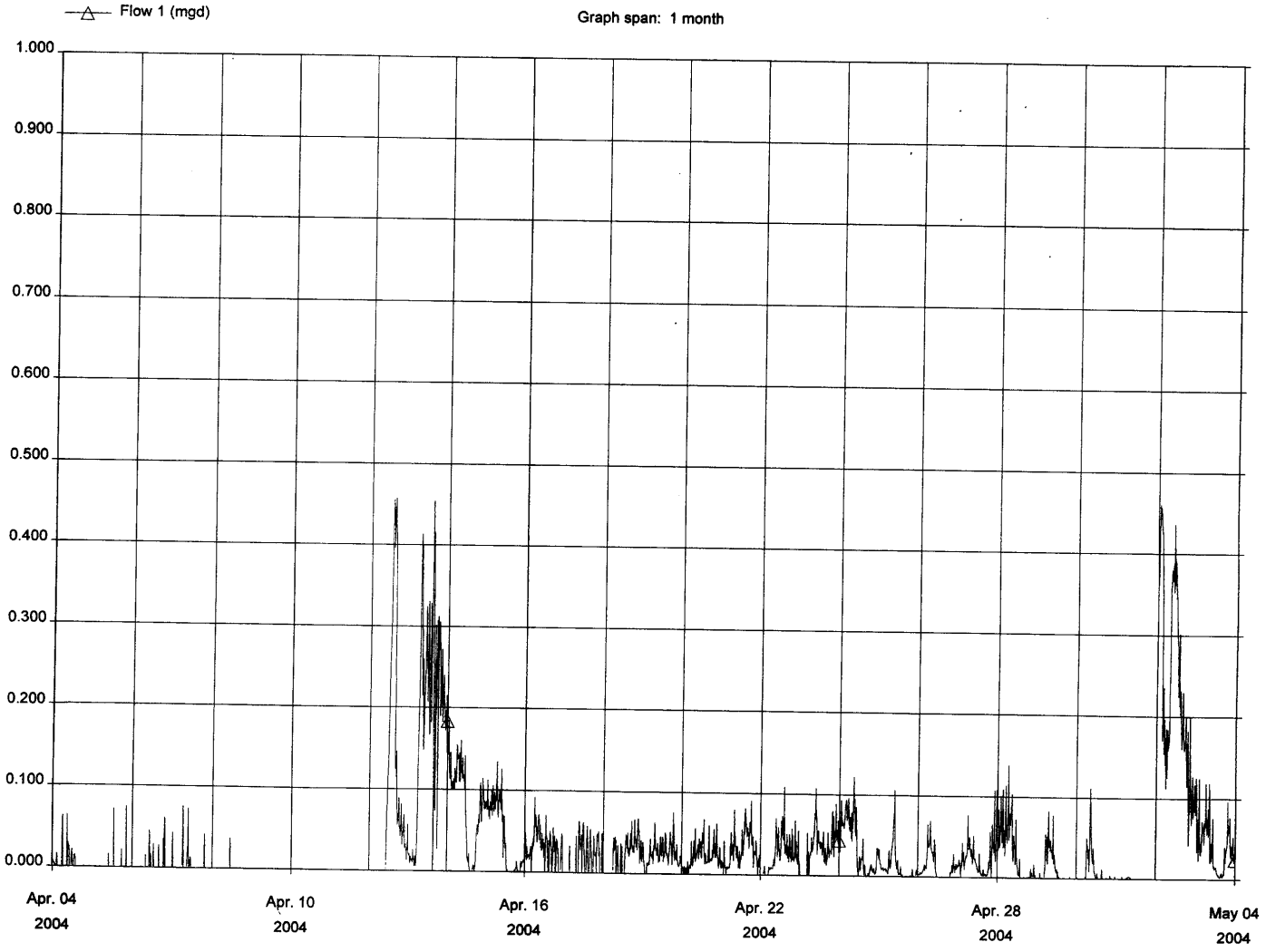
AUGUSTA FM-1 (Second & Frankfort)

Site Id: 88578300 File name: 05050936.S9X



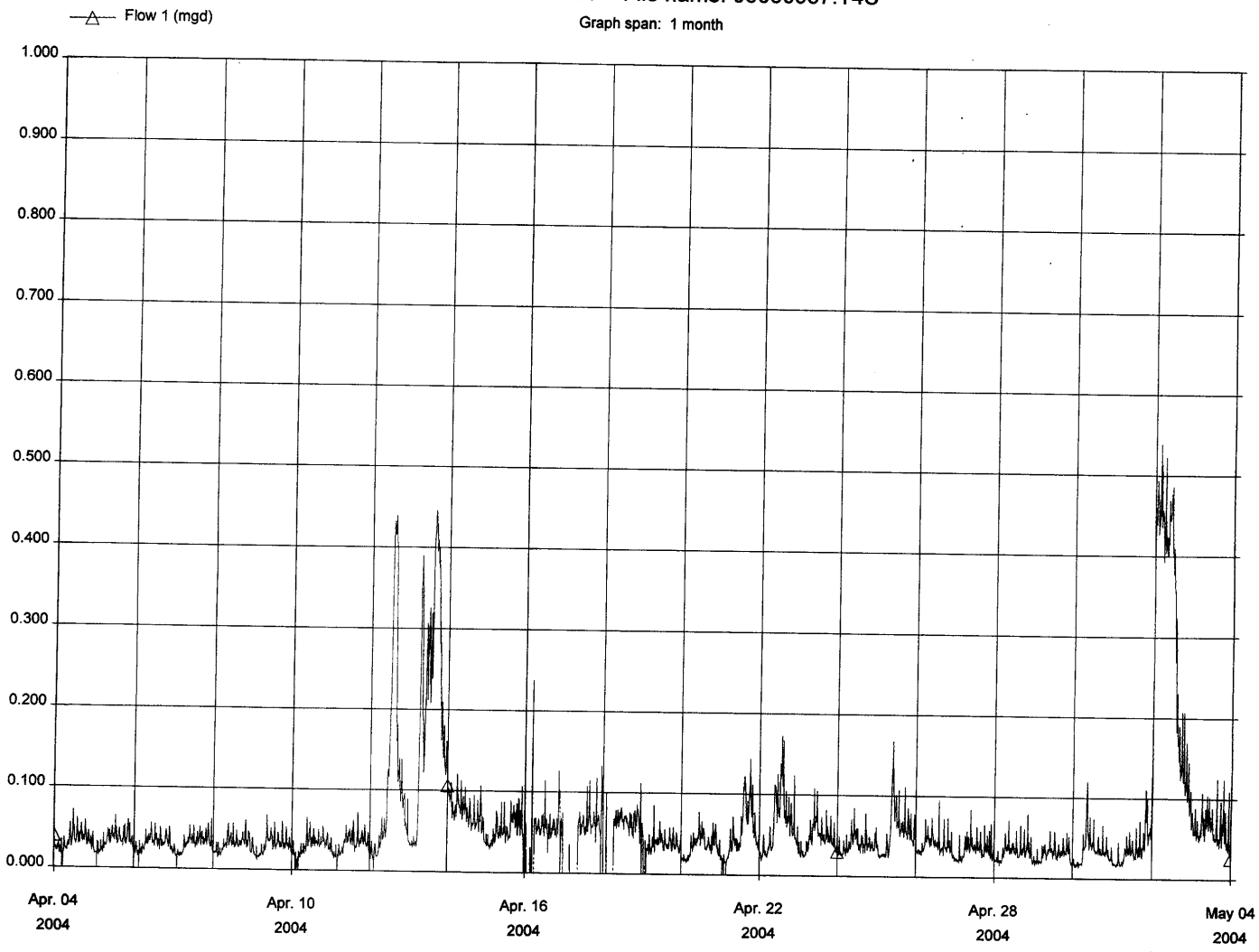
AUGUSTA FM-2 (Second & Upper Alley)

Site Id: 74808300 File name: 05050932.SPJ



AUGUSTA FM-3 (Park View)

Site Id: 83528400 File name: 05050937.T4S



AUGUSTA FM-4 (Second & Ferry)

Site Id: 82658400 File name: 05050931.TAR

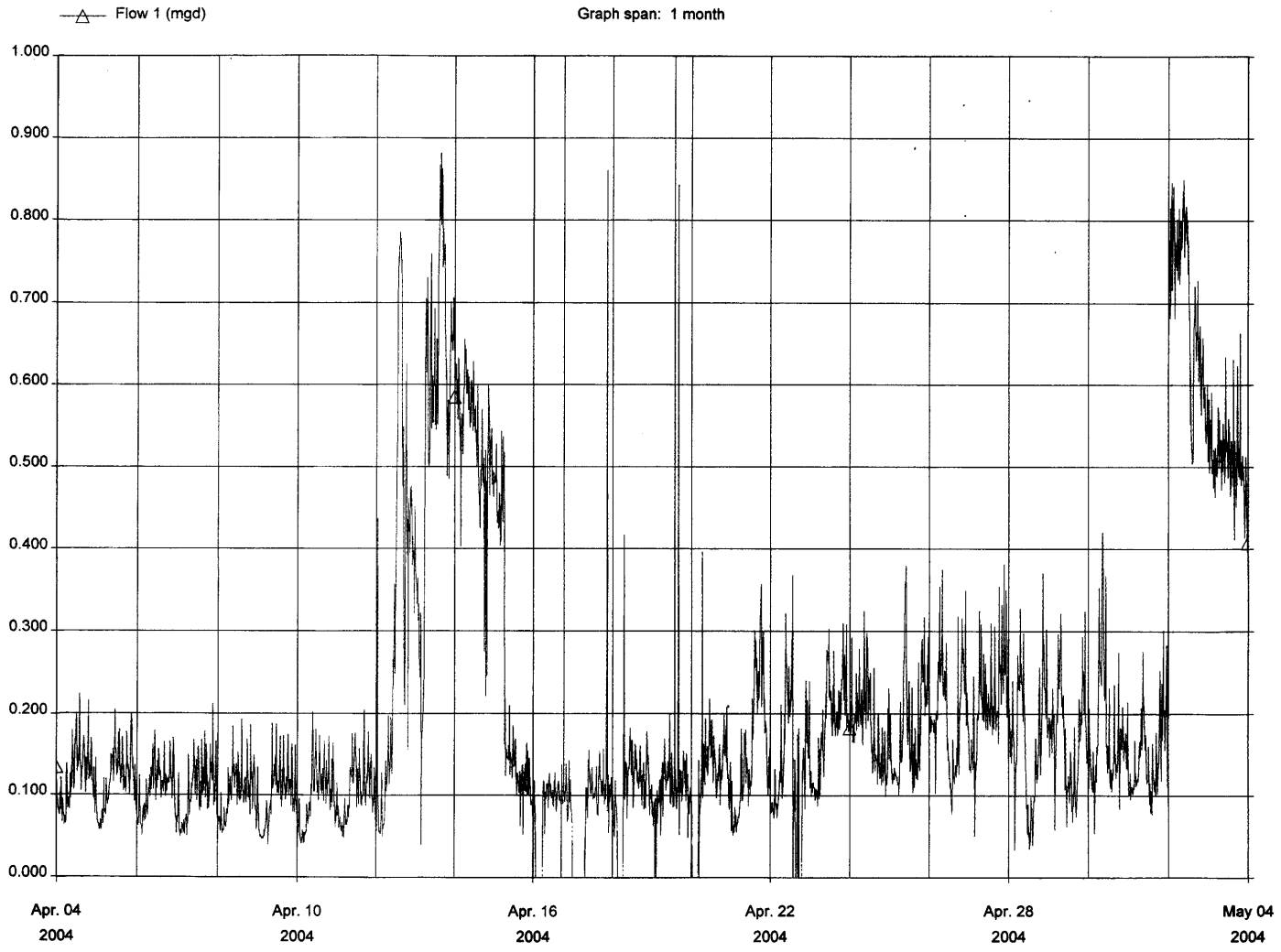


EXHIBIT A.1 - Augusta

Large Rain Event - April 12-13 (1.75" in 2 days)

Flow

Site Name	Ranking (1 Best 4 Worst)	Peak Time	Peak I/I	Peaking Factor	I/I Gallons	Difference in I/I (Gallons)	Gallons per Foot of Pipe
						224,500	
Site 1	2	4/13/04 3:00 PM	0.364	4.8	224,500		17.7
						63,313	
Site 2	1	4/13/04 2:30 PM	0.380	6.1	287,813		15.1
						134,052	
Site 3	3	4/13/04 3:30 PM	0.622	9.4	421,865		18.7
						663,239	
Site 4	4	4/13/04 3:45 PM	0.669	4.2	1,085,104		36.4

EXHIBIT A.1.1
Site #1) Second & Frankfort
Flow and Rainfall vs. Time
April 12-14

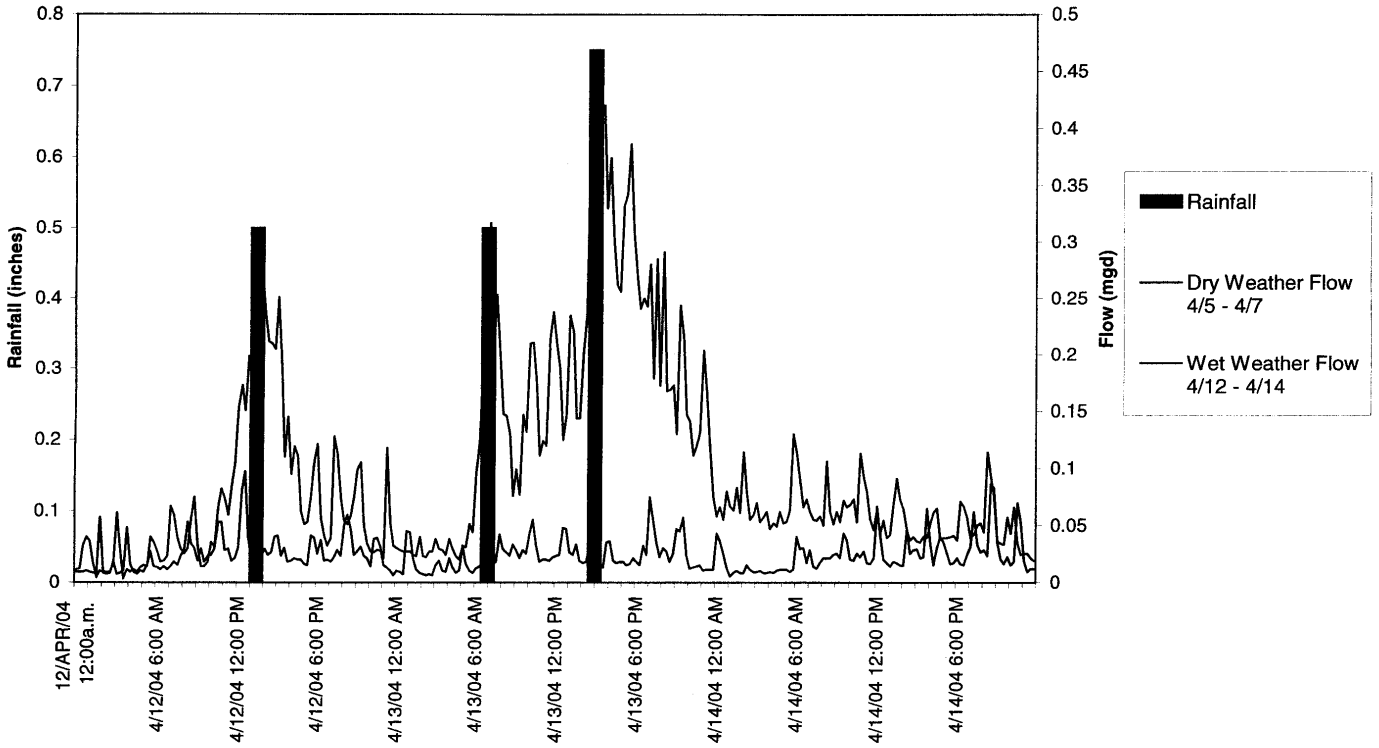


EXHIBIT A.1.2
Site #2) Second & Upper Alley
Flow and Rainfall vs. Time
April 12-14

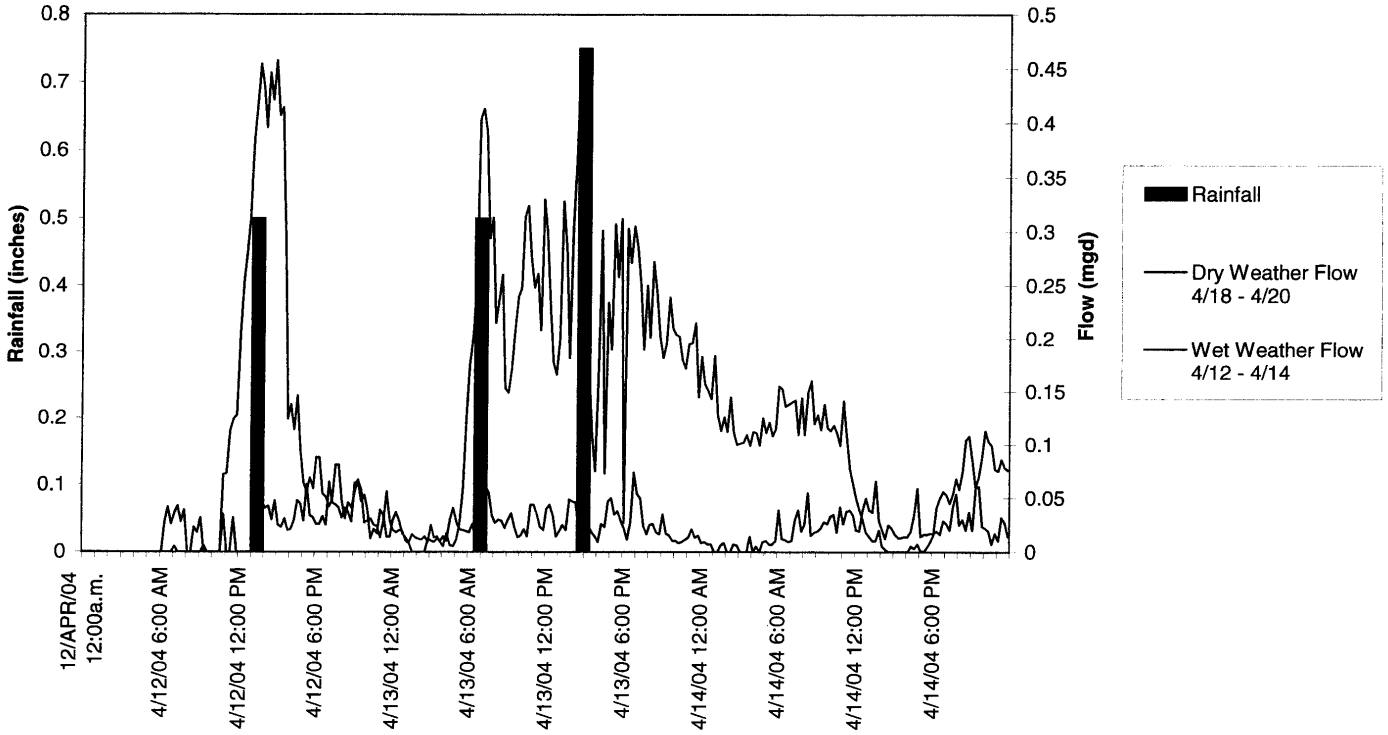


EXHIBIT A.1.3
Site #3) Second & Parkview
Flow and Rainfall vs. Time
April 12-14

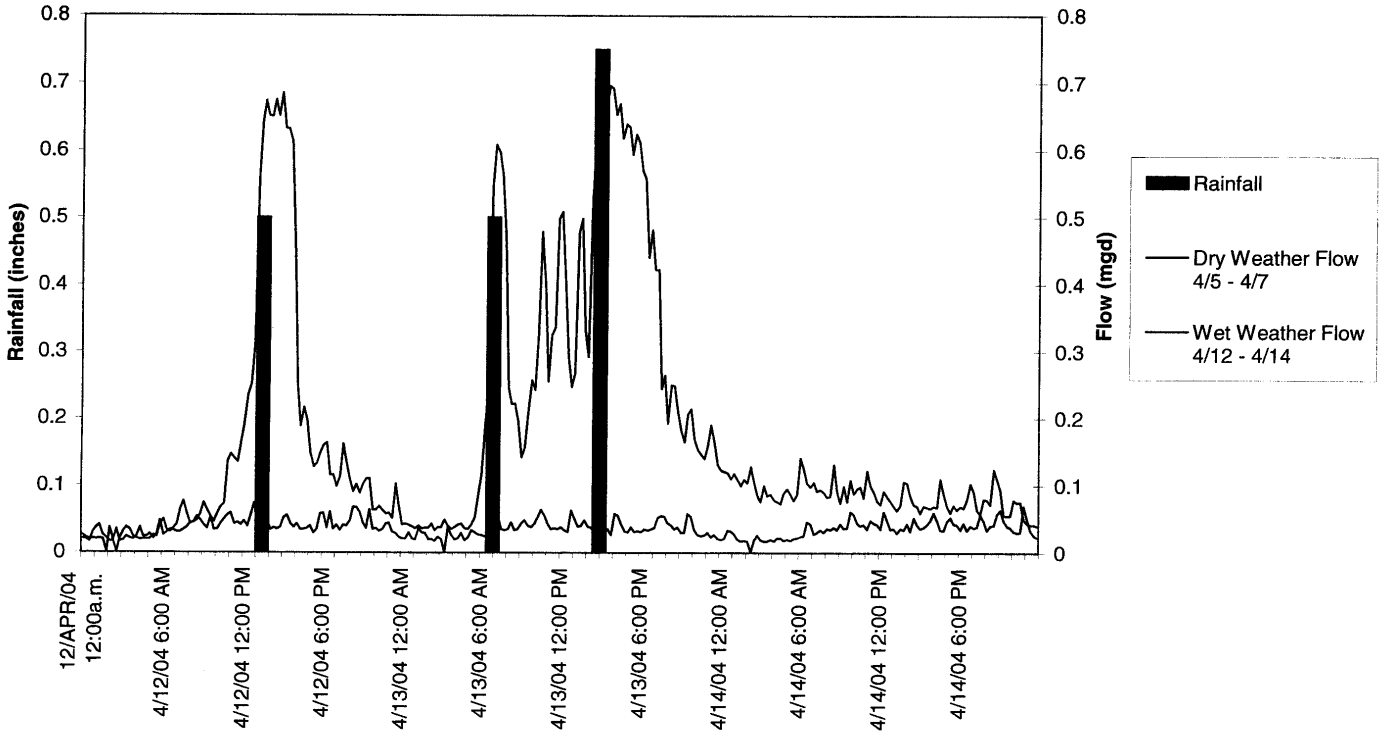


EXHIBIT A.1.4
Site #4) Second & Ferry
Flow and Rainfall vs. Time
April 12-14

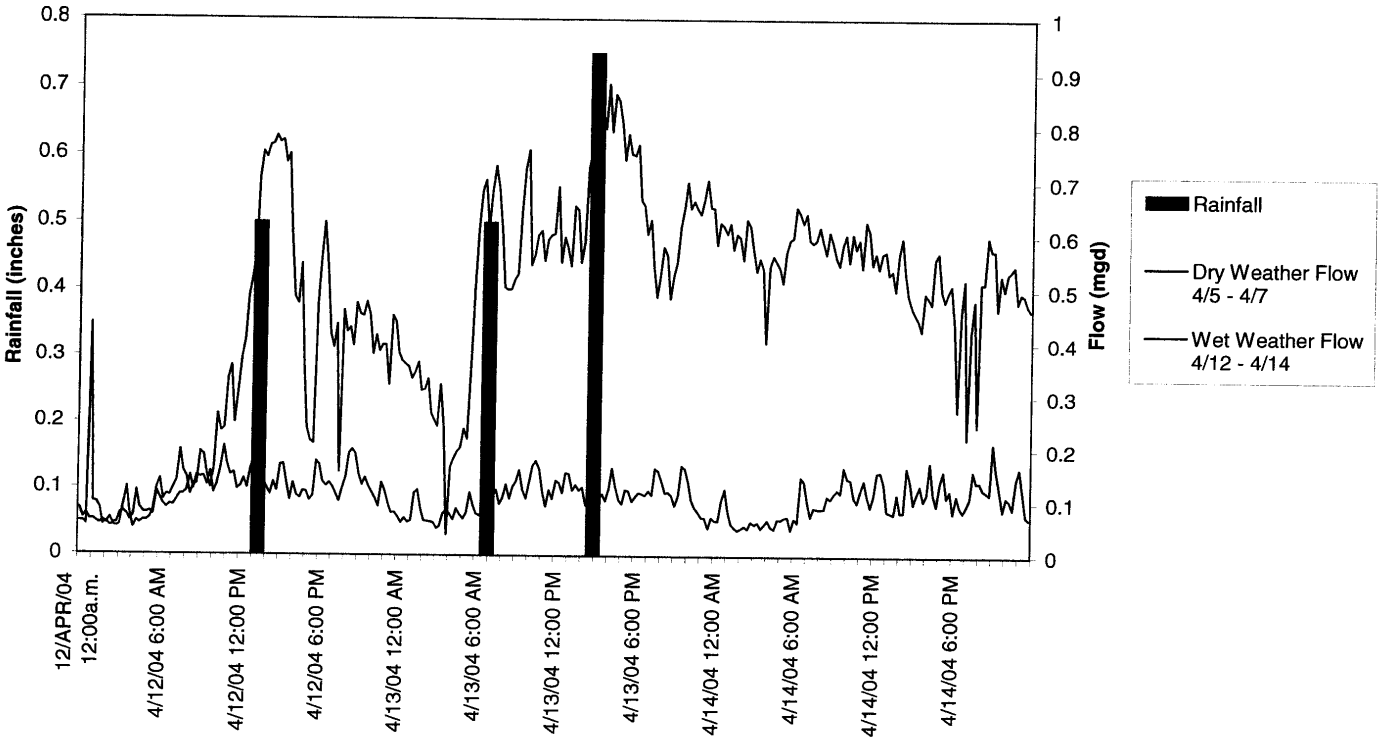


EXHIBIT A.2 - Augusta

Small Rain Event - April 21 - 22 (0.95" in 2 days)

Flow

Site Name	Ranking (1 Best 4 Worst)	Peak Time	Peak I/I	Peaking Factor	I/I Gallons	Difference in I/I (Gallons)	Gallons per Foot of Pipe
						35,854	
Site 1	4	4/22/04 9:30 PM	0.095	2.1	35,854		2.8
						9,146	
Site 2	1	4/22/04 2:30 PM	0.034	1.5	45,000		2.4
						15,458	
Site 3	2	4/22/04 1:30 PM	0.134	2.9	60,458		2.7
						20,490	
Site 4	3	4/22/04 1:30 PM	0.156	1.7	80,948		2.7

EXHIBIT A.2.1
Site #1) Second & Frankfort
Flow and Rainfall vs. Time
April 21 - 22

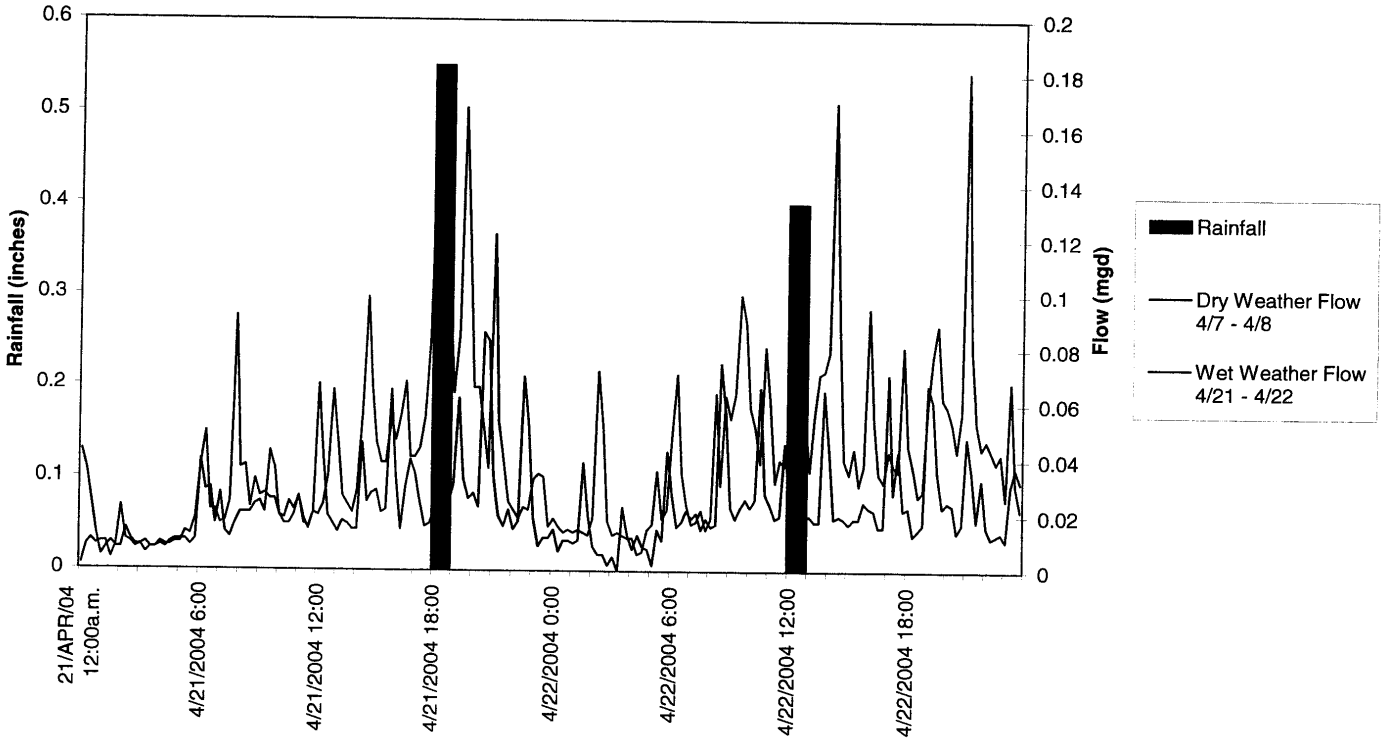


EXHIBIT A.2.2
Site #2) Second & Upper Alley
Flow and Rainfall vs. Time
April 21 - 22

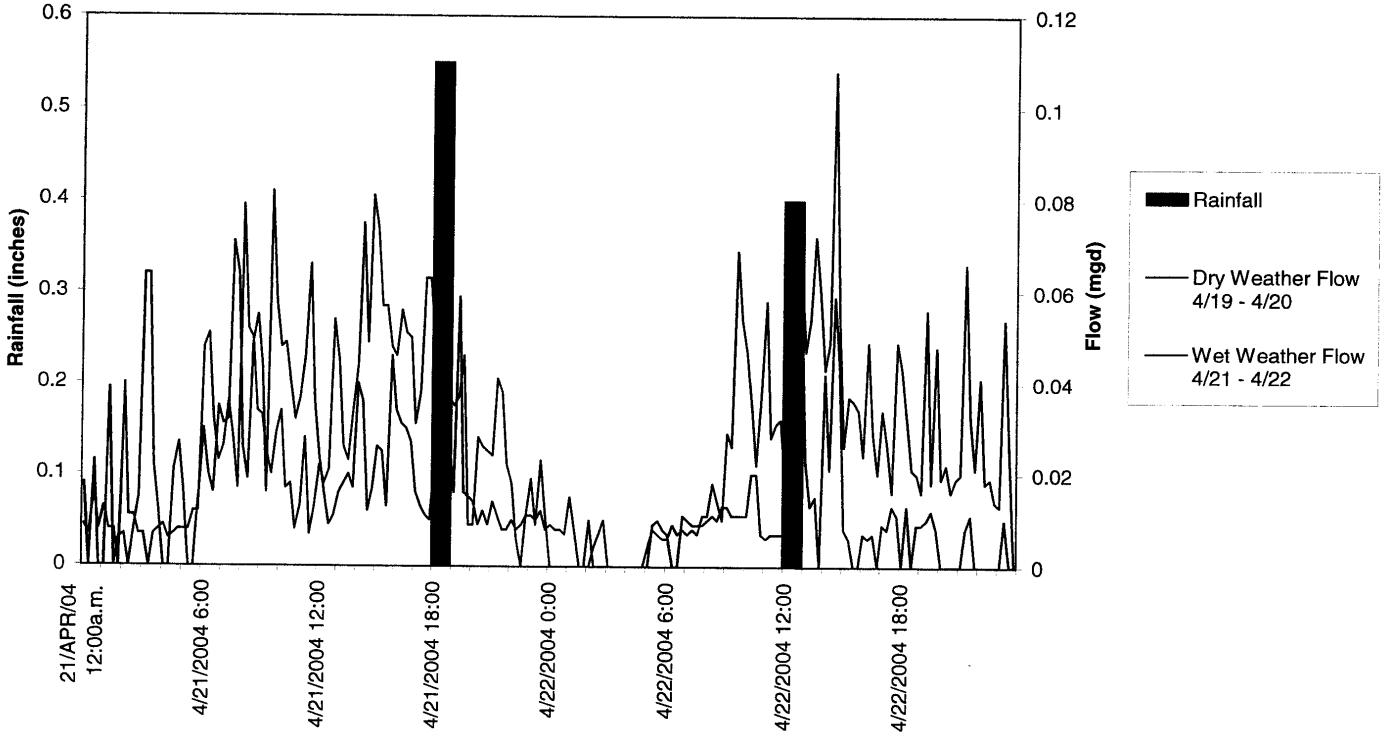


EXHIBIT A.2.3
Site #3) Second & Parkview
Flow and Rainfall vs. Time
April 21 - 22

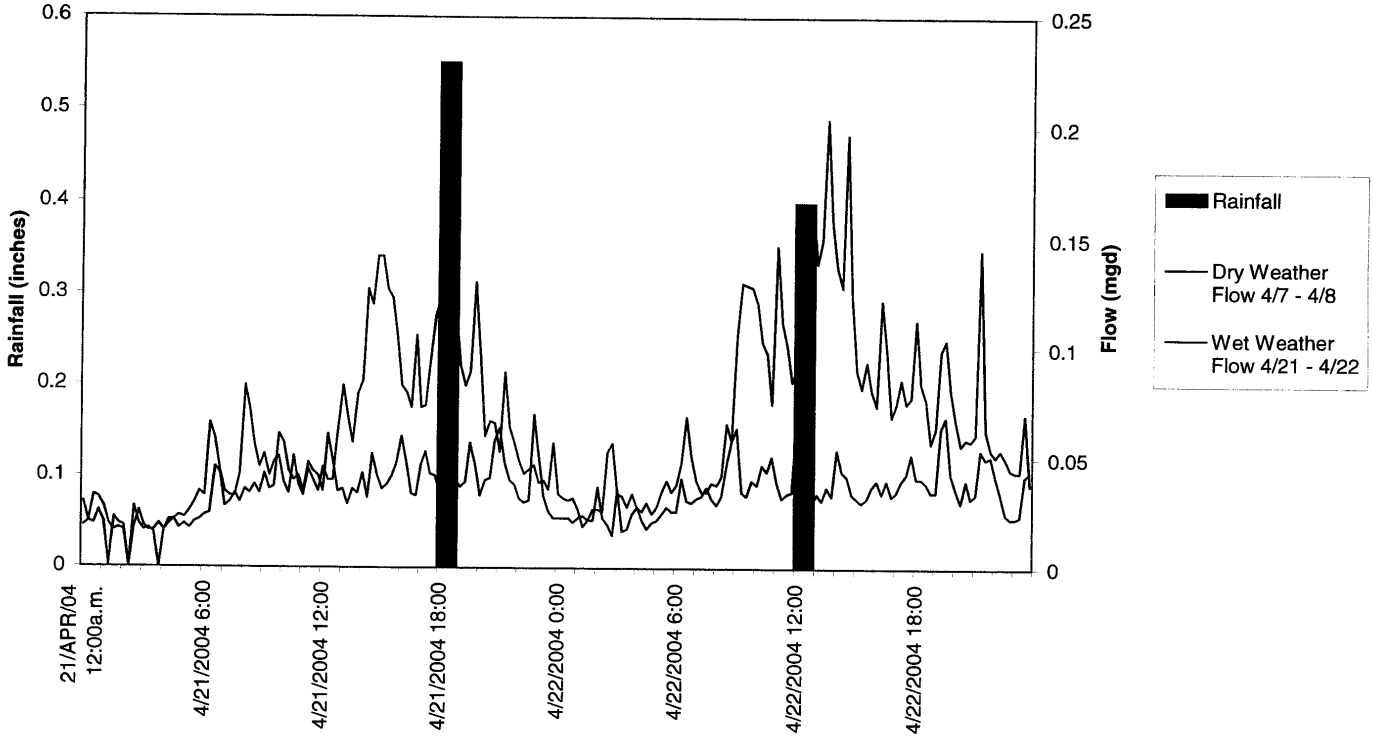


EXHIBIT A.2.4
Site #4) Second & Ferry
Flow and Rainfall vs. Time
April 21 - 22

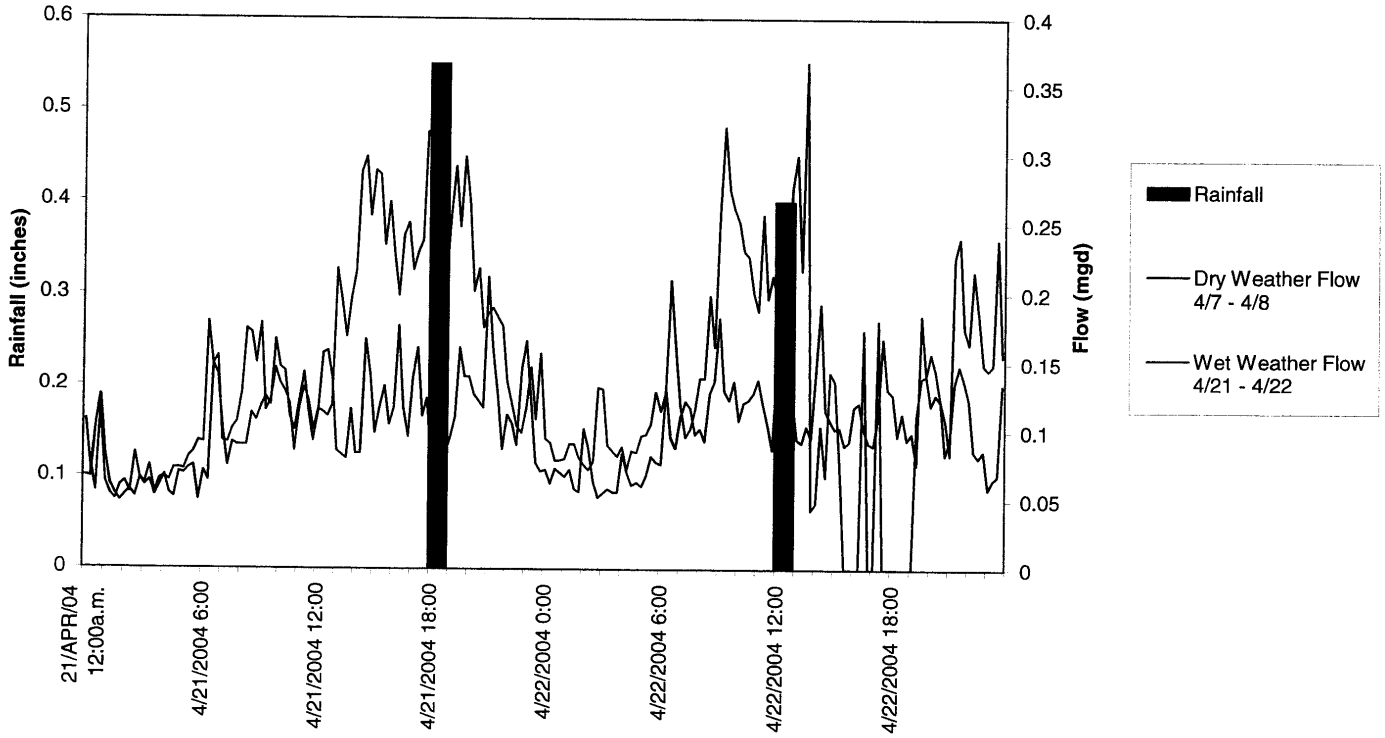


EXHIBIT A.3 - Augusta

Large Rain Event - May 2 (1.60" in 1 day)

Flow

Site Name	Ranking (1 Best 4 Worst)	Peak Time	Peak I/I	Peaking Factor	I/I Gallons	Difference in I/I (Gallons)	Gallons per Foot of Pipe
						126,604	
Site 1	1	5/2/04 2:30 AM	0.244	2.6	126,604		10.0
						90,292	
Site 2	2	5/2/04 1:00 AM	0.381	5.8	216,896		11.4
						224,760	
Site 3	3	5/2/04 3:15 AM	0.755	9.8	441,656		19.6
						220,615	
Site 4	4	5/2/04 2:00 AM	0.467	2.2	662,271		22.2

EXHIBIT A.3.1 - Augusta
Site #1) Second & Frankfort
Flow and Rainfall vs. Time
May 1 - 3

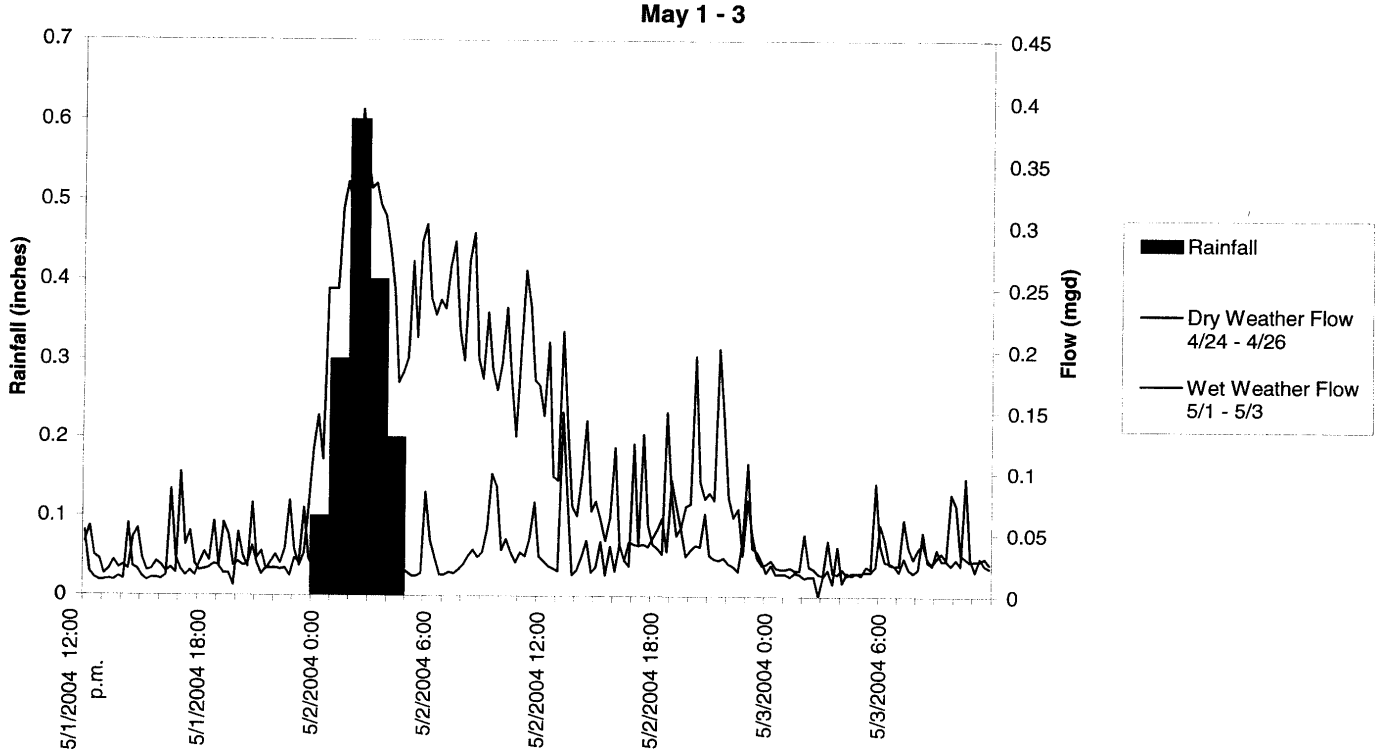


EXHIBIT A.3.2 - Augusta
Site #2) Second & Upper Alley
Flow and Rainfall vs. Time
May 1 - 3

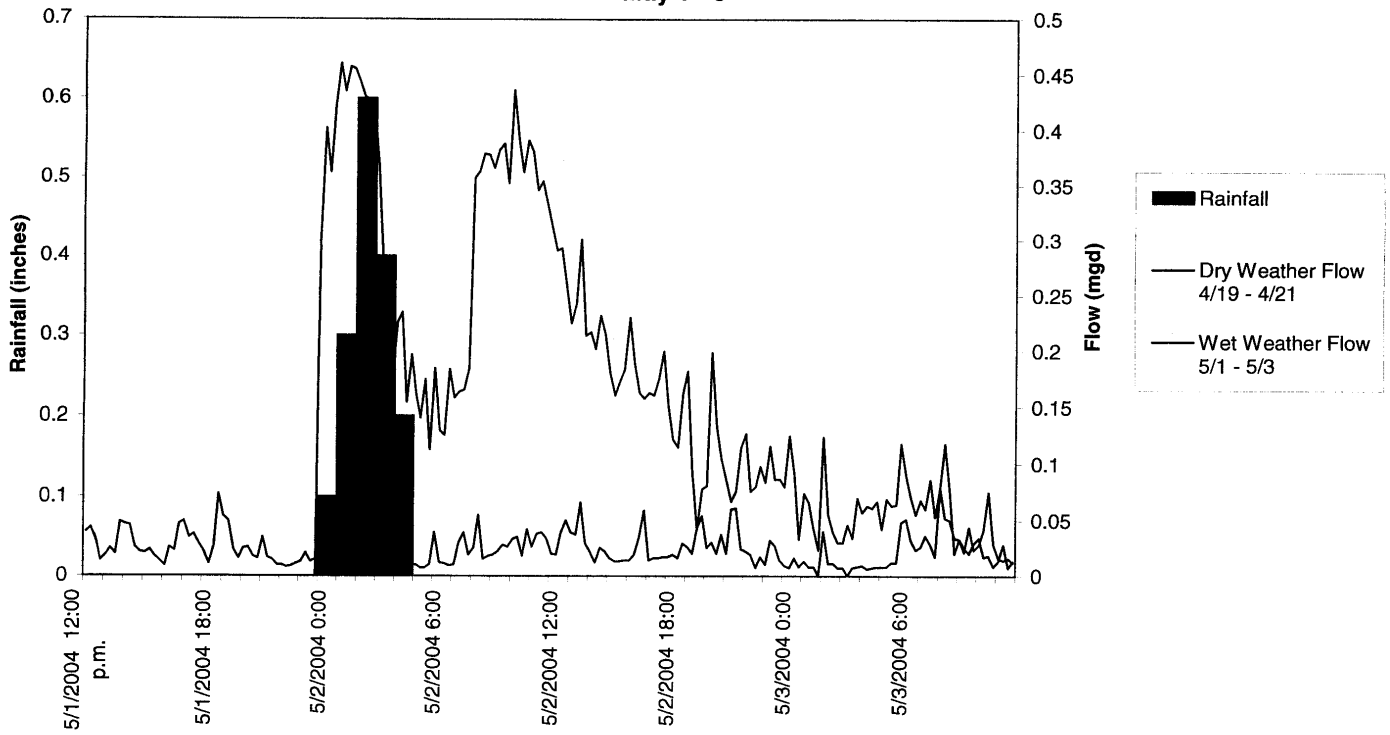


EXHIBIT A.3.3 - Augusta
Site #3) Second & Parkview
Flow and Rainfall vs. Time
May 1 - 3

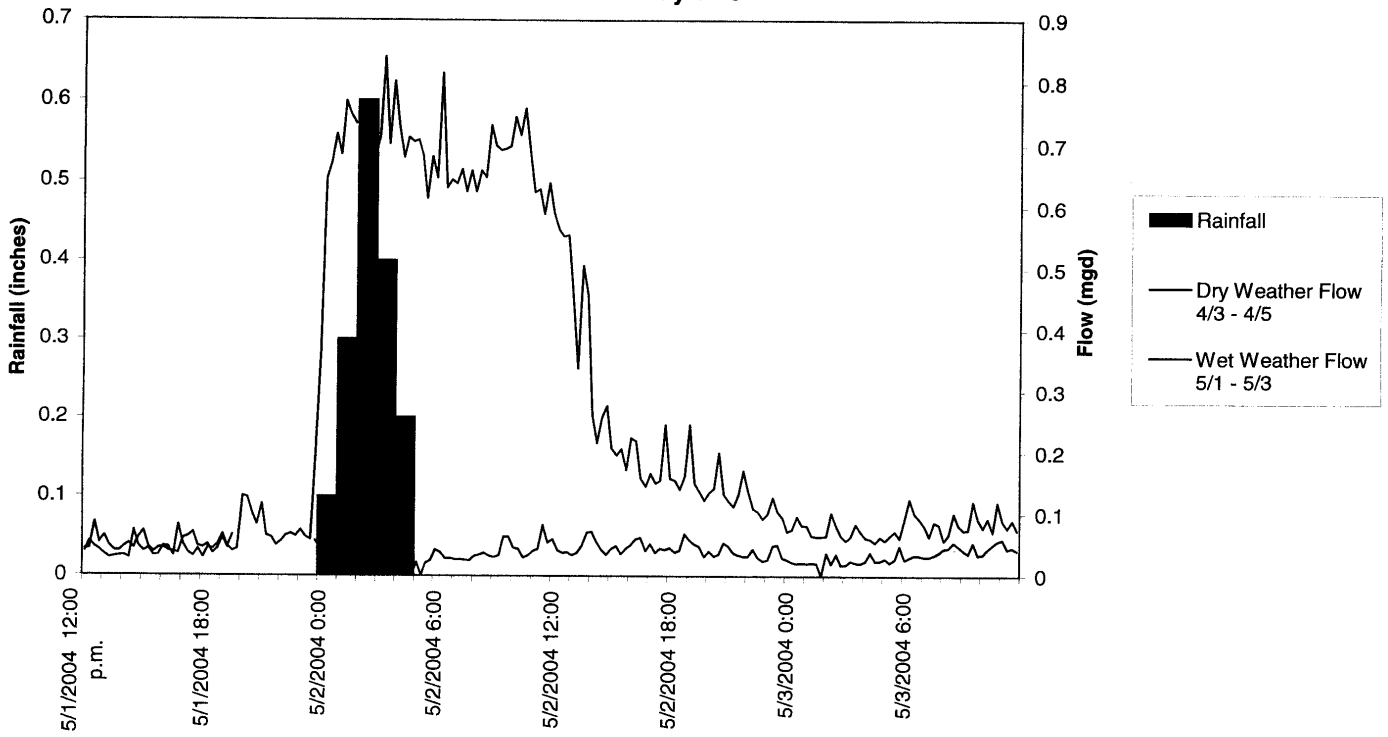
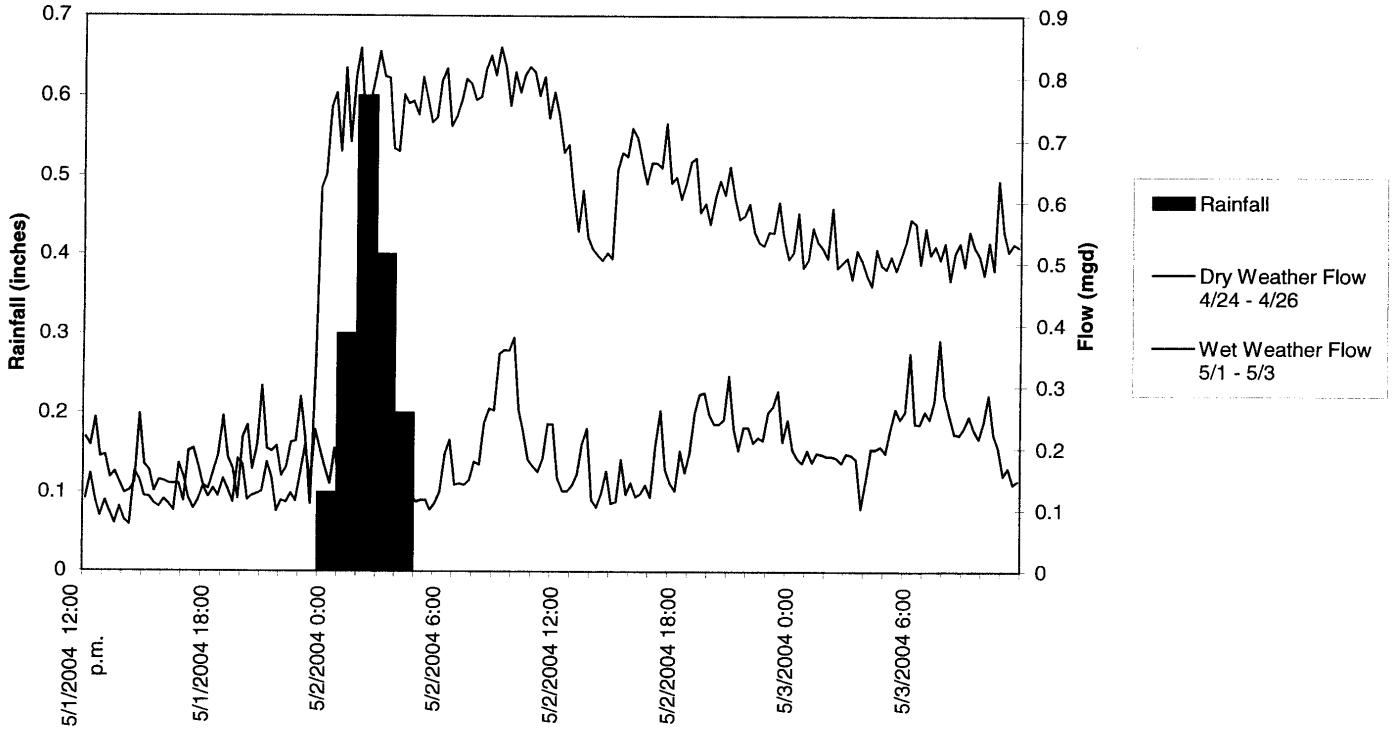


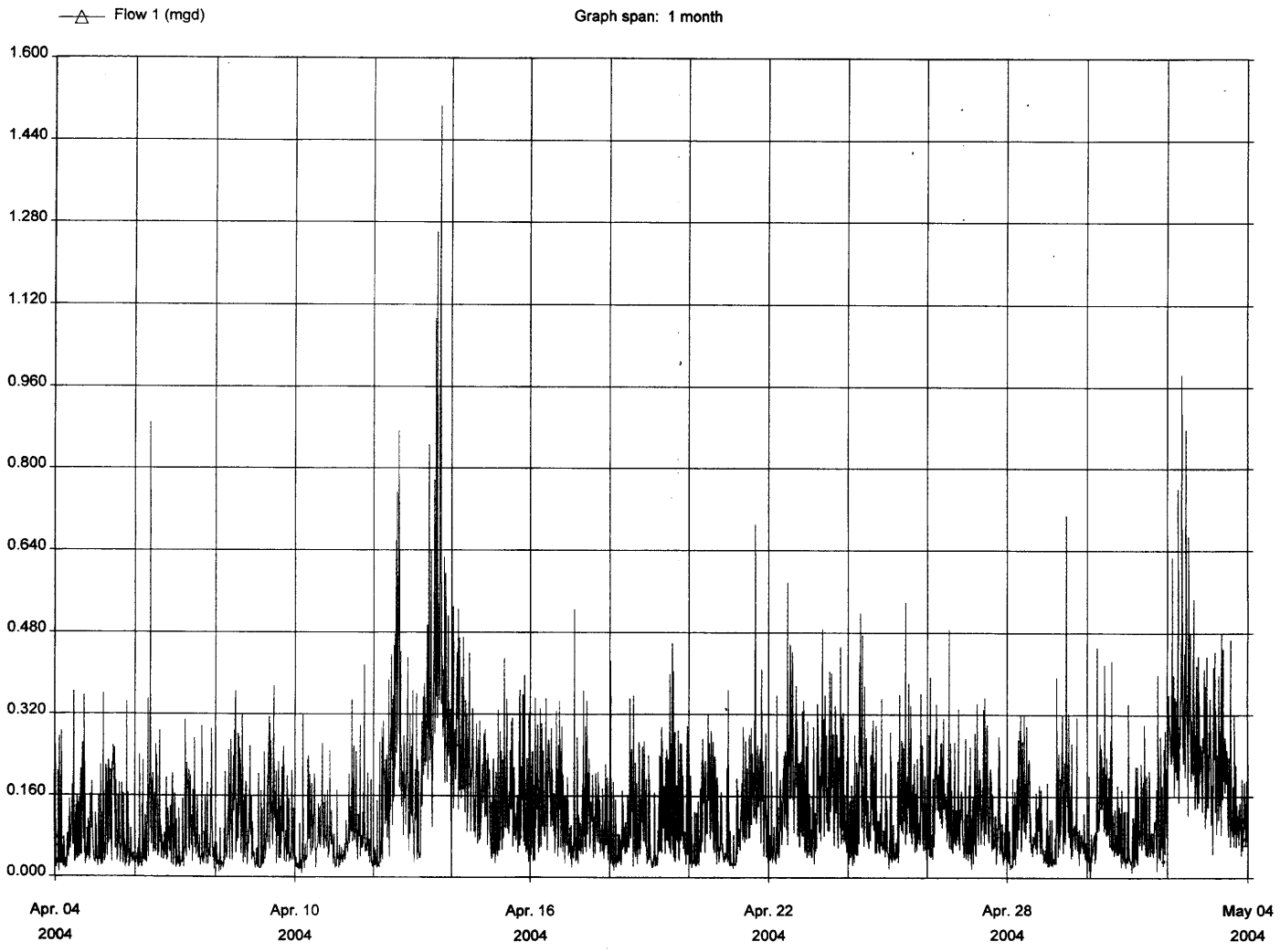
EXHIBIT A.3.4 - Augusta
Site #4) Second & Ferry
Flow and Rainfall vs. Time
May 1 - 3



APPENDIX A
Flow Metering Results
Brooksville, KY

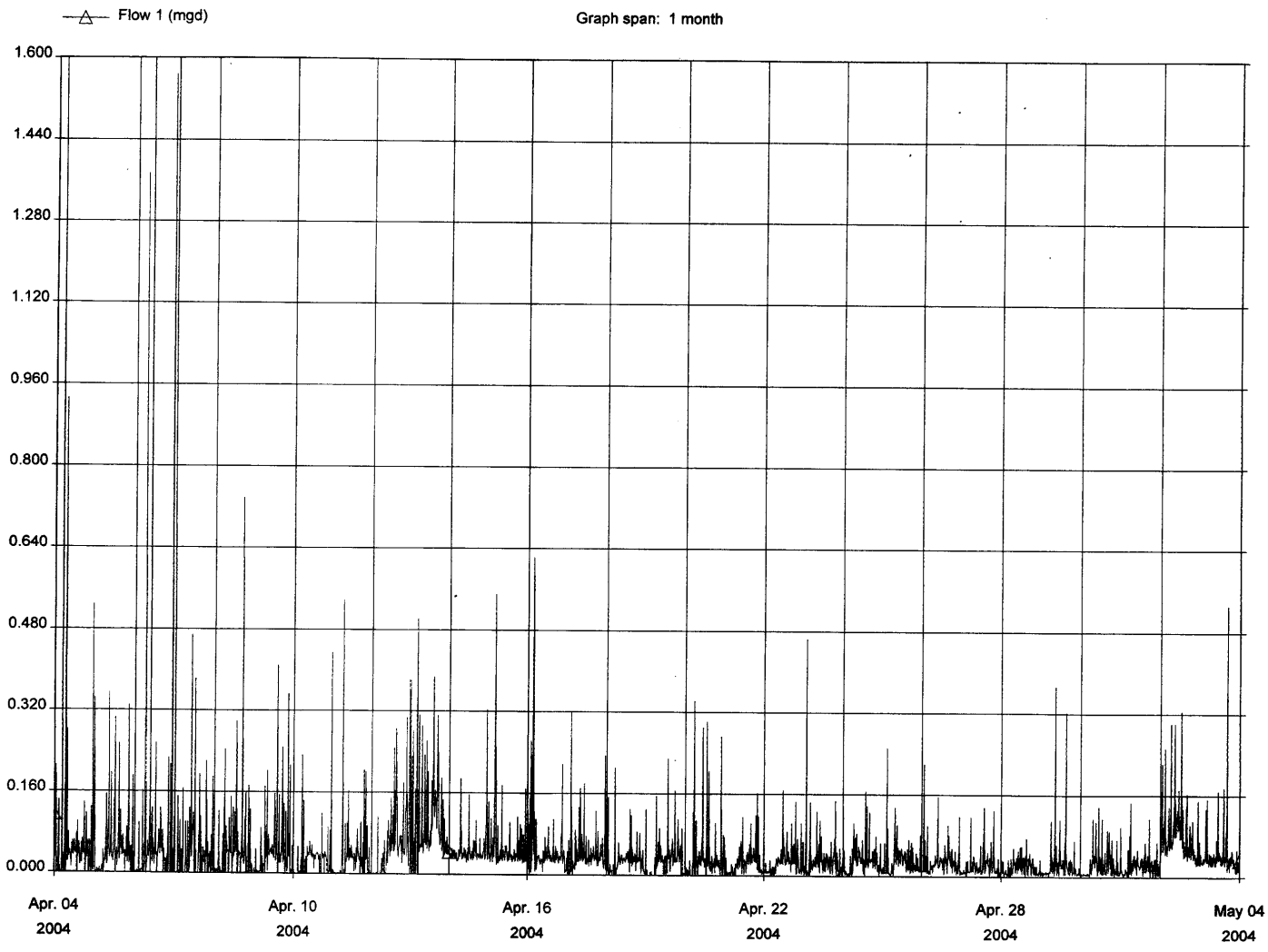
BROOKSVILLE FM-A (MH 3 from MH 4)

Site Id: 50577900 File name: 05051142.O92



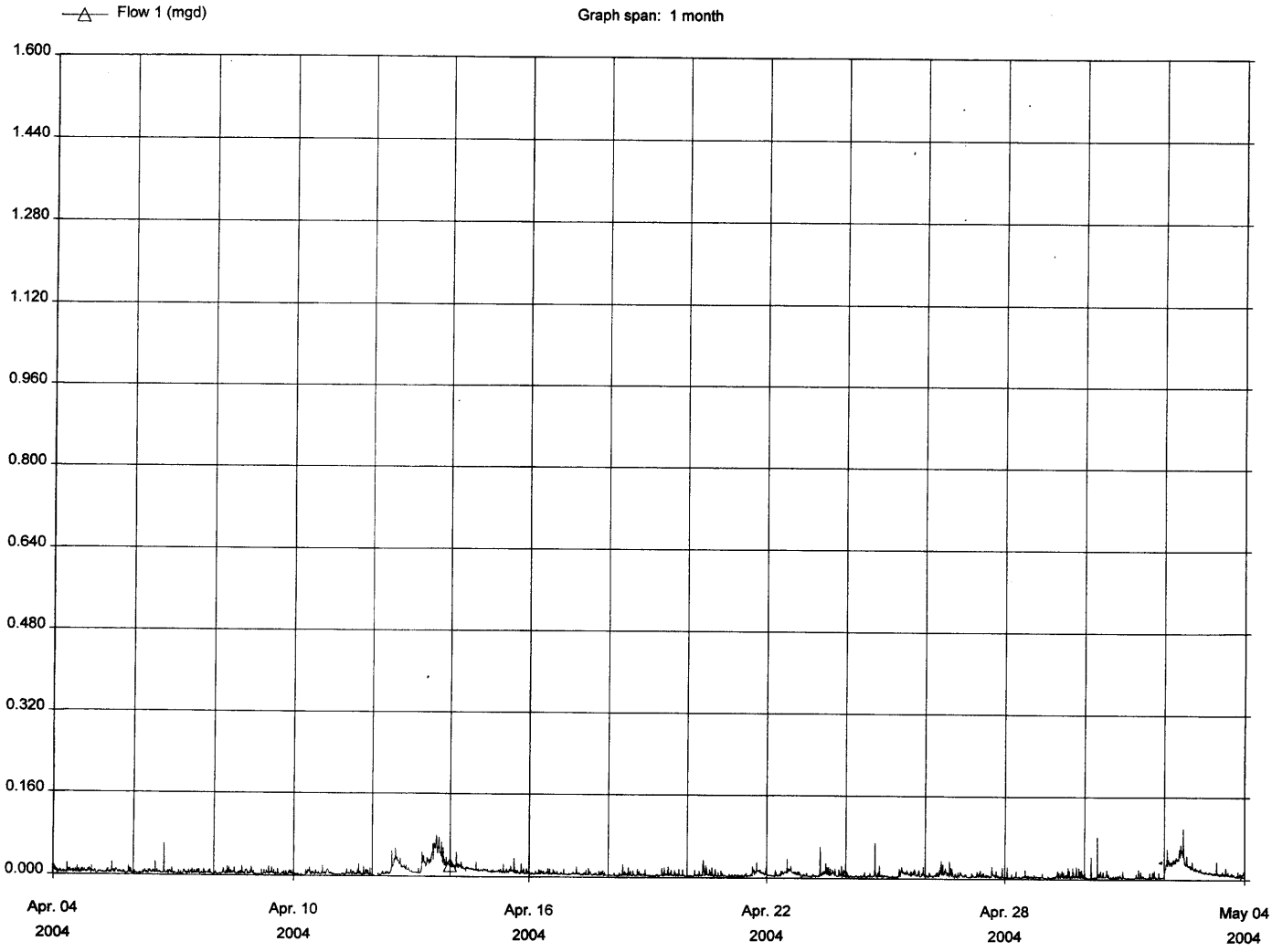
BROOKSVILLE FM-B (MH 3 SOUTH)

Site Id: 56548300 File name: 05051143.S68



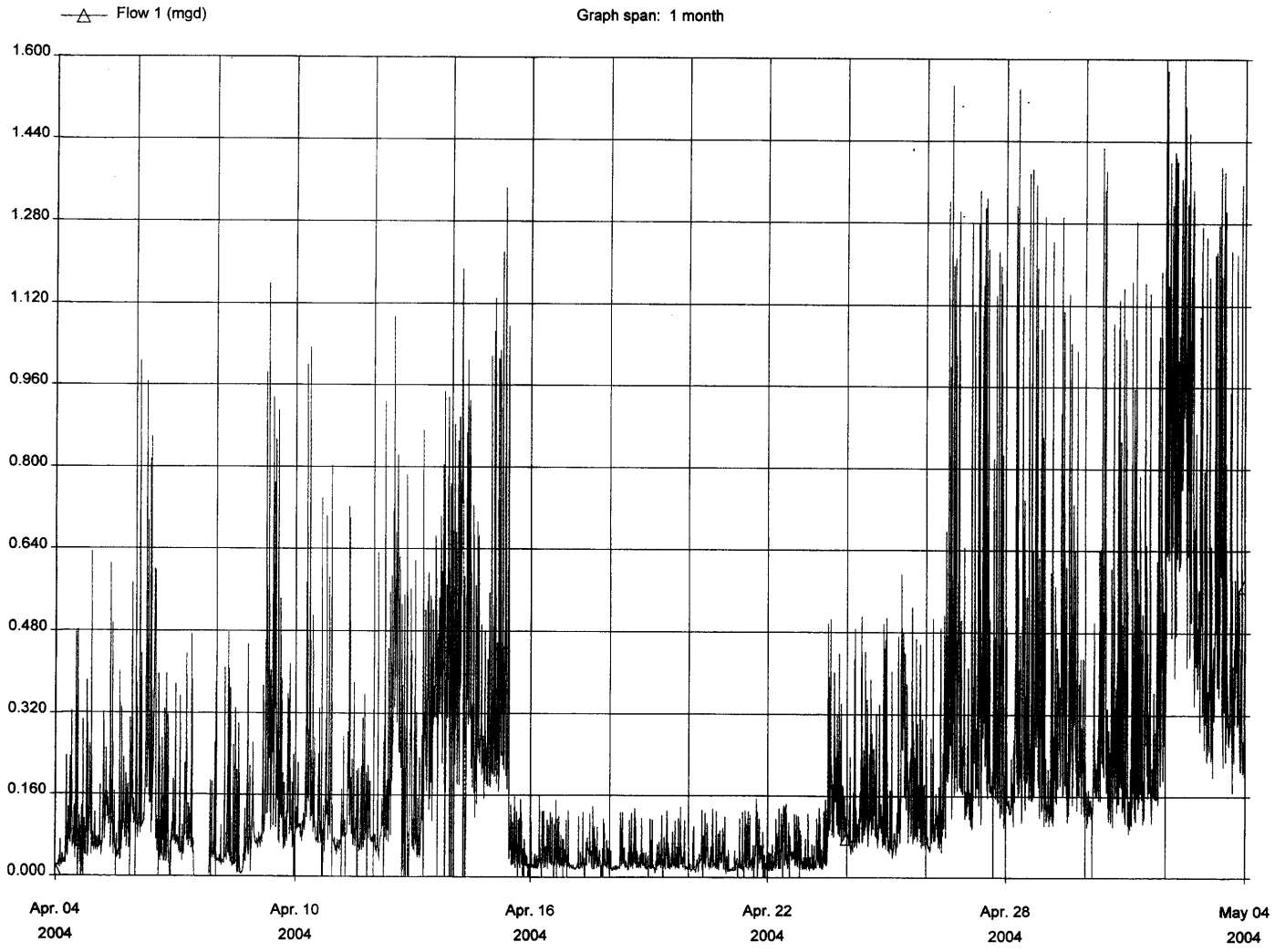
BROOKSVILLE FM-C (MH 72)

Site Id: 70558400 File name: 05051140.T7F



BROOKSVILLE FM-D (MH 8 FROM MH 9)

Site Id: 54568100 File name: 05051145.Q86



BROOKSVILLE FM-E (MH 8 FROM MH 20)

Site Id: 90838300 File name: 05051146.SSZ

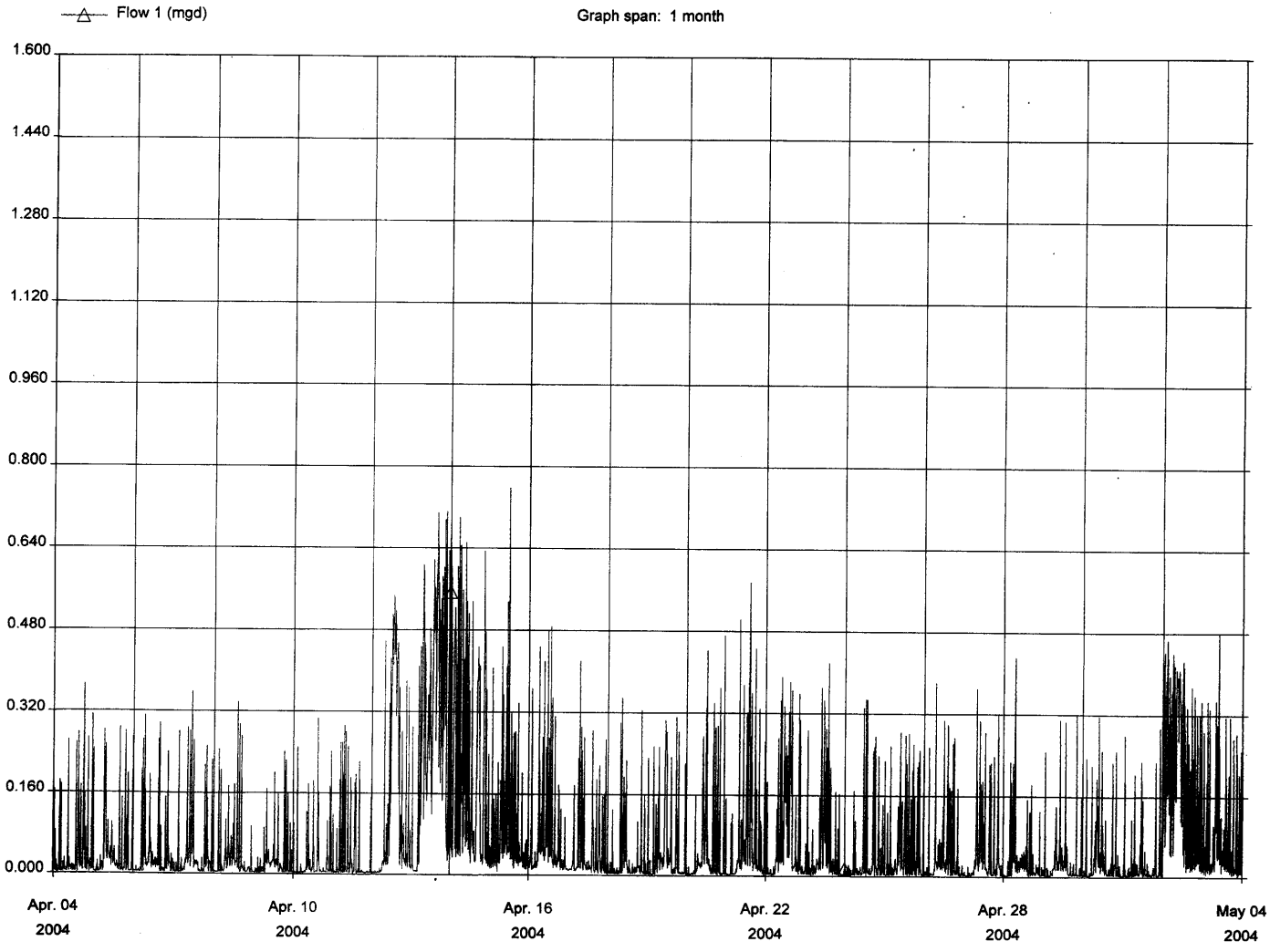


Exhibit B.1 - Brooksville

Large Rain Event - April 12-13 (2.0" in 2 days)

Site Name	Ranking (1 Best 5 Worst)	Peak Time	Peak I/I	Peaking Factor	I/I Gallons	Gallons per Foot of Pipe
Site A	3	4/13/04 3:00 PM	0.617	1.7	497,188	31.8
Site B	1	4/12/04 7:30 AM	-1.420	0.6	56,740	14.5
Site C	2	4/13/04 3:45 PM	0.020	1.3	41,812	16.6
Site D	4	4/14/04 6:15 AM	0.181	1.2	640,708	191.3
Site E	5	4/13/04 9:30 PM	0.352	2.0	528,771	62.5

EXHIBIT B.1.A
Site A) MH 3 From MH 4
Flow and Rainfall vs. Time
April 12-14

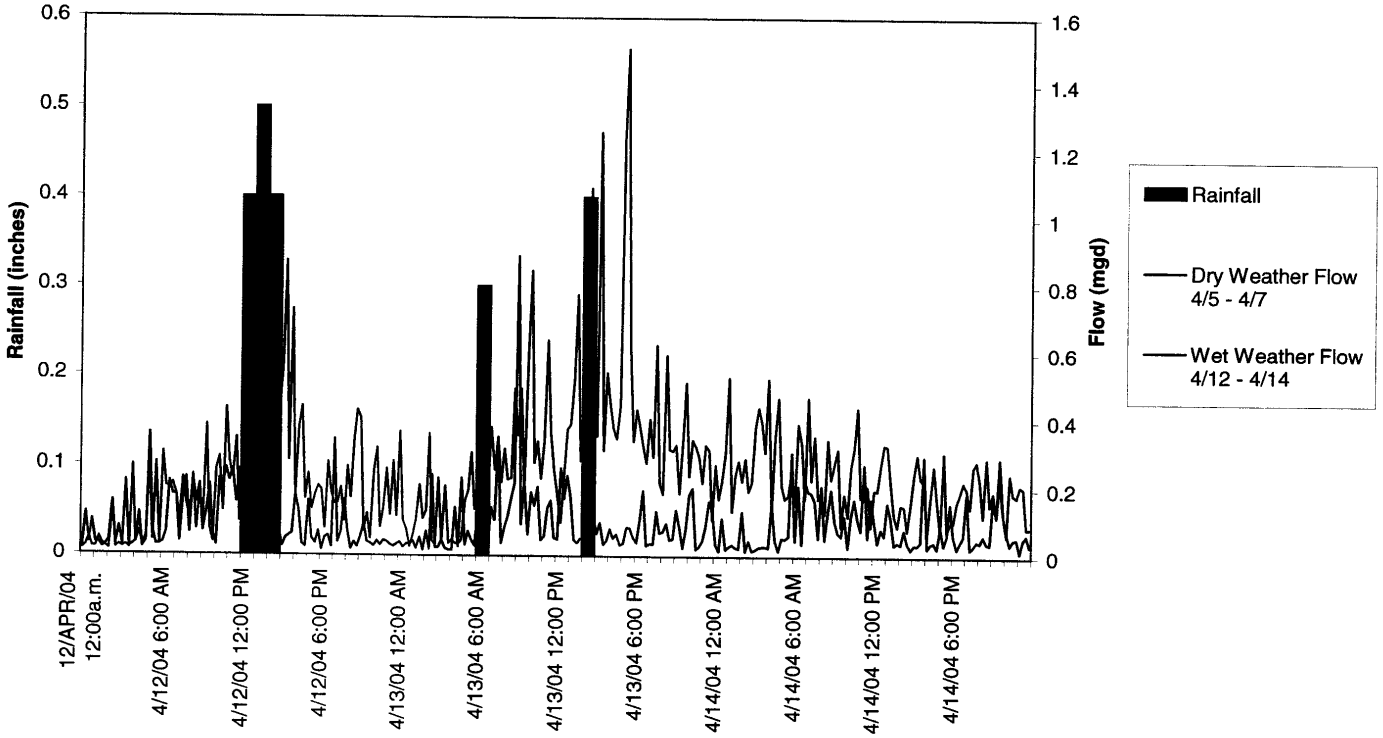


EXHIBIT B.1.B
Site B) MH 3 From South
Flow and Rainfall vs. Time
April 12-14

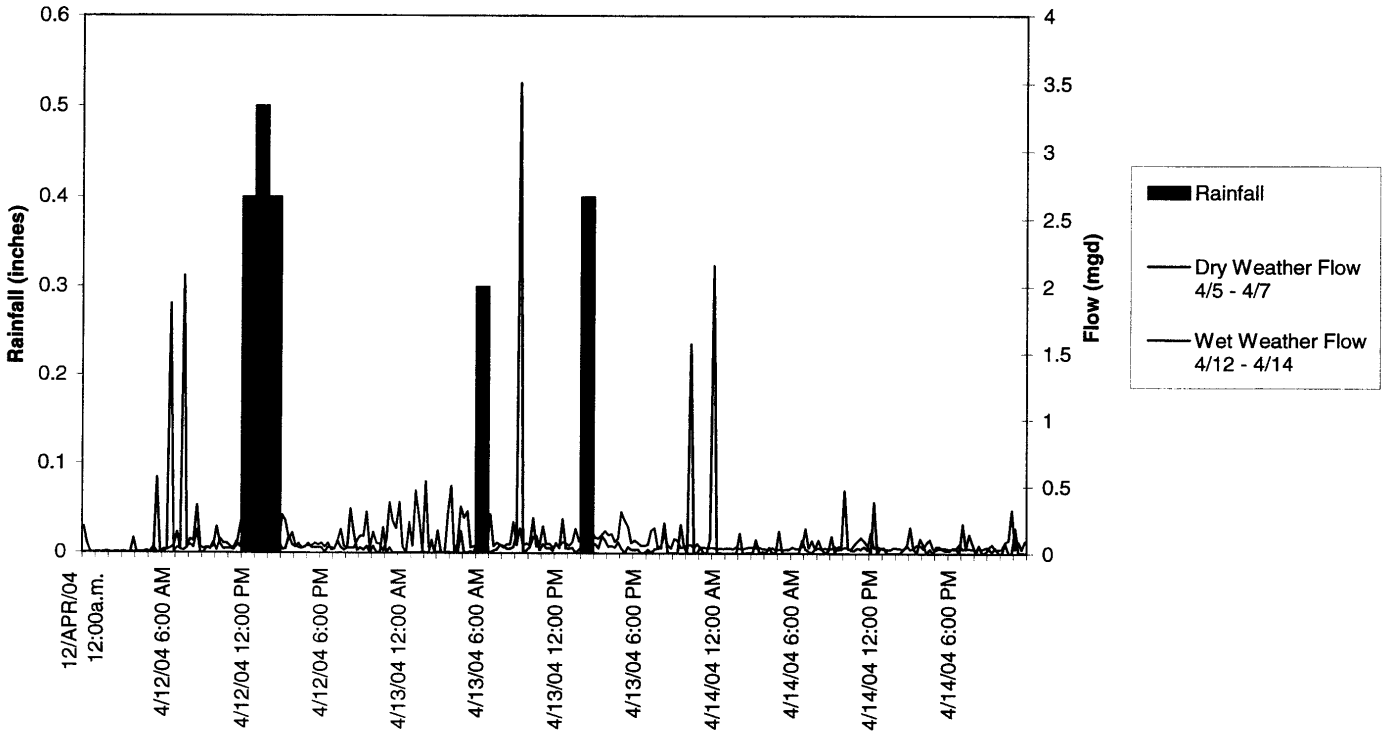


EXHIBIT B.1.C
Site C) MH 72
Flow and Rainfall vs. Time
April 12-14

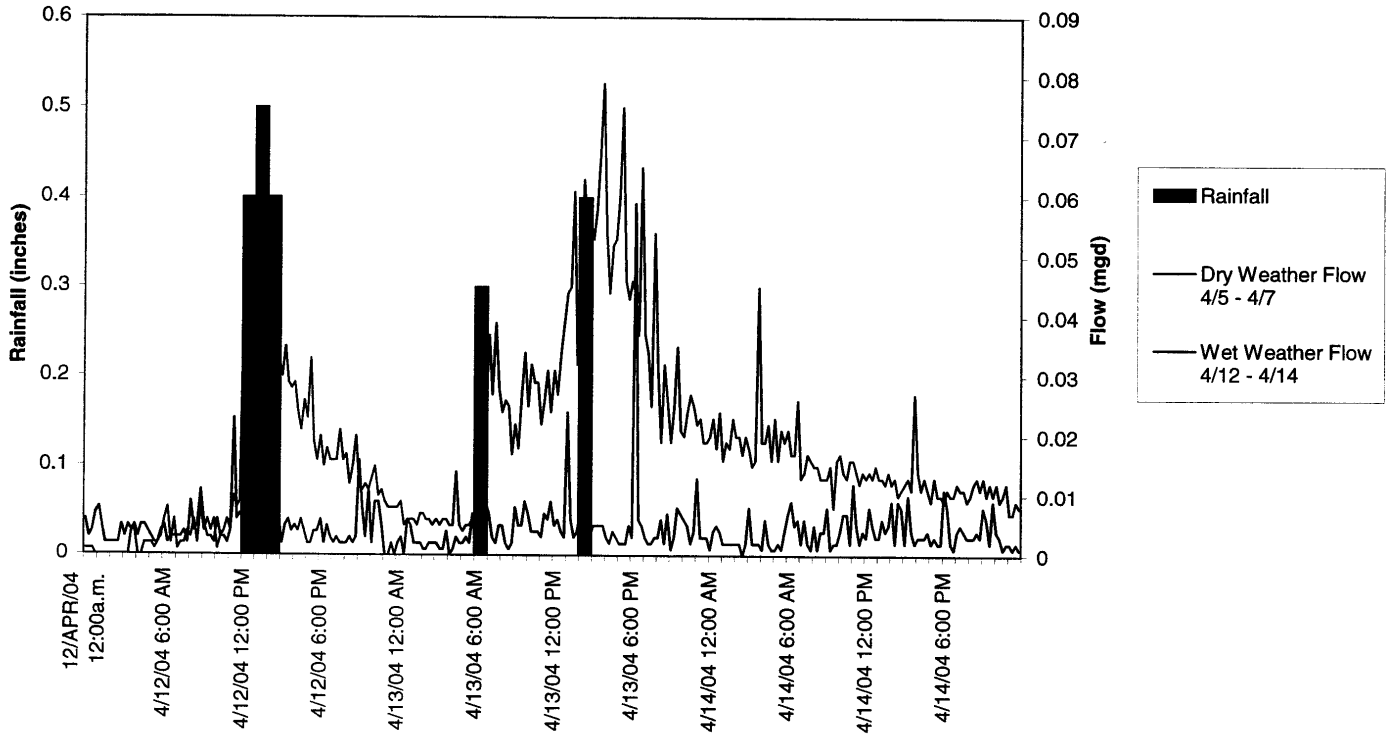


EXHIBIT B.1.D
Site D) MH 8 From MH 9
Flow and Rainfall vs. Time
April 12-14

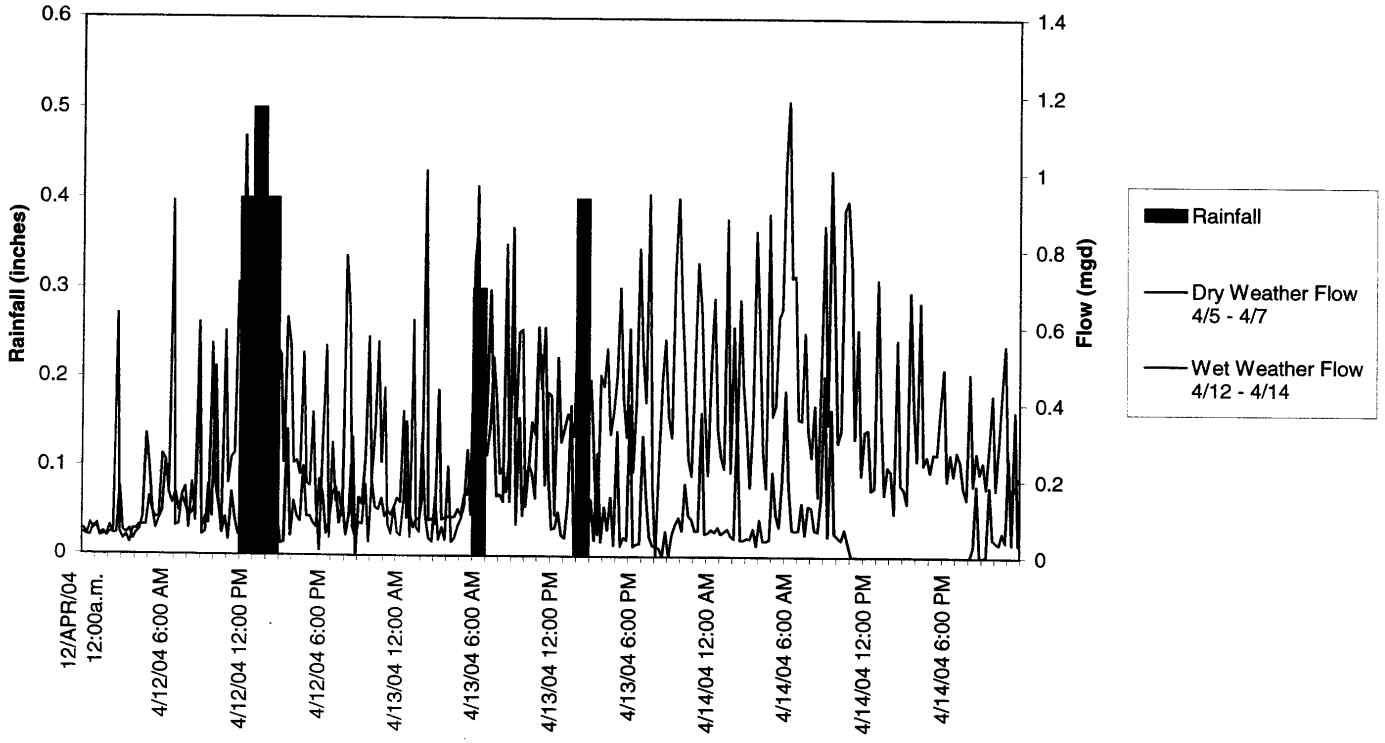


EXHIBIT B.1.E
Site E) MH 8 From MH 20
Flow and Rainfall vs. Time
April 12-14

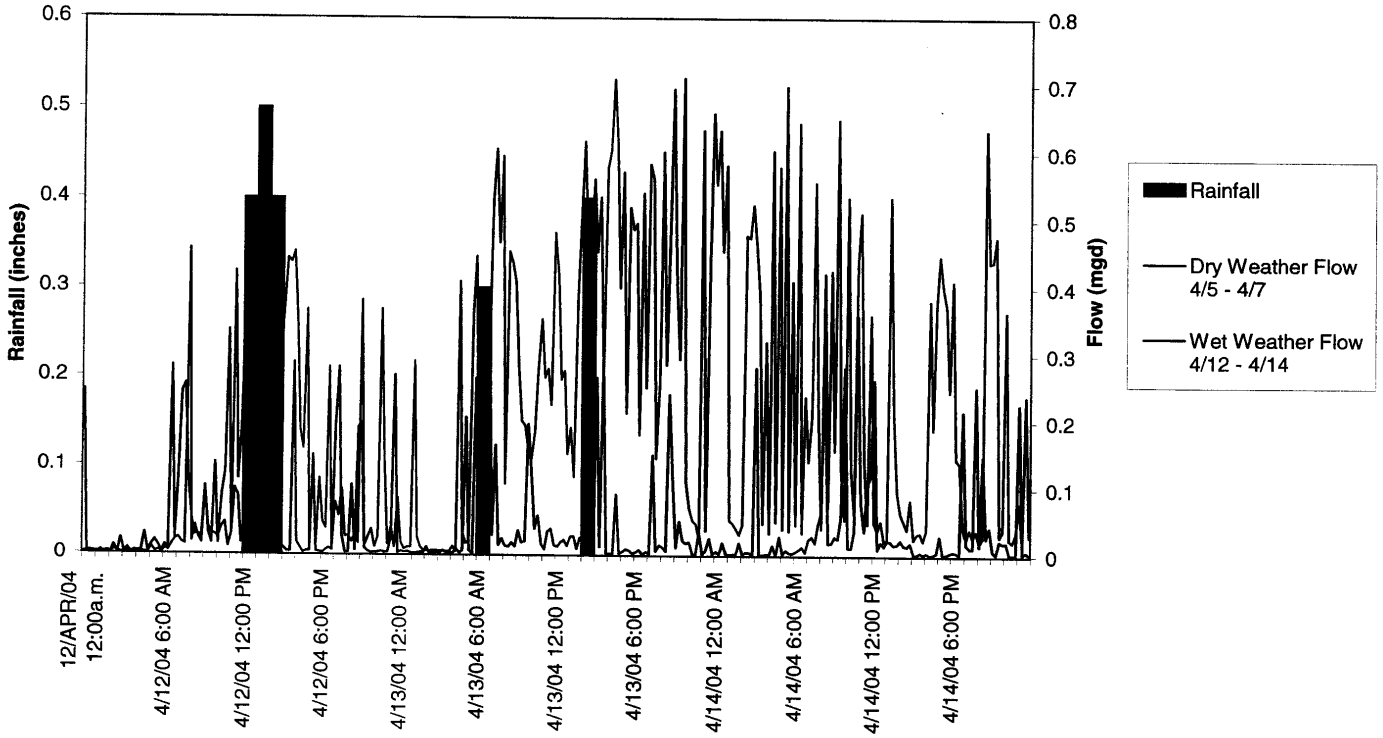


EXHIBIT B.2 - Brooksville

Small Rain Event - April 21 - 22 (0.95" in 2 days)

Flow

Site Name	Ranking (1 Best 4 Worst)	Peak Time	Peak I/I	Peaking Factor	I/I Gallons	Gallons per Foot of Pipe
Site A	3	4/21/04 3:45 PM	0.325	1.9	116,552	7.5
Site B	1	4/21/04 3:15 AM	0.460	1.9	2,667	0.7
Site C	2	4/22/04 12:30 PM	0.020	2.3	4,063	1.6
Site D	*	*	*	*	*	*
Site E	4	4/21/04 2:15 PM	0.216	1.6	87,448	10.3

EXHIBIT B.2.A
Site A) MH 3 From MH 4
Flow and Rainfall vs. Time
April 21 - 22

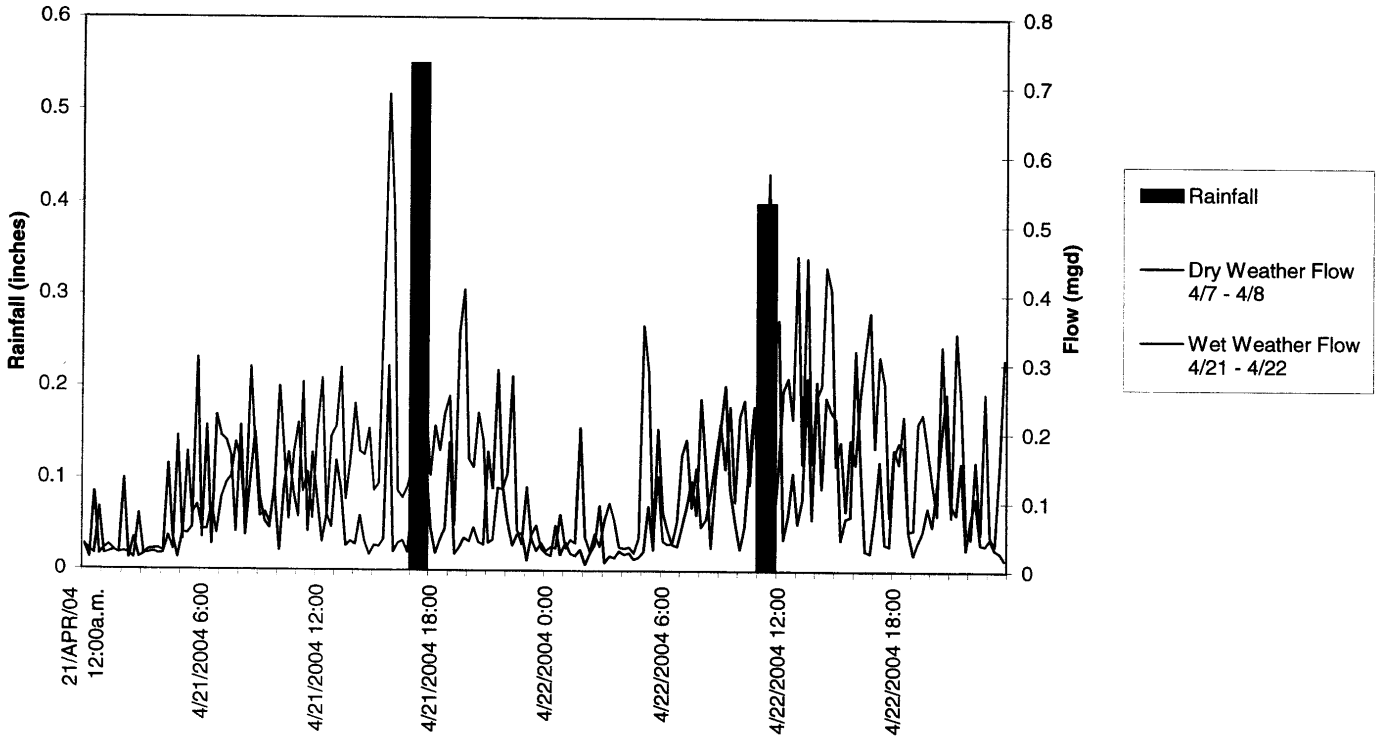


EXHIBIT B.2.B
Site B) MH 3 From South
Flow and Rainfall vs. Time
April 21 - 22

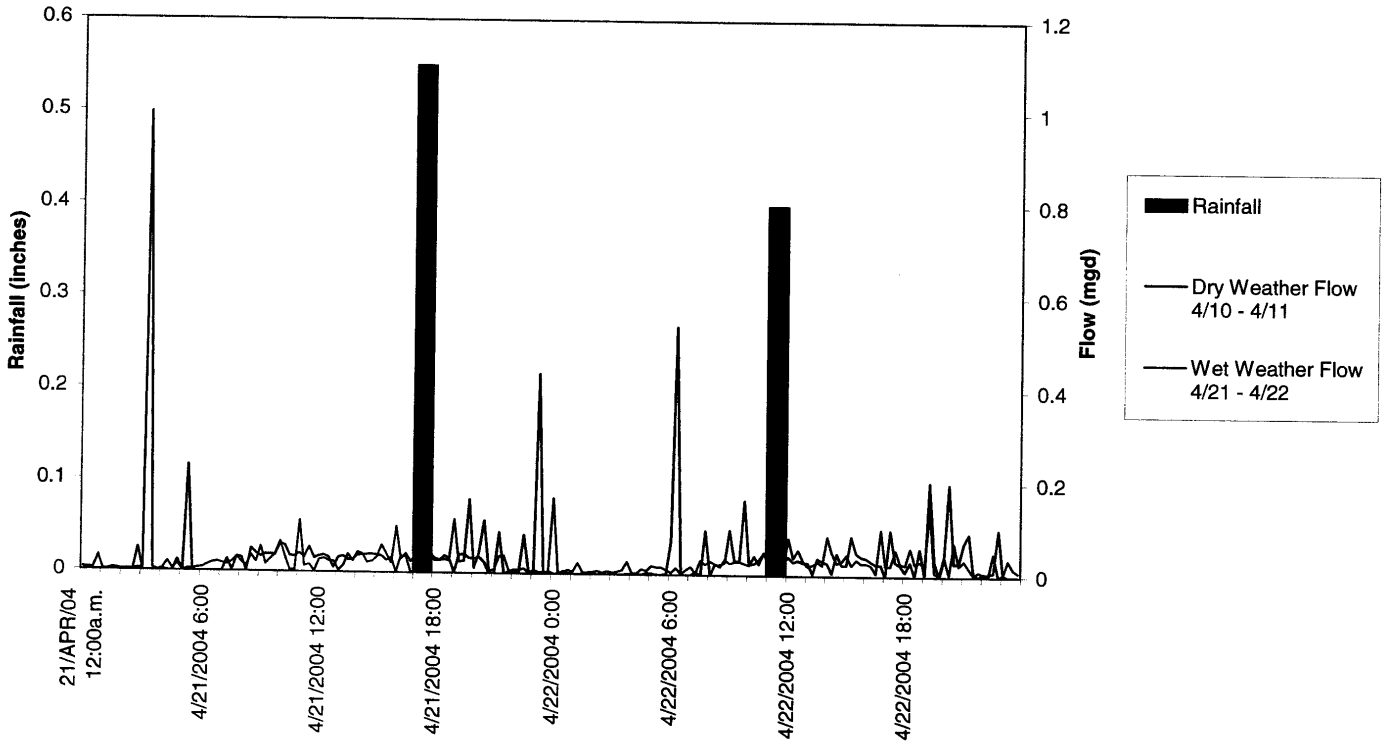


EXHIBIT B.2.C
Site C) MH 72
Flow and Rainfall vs. Time
April 21 - 22

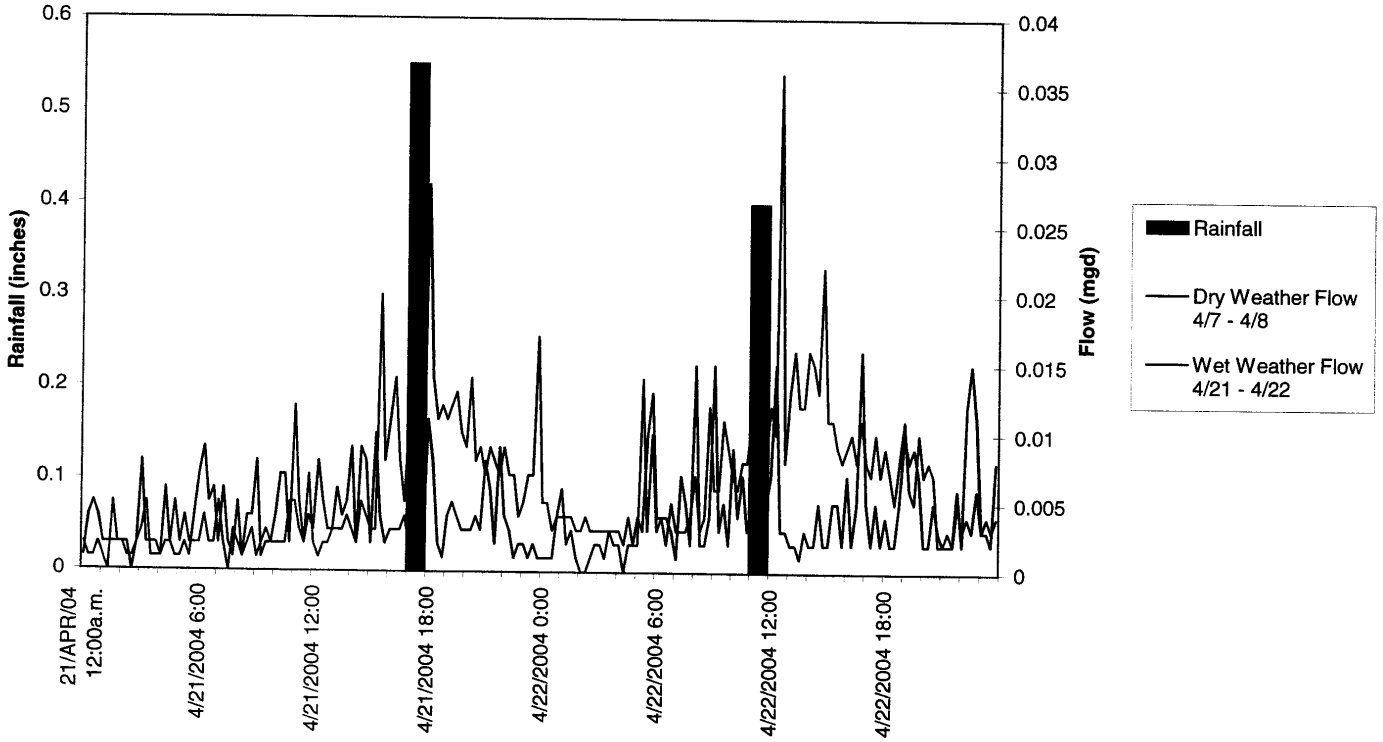


EXHIBIT B.2.E
Site E) MH 8 From MH 20
Flow and Rainfall vs. Time
April 21 - 22

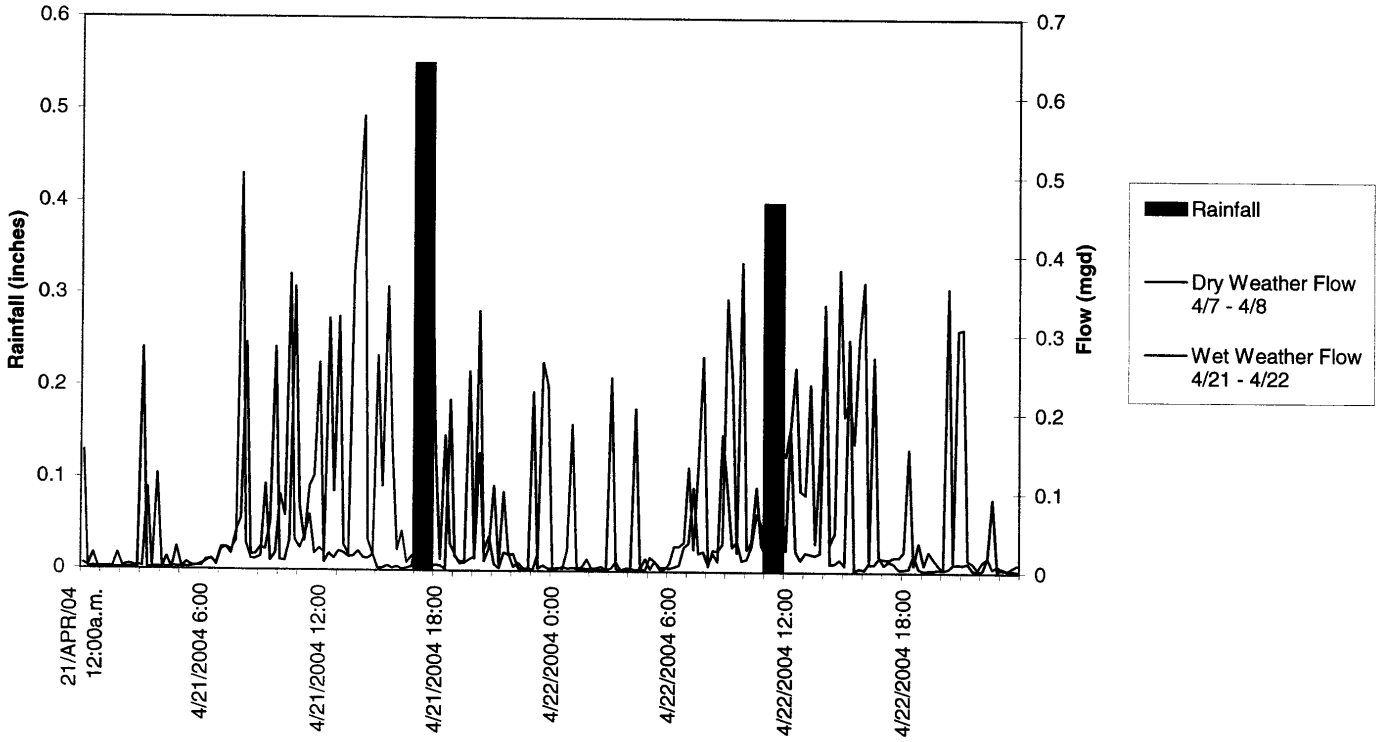


EXHIBIT B.3 - Brooksville

Large Rain Event - May 2 (1.75" in 1 day)

Flow

Site Name	Ranking (1 Best 4 Worst)	Peak Time	Peak I/I	Peaking Factor	I/I Gallons	Gallons per Foot of Pipe
Site A	3	5/2/04 8:30 AM	0.446	1.8	217,854	13.9
Site B	2	5/2/04 12:30 PM	0.073	1.3	54,177	13.8
Site C	1	5/2/04 11:15 AM	0.076	4.5	28,219	11.2
Site D	*	*	*	*	*	*
Site E	4	5/2/04 3:30 AM	0.117	1.3	170,625	20.2

EXHIBIT B.3.A - Brooksville
Site A) MH 3 From MH 4
Flow and Rainfall vs. Time
May 1 - 3

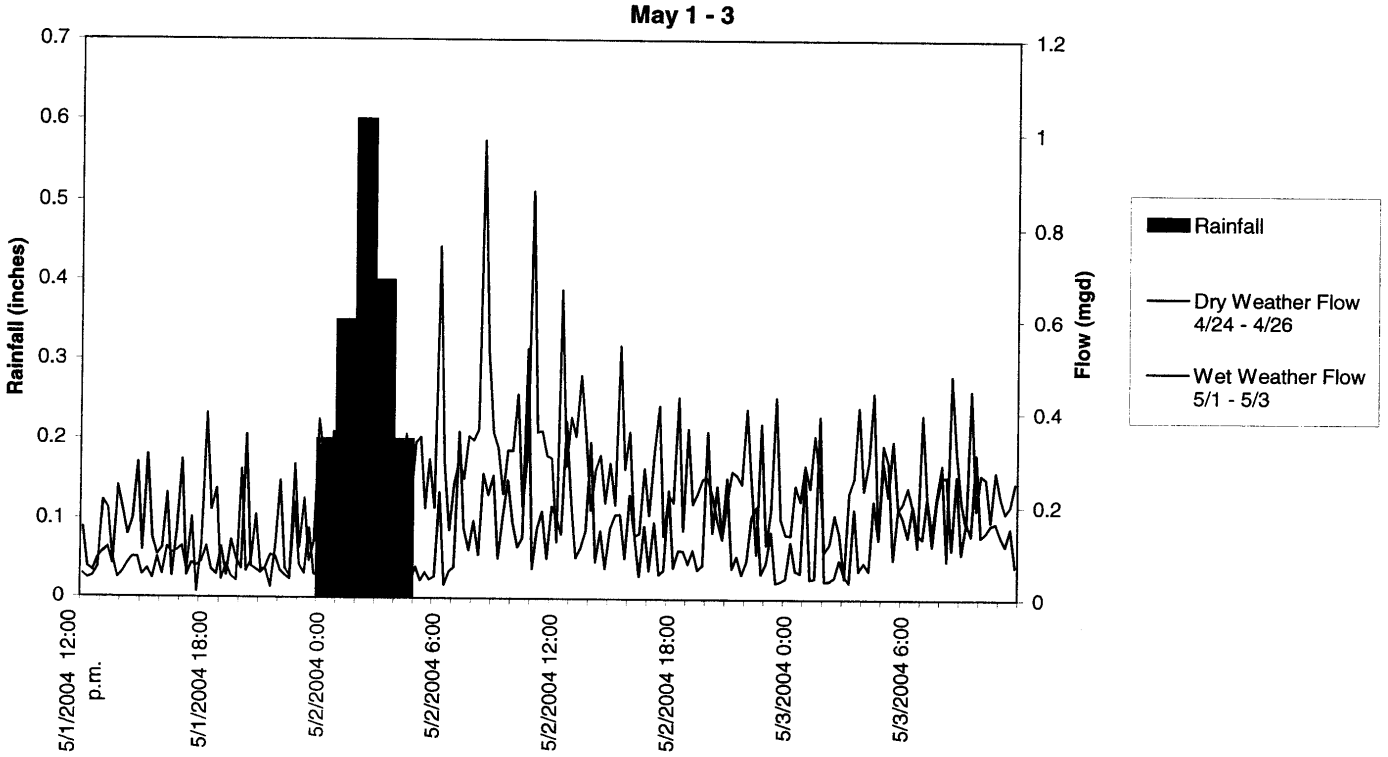


EXHIBIT B.3.B - Brooksville
Site B) MH 3 From South
Flow and Rainfall vs. Time
May 1 - 3

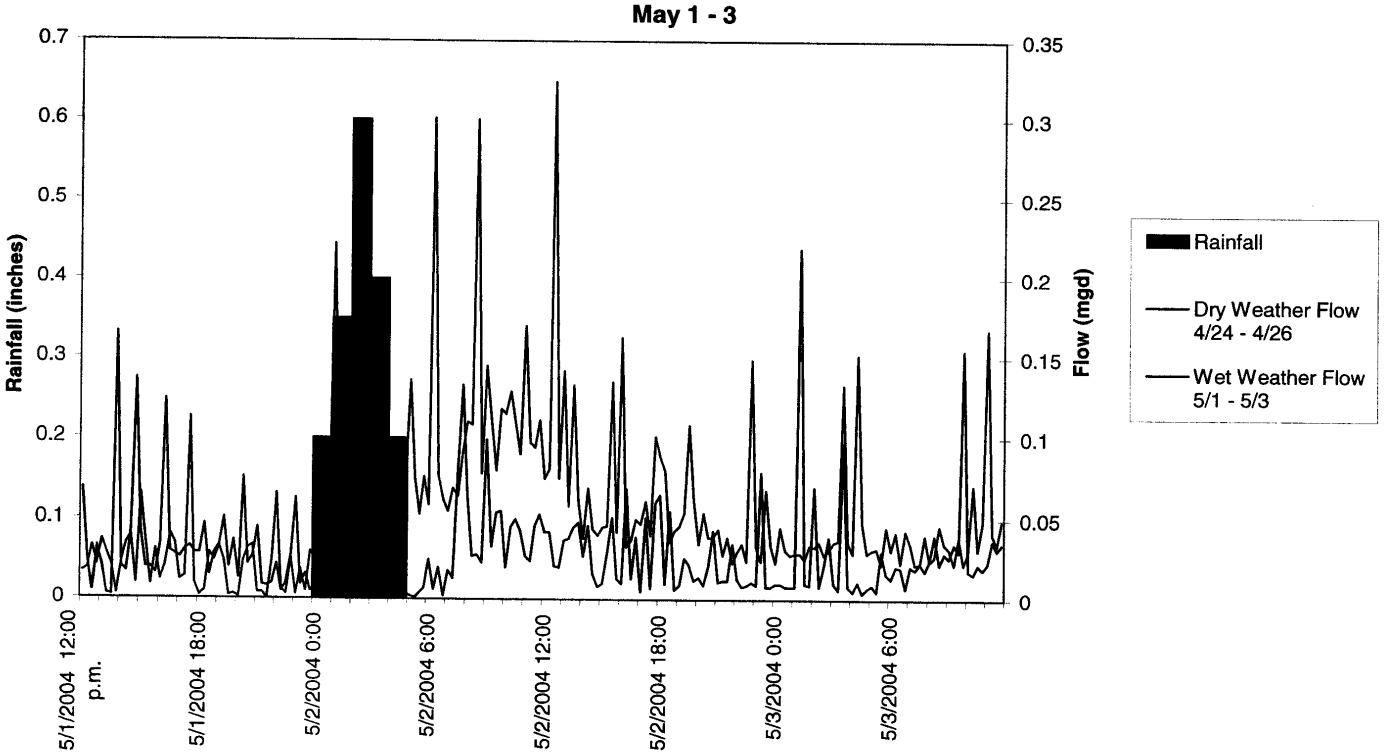


EXHIBIT B.3.C - Brooksville
Site C) MH 72
Flow and Rainfall vs. Time
May 1 - 3

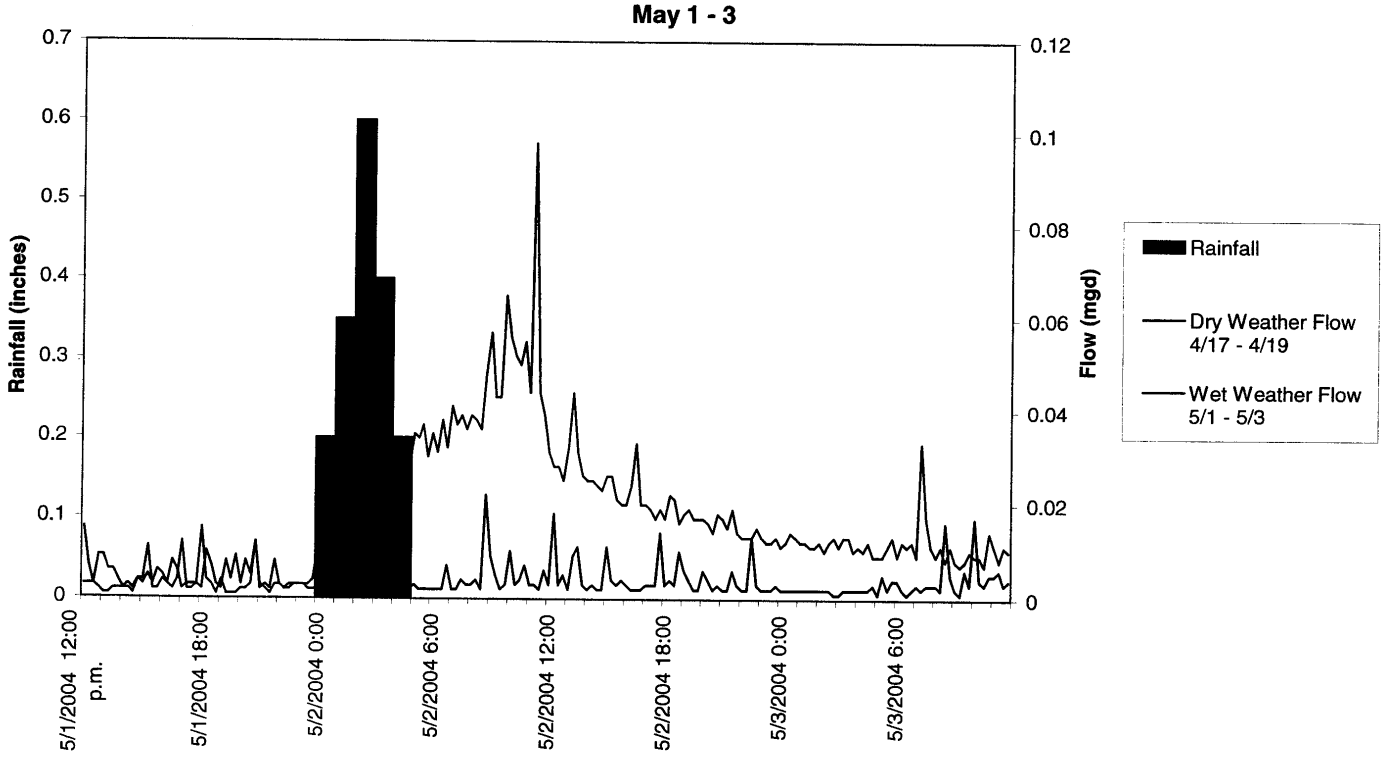
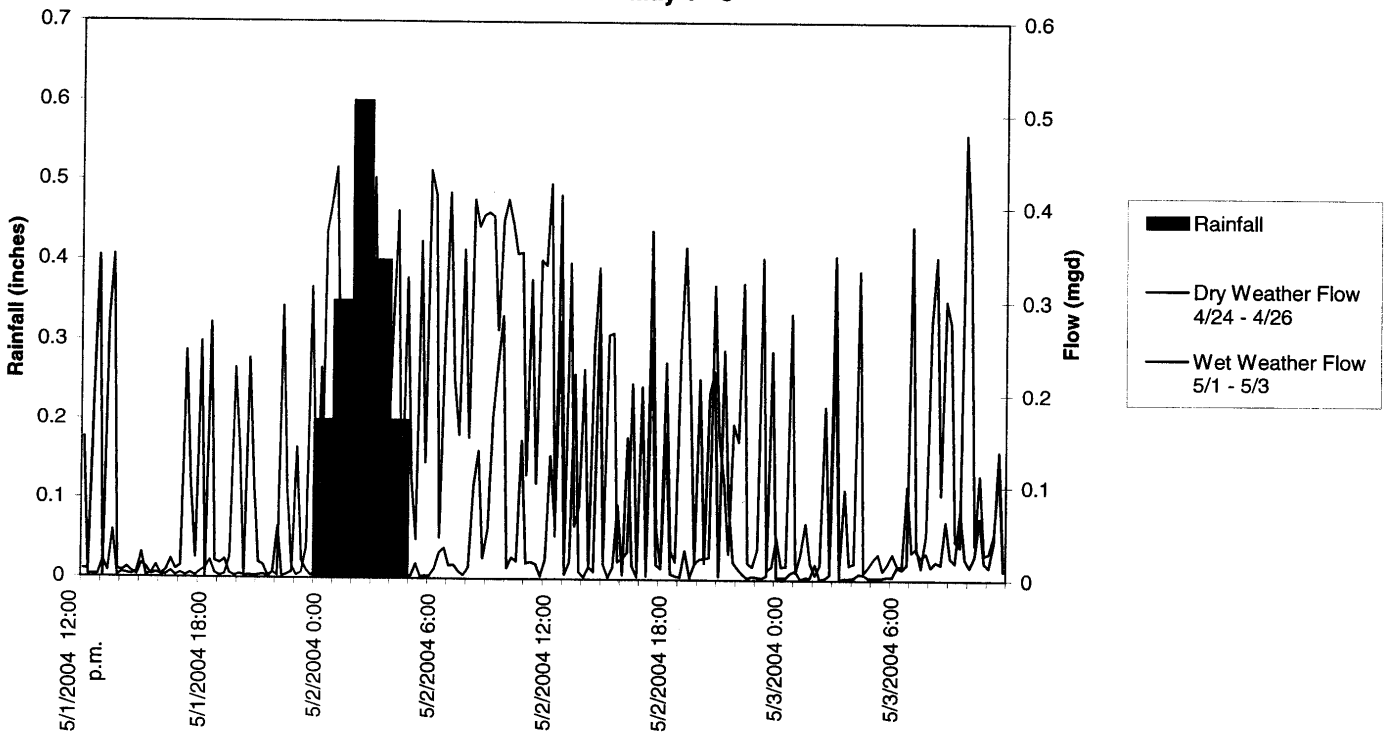


EXHIBIT B.3.E - Brooksville
Site E) MH 8 From MH 20
Flow and Rainfall vs. Time
May 1 - 3



APPENDIX B –
Smoke/Dye Testing Tabulation
Augusta, KY

SMOKE/DYE TESTING REPORT
AUGUSTA, KY

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
											2
1-2	Long Stretch Road	410	S		Surf						
1-2	Long Stretch Road	411	S		Surf						
1-2	Long Stretch Road	413 Garage Apt.	S		No DS						
1-2	Long Stretch Road	419	S		Surf						
1-2	Long Stretch Road	Yellow house west/plant	N		Surf						
1-2	Ferry Street	General John Payne Home	N		IG				DS pipes daylights to river bank		
1-2	Williams Street	108 ?	S		Surf				House address? Mid block 2nd-Riverside		
1-2	Williams Street	Gray house			Surf						
1-2	Riverside Drive	325	N		Surf						
1-2	Riverside Drive	321	N		Surf						
1-2	Riverside Drive	301	N		IG				dye testing found ds drain to surface		
1-2	Riverside Drive	211	S		Surf						
1-2	Riverside Drive	207	NV						Need downspout checked		
1-2	Second Street	312	NV		Surf				Smoke in house - bad interior plumbing?		
1-2	Second Street	306-2	N		No DS						
1-2	Second Street	306	N		No DS						
1-8	Williams Street	310	S		Surf						
1-8	Williams Street	312	S		IG				D.S. connected to sewer sounding	1575	1964
1-8	Third Street	210	N		Surf						0
1-8	Third Street	208 M-home			IG				D.S. outlet not found	480	598
1-8	Third Street	House on Shofstall Alley			Surf						0
1-8	Third Street	206			IG	X			Area drain Property owner said it daylights		0
1-8	Fourth Street (West)	315 Apartments			IG				sanitary to pump station - DS to drain to grade		0
1-8	Fourth Street (West)	412	N		Surf						0
1-8	Fourth Street (West)	318	NV		Surf						0
1-8	Fourth Street (West)	316	NV		Surf						0
1-8	Fourth Street (West)	314	S		IG				D.S. outlet not found	975	1216
1-8	Fourth Street (West)	312	S		Surf						0
1-8	Fourth Street (West)	310	NV		Surf						0
1-8	Fourth Street (West)	308	S		Surf						0
1-8	Fourth Street (West)	306	S		IG				DS outlet to rear		0
1-8	Fourth Street (West)	304	NV		IG				DS outlet to rear		0
1-8	Fourth Street (West)	302			No DS						0
1-8	Fourth Street (West)	305	S		Surf						0
1-8	Fourth Street (West)	201	S		S/IG				Rear downspout smoked	825	1029
1-8	Fourth Street (West)	203	S		S/IG				Rear downspout smoked	1125	1403
1-8	Fourth Street (West)	205	S		IG				DS outlet to curb		0

KEY
X - CONNECTED TO SANITARY SEWER
O - OKAY
S - SMOKE OBSERVED

N - NO VENT FOUND
IG - DOWNSPOUT INTO GROUND
SURF - DOWNSPOUT TO SURFACE

yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

SMOKE/DYE TESTING REPORT
AUGUSTA, KY

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
1-8	Fourth Street (West)	207	S		IG				DS outlet to curb		0
1-8	Fourth Street (West)	209	N		IG				D.S. outlet not found	600	748
1-8	Fourth Street (West)	211	N		IG				D.S. outlet not found	750	935
1-8	Fourth Street (West)	202	S		IG				C.O. rear of house smoked, DS drain to St,		0
1-8	Fourth Street (West)	204 ?	S		IG				DS drain to Street		0
1-8	Fourth Street (West)	206	S		IG/Surf				0		0
1-8	Fourth Street (West)	208	NV		IG/Surf				Rear east side D.S. outlet not found		0
1-8	Fourth Street (West)	210 ? Church	S		IG				0		0
1-8	Fourth Street (West)	212 ?	S		IG				D.S. outlet not found	900	1122
1-8	Fourth Street (West)	110 - same house			IG				D.S. outlet not found	481	600
1-8	Fourth Street (West)	108 - same house			IG				D.S. outlet not found	481	600
1-8	Fourth Street (West)	106			Surf						0
1-12	Fourth Street (East)	102	S						Verify 1 above-remaining unaccessible		
1-12	Fourth Street (East)	104	S		IG						0
1-12	Fourth Street (East)	106	S		IG						0
1-12	Fourth Street (East)	108	S		IG						0
1-12	Fourth Street (East)	108 Augusta Christian Church			IG						0
1-12	Fourth Street (East)	110			IG						0
1-12	Fourth Street (East)	112	S		S/IG				Rear D.S. smoke	900	1122
1-12	Fourth Street (East)	114	S		Surf						0
1-12	Fourth Street (East)	402 Elizabeth	S		Surf						0
1-12	Fourth Street (East)	202	N		IG/Surf				co smoke in rear - downspouts drain to curb		0
1-12	Fourth Street (East)	204	N		No DS						0
1-12	Fourth Street (East)	208 - same house	N	S	S/Surf				Smoke at rear DS and below slab	750	935
1-12	Fourth Street (East)	210 - same house			S/Surf				Smoke at rear DS	750	935
1-12	Fourth Street (East)	212	S		IG						0
1-12	Fourth Street (East)	216	N		IG						0
1-12	Fourth Street (East)	218	N		IG						0
1-12	Fourth Street (East)	220	N	S	IG				C.O. w/o top	100	125
1-12	Fourth Street (East)	Augusta Baptist Church	N	S	IG				Exposed lateral	2500	3117
1-12	Fourth Street (East)	302 - bed & breakfast	N		IG				DS outlet not found	1000	1247
1-12	Fourth Street (East)	304	N		Surf				DS to cistern		0
1-12	Fourth Street (East)	308	N		IG				DS below deck outlet not found	1050	1309
1-12	Fourth Street (East)	312	N		IG				DS to curb		0
1-12	Fourth Street (East)	314	N		IG				DS to curb		0
1-12	Fourth Street (East)	Trinity Methodist			IG				DS drain to surface		0
1-12	Fourth Street (East)	Bradford Funeral Home			IG/Surf				DS drain to surface and storm sewer		0
1-12	Fourth Street (East)	404			IG				DS clogged would not drain possible curb outlet		0

KEY
X - CONNECTED TO SANITARY SEWER
O - OKAY
S - SMOKE OBSERVED

N - NO VENT FOUND
IG - DOWNSPOUT INTO GROUND
SURF - DOWNSPOUT TO SURFACE

yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
1-12	Fourth Street (East)	406			Surf						0
1-12	Route 8	114			Surf						0
1-12	Route 8	116			Surf						0
1-12	Route 8	118	S		Surf						0
1-12	Route 8	122	NV		Surf/IG				front left DS outlet not found		0
1-12	Route 8	124			No DS						0
1-12	Route 8	126			No DS						0
1-12	Route 8	128			No DS			S	Catch basin in front of house smoked	5000	6233
1-12	Route 8	130	S		No DS						0
1-12	Route 8	200	S		No DS						0
1-12	Route 8	202			Surf						0
1-12	Route 8	204			Surf						0
1-12	Route 8	206			No DS						0
1-12	Route 8	208	S		Surf						0
1-12	Route 8	210	S		Surf						0
1-12	Route 8	212 ?	S		IG				DS outlet not found	1000	1247
1-12	Route 8	K's Bestway			IG				DS outlet not found	1875	2338
1-12	Route 8	207	S		Surf						0
1-12	Route 8	Chevron			IG				Open C.O. in parking lot	100	125
1-12	Route 8	Car Wash			Surf						0
1-12	Route 8	312			IG				DS drain to storm sewer		0
1-12	Route 8	SE Apartments			IG				DS drain to surface		0
1-12	Route 8	124			No DS						0
1-20	Route 8	Citgo	S	S	Surf				Open C.O. in parking lot	100	125
1-20	Route 8	210			Surf						0
1-20	Route 8	236	S		IG/Surf				DS drain to surface		0
									Subsystem 1 total (gallons) =		29069
Subsystem 2											
2-1	Second Street	202	N		Surf						
2-1	Second Street	CB west of 202						S	Smoke from CB (assume 50'x100' area)	5000	6233
2-1	Second Street	201	S		Surf						
2-1	Second Street	203	S		No DS						
2-1	Second Street	205	S	COS	No DS				Cleanout smoked open top	100	125
2-1	Second Street	Parkview Inn		C.O.S.	IG				DS to storm east side - west side unknown	100	125
2-1	Riverside Drive	201	NV		IG/Surf				DS In ground to street		
2-1	Riverside Drive	203	N		Surf						
2-1	Riverside Drive	205	S		IG				DS In ground to street		
2-1	Parkview (north of 2nd	107	NV		IG				DS In ground to street		
2-1	Parkview (north of 2nd	106 ? Church of Nazarene	S		surf						

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yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

SMOKE/DYE TESTING REPORT
AUGUSTA, KY

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
2-1	Parkview (north of 2nd	110 ?	S		No DS						
2-1	West Park Street	212	NV		Surf						
2-1	West Park Street	CB West Park & 2nd						S	Smoke from CB (assume 50'x100' area)	5000	6233
2-1	East Park Street	City Pool	S		IG/Surf				DS to storm mh		
2-1	East Park Street	207	N		Surf						
2-1	East Park Street	209			IG				DS outlet not found		
2-1	East Park Street	211			IG				DS outlet not found		
2-1	East Park Street	213			Surf						
2-1	Main Street	202 Bank	S		IG				DS outlet not found		
2-1	Main Street	204	S		IG				DS Clogged		
2-1	Main Street	206 Video Store	S		Surf						
2-1	Main Street	210	S		IG				DS Clogged		
2-1	Main Street	212			Surf						
2-1	Main Street	Antique			IG				DS drain to back		
2-1	Main Street	Pharmacy			IG				DS drain to back		
2-1	Main Street	Dr. Bldg.			IG				DS drain to back		
2-1	Main Street	228			IG				DS to curb		
2-1	Main Street	230			IG				DS to curb		
2-1	Main Street	238			IG				Condemed		
2-7	Third Street (West)	104		S	Surf				Smoke from under house	100	125
2-7	Third Street (West)	106	S		Surf						0
2-7	Third Street (West)	108	S		IG				DS drain to ditch		0
2-7	Third Street (West)	110			IG				DS drain to ditch		0
2-7	Parkview (South)	302			S/IG				Smoke in D.S., south side	900	1122
2-7	Parkview (South)	306	S		No DS						0
2-7	Parkview (South)	308	S		No DS						0
2-7	Parkview (South)	310			Surf						0
2-7	Parkview (South)	305	S		No DS						0
2-7	Parkview (South)	307	S		Surf						0
2-7	Parkview (South)	309			Surf						0
2-7	Parkview (South)	311			S/IG				Smoke rear D.S.	525	655
2-7	Parkview (South)	313 ?			S/IG				Smoke rear D.S.	400	499
2-7	Parkview (South)	304 Not Found									0
2-7	Fourth Street (West)	107	S		S/IG				Smoke 2 rear D.S.	975	1216
2-7	Fourth Street (West)	105			IG				San. & storm @ some connection	900	1122
2-7	Fourth Street (West)	Post Office	S		IG				DS to catch basin		0
2-7	Main Street (Southwes	302		S	Surf				Smoke along rear house lateral & under C.O.	100	125
2-7	Main Street (Southwes	304	N		Surf/IG				DS drain to ground		0

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Blue -clean water to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
2-7	Main Street (Southwes	306	S		Surf						0
2-7	Main Street (Southwes	308	S		IG/Surf				DS drain to cistern and curb		0
2-7	Main Street (Southwes	310	S		IG				DS drain to storm pipe to rear of house		0
2-7	Main Street (Southwes	312	S		IG				DS drain to storm pipe to rear of house		0
2-7	Main Street (Southwes	314	S		Surf						0
2-5	Main Street	Fire Dept/City Garage			IG				DS to storm sewer in alley		
2-5	Main Street	City Office			Surf						0
2-5	Main Street	Barber Shop			IG						0
2-5	Main Street	Riverside Tractor	S		Surf						0
2-5	Main Street	Law Office			No Gutr						0
2-5	Main Street	Diane's Doll House	N		Surf						0
2-5	Main Street	121	S		Surf						0
2-5	Main Street	123	S		Surf						0
2-5	Main Street	125 (Next to Anchor Inn)		S	Surf				Old - M-home site, smoke from lateral	100	125
2-5	Main Street	Anchor Inn			S				DS smoked in rear of building	1500	1870
2-5	Main Street	111	S		Surf						0
2-5	Main Street	113	S		Surf						0
2-5	Main Street	115	S		IG				DS drain to rear		0
2-5	Main Street	117	S		Surf						0
2-5	Main Street	109 - 1/2 Aug. General Store			Surf						0
2-5	Main Street	205			Surf						0
2-5	Main Street	Park's Place	S		IG				DS to curb		0
2-5	Main Street	Jeans & Such			Surf						0
2-5	Second Street	106 Abandoned			No DS						0
2-5	Second Street	108			Surf						0
2-5	Second Street	110			Surf						0
2-5	Second Street	112 ? Eliz. St. ?			IG/Surf						0
2-5	Second Street	Old warehouse			No DS						0
2-5	Elizabeth Street	VFW			IG				DS outlet unknown	3000	3740
2-5	Elizabeth Street	White Hall			IG				DS outlet unknown	3600	4488
2-5	Elizabeth Street	204			Surf						0
2-10	Riverside Drive	104	S		Surf						0
2-10	Riverside Drive	108	S	S	Surf				Open clean out at Water Street	100	125
2-10	Riverside Drive	110	S		Surf						0
2-10	Water Street	117	S		No DS						0
2-10	Water Street	117-1/2 (rear)	S		No DS						0
2-10	Riverside Drive	Welcome Center									0
2-10	Second Street	103		S	IG				Smoke in bldg. seeping under door	100	125

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Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
2-10	Second Street	107			Surf						0
2-10	Second Street	109	S		No DS						0
2-5	Elizabeth Street	108	S		No DS						0
2-5	Elizabeth Street	108-1/2	S		No DS						0
2-5	Elizabeth Street	110	S		Surf						0
2-10	Riverside Drive	101 Beehive Tavern	N		Surf						
2-10	Riverside Drive	103 & 103A	S		IG				DS In ground to cistern		0
2-10	Riverside Drive	105	S		IG				DS In ground to street		0
2-10	Riverside Drive	107	N		IG				DS In ground to street		0
2-10	Riverside Drive	113	S		IG				DS In ground to street		0
2-10	Riverside Drive	115	S		IG				DS In ground to street		0
2-10	Riverside Drive	117	S		IG				DS In ground to street		0
2-10	Riverside Drive	119	N		IG				DS In ground to street		0
2-10	Main Street	130 Studio - 7	S		IG				DS In ground to street		0
2-10	Main Street	120 Augusta Pub	S	S	IG				Open C.O.	100	125
2-10	Main Street	116	S		S				DS smoked	600	748
2-10	Main Street	112 Log cabin	S		Surf						0
2-13	Main Street	301	N		Surf						
2-13	Main Street	305	N		IG				DS to street		0
2-13	Main Street	309	N		IG				Owner said DS to surf could not find		0
2-13	Main Street	311	N		IG				DS to street		0
2-13	Main Street	Alltel	N		IG				DS to surface		0
2-13	Main Street	Library	N		IG				DS to street		0
2-13	Main Street	317			Surf						0
2-13	Elizabeth Street	302			Surf						0
2-13	Elizabeth Street	304			IG				DS to street		0
2-13	Elizabeth Street	306			IG				DS outlet not found		0
2-13	Elizabeth Street	308			IG				DS to storm sewer per owner		0
2-13	Elizabeth Street	310			IG				DS to cistern		0
2-13	Elizabeth Street	312			Surf						0
2-13	Elizabeth Street	314			IG				DS to flower bed per landscaper		0
2-13	Fourth Street (East)	101 Augusta Presb. Church			IG				DS on SW corner to storm others unknown	3000	3740
2-13	Fourth Street (East)	103			IG				DS outlet undetermined	2100	2618
2-13	Fourth Street (East)	105			Surf						0
2-13	Fourth Street (East)	107			IG				DS to curb per owner		0
										Subsystem 2 total (g	35281

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Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
3-5	Riverside Drive	202	N		Surf						
3-5	Riverside Drive	206	NV		IG				DS drain to street		0
3-5	Riverside Drive	210	S	S	Surf				Crawl space smoking from under house	100	125
3-5	Riverside Drive	212	NV	IG-NW corner					DS drain to street		0
3-5	Riverside Drive	216	NV		Surf						0
3-5	Riverside Drive	218	S		Surf/IG				DS drain to river bank		0
3-5	Riverside Drive	222 Riverside & Bracken	S		Surf						0
3-5	Riverside Drive	308	S	S					Smoke SW corner house	675	842
3-5	Second Street	201 Augusta Childcare	S		Surf						0
3-5	Second Street	205	NV		Surf						0
3-5	Second Street	207	S		Surf						0
3-5	Second Street	209	NV		S/IG				DS smoke NE corner house	800	997
3-5	Second Street	213	N		IG				DS outlet undetermined		0
3-5	Second Street	215	N		Surf						0
3-5	Second Street	223			Surf						0
3-5	Second Street	American Legion			IG			S	Abandoned bldg. - smoke in storm CB	5000	6233
3-5	Second Street	301	NV		Surf						0
3-5	Second Street	225 West of American Legion			IG				DS NE corner concreted in		0
3-5	Second Street	203			Surf						0
3-5	Bracken Street	104 ? Under construction									0
3-5	Bracken Street	106 ?			Surf						0
3-5	Bracken Street	108	S		Surf						0
3-5	Bracken Street	112	N		Surf						0
3-5	Bracken Street	Vacant Lots East Side		S					(4) vent stacks or C.O. w/o houses	10000	12467
3-5	Tannery Street	NE corner Tannery & Cherry	S		Surf						0
3-5	Tannery Street	SE corner Tannery & Cherry		S	Surf				C.O. smoked	100	125
3-5	Tannery Street	105			Surf						0
3-5	Frankfort Street	101	S	S	Surf				Broken C.O. 2 locations	200	249
3-5	Frankfort Street	101-1/2 - 1	S		Surf						0
3-5	Frankfort Street	101-1/2 - 2	S	S	Surf				2 open C.O.	200	249
3-5	Frankfort Street	Vacant lot park		S					3 open C.O.	300	374
3-5	Cherry Alley	407-1/2	S		Surf						0
3-5	Cherry Alley	SW corner MH	S		Surf						0
3-5	Cherry Alley	NW corner MH		S	Surf				Cracked C.O.	100	125
3-5	Cherry Alley	North side 3 MH	S		Surf						0
3-9	Second Street	214			Surf						
3-9	Second Street	216			S/D.S.				Downspout smoke	1050	1309
3-9	Second Street	218			Surf						0

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Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
3-9	Second Street	220	S		Surf						0
3-9	Tannery Street	207-1/2	S		Surf						0
3-9	Tannery Street	211		S	Surf				C.O. smoke	100	125
3-9	Third Street	203	S		Surf						0
3-9	Third Street	205	S		Surf						0
3-9	Third Street	205-1/2 A			Surf						0
3-9	Third Street	205-1/2 B	S		Surf						0
3-9	Third Street	203	S	S	Surf				C.O. smoking	100	125
3-9	Third Street	207	S		Surf						0
3-9	Third Street	211			Surf						0
3-9	Third Street	213			Surf						0
3-9	Third Street	215			Surf						0
3-9	Third Street	212	S	S	Surf				Smoke from basement plumbing problem	100	125
3-9	Third Street	214			S/IG				D.S. smoke	500	623
3-9	Third Street	216A	S		IG				DS outlet undetermined	375	468
3-9	Third Street	218	NV		Surf						0
3-9	Third Street	214-1/2 ? M-home	N		Surf						0
3-9	Third Street	216-1/2 ? M-home	N		Surf						0
3-9	Elizabeth Street	301			Surf						0
3-9	Elizabeth Street	303			Surf						0
3-9	Elizabeth Street	305			Surf				Funeral Home		0
3-9	Elizabeth Street	311			Surf						0
3-9	Elizabeth Street	313			Surf						0
3-9	Elizabeth Street	315			IG				DS to cistern under rear porch		0
3-9	Tannery Street	Garage behind	S		Surf						0
3-9	Tannery Street	St. Augustine	S		IG				DS drain to surface		0
3-9	Fourth Street	St. Augustine Church	N		IG				DS NW dye to mh 3-9	1600	1995
3-9	Fourth Street	St. Augustine School	N		S/IG				D.S. smoke rear of school	800	997
3-9	Fourth Street	St. Augusting Parish house	N		IG				DS drain to surface		0
3-9	Fourth Street	St. Augustine portable classrooms	S		Surf						0
3-12	Bracken	204	N		Surf						
3-12	Bracken	206	N		Surf						0
3-12	Bracken	210	S		S				Rear D.S.	1200	1496
3-12	Bracken	212	S		Surf						0
3-12	Bracken	214	NS		S						0
3-12	Bracken	305	S								0
3-12	Bracken	307			Surf/IG				DS to storm system around building		0
3-12	Bracken	311			Surf						0
3-12	Bracken	302	S		Surf						0

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Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
3-12	Bracken	304			Surf						0
3-12	Bracken	306			Surf						0
3-12	Bracken	308	S		Surf						0
3-12	Bracken	310	S		Surf						0
3-12	Bracken	312	S		IG				D.S. smoke	1200	1496
3-12	Bracken	301			Surf						0
3-12	Third Street	304	N		Surf						0
3-12	Third Street	306	N		Surf						0
3-12	Third Street	308	N		Surf						0
3-12	Third Street	310	N		Surf						0
3-12	Third Street	312	N		Surf						0
3-12	Fourth Street	219 NW Corner 4th & Bracken	S		IG				DS drain to storm pipe along Bracken		0
3-12	Fourth Street	301	NV		S/IG				D.S. smoke	1760	2194
3-12	Fourth Street	307	N		IG				DS drain to cistern on west side		0
3-12	Fourth Street	309	S	S	Surf				Broken C.O.	100	125
3-12	Frankfort Street	302	N		Surf						0
3-12	Frankfort Street	306	N		Surf						0
3-12	Frankfort Street	308	N		Surf						0
3-12	Frankfort Street	310	N		Surf						0
3-12	Frankfort Street	312	N		Surf						0
3-12	Frankfort Street	316	N		Surf						0
3-12	Frankfort Street	318			Surf						0
											0
3-4	Second Street	Augusta School	S		S	check			D.S. smoked - need to further test school	18000	22440
										Subsystem 3 total (g	55302

Subsystem 4

4-2	Second Street	404	N	S	Surf				Open C.O. side & rear	100	125
4-2	Second Street	406			Surf/IG				back inside corner (1/2 house)outlet unknown	375	468
4-2	Second Street	408	N		Surf						0
4-2	Second Street	410 M-home	N		Surf						0
4-2	Second Street	412	N		Surf						0
4-2	Second Street	414	N		Surf						0
4-2	Second Street	416	N	S	Surf				Open C.O. between 414 & 416	100	125
4-2	Second Street	420			Surf						0
4-2	Second Street	407			Surf						0
4-2	Second Street	409			Surf						0
4-2	Second Street	411			Surf						0
4-2	Second Street	413	S		Surf						0
4-2	Second Street	415 ?	S		Surf						0
4-2	Second Street	419			Surf						0
4-2	Second Street	421			Surf						0
4-2	Second Street	423			Surf						0
4-2	Second Street	425			Surf						0

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AUGUSTA, KY

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4-2	Second Street	Corner Second & Seminary			Surf						0
4-2	Frankfort Street	201	N		Surf						0
4-2	Frankfort Street	203			IG				Same building DS outlet to cistern		0
4-2	Frankfort Street	209	S		IG				Same building DS outlet to cistern		0
4-2	Frankfort Street	211			Surf						0
4-2	Frankfort Street	213	N		Surf						0
4-2	Frankfort Street	215	N		Surf						0
4-2	Sycamore	210		S	Surf				Smoke under M-home	100	125
4-4	Sycamore	M-home (behind 421 3rd)									
4-4	Sycamore	Seminary - 208	N		Surf						0
4-4	Third Street	403			Surf						0
4-4	Third Street	405			Surf						0
4-4	Third Street	411	N	S	Surf				Smoke from under house	100	125
4-4	Third Street	413	N		Surf						0
4-4	Third Street	415			Surf						0
4-4	Third Street	417			Surf						0
4-4	Third Street	419	N		Surf						0
4-4	Third Street	421	N		Surf	NS			5' x 10' area	50	62
4-4	Third Street	423	N		Surf						0
4-4	Third Street	425	N		Surf						0
4-4	Third Street	402 ?	S		Surf						0
4-4	Third Street			S					Near MH 4-7 west side toward 402 3rd St	100	125
4-4	Third Street	West Seminary near mh4-7						S	Smoke from CB	5000	6233
4-6	Frankfort	303	N		Surf				Under construction		
4-6	Frankfort	305	S		IG						0
4-6	Frankfort	307	N		Surf						0
4-6	Frankfort	309	S		IG						0
4-6	Frankfort	311			Surf						0
4-6	Frankfort	313	S		Surf						0
4-6	Frankfort	315			Surf						0
4-6	Sycamore Street	302	S		Surf						0
4-6	Sycamore Street	304			Surf						0
4-6	Sycamore Street	306		S	Surf				C.O. smoke south 308	100	125
4-6	Sycamore Street	310			Surf						0
4-6	Sycamore Street	312			Surf						0
4-6	Sycamore Street	314			Surf						0
4-6	Sycamore Street	316 ?			Surf						0

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Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
4-6	Sycamore Street	318 No M-home		S					2 C.O. smoking	200	249
4-6	Sycamore Street	309			Surf						0
4-6	Sycamore Street	311	S		Surf						0
4-6	Sycamore Street	313	S		Surf						0
4-6	Sycamore Street	317	S		Surf						0
4-6	Sycamore Street	319	S		Surf						0
4-6	Fourth Street	401			Surf						0
4-6	Fourth Street	403			S/IG				D.S. smoke, front surf	1200	1496
4-6	Fourth Street	405	S		Surf						0
4-6	Fourth Street	409	NV		Surf						0
4-6	Fourth Street	411	S		S/IG				Front to surf, D.S. smoke	1125	1403
4-6	Fourth Street	415			Surf						0
4-6	Fourth Street	404			IG				Looks to outlet to curb pipe clogged		0
4-6	Fourth Street	406			IG				Looks to outlet to curb pipe clogged		0
4-6	Fourth Street	410			Surf						0
4-6	Fourth Street	412			Surf						0
4-6	Fourth Street	414			IG				DS outlet to curb		0
4-9	Seminary Street	314	S		Surf						
4-9	Seminary Street	316 Garage			Surf						0
4-9	Seminary Street	320			Surf						0
4-9	Seminary Street	307 ?	N		Surf						0
4-9	Seminary Street	309	S		Surf						0
4-9	Seminary Street	311			IG/Surf				DS in front to curb		0
4-9	Seminary Street	313	S		Surf						0
4-9	Seminary Street	321 ?			Surf/IG				DS piped to front yard		0
4-9	Seminary Street	301	N		Surf						0
4-9	Seminary Street	303	S		IG				Drain to curb		0
4-9	Seminary Street	305			IG				Drain to curb		0
4-9	Seminary Street	304	S		Surf/IG			S	Front of 304 DS outlet to CB and daylight	5000	6233
4-9	Seminary Street	306	S		S/IG				DS smoke	750	935
4-9	Seminary Street	308			IG				DS drain to cistern in rear curb in front		0
4-9	Seminary Street	312	S		Surf						0
4-9	Third Street	City Building						S	Smoke from CB on Seminary	5000	6233
4-9	Third Street	500	S		Surf						0
4-9	Third Street	502A	S		Surf						0
4-9	Third Street	502B	S		Surf						0
4-9	Third Street	504			Surf						0
4-9	Third Street	508	N		Surf						0

KEY
X - CONNECTED TO SANITARY SEWER
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N - NO VENT FOUND
IG - DOWNSPOUT INTO GROUND
SURF - DOWNSPOUT TO SURFACE

yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
4-9	Third Street	420	S		Surf						0
4-9	Third Street	416 Someplace Else	S		S/IG/Surf				D.S.	1800	2244
4-10	Fourth Street	506	S		Surf						
4-10	Fourth Street	508	N		IG				DS front to cistern back unknown	400	499
4-10	Fourth Street	Bulk Transit	S		IG				DS daylight to yard		0
4-10	Fourth Street	505	NV		Surf						0
4-10	Fourth Street	507	S		IG				DS daylight to yard		0
4-10	Fourth Street	509	S		Surf						0
4-10	Fourth Street	419			Surf						0
4-10	Fourth Street	421			Surf						0
4-10	Fourth Street	423			Surf/IG				DS daylight to back of house		0
4-10	Fourth Street	425			Surf						0
4-10	Fourth Street	416			Surf/IG				DS drain to curb		0
4-10	Fourth Street	418			IG/Surf				DS drain to curb		0
4-10	Fourth Street	420?			IG/Surf				DS drain to curb		0
4-10	Fourth Street	422? Bank of Germantown			Surf						0
4-10	Fourth Street	426	S	S	Surf				C.O. smoke west side	100	125
4-10	Fourth Street	504	S		IG				DS daylight to back of house		0
										Subsytem 4 total g	26928
Subsystem 5											
5-2	Second Street	Golden Rule Lumber			IG				DS to CB in street		0
5-2	Second Street	502 Apartments	S		Surf						0
5-2	Second Street	504	S		Surf						0
5-2	Second Street	506	S		Surf						0
5-2	Second Street	508	S		No DS						0
5-2	Second Street	510	S		No DS						0
5-2	Second Street	514			IG				DS piped to rear to alley		0
5-2	Second Street	Garage behind	S		Surf						0
5-2	Second Street	516	S	S	IG				C.O. smoked	100	125
5-2	Second Street	515	S		Surf						0
5-2	Second Street	517 #1-5	S		Surf						0
5-2	Second Street	521			S/IG				DS Smoked front of house	1200	1496
5-2	Second Street	518	S		Surf						0
5-2	Second Street	522			Surf						0
5-2	Second Street	524		S	Surf				C.O. smoke	100	125
5-2	Second Street	526	S		Surf			S	CB in front of house smoked	5000	6233
5-2	Second Street	523	S		Surf						0
5-2	Second Street	525			Surf				Under construction		0

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yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

SMOKE/DYE TESTING REPORT
AUGUSTA, KY

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
5-2	Second Street	531	NV		Surf				Elevated C.O. w/smoke in front		0
5-2	Second Street	Park Restroom	S		Surf						0
5-2	Second Street	528			Surf/IG				DS in rear drain to cistern		0
5-2	Second Street	530			Surf						0
5-2	Second Street	532			Surf						0
5-2	Second Street	534			Surf/IG				DS daylight to surface		0
5-2	Second Street	536?			Surf						0
5-2	Second Street	536*			Surf						0
5-2	Second Street	FA Neider Co.			IG				DS drain to storm sewer per maintenance supervisor		0
5-4	Second Street	609	S		Surf						0
5-4	Second Street	611	S		Surf						
5-4	Second Street	613	N		Surf						0
5-4	Second Street	617	N		Surf						0
5-4	Second Street	606?	S		Surf						0
5-4	Second Street	608	N		Surf						0
5-4	Second Street	621	N		Surf						0
5-4	Second Street	623	N		Surf						0
5-4	Second Street	625	N		Surf						0
5-4	Second Street	627	N		Surf						0
5-4	Hamilton	202 P538 2nd St.	N		Surf						0
5-4	Hamilton	204	N		Surf						0
5-4	Hamilton	206	N		Surf						0
5-4	Hamilton	210	N		No DS						0
5-4	Hamilton	212	N		Surf				Smoke in house at washer		0
5-4	Hamilton	205 #1 M-home	N		Surf						0
5-4	Hamilton	205 #2	N		Surf						0
5-4	Hamilton	205 #3	N		Surf						0
5-4	Hamilton	205 #4	S	S	Surf					100	125
5-4	Hamilton	205 #6	S		Surf						0
5-4	Hamilton	205 #7	S		Surf						0
5-4	Hamilton	205 #8	S		Surf						0
5-4	Hamilton	205 #9	NV		Surf						0
5-4	Hamilton	215	S		Surf						0
5-4	Hamilton	Corners café	S		Surf						0
											0
5-9	Second Street	630	S		Surf						0
5-9	Second Street	640	N		Surf						0
5-9	Second Street	628	S		Surf						0

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yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

SMOKE/DYE TESTING REPORT
AUGUSTA, KY

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
5-9	Second Street	626	S		Surf						0
5-9	Second Street	624	S		Surf						0
5-9	Second Street	622	S		Surf						0
5-9	Pleasant Street	201	S		Surf						0
5-9	Pleasant Street	203			No DS						0
5-9	Pleasant Street	206 or 622 2nd Street	S		Surf						0
5-9	Pleasant Street	208	S		No DS						0
5-12	Hamilton	301 Store	S		Surf						
5-12	Hamilton	303			Surf						0
5-12	Hamilton	305			Surf						0
5-12	Hamilton	305-1/2			Surf						0
5-12	Hamilton	307 Augusta Floor Tile	S		No DS	Dye			2 area drains daylight to front yard		0
5-12	Third Street	510	NV		Surf	X			Area drain outlet unknown	100	125
5-12	Third Street	512	S		Surf						0
5-12	Third Street	514			Surf						0
5-12	Third Street	513 - group of MH rear Corners			Surf						0
5-12	Chapel Street	514	NV	S	Surf				Smoke hole w/concrete cap	100	125
5-12	Chapel Street	516	NV		Surf						0
5-12	Chapel Street	518	NV		Surf						0
5-12	Chapel Street	503			Surf						0
5-12	Chapel Street	505	S		IG				DS piped to alley & front		0
5-12	Chapel Street	507			Surf						0
5-12	Chapel Street	509	N		Surf				NW Surf/Plugged pipe NE		0
5-12	Chapel Street	511	N		S/IG				DS smoke back west	750	935
5-12	Chapel Street	515	N		IG						0
5-12	Chapel Street	519	N		Surf						0
5-12	Chapel Street	517			Surf	N			Area drain to Chapel		0
5-12	Chapel Street	504	NV		Surf						0
5-12	Chapel Street	506	S		Surf						0
5-12	Chapel Street	508			Surf						0
5-12	Chapel Street	510			Surf						0
											0
5-15	Hamilton	313	S		IG			S	C.B. across st. smoking	5000	6233
5-15	Hamilton	315	S		IG				DS daylight to surface in yard		0
5-15	Hamilton	317	S		S/IG				D.S. smoke	525	655
5-15	Hamilton	319	NV		Surf						0
5-15	Hamilton	321	NV		Surf/IG				DS daylight to surface in yard		0
5-15	Clopay	3rd - Chapel									0

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yelow - undetermined clean water discharge

Blue -clean water to sanitary sewer

SMOKE/DYE TESTING REPORT
AUGUSTA, KY

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Drainage Area (sf)	Inflow (gal) Rain (")
5-15	Clopay	4th - Chapel									0
5-15	Clopay	4th - Minerva									0
5-17	St Rte 435	6581	S		Surf						
5-17	St Rte 435	6551?	S		Surf						
5-17	St Rte 435	6523	S	S	Surf				Smoke above lateral near rear building	100	125
5-17	St Rte 435	6459	S								
5-17	St Rte 435	6439	S		Surf						
5-17	St Rte 435	6522	S		IG					1350	1683
5-17	ST Rte 2370	Curtis Store	S		Surf/IG					900	1122
5-17	ST Rte 2370	5168	S		IG					700	873
5-17	ST Rte 2370	Behind 5168							Crack in pipe needs repair		
5-17	ST Rte 2370	5104			Surf						
5-26	Apartment Rd	46	S		Surf						
5-26	Apartment Rd	52	S		Surf						
5-26	Apartment Rd	51	S		Surf						
5-26	Apartment Rd	100 & 200 Apartment	S		Surf						
5-26	Apartment Rd	300, 400 & 500 Apartment	S		Surf						
5-26	Apartment Rd	Trailor Park private (not tested)									
									Subsystem 5 total (gallons) =		19978

Summary

Subsystem 1 total (gallons) =	29,069
Subsystem 2 total (gallons) =	35,281
Subsystem 3 total (gallons) =	55,302
Subsystem 4 total (gallons) =	26,928
Subsystem 5 total (gallons) =	19,978
Total all Subsystems (gallons) =	166,558

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APPENDIX B
Smoke/Dye TestingTabulation
Brooksville, KY

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	inflow gal rain(") 2
To pump station No. 2 Powel Street											
53	Woodward	106	N		surf						
53	Woodward	108	N		surf						
53	Woodward	103	S		surf				Bathroom floor drain smoked check plumbing trap		
53	Woodward	Fire Dept./City Bldg.	S		ig						
53	Woodward	105	N		surf						
53	Woodward	107	N		surf/ig	X			DS drains to cistern Area drain undetermined	50	62
53	Woodward	111	N		surf						
53	Woodward	114	S		surf/ig				SE rear corner DS drain to daylight per owner		
53	Woodward	116	N		surf						
53	Woodward	115	N		surf						
53	Woodward	120	S		surf						
53	Woodward	124	S		surf						
53	Woodward	119	N		surf						
53	Woodward	121	N		surf						
53	Woodward	128	S		surf						
53	Woodward	132 KY Farm Bureau+	N		surf						
53	Woodward & Fr	Woodward & Frankfort-corner st	S		surf						
53	Frankfort	207	S		surf						
53	Frankfort	mobile home	N		surf						
53	Frankfort	209	N		surf						
53	Frankfort	213	N		surf						
53	Frankfort	215	N		surf						
53	Frankfort	217	S		surf						
53	Locust	101A garage in rear	N/A		ig	N			Per Eddie DS drain to storm sewer		
53	Locust	101A- hair headquarters			surf						
53	Locust	A.J.'s Furniture & Appliance	S		surf						
53	Locust	105 1st National Bank	S		surf						
53	Locust	Dean's Pharmacy			surf				Dye test rear ds to sanitary	3750	4675
53	Locust	Country Loft			surf				Dye test rear ds to sanitary	1250	1558
53	Locust	Carbo's Café			ig				Dye test rear ds to sanitary	3000	3740
53	Locust	115 True Value	S		surf				Dye test rear ds to sanitary	3000	3740
53	Locust	Video Store			ig				Dye test rear ds to sanitary	3000	3740
53	Locust	Frankfort House	2 S		ig						
	Madsion	104	S		ig				DS drain to large cisterns on property		
35	Frankfort	212 1st Stop Gas	N		surf/ig				Canopy surf / bldg ig - undetermined outlet w/ dye test		
35	Frankfort	The Bracken County News	S		no ds						
35	Frankfort	USDA	S		no ds						
35	Frankfort	221	N		ig				DS drain to daylight in rear		
35	Frankfort	223	N		ig				DS drain to daylight in rear		
35	Frankfort	225	N		surf/ig				DS drain to daylight in rear		
35	Frankfort	231	N		ig				DS drain to daylight in rear		
35	Frankfort	224 Gary McCord Dentist	S		surf						
35	Frankfort	224 Tanning Salon	S		surf						
35	Frankfort	224 Bracken Eye Care	N		surf						
35	Frankfort	237	N		surf						
35	Frankfort	230	N		surf						

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SURF - DOWNSPOUT DRAIN TO SURFACE

YELLOW - Undertermined clean water connection
BLUE - Clean water connection to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	inflow gal
35	Frankfort	240	N		surf						
35	Frankfort	251	S		surf						
35	Frankfort	244	S		surf/ig				Hole in ground next to vent stack smoking	400	499
56	Locust	216	S		surf						
35	Cooper	104	S		surf						
35	Cooper	106	S		surf						
35	Cooper	107	NV		surf						
35	Cooper	105	N		surf						
35	Willow	201	S		surf						
35	Willow	209	S		surf						
35	Willow	210	NV		surf						
35	Willow	206	NV		surf						
35	Willow	202	S		surf						
35	Willow	111	N		ig				DS drain to daylight in rear		
35	Willow	109	N		ig	N			Area drain & DS drain to daylight in rear		
40	Frankfort	350	S		ig				DS drain to daylight in rear		
40	Frankfort	346	S		ig				DS drain to daylight in front		
40	Frankfort	338	S	S	surf/ig				Lateral smoke in grass DS drain to street	400	499
40	Frankfort	332			surf/ig				DS drain to storm in front		
40	Frankfort	328			surf						
40	Frankfort	326			surf						
40	Frankfort	right of 326	S		surf						
40	Frankfort	320	S		surf						
40	Frankfort	314			S / ig				Rear DS Smoke	1520	1895
40	Frankfort	325	S		surf/ig				DS outlet undetermined Need further investigation		
40	Frankfort	Feed Store	N		surf						
40	Frankfort	308	S		ig				DS outlet undetermined Need further investigation		
40A	Frankfort	401	S		surf/ig				Ds drain to daylight		
40A	Frankfort	405	S		ig	N			Ds outlet undetermined by dye testing - need further inve	2651	3305
40A	Frankfort	411	S		ig				Ds drain to daylight in rear		
40A	Frankfort	415	2-S		surf/ig	N			Ds drain to daylight in rear		
40A	Frankfort	417	S		surf						
40A	Frankfort	423	N		surf						
40A	Frankfort	Health Dept.	N		surf						
41	Frankfort	410	S		surf						
41	Frankfort	406	N		ig				DS drain to daylight in rear		
41	Frankfort	402	N		surf						
	Galloway Dr.	147	S	S	ig				previous test smoke @ phone trench and sewer main	400	499
	Galloway Dr.	139	S	S	ig				previous test smoke @ phone trench and sewer main	400	499
	Galloway Dr.	135	S		surf						
	Galloway Dr.	131	S		ig						
	Galloway Dr.	127	S		ig						
	Galloway Dr.	119	S		surf						
	Galloway Dr.	111	S		ig						
	Galloway Dr.	118	S		ig						
	Galloway Dr.	124	S		ig						
	Galloway Dr.	132	S		ig				T.D.@garage doors and area dr. in rear		

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SURF - DOWNSPOUT DRAIN TO SURFACE

YELLOW - Undertermined clean water connection
BLUE - Clean water connection to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	inflow gal
	Galloway Dr.	136	S		ig						
	Galloway Dr.	140	S		ig/surf				Rear vent not smoking		
	Galloway Dr.	144	S		ig						
	Galloway Dr.	161	S	S	no d.s.				Smoke in grass by B-B goal post	400	499
32	Madison	Bank of Gremantown	S		ig				Dye test inconclusive - need further investigation	4140	5161
32	Madison	Bldg. North of post office	S		ig				Dye test inconclusive - need further investigation	1295	1614
32	Madison	Post Office	S		surf						
32	Locust	Alltel	S		surf						
32	Locust	Doctor's office			surf						
32	Miami	Courthouse			surf/ig				Needs further investigation on roof drain discharge	7900	9849
	Jefferson	MH 31							Low mh frame	100	125
29	Jefferson	133	N								
29	Jefferson	125	S		surf						
29	Jefferson	120	N		none						
28	Powell St.	110	S	S	surf				Open Lateral	100	125
28	Powell St.	left of 110	N		no d.s.						
28	Powell St.	118	N		no d.s.						
28	Powell St.	116	S		surf/ig				DS daylight to surf in rear		
28	Powell St.	Old school			surf/ig				Needs further investigation on roof drain discharge	19840	24734
	Powell St.	Old Pool	S		surf				Dsiconnect lateral from sewer possible infiltration point		
		MH 27							needs to be sealed at bottom of frame	100	125
										Subsystem B1 Total	66941

To pump station No. 3

16	Miami	301	NV		surf						
16	Miami	303	S		ig				DS to cistern & daylight to Elizabeth		
16	Miami	305	S	S	surf				Open CO	100	125
16	Miami	307	S		surf						
16	Miami	311	S		ig				DS drain to daylight		
16	Miami	313	N		surf						
16	Miami	317	S		surf						
16	Miami	327	S		surf						
16	Miami	331	N		ig				Clogged DS need to verify outlet		
16	Miami	335	S	S					CO open	100	125
16	Miami	339	S		surf						
16	Miami	341	N		surf						
16	Miami	343	N		surf						
16	Miami	353	S		surf						
16	Miami	high school									
16	Miami	346	N		surf						
16	Miami	342	S		ig				DS daylight to rear & cistern		
16	Miami	340	NV		surf						
16	Miami	334 - County Garage	N		surf						
16	Miami	330	N		surf						
16	Miami	326	S		surf	S			Area drain to basement smoke	100	125
16	Miami	322	S		ig				DS daylight to rear		
16	Miami	320	N		surf						
16	Miami	316	S		surf				pump station overflow in back yard		

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YELLOW - Undertermined clean water connection
BLUE - Clean water connection to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	inflow gal
16	Miami	314	N	S	Surf				Open lateral in back of house	100	125
16	Miami	Library	S		ig				DS daylight to rear per asbuilt drawings		
16	Miami	304 - mobile home	N		surf						
16	Miami	302	S		ig				DS outlet not found during dye testing		
16	Gibson	104 - mobile home	N		surf				on grinder pump		
16	Gibson	1112 - mobile home	N		surf				on grinder pump		
16	Gibson	106 - mobile home	N		surf						
To MH 9											
20	Elizabeth	Snappy Tomato Pizza	S		surf						
20	Elizabeth	102	N		surf						
20	Elizabeth	106	N		surf						
11	Elizabeth	115	NV		ig						
11	Elizabeth	113	S		ig						
11	Elizabeth	111	S		ig						
11	Elizabeth	102	N		surf						
11	Elizabeth	106	S		surf						
11	Elizabeth	108	NV		surf						
11	Elizabeth	110	NV		surf						
11	Elizabeth	112	NV		surf				Smoke in yard X3	400	499
11	Corliss	105	S		surf						
11	Corliss	101	S		surf/ig				DS daylight to rear		
11	Elizabeth	203	N		surf						
11	Elizabeth	207			surf				Smoke in chimney - possilbe poor plumbing vent system		
11	Elizabeth	209	S		surf						
11	Elizabeth	210	S		ig	(X3)			Sump pump ig - determine outlet location		
11	Elizabeth	214	S		ig				To cistern		
11	Elizabeth	216 mobile home	S		surf						
94	Corliss	110	S		S				DS smoking	1200	1496
94	Corliss	114	S		surf						
94	Corliss	111	NV		surf						
94	Corliss	116	S		none				Service co smoke	100	125
94	Corliss	113	N		ig				DS daylight in rear		
94	Corliss	117			surf				open cleanout	100	125
94	Corliss	122	S		surf						
94	Corliss	118	N		surf						
94	Corliss	124	N		surf						
94	Corliss	121	S		surf						
94	Corliss	125	S		surf						
										Subsystem B2 total =	2743
To MH 7	All above plus										
20	Miami St.	208	S		surf/ig	X			Apears that area drain and rear DS are connected to san	1800	2244
20	Miami St.	Bracken Co family resource	N		sur/ig				DS daylight to rear		
20	Miami St.	Church of Christ			ig				DS daylight to ditch in rear		
20	Miami St.	144	N		surf/ig				ig Ds daylight to street		

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YELLOW - Undertermined clean water connection
BLUE - Clean water connection to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	inflow gal
20	Miami St.	140	S		surf/ig				ig DS daylight to front		
20	Miami St.	136 (church)	S		S / surf				4 d.s. smoke	4560	5685
20	Miami St.	Powell St. Brook. Head store	2-S		surf						
7	Persimmon	104	N		n/a						
7	Persimmon	109	S		surf				vent in chimney		
7	Persimmon	100	2-S		surf						
7	Miami St.	139	2-S		surf						
7	Miami St.	Between 139 & 143	S		surf						
7	Miami St.	147	NV		surf						
7	Miami St.	149	S		ig				DS daylight to surface in rear		
7	Miami St.	Garage right of old gas	NV		surf						
7	Miami St.	Old gas station	NV		surf						
7	Miami St.	101	S		n/a						
7	Miami St.	143	S		ig				DS outlets to surface		
to MH5	All above plus										
83	Miami St.	135	S		surf						
83	Miami St.	133	NV		surf						
83	Miami St.	131	NV		surf				open/Day light clay pipe in rear		
83	Miami St.	Carolyn B. Morgan Insurance	S		surf						
83	Miami St.	Mark A. Schumacher Attorney	S		surf						
83	Miami St.	Edward Rudd Attorney	NV		surf						
83	Miami St.	Old warehouse	NV		n/a						
83	Miami St.	123	N			X			F.D.@basement entrance-no exit found	100	125
83	Miami St.	137	NV	S	n/a				open service pipe	100	125
7	Augusta	203									
7	Augusta	209	NV		surf/ig				Front d.s. in ground full of water		
7	Augusta	213	NV		surf						
7	Augusta	217	N		surf						
7	Augusta	225	S	S	surf				Hole in ground at rear of house keeps getting larger	400	499
		MH 6							12" above grade bad seal @ frame and MH lid		
		Brooksville Court Apartments	S		surf						
		manhole between apt.& Augusta							Top of casting not sealed smoke from lifting holes		
	Persimmon	MH 86							sewer clogged & leaking upstream of mh possible infiltration source		
88	Lincoln St.	120	NV		surf				Outlets to surface		
88	Lincoln St.	118	NV		surf						
88	Lincoln St.	116	NV		ig				DS pit filled with rock		
88	Lincoln St.	114	NV		surf						
88	Lincoln St.	112	NV		ig						
88	Lincoln St.	110	NV		S				Abandoned	700	873
88	Lincoln St.	108	S		surf						
88	Lincoln St.	106	NV		ig				DS daylights to surface		
88	Miami St.	123	N		surf	X			Area dr.@ basement dye test inconclusive	100	125
88	Miami St.	119	S	see note	surf				open c/o with smoke	100	125

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YELLOW - Undertermined clean water connection
BLUE - Clean water connection to sanitary sewer

Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	inflow gal
88	Miami St.	117	NV		surf						
88	Miami St.	Nancy's	S		surf						
88	Miami St.	Carota's Pizza	NV		surf						
88	Miami St.	109C	N		surf						
88	Miami St.	109	NV		surf						
88	Miami St.	Utility and Police	NV		surf						
88	Miami St.	105	NV		surf						
88	Miami St.	103	S		surf						
88	Miami St.	101	N		S	S				936	1167
										Subsystem B3 total =	10966

To MH 3 All above plus

49	Lincoln	111	NV		ig				DS daylight to surf		
49	Lincoln	109	NV		surf						
49	Lincoln	105	S		surf						
49	Lincoln	Hargette's Deli./Empress Chili	N	S	ig				New lateral piping leaking Not covered	100	125
49	Lincoln	Right of Hargette's Deli	NV	S	surf				Smoke @end wall along lateral	100	125
49	Lincoln	car wash	NV		surf	S	T.D.		smoke in inside trench drain		
49	Lincoln	Laundrymat	2-S		surf						
49	Lincoln	car wash storage	S		surf						
	Lincoln	MH 50							smoke around base needs to be sealed		
60	Wallin St.	114	S		surf						
60	Wallin St.	120	S		surf/ig	X			AD & DS on southside undetermined by dye testing	800	997
60	Wallin St.	119			ig				DS daylight to rear		
60	Wallin St.	115	S		ig				DS daylight to rear		
60	Wallin St.	113	S		surf						
60	Wallin St.	111	N		surf						
60	Wallin St.	109	S		surf						
61	Wallin St.	105									
61	Wallin St.	104	S		Surf				DS daylight to rear		
61	Wallin St.	108	N	S	ig				DS daylight to rear		
61	Wallin St.	110	N		surf						
61	Miami	Bestway	N		surf/ig				DS in rear need investigation septic area in rear	2000	2493
61	Miami	First National Bank	S		ig				DS to storm sewer		
61	Garrett Ave.	Citco	S		surf						
61	Garrett Ave.	Abandoned Citco (above)	S		N						
61	Garrett Ave.	202	N		surf						
61	Garrett Ave.	206	NV		ig				DS daylight to rear		
61	Garrett Ave.	Right of church	S		surf				CO open	100	125
61	Garrett Ave.	St. James Church	NV		ig	XX			DS south side daylight to rear	2800	3491
61	Garrett Ave.	122	NV		S	S				1310	1633
61	Garrett Ave.	Bracken Co. Day Care Center	NV		surf	X			Dye test did not reveal outlet	2000	2493
61	Garrett Ave.	209	N		surf						
61	Garrett Ave.	108	N		surf						
61	Garrett Ave.	104	S		surf						
61	Garrett Ave.	202	N		surf						
61	Church	135	N		ig				DS daylight to north		
61	Church	131	N	S	surf				smoke along foundation wall	100	125

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Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	inflow gal
61	Church	127	N		ig				DS daylight to surface		
61	Church	140	S		surf/ig				DS daylight to surface		
67	Garrett Ave.	354	N		surf						
67	Garrett Ave.	350	S		surf						
67	Garrett Ave.	346	NV		surf						
67	Garrett Ave.	349	N		surf						
67	Garrett Ave.	351	S		surf						
67	Garrett Ave.	359	N		surf				lateral tied in at P.S.		
67	Garrett Ave.	P.S.# 4							Overflow smoke		
67	Garrett Ave.	342	NV		surf						
67	Garrett Ave.	338	S		surf						
67	Garrett Ave.	332	S	S					Stand pipe smoke		
67	Garrett Ave.	326	NV		ig				DS to cistern per owner		
67	Garrett Ave.	322	N	S	surf				Smoke at foundation wall	100	125
67	Garrett Ave.	318	S		surf						
67	Garrett Ave.	314	NV		surf						
67	Garrett Ave.	310	N		surf						
67	Garrett Ave.	left of 238	NV		surf	X			Area Drain to basement	50	62
67	Garrett Ave.	303	S		ig				DS outlet not found	2025	2525
67	Garrett Ave.	311	NV		surf						
67	Garrett Ave.	315	S		surf						
67	Garrett Ave.	323	S		ig				DS pipe clogged outlet not found	1600	1995
67	Garrett Ave.	331	NV		ig				DS to cistern		
67	Garrett Ave.	Left apartment	2-S		ig				DS daylight to front		
67	Garrett Ave.	Right apartment	2-S		ig				DS daylight to front		
67	Garrett Ave.	238	NV		ig				DS outlet not found	900	1122
67	Garrett Ave.	234	NV		ig				DS to surf per owner		
67	Garrett Ave.	228	S		surf						
67	Garrett Ave.	220	N		surf						
67	Garrett Ave.	216	S		surf						
67	Garrett Ave.	212	2-S		ig				DS outlet not found	1050	1309
67	Garrett Ave.	229	S		surf						
67	Garrett Ave.	235	S		surf						
									Subsystem B4 total =		18744

To MH 1 All the above plus

77	Miami	240 ?	S		surf						
77	Miami	238	S		surf/ig				DS daylights to rear		
77	Miami	234	S		surf	X			possible at basement door DS daylights to rear	50	62
77	Miami	230	2-N		surf						
77	Miami	Right of 230	S		surf				Abandoned 1		
77	Miami	2nd house west of 230	S		ig	X			Abandoned 2 - Area drain for basement DS concreted	50	62
77	Miami	3rd house west of 230	N	S	n/a				Abandoned 3 - lateral smoking in front	100	125
77	Miami	260	S		surf						
77	Miami	270	S		surf						
77	Grandview	101	S		n/a						
77	Grandview	318	S		n/a						

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Smoker at MH#	Street	Address / Description	HOUSE VENT	HOUSE LATERAL	DOWN SPOUT	AREA DRAIN	DRIVE DRAIN	STORM SEWER	REMARKS	Area sf	inflow gal
77	Grandview	107	NV	S	n/a				Smoke in stand pipe		
77	Grandview	103	S		n/a						
77	Grandview	Grandview Senior Citizens	S		surf						
77	Grandview	White Block Bldg.	3-S		surf						
77	Grandview	137	N	S	surf				open c.o.	100	125
77	Grandview	129	S		surf						
77	Grandview	127	S		surf						
77	Grandview	125	S		surf						
77	Grandview	123	NV		surf						
77	Grandview	121	NV		surf						
77	Grandview	119	NV	S	surf				open c.o.	100	125
77	Grandview	117	S		surf						
77	Grandview	115	S		surf						
77	Grandview	113	NV		surf						
77											
77	Miami	302	S		surf						
77	Miami	310	S		surf						
77	Miami	314	S		surf						
77	Miami	313	N		ig				ig front corner outlets to surface		
77	Miami	317							Not connected		
77	Miami	330	S		surf						
77	Miami	326	S		surf				Manhole in front has loose frame and cover	400	499
77	Miami	320	N		n/a						

Subsystem B5 total = 997

Subsystem B1 total =	66941
Subsystem B2 total =	2743
Subsystem B3 total =	10966
Subsystem B4 total =	18744
Subsystem B5 total =	997
System Total =	100390

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BLUE - Clean water connection to sanitary sewer

APPENDIX C

PUBLIC HEARING

NOTICE OF PUBLIC HEARING

(PURSUANT TO 401KAR5:006 SECTION 4 & 5; KRS-424, and 40CFR 25.5 & 6)

The City of Augusta, City of Brooksville, and Bracken County Fiscal Court have drafted a 20-year Regional Facilities Plan (RFP) containing waste water requirements for collection and treatment and its cost, within the planning area, as described therein, to be served. Interested citizens may obtain further information including copies of the draft RFP by contacting or calling between the hours of 8 a.m. and 4 p.m. on Monday to Friday:

Gretchen Usleaman
City of Augusta
219 Main Street
P.O. Box 85
Augusta, KY 41002-0085
(606) 756-2183

Sandra Reynolds
City of Brooksville
101 Frankfort Road
P.O. Box 216
Brooksville, KY 41004
(606) 735-2501

Planning area includes the north portion of Bracken County from Brooksville to the Ohio River (area north of Route 10), with most activity in Augusta and Brooksville and along State Route 19 between Augusta and Brooksville.

A public hearing will be held on Thursday, September 22, at 5:30 p.m. at the Watson Community Building/Brooksville City Building, 101 Frankfort Road, Brooksville, Kentucky 41004 and at 7:30 p.m. at the City Building, 565 Main Street, Augusta, Kentucky 41002. The purpose of the hearing is to discuss the draft plan and its contents, specifically the alternatives, project cost, financing sources, user charges and hook up/tap on fee. This project may affect sewer rates. The public is encouraged to attend this meeting and shall have a right to comment on the plan for a period of 30 days from the date of publication of this notice by writing to the above address or before the termination of the hearing whichever is later. A longer comment period may be requested in writing. All persons who believe any condition of the draft plan is inappropriate, inaccurate, incomplete, or otherwise not in the best interest of the public and environment must raise all reasonable issues and submit all reasonable arguments, facts, and comments with supporting documents to the above given contact person.

Advertised in the Bracken County News: September 8, 2005, September 15, 2005 and September 22, 2005

- CIP (Capital Improvement) Plan
- Rate structure
- FACT sheet

III. Summary of Points System Used to Establish Project Priority Ranking

The following table summarizes the numerical ranking system for prioritizing potential CWSRF projects: (***If you agree with earlier corrections to 3, update the table)***

#	Priority Ranking Criteria	Possible Points
1	Is the project necessary to achieve full or partial compliance with a court order, or a judicial or administrative consent decree?	~~100~~ points
2	Does the project promote compliance with the CWA and KRS Chapter 224?	40 points plus 10 for each additional priority
3	Will the project make reasonable progress towards eliminating identified pollutant sources of water quality impairments of waterbodies on the 305(b) report or 303(d) list?	20 points for each pollutant-waterbody combination
4	Will the project make reasonable progress towards eliminating identified pollutant sources of water quality impairments within an identified Priority Watershed?	20 points
5	Will the project correct a public health or water quality problem as documented by applicant, for waterbodies that have not been monitored and assessed?	10 points
6	Does the project eliminate existing or potential sources of pollution in sensitive groundwater areas?	10 points for high or highest sensitivity 5 points for moderate sensitivity
7	Is the project located within an identified SWAPP zone or WHPA?	10 for each Zone 1 7 for each Zone 2 3 for each Zone 3
8	Will the project address a contaminant source that is causing or may cause a drinking water supply to use higher-than-conventional treatment?	5-15 points for each contaminant source
9	Will the project have a positive effect on Special Use Waters?	5 points

IV. Developing and Updating the Integrated Project Priority List

In order for a project to be considered for funding from the CWSRF, it must appear on the Integrated Project Priority List. To be included in this list, an eligible project applicant must complete a *KY CWSRF Project Questionnaire Form*. A copy of the questionnaire may be found on DOW's website. www.water.ky.gov/publicassistance/funding/CWSRF/

A project applicant must submit a completed *KY CWSRF Project Questionnaire Form* to DOW no later than September 8, 2006. Once the questionnaire is received, DOW staff will evaluate the project based on the ranking system discussed above and assign the project a numeric score. The project will then be added to the Integrated Project Priority List. DOW will publish and maintain the Integrated Project Priority List on its website. Those projects with the same numerical score will be ranked based on the date the

Wastewater Collection and Treatment System
201 Facilities Plan Update
Public Hearing Brooksville, KY
5:30 pm - September 22, 2005

Name	Representing	Telephone
Don Bezold	Burgess & Niple	(513) 579-0042
Doug Podgett	Buffalo Trace ADD	606 564-6894
Tim Boyd	City of Brooksville	606-735-2028
TOM CORNICK	CITY OF BROOKSVILLE	606-735-3259
KENNY CARL	CITY OF BROOKSVILLE	606-735-2044
JOHN CORLIS	CITY OF BROOKSVILLE	606-735-2205

Wastewater Collection and Treatment System
201 Facilities Plan Update
Public Hearing Brooksville, KY
5:30 pm - September 22, 2005

Meeting Minutes

Don Bezold – Burgess & Niple, Inc. – Summarized the Plan as shown on the attached public hearing outline and exhibits.

Councilman Tom Cortner questioned the individual plant versus regional plant concept. But felt a regional plant being able to serve more of the County area and reduction of duplication in operating expenses with one versus two or more plants would be beneficial to the public.

Mayor Corlis – City of Brooksville – Commented that he felt the regional alternative is the best solution since both Augusta and Brooksville could share in the cost as well as providing service to public outside the Cities along the route of the force main. New costumers would also help to reduce the cost.

Don Bezold suggested that sewer rate increase should be reviewed to aid in payment of sewer collection system improvements to find and correct inflow and infiltration I&I problems in the systems. Work could then begin while the Cities are investigating funding sources for the plan recommendations. See table 10-4 for breakdown of rate increase for collection system improvements. Reducing the I&I will decrease cost of transportation and treatment. Transportation cost will be significant since all the Brooksville flow will need to be pumped to Augusta.

Councilman Tom Cortner asked if the existing plant could be used for anything with the regional solution.

Don Bezold responded that depending on its condition it could be used as a holding tank or flow equalization basin to cut down the size of the pumps required to pump to a regional plant.

Wastewater Collection and Treatment System
201 Facilities Plan Update
Public Hearing Augusta, KY
7:30 pm - September 22, 2005

Name	Representing	Telephone
Don Bezold	Burgess & Niple	(513)579-0042
Doug Podgett	BTADD	606-564-6894
Joe Goecke	City Council	606-756-2249
Dawn Smithers	City of Augusta	606-756-3426
Cynthia C. Thompson	City of Augusta	606-756-2663
[illegible]	City of Augusta	606-756-3183

Wastewater Collection and Treatment System
201 Facilities Plan Update
Public Hearing Augusta, KY
7:30 pm - September 22, 2005

Public Meeting Minutes

Don Bezold – Burgess & Niple, Inc. – Summarized the Plan as shown on the attached public hearing outline and exhibits.

Mayor Laycock commented that he was hoping the regional plant near Wellsburg would have been cost effective since it would set the plant outfall farther from the City limits and location of future water intake for the Augusta Water Treatment Plant which presently is using ground water as a source for water. Wellsburg would provide the 1 mile buffer requirement required by Division of Water.

Don Bezold suggested that sewer rate increase should be reviewed to aid in payment of sewer collection system improvements to find and correct inflow and infiltration I&I problems in the systems. Work could then begin while the Cities are investigating funding sources for the plan recommendations. See Table 10-4 for breakdown of rate increase for collection system improvements. Reducing the I&I will decrease cost of transportation and treatment. Transportation cost will be significant since all the Brooksville flow will need to be pumped to Augusta.

Wastewater Collection and Treatment System
201 Facilities Plan Update
Public Hearing Outline

1. Welcome

2. Introduction

   A. Purpose
      a. Required by Division of Water as a routine planning tool
      b. Existing WWTP plants are reaching the end of useful life
         Brooksville – 35 years old
         Augusta – 25 years old

   B. Scope of Work
      a. Description of existing conditions.
      b. Tabulate existing wastewater loads.
      c. Project future population.
      d. Investigate regional solution versus independent wastewater collection and treatment.
      e. Compare alternative type treatment systems for best regional solution.
      f. Describe recommended project.
      g. Estimate financial needs and Implimentation of recommended project.

3. Planning Area
   A. Northern Portion of Bracken County (drainage area to Ohio River and area north of Route 10.
   B. Topography – Most of the planning area is very hilly with ridge tops and steep valleys. Makes it difficult for collection of wastewater without pumping.

4. Existing Facilities
   A. Augusta
      a. WWTP – 330,000 gpd design 148,000 gpd existing
      b. 27,130 ft of 10" & 8" sewer
      c. 6 pump stations
      d. Problems with system
         i. Only one aeration tank and one final clarifier
         ii. Plant has reached it useful life
      e. I&I – 6 times dry weather flow
         i. Average day -123 gpd per capita vs div water 120 gpdpc
         ii. Peak day - 745 gpdpc vs DOW 245 gpdpc
         iii. SSES Study found approx 20-25% of I&I in the system.
         iv. More investigation work is necessary

B. Brooksville WWTP
    a. WWTP – 125,000 gpd design 68,000 gpd existing
    b. 20,060 ft of 10" & 8" sewer
    c. 8 pump stations (public and private)
    d. Problems with system
        i. Only one aeration tank and one final clarifier
        ii. Plant is over it useful life
    e. I&I – 5.8 times dry weather flow
        i. Average day -115 gpd per capita vs DOW 120 gpdpc
        ii. Peak day - 579 gpdpc vs DOW 245 gpdpc
        iii. SSES Study found approx 30% of I&I in the system
        iv. More investigation work is necessary

C. Industrial Park Package Plant
    a. WWTP – 10,000 gpd No existing flow

D. Augusta Health Care Center
    a. WWTP – 8000 gpd

E. Multiple other plants (10 residential units) through county with capacity of 500 gpd.

F. On-site systems make up remainder of County – septic tank with leach fields
    a. Mostly working properly
    b. Requires minimum of 1 acre lot with permeable soils

5. Population Projections

A. Historic trends show Bracken County increasing in population and both Augusta and Brooksville decreasing.

B. Study projections - Bracken County and Brooksville used projected population increase of 3% during a 5 year period. Augusta population remained constant due to land locked status. See Table 5-4.

C. Flow Projections based on population projections for each area to be served by the alternatives.
    a. Individual Plants – Augusta – 330,000 gpd & Brooksville – 200,000 gpd
    b. Regional WWTP @ Augusta – 690,000 gpd – Table 5-5
    c. Regional WWTP @ Wellsburg – 595,000 gpd – Table 5-6

6. Alternative Comparisons

A. Construction Cost
B. Operation and Maintenance Cost
C. Equipment Replacement Cost

D. Salvage Value
E. Present Worth Analysis

7. Regional Wastewater Analysis

A. No Action

B. Augusta and Brooksville Individual WWTP

C. Regional WWTP near Augusta with Pump Station in Brooksville and force main along Rte 19.

D. Regional WWTP near Wellsburg with Pump Stations in Augusta and Brooksville and force mains along Rte 1159 and Rte 8.

8. Wastewater Treatment Plant Alternatives

A. Single Stage Activated Sludge with Biological Nitrogen Removal

B. Poured in Place Activated Sludge Plant Equipped with Package Equipment

C. Oxidation Ditch

10. Recommended Plan

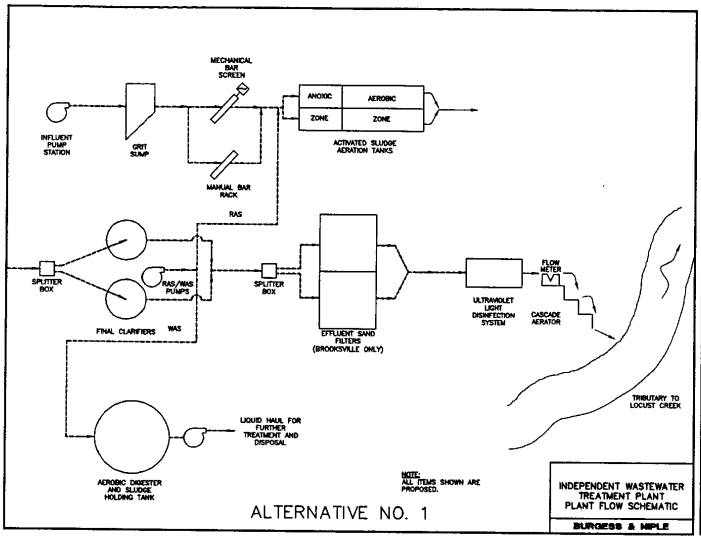
A. Regional Plant in Augusta utilizing Single Stage Activated Sludge with Biological Nitrogen Removal.

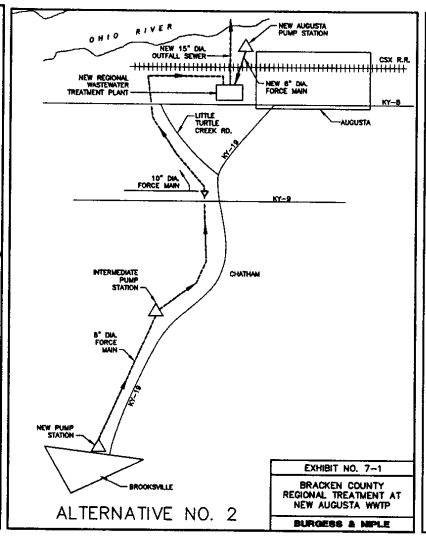
B. Financial Requirements – Table 10-2

C. Funding Options and Monthly Costs – Table 10-3
   a. Kentucky Infrastructure Authority –KIA – Administered by DOW State appropriations funds (Tobacco Fund - $500,00 max)
   b. Community Development Block Grant – CDBG - $1,000,000 max grant requires income survey – 51% of households must be low to moderate income.
   c. USDA Rural Development – Based on 2000 census (Augusta – 45% grant & Brooksville – 75% grant).
   d. Federal Budget Appropriation Grants – Administered by DOW Grants from 0-55%

D. Sanitary Sewer System Corrections – Table 10-4

E. Implementation Schedule – Table 10-5





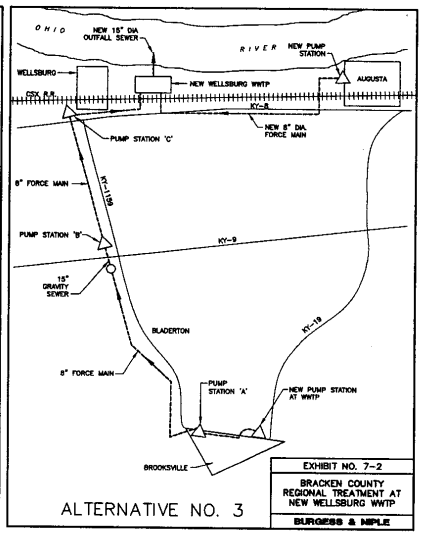
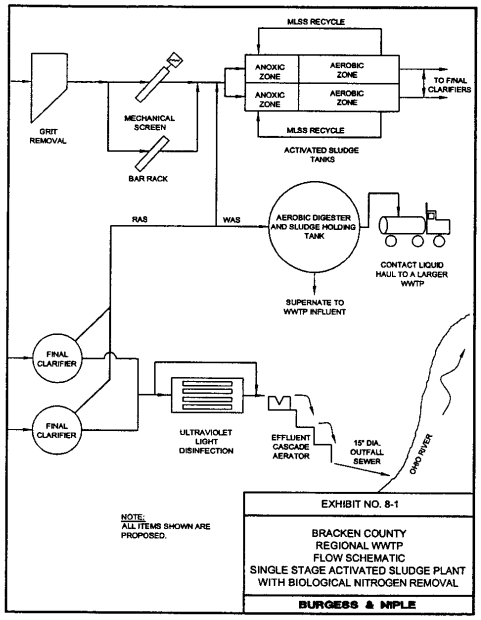
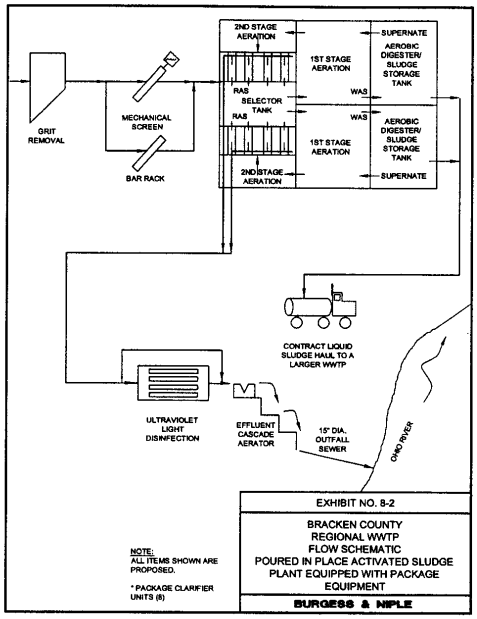


TABLE 7-4

ECONOMIC ANALYSIS AND COMPARISON OF REGIONAL WASTEWATER COLLECTION AND TREATMENT ALTERNATIVES

Cost Item	Factor	Alternative No. 1 Separate Treatment	Alternative No. 2 Regional Treatment at Augusta	Alternative No. 3 Regional Treatment at Wellsburg
A. Total Project Cost	A	$5,220,000	$7,800,000	$9,630,000
B. Operation, Maintenance and Replacement Costs (Present Worth)	12.462	4,006,533	3,777,232	3,484,375
C. Salvage Value (Present Worth)	0.3769	(409,313)	(846,517)	(1,106,955)
D. TOTAL PRESENT WORTH	A + B - C	$8,817,220	$10,730,715	$12,007,420
E. Design Capacity (gpd)		530,000	690,000	595,000
F. Unit Flow Present Worth ($ per GPD) (D ÷ E)		$16.64	$15.55	$20.18
G. Relative Percent Cost of Least Cost Alternative		+7.0%	Least Cost	+30%





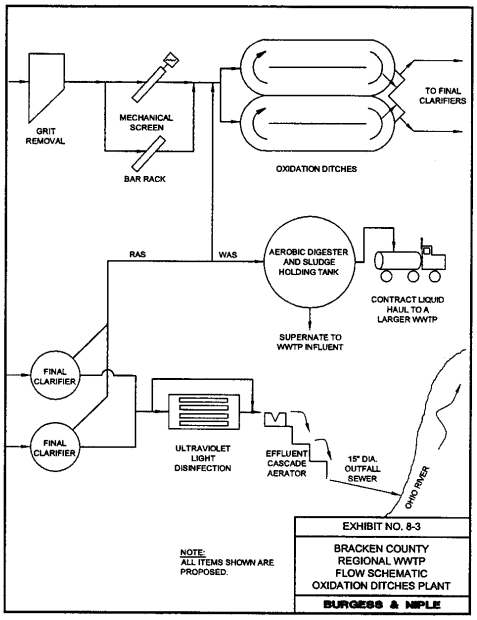
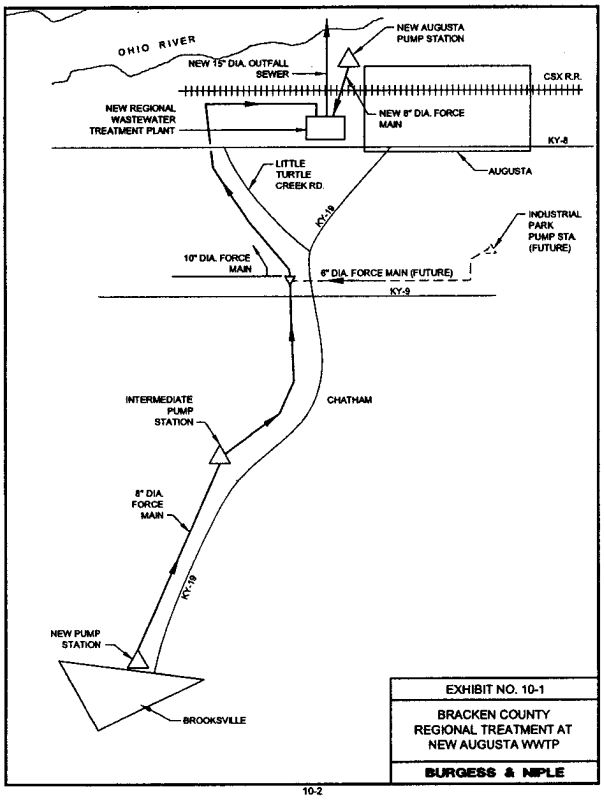


TABLE 8-4

ECONOMIC ANALYSIS AND COMPARISON
OF THE AUGUSTA REGIONAL WASTEWATER TREATMENT PLANT ALTERNATIVES

Cost Item	Factor	Alternative No. 1 Single Stage Activated Sludge Plant with Biological Nitrogen Removal	Alternative No. 2 Poured-in-Place Activated Sludge Plant Equipped with Package Equipment	Alternative No. 3 Oxidation Ditches
A. Total Project Cost	A	$4,090,000	$4,685,000	$4,320,000
B. Operation, Maintenance and Replacement Costs (Present Worth)	12.462	1,198,844	1,076,717	1,399,483
C. Salvage Value (Present Worth)	0.3769	(368,608)	(322,250)	(376,900)
D. TOTAL PRESENT WORTH	A + B - C	$4,920,236	$5,439,467	$5,342,583
G. Relative Percent Cost of Least Cost Alternative		Least Cost	+10.6%	+8.6%



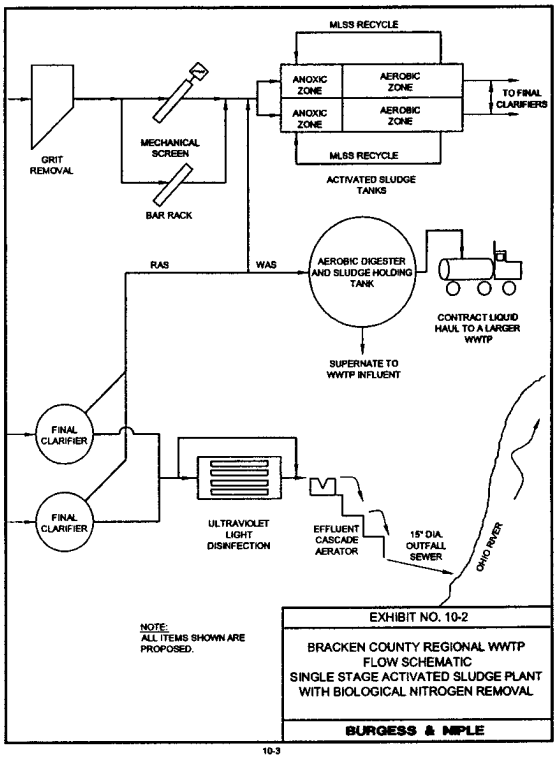


TABLE 10-2

FINANCIAL REQUIREMENTS WITH 3% LOAN FROM THE STATE REVOLVING FUND

Item	Cost
Total Project Cost	$7,800,000
Estimated Annual Debt Retirement at 3% for 20 years (0.06722 x $7,800,000)	524,316 /yr.
Annual Payment on Principle, First Year (0.002 x $7,800,000)	15,600 /yr.
Initial Year O&M&R	244,200 /yr.
Total Annual Revenue Required	$784,116/yr.
Current Revenue	271,000 /yr.
Revenue Increase Required	513,116 /yr.
Percent Increase in Revenue Required	189%
Multiplier Factor as Compared to Existing Revenue	2.89

Table 10-4

AUGUSTA AND BROOKSVILLE, KY SANITARY SEWER SYSTEM CORRECTIONS

Augusta

Work Description	Cost	Cost per year
I&I corrections	$52,800	$13,200
Manhole lid raising	$40,000	$10,000
Investigation & Future work		$24,000
	Total =	$47,200 / year

User cost increase - $47,200 / 560 customers / 12 mo. = $7.00 / mo.

Brooksville

Work Description	Cost	Cost per year
I&I corrections	$8,100	$2,025
Manhole lid raising and anchoring	$45,000	$11,250
Investigation & Future work		$19,000
	Total =	$32,275 / year

User cost increase - $32,275 / 434 customers / 12 mo. = $6.20 / mo.

TABLE 10-3

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT MONTHLY COST PER FUNDING OPTIONS

	100% Loan	50/50 Grant/Loan	75/25 Grant/Loan	80/20 Grant/Loan		
Loan Amount	7,800,000	3,900,000	1,950,000	1,560,000		
Debt Service	524,283	262,141	131,071	104,857		
.2% loan service fee	15,600	7,800	3,900	3,120		
Debt Service Income required	539,883	269,941	134,971	107,977		
Estimated OM & R	244,200	244,200	244,200	244,200		
Total Revenue Required	784,083	514,141	379,171	352,177		
					Existing Augusta	Existing Brooksville
Unit Cost/1,000 Gals	$12.15	$7.97	$5.87	$5.46	$12.07	$15.79
Min Bill < 2000 gal	$24.29	$20.00	$18.00	$16.00	$14.14	$15.79
Bill for 4,000 Gals	$48.59	$31.86	$23.50	$21.82	$18.28	$24.89
Bill for 5,000 Gals	$60.73	$39.83	$29.37	$27.28	$20.35	$29.44
Bill for 6000 Gals	$72.88	$47.79	$35.24	$32.74	$22.42	$33.99
Bill for 7,000 Gals	$85.03	$55.76	$41.12	$38.19	$24.49	$38.54
Bill for 8,000 Gals	$97.18	$63.72	$46.99	$43.65	$26.56	$43.09

Loan - percentage rate 3 % term = 20 yrs (Based on State Revolving Loan financing)
Flow Estimate - Number of users = 881 Households
Avg. water usage = 200.5 Gal/day/household - 6,015Gal/mo
365 Days
64,549,520 Gal/year

TABLE 10-5

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT PROPOSED SCHEDULE

Task	Completion Date
I&I Investigation and Corrections	2005 - 2008
Obtain low interest loan and grant funding	October 1, 2007
Complete Design	October 1, 2008
Obtain Division of Water Approval	December 1, 2008
Receive bids	February 1, 2008
Award contracts and start construction	March 1, 2009
Complete construction	March 1, 2010
Complete start-up	May 1, 2010

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX; (502) 315-6677
http://www.lrl.usace.army.mil/

November 20, 2009

Operations Division
Regulatory Branch (South)
ID No. LRL-2009-1028-pjl

Mr. Donald W. Bezold
Burgess & Niple, Incorporated
312 Plum Street
12th Floor
Cincinnati, Ohio 45202-2678

Dear Mr. Bezold:

This is in response to your letter dated September 10, 2009, regarding the Regional Wastewater Facilities Plan for the Cities of Augusta, Brooksville, and Northern Bracken County, in Kentucky. Your letter indicated the plan reviewed alternatives to collect and treat wastewater in the planning area generally concentrated in the Augusta and Brooksville areas, with a preferred alternative to construct a new treatment plant near Augusta with discharge to the Ohio River and transportation of wastewater from Brooksville to the new plant via pump stations and force mains along KY 19 roadway.

The Corps of Engineers exercises regulatory authority under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344). The data you furnished indicates an authorization under one or both of these sections of law may be required before you begin the work. However, the information given is insufficient for us to be certain of the need for a permit on this particular proposal. We will need additional detail on the project's design, scope, construction methods and purpose in order to determine whether a permit is required.

We have found it is usually in the applicant's best interest to submit that data in a formal permit application. Should an individual permit be required, we can then begin processing your request immediately.

Enclosed is a packet which contains the information and forms needed to apply for a DA permit. Currently, the processing time for noncontroversial applications requiring individual review takes approximately 120 days. Please allow sufficient time in your preconstruction schedule for the processing of a DA permit application.

If we can be of any further assistance, please contact us by writing to the above address, ATTN: CELRL-OP-FS, or by calling me at (502) 315-6693.

Sincerely,

Pam Loeffler
Project Manager, South
Regulatory Branch

Enclosures

Beykzadeh, Hamid (EEC)

From: Bezold, Donald [dbezold@burnip.com]
Sent: Tuesday, November 24, 2009 2:22 PM
To: Beykzadeh, Hamid (EEC)
Cc: John Laycock; Doug Padgett; kcornette@btadd.com; cityclerk@maysvilleky.net
Subject: RE: Bracken County 201 Plan update
Attachments: usacoe response112009.pdf

Hamid,
See attached letter from US Army COE. They commented that an additional review will be required upon completion of force main route selection and treatment plant location for Section 10 and Section 404 permitting. This review will be submitted during the next phase of the project when mapping, preliminary alignments and plant location are developed.

Hope all is going well with the SPEAR review. Give us a call if additional information is needed.

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

From: Beykzadeh, Hamid (EEC) [mailto:Hamid.Beykzadeh@ky.gov]
Sent: Friday, November 13, 2009 8:27 AM
To: Bezold, Donald
Cc: John Laycock; Doug Padgett; kcornette@btadd.com; cityclerk@maysvilleky.net
Subject: RE: Bracken County 201 Plan update

Thanks Donald, I will incorporate those comments in a final SPEAR. Thanks

---

From: Bezold, Donald [mailto:dbezold@burnip.com]
Sent: Wednesday, November 11, 2009 5:37 PM
To: Beykzadeh, Hamid (EEC)
Cc: John Laycock; Doug Padgett; 'kcornette@btadd.com'; 'cityclerk@maysvilleky.net'
Subject: RE: Bracken County 201 Plan update

Hamid,
Attached are my comments on the SPEAR. Please call if you have any questions. I have placed several calls to COE and have had no response to date. I will keep trying.

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

From: Beykzadeh, Hamid (EEC) [mailto:Hamid.Beykzadeh@ky.gov]
Sent: Wednesday, November 04, 2009 9:52 AM
To: Bezold, Donald
Subject: FW: Bracken County 201 Plan update

Don,
Attached is a copy of Augusta/ Brooksville SPEAR, please take a look at it and feel free to modifying, add or delait as you see. Please send me your revision of it. Thanks

Note: we still need a letter from Armey Cop. Eng. and any revised project costs.

From: Bezold, Donald [mailto:dbezold@burnip.com]
Sent: Wednesday, November 04, 2009 9:47 AM
To: Beykzadeh, Hamid (EEC)
Subject: RE: Bracken County 201 Plan update

My email address
dbezold@burnip.com

From: Beykzadeh, Hamid (EEC) [mailto:Hamid.Beykzadeh@ky.gov]
Sent: Thursday, September 03, 2009 9:09 AM
To: Bezold, Donald
Cc: Singh, Anshu (EEC)
Subject: RE: Bracken County 201 Plan update

It is,
Mr. Lee Andrews
U.S dept. of the interior
Fish and Wild Life Services
No. 1 Sportman Lane
Frankfort ky 40601
Tele.502-695-0468

Mr. Lee Andrews
U.S. Fish & Wildlife Service
330 West Broadway, Room 266
Frankfort, Kentucky 40601

Attached is a sample letter and name and address, please let me know if you have any question. I have included other agencies as well in below:

Ms. Donna M. Neary, Executive Director
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

Mr. Mike Hardin
Kentucky Department of Fish & Wildlife Resources
#1 Sportsman Lane
Frankfort, Kentucky 40601

Mr. Lee Andrews
U.S. Fish & Wildlife Service
330 West Broadway, Room 266
Frankfort, Kentucky 40601

Col. Raymond Midkiff,
Commander, Louisville District
U.S. Army Corps of Engineers
P.O. Box 59
Louisville, Kentucky 40201

Colonel Dana R. Hurst
Commander, Huntington District
U.S. Army Corps of Engineers
502 8th Street
Huntington, WV 25701-2070

LTC Steven Roemhildt
Commander, Nashville District
U.S. Army Corps of Engineers
P.O. Box 1070
Nashville, TN 37202-1070

Colonel Charles 0. Smithers
Commander, Memphis District
U.S. Army Corps of Engineers
167 North Main Street
Room B-202
Memphis, TN 38103-1894

From: Bezold, Donald [mailto:dbezold@burnip.com]
Sent: Thursday, September 03, 2009 8:31 AM
To: Beykzadeh, Hamid (EEC)
Subject: RE: Bracken County 201 Plan update

Do you have the correct address for the KY Fish and Wild Life and Federal Fish and Wild Life for sending these notifications? The last packet I sent you has the letter to Ky Heritage requesting a review update.

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

From: Beykzadeh, Hamid (EEC) [mailto:Hamid.Beykzadeh@ky.gov]
Sent: Wednesday, September 02, 2009 10:34 AM
To: Bezold, Donald
Cc: Singh, Anshu (EEC)
Subject: RE: Bracken County 201 Plan update

Hi Don,

Please make sure that notification along with a map of the proposed project sends to Ky fish and wild life and federal fish & wild life regarding any spices and animal, Ky heritage council. If you have any question please call me 502-564-3410 ext. 4822. Please send me a copy of what you sending to these agencies. Thanks

---

From: Bezold, Donald [mailto:dbezold@burnip.com]
Sent: Wednesday, September 02, 2009 9:38 AM
To: Beykzadeh, Hamid (EEC)
Subject: RE: Bracken County 201 Plan update

Hamid,
In response to your telephone call last week, we sent notifications to Kentucky Heritage Council and are awaiting their response. Are there additional notification we need to send and what should be send with the notifications?

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

Note:
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It is our professional opinion that this electronic information provides information current as of the date of its release. Any use of this information is at the sole risk and liability of the user. The user is responsible for updating information to reflect any changes in the information following the preparation date of this transmittal.
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STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

August 3, 2009

Mr. Donald W. Bezold
Burgess & Niple, Incorporated
312 Plum Street
12th Floor
Cincinnati, Ohio 45202-2678

Re: Waste Load Allocation (WLA) Update Request
Regional Facilities Plan for Augusta,
Brooksville and Northern Bracken County
Bracken County, Kentucky

Dear Mr. Bezold:

This is in response to your July 28, 2009 letter, requesting an updated WLA for the subject facility. A WLA was previously provided in Division of Water correspondence dated April 22, 2008. The design capacity of the proposed WWTP is to be 0.69 MGD, with discharge to mile point (mp) 553.9 of the Ohio River (mp 427.5 ACOE convention), segment 08206. The WLA information provided will be utilized in preparation of a Regional Wastewater Facilities Plan.

Effluent limitations applicable to the subject facility are stated below. The requirements specified are the same as those previously provided in DOW correspondence dated April 22, 2008, with the exception that limitations for BOD_5 and total residual chlorine have been corrected.

Parameter	May 1 - October 31	November 1 - April 30
BOD_5	30 mg/l	30 mg/l
Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	20 mg/l	20 mg/l
Dissolved Oxygen	2 mg/l	2 mg/l
Total Phosphorus, mg/l	Monitor	Monitor
Total Nitrogen, mg/l	Monitor	Monitor
Total Residual Chlorine	0.019 mg/l	0.019 mg/l

Reliability Classification = Grade 3

In addition to the above limits, the monthly average and maximum weekly average values of Escherichia coli shall be at or below 130 colonies per 100 milliliters or 240 colonies per 100 milliliters, respectively, the year around. Additional effluent limitations and water quality standards are contained in the Division of Water Regulations.

These preliminary design effluent limitations are valid for one (1) year from the date of this letter, and are subject to change as a result of additional information which may be presented during the public notice phase of the KPDES permitting process. Please note that this letter does not convey authorization or approval to proceed with the construction or operation of the proposed wastewater treatment facilities. Construction and KPDES permit

applications must be submitted to request such authorization. Nor does this letter ensure the issuance of either permit. During the review processes of these permits the Division of Water will further evaluate the viability of the project.

Should you have any questions regarding this correspondence, please contact me at (502) 564-8158, extension 4914 or E-mail at Courtney.Seitz@ky.gov.

Sincerely,

Courtney Seitz

Courtney Seitz, WLA Coordinator
Surface Water Permits Branch
Division of Water

CS
c: Compliance and Technical Assistance
Branch, Florence Section
Anshu Singh, Water Infrastructure Branch
Division of Water Files

RESOLUTION
OF
AUGUSTA, KENTUCKY

A RESOLUTION, in the name and on behalf of the residents of Augusta, Kentucky, approving the City of Augusta and City of Brooksville and Northern Bracken County Plan dated June 2005.

BE IT RESOLVED BY THE CITY OF AUGUSTA, KENTUCKY, AS FOLLOWS:

WHEREAS, Augusta, Kentucky desires to protect human health and the environment in the vicinity of Northern Bracken County, Kentucky and adjoining areas between City of Augusta and the City of Brooksville, Kentucky by providing a regional wastewater collection and transportation system meeting the State of Kentucky's requirements; and

WHEREAS, the Cities of Augusta and Brooksville, Kentucky have developed a plan to accomplish this goal as described in its 201 Facilities Plan dated June 2005; and

WHEREAS, the residents of the area to be served by the planned wastewater facilities have, during a Public Hearing on September 22, 2005, given general approval to the plan;

NOW, THEREFORE, BE IT RESOLVED that the City of Augusta, Kentucky, endorse and approve this 201 Facilities Plan.

Publicly read and approved this 19th day of October, 2005

By City Council, Augusta, Kentucky

John Laycock, Mayor
City of Augusta

Attest: Gretchen Usleaman
Gretchen Usleaman, City Clerk/Treasurer

RESOLUTION
OF
BROOKSVILLE, KENTUCKY

A RESOLUTION, in the name and on behalf of the residents of Brooksville, Kentucky, approving the City of Augusta and City of Brooksville and Northern Bracken County Plan dated June 2005.

BE IT RESOLVED BY THE CITY OF BROOKSVILLE, KENTUCKY, AS FOLLOWS

WHEREAS, Brooksville, Kentucky desires to protect human health and the environment in the vicinity of Northern Bracken County, Kentucky and adjoining areas between City of Augusta and the City of Brooksville, Kentucky by providing a regional wastewater collection and transportation system meeting the State of Kentucky's requirements; and

WHEREAS, the Cities of Augusta and Brooksville, Kentucky have developed a plan to accomplish this goal as described in its 201 Facilities Plan dated June 2005; and

WHEREAS, the residents of the area to be served by the planned wastewater facilities have, during a Public Hearing on September 22, 2005 given general approval to the plan.

NOW, THEREFORE, BE IT RESOLVED that the City of Brooksville, Kentucky, endorse and approve this 201 Facilities Plan.

Publicly read and approved this 12 day of November, 2005

By City Council, Brooksville, Kentucky

John H. Corlis

Mayor
City of Brooksville

COMMONWEALTH OF KENTUCKY
COUNTY OF BRACKEN

Witness my hand, this 12 day of November, 2005.

My Commission expires November 2008

Sandra Reynolds

Notary Public

COMMERCE CABINET
KENTUCKY HERITAGE COUNCIL

Ernie Fletcher
Governor

The State Historic Preservation Office
300 Washington Street
Frankfort, Kentucky 40601
Phone (502) 564-7005
Fax (502) 564-5820
www.kentucky.gov

George Ward
Secretary

Donna M. Neary
Executive Director and
State Historic Preservation Officer

November 1, 2007

Mr. Donald W. Bezold
Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, Ohio 45202-2678

Dear Mr. Bezold:

Thank you for your letter of September 28, 2007 (received October 1, 2007) concerning the Regional Facilities Plan for the City of Augusta and City of Brooksville in Bracken County, Kentucky. Your letter indicates that the current plan is to run the force main along KY 19 (primarily along the newly relocated KY 19 and a segment of the old KY 19) between the City of Brooksville and the wastewater plant at Augusta. There are no recorded archaeological sites along the proposed force main route. Provide that the force main follows disturbed highway right-of-ways, we would not require an archaeological survey. Once the project reaches the design phase, we will be happy to review the selected force main alignment.

Should you have any questions, feel free to contact Charles Hockensmith of my staff at (502) 564-7005.

Sincerely,

Donna M. Neary

Donna M. Neary, Executive Director
and State Historic Preservation Officer

Beykzadeh, Hamid (EEC)

From: Bezold, Donald [dbezold@burnip.com]
Sent: Tuesday, October 06, 2009 11:59 AM
To: Bezold, Donald; Beykzadeh, Hamid (EEC)
Cc: John Laycock; Doug Padgett; 'kcornette@btadd.com'; 'cityclerk@maysvilleky.net'
Subject: RE: Bracken County 201 Facilities Planning
Attachments: us fishwildlife-092809.pdf; planrev-072809.pdf

Hamid,
See attached letter from US Fish and Wildlife . Once a specific site is located for the WWTP and pump stations a survey by a qualified person will be completed to determine if the Indiana bat or running buffalo habitat is present at the sites. This will be completed in the next phase of the project as previously discussed once funding has been determined, preliminary design begins and potential sites are selected.

We are still waiting on reports from KY Fish and Wildlife and Army Corps of Engineers comments.

The user charge information you requested today was included in the chapter 10 pricing revisions submitted at our meeting with you in July. We have attached another copy for your reference see page 10-8 (rev 072809).

If you know of any other items missing let us know.

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

Note:
These electronic documents are provided by Burgess & Niple (B&N) as a convenience to our clients.
The official document is available as a manually signed, initialed, or sealed hard copy. If there is a discrepancy between electronic files and the hard copies, the hard copies shall prevail.
It is our professional opinion that this electronic information provides information current as of the date of its release. Any use of this information is at the sole risk and liability of the user. The user is responsible for updating information to reflect any changes in the information following the preparation date of this transmittal.
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Beykzadeh, Hamid (EEC)

From: Beykzadeh, Hamid (EEC)
Sent: Wednesday, September 02, 2009 10:34 AM
To: 'Bezold, Donald'
Cc: Singh, Anshu (EEC)
Subject: RE: Bracken County 201 Plan update

Hi Don,

Please make sure that notification along with a map of the proposed project sends to Ky fish and wild life and federal fish & wild life regarding any spices and animal, Ky heritage council. If you have any question please call me 502-564-3410 ext. 4822. Please send me a copy of what you sending to these agencies. Thanks

---

From: Bezold, Donald [mailto:dbezold@burnip.com]
Sent: Wednesday, September 02, 2009 9:38 AM
To: Beykzadeh, Hamid (EEC)
Subject: RE: Bracken County 201 Plan update

Hamid,
In response to your telephone call last week, we sent notifications to Kentucky Heritage Council and are awaiting their response. Are there additional notification we need to send and what should be send with the notifications?

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

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It is our professional opinion that this electronic information provides information current as of the date of its release. Any use of this information is at the sole risk and liability of the user. The user is responsible for updating information to reflect any changes in the information following the preparation date of this transmittal.
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KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
TOURISM, ARTS, AND HERITAGE CABINET

Steven L. Beshear
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

Marcheta Sparrow
Secretary

Dr. Jonathan W. Gassett
Commissioner

October 7, 2009

Donald Bezold
Burgess & Niple
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678

RE: Regional Wastewater Facilities Plan for the City of Augusta, City of Brooksville and Northern Bracken County Bracken County, KY

Dear Mr. Bezold:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) have received your request for the above-referenced information. The Kentucky Fish and Wildlife Information System (KFWIS) indicate that state/federal threatened and endangered species are known to occur within close proximity of the proposed project area. However, the KDFWR does not expect impacts to listed species due to the location and nature of the project. Please be aware that our database system is a dynamic one that only represents our current knowledge of the various species distributions.

KDFWR recommends that erosion control measures be developed and utilized during any construction to minimize siltation into nearby waterways. Such erosion control measures may include, but are not limited to silt fences, staked straw bales, brush barriers, sediment basins, and diversion ditches. Erosion control measures will need to be installed prior to construction and should be inspected and repaired regularly as needed.

I hope this information proves helpful to you. If you have any questions or require additional information, please call me at (800) 852-0942 Extension 4473.

Sincerely,

Courtney Hunt

Courtney C. Hunt
Fisheries Biologist II

Cc: Environmental Section File

Beykzadeh, Hamid (EEC)

From: Bezold, Donald [dbezold@burnip.com]
Sent: Monday, October 12, 2009 11:45 AM
To: Bezold, Donald; Beykzadeh, Hamid (EEC)
Cc: John Laycock; Doug Padgett; 'kcornette@btadd.com'; 'cityclerk@maysvilleky.net'
Subject: RE: Bracken County 201 Facilities Planning
Attachments: KY fish&wildlife-101108.pdf

Hamid,
See attached letter from KY Fish and Wildlife. They do not see any impact with the project but encourage erosion control measures which will be added to plans during development of construction drawings. We will resubmit to them once all site selections have been made.
We are still waiting on a response from the Army COE.

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

From: Bezold, Donald
Sent: Tuesday, October 06, 2009 11:59 AM
To: Bezold, Donald; 'Hamid.Beykzadeh@ky.gov'
Cc: 'John Laycock'; 'Doug Padgett'; 'kcornette@btadd.com'; 'cityclerk@maysvilleky.net'
Subject: RE: Bracken County 201 Facilities Planning

Hamid,
See attached letter from US Fish and Wildlife . Once a specific site is located for the WWTP and pump stations a survey by a qualified person will be completed to determine if the Indiana bat or running buffalo habitat is present at the sites. This will be completed in the next phase of the project as previously discussed once funding has been determined, preliminary design begins and potential sites are selected.

We are still waiting on reports from KY Fish and Wildlife and Army Corps of Engineers comments.

The user charge information you requested today was included in the chapter 10 pricing revisions submitted at our meeting with you in July. We have attached another copy for your reference see page 10-8 (rev 072809).

If you know of any other items missing let us know.

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

Note:
These electronic documents are provided by Burgess & Niple (B&N) as a convenience to our clients.
The official document is available as a manually signed, initialed, or sealed hard copy. If there is a discrepancy between electronic files and the hard copies, the hard copies shall prevail.
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BURGESS & NIPLE

Hamid Beykzahdeh
KPDES Branch
Division of Water
200 Fair Oaks Lane
Frankfort, KY 40601

Re: Regional Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

July 28, 2009

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Beykzahdeh:

Attached is updated information on the Wastewater Collection and Treatment System 201 Facility Plan Update report for the City of Augusta, City of Brooksville and Northern Bracken County. The following items are being addressed in this letter or by attachment:

1. Additional mapping of the Planning Area showing 0-5 year, 5 to 10 year and 10 to 20 year planning. (Attached half size map of planning area with full size pdf electronic copy on CD.)
2. Updated cost and user charge system. (Attached revised section 7.4.4 Cost Summary pump station force main and treatment plant and Chapter 10 Recommended Plan).
3. Letter requesting update of Waste Load Allocation to Mr. Courtney Sitz dated July 28, 2009.
4. Cross Cutters initial review found no concern with force main along its routing since it will be within the previously disturbed areas within road right of way. The Planning Area maps attached as noted in item 1 above can be used for additional review for anticipated treatment plant and intermediate pump station location. The treatment plant site has not been finalized but is anticipated to be within 2000' of the area indicated.
5. I&I reduction plan in the sewer systems – The Cities are in the process of establishing a plan for I&I removal. Recommendations listed in the SSES Report will be reviewed and a schedule for completion developed. Additionally the Cities have jointly financed an internal inspection camera. This camera will be used to search for additional I&I sources. An inspection program is being developed to review areas of each City to pin point additional I&I sources.
6. The anticipated funding sources for the project are shown in Chapter 10, Section 10.3. Funding applications Kentucky Infrastructure Authority (KIA), Community Block grant and USDA Rural Development will be the prepared to find the available funding.
7. Ownership Agreement – Ownership discussions are in the preliminary stages. General consensus is leaning toward joint ownership in the form of a Utility Commission which will have representatives from each community involved Augusta, Brooksville and Bracken County ~~Circuit~~ Fiscal Court.

Please review the information and let us know if additional information is needed or if the Facility Plan with the attached information is acceptable.

Sincerely,

Donald W. Bezold

Cc. Mayor Laycock – City of Augusta
Mayor Corlis – City of Brooksville
Kevin Cornette – Buffalo Trace Area Development District

BURGESS & NIPLE

Courtney Sitz
KPDES Branch
Division of Water
14 Reilly Road
Frankfort, KY 40601

Re: A.I. No.: 387
Regional Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

July 28, 2009

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Sitz:

We are requesting an update to the wasteload allocation for a proposed wastewater treatment plant (WWTP) for the Northern Bracken County area which includes the City of Augusta and City of Brooksville. The previous wasteload allocation determination was completed on April 22, 2008 and was good for one year. A Regional Treatment Facilities Plan for the area is being reviewed by Hamid Beykzadeh of Facilities Construction Branch. The proposed WWTP will be sized at 690,000 gallons per day for treating Augusta, Brooksville and portions of Northern Bracken County for design flow year 2025.

The facility planning and proposed treatment plant location remains the same as previous submittal as noted below.

As part of the facilities planning process several alternative type treatment plants as well as treatment plant locations were reviewed to determining the cost effectiveness of regionalizing the wastewater treatment plants in the area. Through the facilities planning process it was determined the existing plants for Augusta and Brooksville will be abandoned and a new regional WWTP will be constructed. Wastewater will be pumped to the new WWTP located downstream of Augusta on the Ohio River. Plant discharge will be to the Ohio River near the location of the existing Augusta plant. The actual location of the new WWTP will be further away from the river and above the 100 year flood elevation. It is anticipated that 2 pump stations will be required to pump Brooksville and surrounding area wastewater flow to the new WWTP near Augusta.

The recommended WWTP will consist of the following treatment units:

- Gravity grit removal
- Mechanical screen with standby bar rack
- Two aeration basins with each having an anoxic zone and an aerobic zone
- Two final clarifiers
- Three return and waste activate sludge pumps
- Ultraviolet light disinfection
- Cascade aerator
- Aerobic digestor/sludge holding tank
- Sludge tank truck loading area

- Control building

Please review the above information and provide an updated wasteload allocation. If there is additional information is needed, let us know.

Sincerely,

Donald W. Bezold

Cc. Mayor Laycock – City of Augusta
Mayor Corlis – City of Brooksville
Kevin Cornette – Buffalo Trace Area Development District

STEVEN L. BESHEAR
GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL

MARCHETA SPARROW
SECRETARY

THE STATE HISTORIC PRESERVATION OFFICE
300 WASHINGTON STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-7005
FAX (502) 564-5820
www.heritage.ky.gov

MARK DENNEN
EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

September 22, 2009

Mr. Donald W. Bezold
Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, Ohio 45202-2678

Re: Regional Facilities Plan for the City of Augusta, City of Brooksville and Northern Bracken County

Dear Mr. Bezold:

Thank you for your update on the City of Augusta, City of Brooksville and Northern Bracken County regional facilities plan. The location of the new wastewater treatment plant will need to be surveyed by a professional archaeologist. There are numerous sites in the vicinity including two that contain human burials that will require Native American consultation if they are to be disturbed. A report documenting the results of this investigation must be submitted to the State Historic Preservation Officer for review, comment, and approval. The pump stations and lines within existing state right-of-ways do not need to be surveyed but any lines or pump stations outside of the right of way will need to be surveyed by a professional archaeologist. Again, a report documenting the results of this investigation must be submitted to the State Historic Preservation Officer for review, comment, and approval. Where a given project area or portions thereof have been disturbed by prior construction, the applicant may file documentation of that disturbance with the State Historic Preservation Officer and request an opinion concerning the need of an archaeological survey.

Should you have any questions, feel free to contact Philip Mink of my staff at 564-7005, ext. 122.

Sincerely,

Mark Dennen,
Executive Director and
State Historic Preservation Officer

MD:pbm

Beykzadeh, Hamid (EEC)

From: Bezold, Donald [dbezold@burnip.com]
Sent: Thursday, October 01, 2009 1:26 PM
To: Beykzadeh, Hamid (EEC)
Cc: John Laycock; Doug Padgett; 'kcornette@btadd.com'; 'cityclerk@maysvilleky.net'
Subject: Bracken County 201 Facilities Planning
Attachments: ky heritage council-092209.pdf

Hamid,
See attached letter from Kentucky Heritage Council. Once a specific site is located for the WWTP and pump stations a survey by a professional archeologist will be completed. This will be completed in the next phase of the project as previously discussed once funding has been determined and preliminary design begins.
We are still waiting on reports from Fish and Wildlife and Army Corps of Engineers comments.

If you know of any other items missing let us know.

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

Note:
These electronic documents are provided by Burgess & Niple (B&N) as a convenience to our clients.
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

September 28, 2009

Mr. Donald W. Bezold
Burgess & Niple, Inc.
312 Plum Street, 12th Floor
Cincinnati, Ohio 45202-2678

Re: FWS 2007-B-0331; Burgess & Niple, Regional Wastewater Facilities Plan for City of Augusta, Cuty of Brooksville and Northern Bracken County, located in Bracken County, Kentucky

Dear Mr. Bezold:

Thank you for the correspondence dated September 10, 2009 regarding the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed this proposed project and offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

According to your correspondence, a Wastewater 201 Facility Plan for Augusta, Brooksville and Northern Bracken County is nearing the approval stage. The planning period is 20-years. The associated projects are divided into Phase I (0-5 years), a 5-10 year residential phase, and a 10-20 year phase. Due to potential changes in the status of Federally listed threatened and endangered species, and possible additions to the Federal endangered species list, the Service can only provide comments on Phase I at this time. Request for future activities should be resubmitted to the Service within one year of their start date.

Based on your correspondence, Phase I involves following activities: the construction of a new wastewater treatment plant (WWTP) near Augusta with discharge to the Ohio River; the construction of three pump stations, one in Brooksville, one near Chatham and one in Augusta; and, the construction of approximately 8.3 miles of 10" and 8" force main. The proposed site for the WWTP appears to be in a forested area. The majority of the proposed route for the force main would run along the newly relocated right-of-way of Kentucky Route 19. The force main would also parallel Little Turtle Creek, and would require a crossing of Locust Creek. It appears that the WWTP would discharge directly into Little Turtle Creek, which feeds into the Ohio River.

In accordance with provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the project with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that two federally listed species have the potential to occur within the project vicinity. The listed species are:

Common Name	Scientific Name	Federal Status
Indiana bat	*Myotis sodalis*	endangered
running buffalo clover	*Trifolium stoloniferum*	endangered

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

Summer roost and/or winter habitat for the endangered Indiana bat may exist within the proposed project site. Based on this information, we believe that: (1) forested areas in the vicinity of and on the project area may provide potentially suitable summer roosting and foraging habitat for the Indiana bat; and (2) caves, rockshelters, and abandoned underground mines in the vicinity of and on the project area may provide potentially suitable wintering habitat for the Indiana bat. Our belief that potentially suitable habitat may be present is based on the information provided in your correspondence, the fact that much of the project site and/or surrounding areas contain forested habitats that are within the natural range of this species, and our knowledge of the life history characteristics of the species.

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (i.e., dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH.

Prior to hibernation, Indiana bats utilize the forest habitat around the hibernacula, where they feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period is dependent upon weather conditions and may last from about September 15

to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation. Research has shown that bats exhibiting this "swarming" behavior will range up to five miles from chosen hibernacula during this time. For hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation.

Because we have concerns relating to the Indiana bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we would have the following recommendations relative to Indiana bats.

1. Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter habitat for Indiana bats. Therefore, we would recommend that the project proponent survey the project area for caves, rock shelters, and underground mines, identify any such habitats that may exist on-site, and avoid impacts to those sites pending an analysis of their suitability as Indiana bat habitat by this office.

2. We would also recommend that the project proponent only remove trees within the project area between October 15 and March 31 in order to avoid impacting summer roosting Indiana bats. However, if any Indiana bat hibernacula are identified on the project area, we recommend the project proponent only remove trees between November 15 and March 31 in order to avoid impacting Indiana bat "swarming" behavior.

However, if these recommendations cannot be incorporated as project conditions, then the project area may be surveyed to determine the presence or absence of this species within the project area in an effort to determine if potential impacts to the Indiana bat are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

If your project schedule requires the clearing of potential Indiana bat habitat (i.e., trees) during the period of April 1 to October 14, you have two primary options for addressing impacts to Indiana bats. First, you can survey the project site as described previously, or you can enter into a Conservation Memorandum of Agreement (MOA) with the Service. By entering into a Conservation MOA with the Service, Cooperators gain flexibility in project timing with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures as set forth in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

running buffalo clover

Running buffalo clover may occur within the proposed project site. This species requires periodic, moderate disturbances to reduce competition and maintain open or semi-open habitat conditions. Disturbed areas such as old pastures, moderately grazed fields, road rights-of-way, and power line rights-of-way that are mechanically maintained are known to provide suitable habitat for these species. Additionally, running buffalo clover is known to occur in habitats ranging from stream banks and low mesic (moderately moist) forests to lawns and cemeteries. If the proposed project(s) require alteration of habitat that coincides with the habitat required for this species, an on-site inspection or survey of the area must be conducted to determine if the listed species is present or occurs seasonally. Prior to construction activities including tree clearing, a survey should be done by qualified personnel and be conducted during the appropriate time of day and/or year to ensure confidence in survey results. Please notify this office with the results of any surveys and an analysis of the "effects of the action," as defined by 50 CFR 402.02 on any listed species including consideration of direct, indirect, and cumulative effects.

Surveys for both species would not be necessary if sufficient site-specific information was available that showed that: (1) there is no potentially suitable habitat within the project area or its vicinity or (2) the species would not be present within the project area or its vicinity due to site-specific factors. A survey for Indiana bats would also not be necessary if trees were removed from the site between October 15 and March 31, or if the project proponent chooses to enter into a Conservation MOA with the Service.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact James Gruhala at (502) 695-0468 extension 116.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

BURGESS & NIPLE

RECEIVED
SEP 14 2009
WIB

Mr. Mike Hasty
Louisville District
US Army Corps of Engineers
CELRL-OP-FS Room 752
PO Box 59
Louisville, Kentucky 40201-0059

Re: Regional Wastewater Facilities Plan for
City of Augusta, City of Brooksville and
Northern Bracken County
Bracken County, KY

September 10, 2009

Dear Mr. Hasty:

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

A wastewater 201 Facility Plan for Augusta, Brooksville and Northern Bracken County, Kentucky has been under review by Division of Water since 2005. The plan is nearing the approval stage but Division of Water reviewers have requested us send out letters to other agencies for input on the plan prior to the final approval.

The Plan reviewed alternatives to collect and treat wastewater in the planning area but generally concentrated on the Augusta and Brooksville areas. The selected alternative is the construction of a new treatment plant near Augusta with discharge to the Ohio River and transportation of wastewater from Brooksville to the new plant via pump stations and force mains along KY 19 roadway. Unsewered areas adjacent force main route will also be collected and connected to the force main.

We have included mapping which shows the anticipated location of the new wastewater treatment plant along KY 8 west of Augusta and the pump stations at Brooksville as well Chatam along KY 19. The attached mapping shows the northern portions of Bracken County. We are anticipating the force main linking Brooksville and Augusta will be within the previously disturbed area of the road right of way. The majority of the alignment will be along the newly relocated KY Route 19 from Brooksville to the AA Highway and just to the north of the AA Highway it will run along Old Route 19 down to the proposed wastewater treatment plant. Total length of force main in the project is approximately 8.3 miles of 10" and 8" pipe. Three pump stations will be constructed as part of the project, one in Brooksville, one in a low area near Chatam and one in Augusta. Additional smaller pump stations or individual user grinder pumps will be added to collect users along the force main route.

As the project progresses into the design phase, updated mapping will be developed and the force main alignment, pump station and wastewater treatment plant sites can be tied down to the exact location and reissued for your comments.

Please review the attached mapping and provide comments concerning the force main routing or the anticipated treatment plant site.

If there are any questions, do not hesitate to call.

Sincerely,

Donald W. Bezold

Cc. Hamid Beykzahdeh, DOW
Mayor Laycock, Augusta
Mayor Corlis, Brooksville

BURGESS & NIPLE

Mr. Mike Hardin
Kentucky Department of Fish & Wildlife Resources
#1 Sportsman Lane
Frankfort, Kentucky 40601

Re: Regional Wastewater Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

September 10, 2009

Dear Mr. Hardin:

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

A wastewater 201 Facility Plan for Augusta, Brooksville and Northern Bracken County, Kentucky has been under review by Division of Water since 2005. The plan is nearing the approval stage but Division of Water reviewers have requested us send out letters to other agencies for input on the plan prior to the final approval.

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As the project progresses into the design phase, updated mapping will be developed and the force main alignment, pump station and wastewater treatment plant sites can be tied down to the exact location and reissued for your comments.

Please review the attached mapping and provide comments concerning the force main routing or the anticipated treatment plant site.

If there are any questions, do not hesitate to call.

Sincerely,

Donald W. Bezold

Cc. Hamid Beykzahdeh, DOW
Mayor Laycock, Augusta
Mayor Corlis, Brooksville

BURGESS & NIPLE

Mr. Lee Andrews
U.S. Fish & Wildlife Service
330 West Broadway, Room 266
Frankfort, Kentucky 40601

Re: Regional Wastewater Facilities Plan for
City of Augusta, City of Brooksville and
Northern Bracken County
Bracken County, KY

September 10, 2009

Dear Mr. Andrews:

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

A wastewater 201 Facility Plan for Augusta, Brooksville and Northern Bracken County, Kentucky has been under review by Division of Water since 2005. The plan is nearing the approval stage but Division of Water reviewers have requested us send out letters to other agencies for input on the plan prior to the final approval.

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As the project progresses into the design phase, updated mapping will be developed and the force main alignment, pump station and wastewater treatment plant sites can be tied down to the exact location and reissued for your comments.

Please review the attached mapping and provide comments concerning the force main routing or the anticipated treatment plant site.

If there are any questions, do not hesitate to call.

Sincerely,

Donald W. Bezold

Cc. Hamid Beykzahdeh, DOW
Mayor Laycock, Augusta
Mayor Corlis, Brooksville

THE BRACKEN COUNTY NEWS
P.O. BOX 68
216 FRANKFORT STREET
BROOKSVILLE, KENTUCKY 41004

Phone : (606) 735-2198 Fax : (606) 735-2199

City of Augusta
P.O. Box 85
Augusta KY 41002

INVOICE DATE: 09/30/05
INVOICE NUMBER: B171

(Payment is due upon receipt of invoice. Please mark invoice number on check.)

DESCRIPTION	PRICE
9/1,8,15,22 Hearing (RFP) 2cx7	168.00
9/1/05 Heritage Days Schedule	20.00
9/29/05 Ord #2005-T-1 2cx14"	84.00
9/29/05 Ord #2005-T-2 2cx6.5"	39.00

BALANCE DUE: 311.00

Public Notices

NOTICE OF PUBLIC HEARING

(Pursuant to 401KAR5:006 Section 4 & 5; KRS-424, and 40CFR 25.5 & 6)

The City of Augusta, City of Brooksville, and Bracken County Fiscal Court have drafted a 20-year Regional Facilities Plan (RFP) containing waste water requirements for collection and treatment and its cost, within the planning area, as described therein, to be served. Interested citizens may obtain further information including copies of the draft RFP by contacting or calling between the hours of 8 a.m. and 4 p.m. on Monday to Friday: Gretchen Usleaman, City of Augusta, 219 Main Street, P.O. Box 85, Augusta, KY. 41002-0085, (606) 756-2183 or Sandra Reynolds, City of Brooksville, 101 Frankfort Road, P.O. Box 216, Brooksville, KY. 41004, (606) 735-2501.

Planning area includes the north portion of Bracken County from Brooksville to the Ohio River (area north of Route 10), with most activity in Augusta and Brooksville and along State Route 19 between Augusta and Brooksville.

A public hearing will be held on Thursday, September 22, at 5:30 p.m. at the Watson Community Building/ Brooksville City Building, 101 Frankfort St., Brooksville, KY. 41004 and at 7:30 p.m. at the City Office, 219 Main St., Augusta, KY. 41002. The purpose of the hearing is to discuss the draft plan and its contents, specifically the alternatives, project cost, financing sources, user charges and hook up tap on fee. This project may affect sewer rates. The public is encouraged to attend this meeting and shall have right to comment on the plan for a period of 30 days from the date of publication of this notice by writing to the above address or before the termination of the hearing whichever is later. A longer comment period may be requested in writing. All persons who believe any condition of the draft plan is inappropriate, inaccurate, incomplete, or otherwise not in the best interest of the public and environment must raise all reasonable issues and submit all reasonable arguments, facts, and comments with supporting documents to the above given contact person.

Bracken County Schools
Tax Rates
2005-2006

Tax Rates Per $100 Assessed Valuation

Real Estate	36.7 cents
Tangible Property	36.7 cents
Motor Vehicle	52.5 cents
Utilities Tax	3%

Aircraft (recreational & non-commercial) are exempted from the above rates.

NOTICE OF PUBLIC HEARING

The Public Service Commission of Kentucky will hold a hearing on September 22, 2005, at 9:00 a.m., Eastern Daylight Time, in Hearing Room 1 of the Commission's offices located at 211 Sower Boulevard in Frankfort, Kentucky, for the purpose of cross-examining witnesses in Case No. 2005-00242, which is an examination of the application of the Fuel Adjustment Clause of Kentucky Utilities Company from November 1, 2004 to April 30, 2005.

KENTUCKY UTILITIES COMPANY
220 West Main Street
Louisville, Kentucky

COMMONWEALTH OF KENTUCKY
TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
NOTICE TO CONTRACTORS

Sealed bids will be received by the Department of Highways in the Division of Contract Procurement on the 3rd Floor and/or the Auditorium located on the 1st Floor of the Transportation Cabinet Office Building, Frankfort, Kentucky, until 10:00 a.m., Daylight Saving Time on the 23 day of September, 2005, at which time bids will be publicly opened and read for the improvement of:

BRACKEN COUNTY: BRZ 0603 (190): PARINE PIKE (CR 1116) REPLACE BRIDGE AND APPROACHES AT NORTH FORK OF LICKING RIVER (MP 6.083) AT THE ROBERTSON COUNTY LINE (MP 6.183), A DISTANCE OF 0.26 MILES. ASPHALT SURFACE WITH GRADE & DRAIN.

The Department of Highways hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, Disadvantaged Business enterprises, will be afforded full opportunity to submit bids in response to this invitation, and will not be discriminated against on the grounds of race, color, or natural origin in consideration for an award.

Bid proposals for all projects will be available at the Division of Contract Procurement until 3:00 p.m. Daylight Saving Time, preceding the day of the letting of Friday, September 23, 2005. Bid proposals for all projects will be available at a cost of $10 each and remittance payable to the State Treasurer of Kentucky must accompany request for

Yard Sale

YARD SALE: Sat., Sept. 10 at 9 a.m. at Julie Moford's, 201 McNamara Lane, off of Reservoir Rd. Lots of toys (like new), toy box (like new), nic nacs, lots of misc. items, toddler bed, clothes - children's size 3T, 4T & some 7, lots of good stuff. 9-8-p

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OLE CURIOSITY SHOP, in Germantown, will be open Sat., Sept. 10 from 9-4 p.m. & Sun., Sept. 11 from 12-4 p.m. Antiques & Collectibles. 9-8-p.

YARD SALE: Thurs., Fri. & Sat. at 4369 Hwy. 10. Clothes, toys, dishes, furniture, & much more! 9-8-p

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3 FAMILY YARD SALE: Sat., Sept. 10 at 9 a.m. at 73 Liberty Drive across from Brooksville Meat Locker. Boy clothing - infant to size 6, baby furniture, lots of household items. 9-8-p

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3 FAMILY YARD SALE: Sept. 9 & 10 on KY. Hwy. 1019 next to Lenoxburg. Little bit of everything, homemade crafts, candles. Phone 747-5676. 9-8-p

---

YARD SALE: Sat., Sept. 10 from 8-? at 86 Jett Estates Circle, turn on 875 - 1 mile Germantown. Cancel if rain. 9-8-p

---

YARD SALE: Sat., Sept. 10 from 9-? Bertha Jones & family at Storage Plus, Hwy. 10 between Brooksville & Frogtown. Bookcases, sheets, clothes - men, women & children, glass door, window, lots of everything. 9-8-p

Taylor Elementary
Cheer Bear

Public Notices

NOTICE OF PUBLIC HEARING

Pursuant to 401KAR5:006 Section 4 & 5; KRS 424 and 40CFR 25.5 & 6)

City of Augusta, City of Brooksville, and Bracken nty Fiscal Court have drafted a 20-year Regional ilities Plan (RFP) containing waste water requirements collection and treatment and its cost, within the planning as described therein, to be served. Interested citizens obtain further information including copies of the draft by contacting or calling between the hours of 8 a.m. 4 p.m. on Monday to Friday: Gretchen Hampton, City ugusta, 219 Main Street, P.O. Box 87, Augusta, KY, 02-0085, (606) 756-2183 or Sandra Reynolds, City of ooksville, 101 Frankfort Road, P.O. Box 216, ooksville, KY. 41004, (606) 735-2001.

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Confidentiality Of Educational Records Public Notice

In accordance with the Family Education Rights and Privacy Act, written policies and procedures have been developed which describe the Bracken Co. School District's requirements regarding the confidentiality of personally identifiable information. Stated in this notice is a summary of your rights under the Act. These rights are passed on to the student at age eighteen. For the purpose of this notice, a student 18 years or older will be referred to as "eligible" student. Parents, guardians, and eligible students may review and inspect all education records relating to that student by making a request to the Principal of the school where that student attends.

The BCSD will presume that the parent has the authority to review and inspect records relating to their children unless the district has been advised in writing that the parent does not have legal authority under applicable state law governing such matters as guardianship, separation, and divorce.

Personally identifiable information is not released to another party unless there is written authorization from the parent or eligible student, or there is a "Legitimate Educational Interest" as defined in the policies and procedures for confidentiality. A current list of employees' names and positions who have access to personally identifiable information is on file in each school. The BCSD has described in its policies and procedures the conditions under which personally identifiable information is released to another person without written parental consent.

"Directory Information" is information contained in an educational record which would not generally be considered harmful or an invasion of privacy if disclosed. This information may be released to news media, athletic organizations, scholarship or college entrance committees, or official organizations whose need for data is connected with student help activities. "Directory Information" includes, but is not limited to the student's name, address, telephone listing, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended. The parent, guardian, or eligible student currently enrolled, may request all or part of the directory information be withheld. The request must be in writing to the Principal of your child's school, within 30 calendar days after this notification has been distributed. The written request must specifically state what information may not be classified as directory information.

In accordance with federal regulation concerning the release or transfer of educational records, it is the policy of this school district to forward education records on request to a school in

POSTED

No hunting, trespassing, or 4-wheeling on the McKenney land on #19 between Petra and Milford on Toadvine Rd. and on Moore Rd. (9-05)

No hunting or trespassing for any reason on the property of Dinah Westerfield on Rt. #1109 & Rt. 8 near Foster, KY. (9-05)

Private Property. No trespassing for any purpose on the Old Winery property in Augusta, as well as the land across on Rt. 19 from the Old Winery. D. Bird. (9-05)

Absolutely no trespassing or hunting on the property of Richard Zurline on Fords Ave. (Old Bullskin Rd.) at anytime. Violators will be prosecuted. (9-05)

No hunting, fishing, or trespassing of any kind on the 135 acres owned by Wally & Debbie Reinhart and Craig & Julie Reinhart between Stump & Mattox Rd. (9-05)

No hunting or trespassing on the John Wynocker farm located on Fords Ave. off Bull Skin Rd. All violators will be prosecuted to the full extent. (9-05)

Absolutely no trespassing or hunting of any kind on the 115 acres located at 4641 Augusta-Minerva Rd., former Roy Collins farm. This property is posted and violators will be prosecuted to the full extent. Anthony & Marilyn Noll. (10-05)

No hunting or trespassing on the family farms of Rose Mary Lawson at Powersville, Chaney Rd. and Jacobs Rd.

Absolutely no trespa hunting of any k property known as the farm located on Spark Willow. This prop posted and violators prosecuted to the full Louis J. Johnson.

No hunting, fish trespassing on property either on Oakland Hamilton Rd. belon Barry or Jackie Quack without express permission.

Absolutely no trespa any kind on the 75 ac of Mark Inloes located sides of the road o Ridge. Anyone caught fully prosecuted and a will be shot.

Private property hunting, fishing or tres for any purpose on the Dunn property on Old Rd. & Hall Rd. in Ro Co. Violators wi prosecuted.

No hunting or tres for any reason on pr owned on Belmon belonging to J. Rook Groeschen. Violators prosecuted. Dogs r loose will be shot.

No hunting or tres on property owned by Wietholter at 2898 Sna Rd., Foster.

Absolutely no trespa hunting of any kind on t acre farm of Jackie Ha 2248 Toadvine Rd.

Public Notices

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Notification of FERPA Rights

The Family Education Rights and Privacy Act (FERPA) affords parents and "eligible students" (students over 18 years of age or students who are attending a postsecondary institution) certain rights with respect to the student's education records. They are:

1) *The right to inspect and review the student's education records within forty-five (45) days of the day the District receives a request for access.*

Parents or eligible students should submit to the school Principal/designee a written request that identifies the record(s) they wish to inspect. The Principal will make arrangements for access and notify the parent or eligible student of the time and place where the record(s) may be inspected.

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Personally identifiable information is not released to another party unless there is written authorization from the parent or eligible student, or there is a "Legitimate Educational Interest" as defined in the policies and procedures for confidentiality. A current list of employees' names and positions who have access to personally identifiable information is on file in each school. The BCSD has described in its policies and procedures the conditions under which personally identifiable information is released to another person without written parental consent.

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In accordance with federal regulation concerning the release or transfer of educational records, it is the policy of this school district to forward education records on request to a school in which a student seeks or intends to enroll. Parents may obtain upon request a copy of the records transferred. The Bracken Co. Schools keeps child and youth records in a secure computer system and in locked files in each school and central office.

Any parent or guardian of a student, or any eligible student, may challenge the content or accuracy of any material or entries in the student's educational records on the grounds that it is inaccurate, misleading, or otherwise in violation of the privacy or other rights of the student. Requests to amend the records are submitted to the principal of your child's school.

For students who have been determined eligible for programs for children and youth with disabilities, educational records will be destroyed at the request of the parent when they are no longer needed to provide educational programs and services. The BCSD will destroy the educational records of a child or youth without a parent's request after the records have been

7.4.3 KY-9 Area

This alternative does not include any pump station and force main to serve the industrial park. It is not justified at this time due to current low flows at the park. Also, it should be otherwise funded, since the purpose of such a pump station and force main would be job creation. If a residential development were proposed, it would be expected that the developer would contribute to, or even construct this pump station and force main.

7.4.4 Cost Summary

Table 7-2 exhibits the estimate of costs. The estimated total project cost is $7,800,000. The estimated design flow annual O&M&R cost is $303,100 per year, as compared to the current sum of $248,000 for both communities. Since new customers could be added to the system, this cost could be spread further so as to lessen the impact to existing customers. Of course, to implement this system, a regional type sewer district would have to be established.

TABLE 7-2

ALTERNATIVE NO. 2
REGIONAL TREATMENT AT AN AUGUSTA
WASTEWATER TREATMENT PLANT
ESTIMATE OF COSTS

Construction and Project Costs

Item	Estimated Construction Cost	Year 20 Salvage Value
Brooksville to Augusta Pump Stations and Force Main		
Force Main	$2,090,000	$1,110,000
Brooksville Pump Station	225,000	19,000
Intermediate Pump Station	180,000	19,000
Subtotal	$2,495,000	$1,148,000
Mobilization (3%)	75,000	
Contingencies (10%)	250,000	115,000
Total Estimated Construction Cost	$2,820,000	$1,263,000

Pump Station Property	5,000	5,000
Temporary Easements	60,000	
Permanent Easements	120,000	
Project Related Costs (25%)	705,000	
Estimated Project Cost	$3,710,000	$1,268,000
Augusta Regional Wastewater Treatment Plant (650,000 GPD)		
Site Work and Control Building	$800,000	$300,000
Influent Pump Station	260,000	80,000
Screening and Grit Removal	155,000	19,000
Activated Sludge Aeration Tank	700,000	225,000
Final Clarifiers/RAS Pump Station	480,000	130,000
Ultraviolet Light Disinfection/Effluent Aeration	175,000	17,000
Aerobic Digester and Sludge Storage Tank	305,000	92,000
Subtotal	$2,875,000	$863,000
Mobilization (3%)	85,000	
Contingencies (10%)	290,000	85,000
Total Estimated Construction Cost	$3,250,000	$948,000
Pump Station Property	5,000	5,000
WWTP Property	25,000	25,000
Project Related Costs (25%)	810,000	
Estimated Project Cost	$4,090,000	$978,000
Total Estimated Project Cost	$7,800,000	
Total Estimated Salvage Value		$2,246,000
Total Estimated Project Cost per Gallon per Day Capacity ($7,800,000/(690,000 gpd))	= $11.30/GPD	

Annual Operating, Maintenance and Equipment Replacement Costs

Existing Augusta System Cost	$128,000 /yr.
Reduce Brooksville Cost to Collection System Only	30,000 /yr.
Pump Stations – Force Main Costs	
Labor	9,400
Power	28,000
Materials and Supplies	4,500
Equipment Replacement Fund	7,000

Augusta Regional WWTP Cost	
Additional Labor	8,600
Additional Power	24,000
Additional Materials & Supplies	4,600
Equipment Replacement Fund	14,000
Sludge Disposal (4¢/gallon)	45,000
Total Estimated Annual O&M&R	$303,100 /yr.

7.5 Alternative No. 3 – Regional Treatment at a Wellsburg Wastewater Treatment Plant

The concept of this alternative is to allow for the construction of a force main north of Brooksville along KY-1159 to Wellsburg, to allow for the collection of wastewater from residences along that road.

7.5.1 Wellsburg Wastewater Treatment Plant

The treatment plant would be located east of Wellsburg. The plant site in this location, still below the 100-year flood elevation, is at a slightly higher elevation than the site west of Augusta. The plant would be sized to treat a wastewater flow of 595,000 gpd, which includes 330,000 gpd for Augusta, 200,000 gpd for Brooksville and 65,000 gpd for rural areas. The industrial park, being too distant from the proposed force main, is not included.

7.5.2 Force Mains

Exhibit 7-2 shows this alternative schematically. Four pump stations would be needed to transport wastewater from Brooksville to Wellsburg. One, at the old wastewater treatment plant, one up the hill and in the City limits to overcome the change in elevation, one at KY-9 and KY-1159 intersection to push the wastewater over the hill south of Wellsburg and one at Wellsburg to transport the wastewater to the plant. A section of gravity sewer is included at KY-9 and KY-1159, so a small amount of commercial growth could be supported.

Homes along KY-1159 could be served by the new force main, but on a case by case basis as described for Alternative No. 2. There are more homes along KY-1159 near Brooksville. There is good potential to serve these with this alternative as these homes are close to town and are clustered closer together here as compared to other parts of the planning area.

CHAPTER 10 – RECOMMENDED PLAN

10.1 Recommended Plan

Exhibit 10-1 shows the recommended regional solution for wastewater collection, transport and treatment for the planning area. The treatment plant for Brooksville should be abandoned and the wastewater pumped to Augusta to a new regional wastewater treatment plant. In Augusta, the existing influent pump station should be replaced with a new one and the existing wastewater treatment plant abandoned. A future project recommended is the pump station and force main from the industrial park to the regional system. This should be constructed when sufficient development occurs so that the industrial park's package plant would be of insufficient capacity to treat the wastewater generated. Features of the initial recommended project to implement include the following;

- A new 465 gpm pump station located on the current Brooksville Wastewater Treatment property.
- A new 500 gpm pump station located next to Ky 19, just south of Chatham.
- A new 8 inch diameter force main from Brooksville along Ky 19 to the Ky 19 - Ky 9 intersection.
- A new 10 inch diameter force main laid north from Ky 9 alongside Ky 19 and Little Turtle Creek Road and then to the new regional wastewater treatment plant.
- A new 765 gpm pump station to replace Augusta's main pump station and a new 8 inch diameter force main to the new regional wastewater treatment plant.
- A new 690,000 gpd regional wastewater treatment plant.
- A new 15 inch diameter gravity outfall sewer to the Ohio River from the new regional wastewater treatment plant.

The new regional wastewater treatment plant uses technology that will not only provide a high quality effluent, but also one that has had most nitrogen removed. The effluent produced from this treatment plant should consistently produce an effluent with a water quality of $CBOD_5 \leq 5$ mg/l, TSS ≤ 10 mg/l, Ammonia N ≤ 1 mg/l and total nitrogen ≤ 5 mg/l. Exhibit 10-2 shows a schematic of the proposed plant. Plant features include;

- Gravity Grit Removal
- Mechanical Screen with standby bar rack

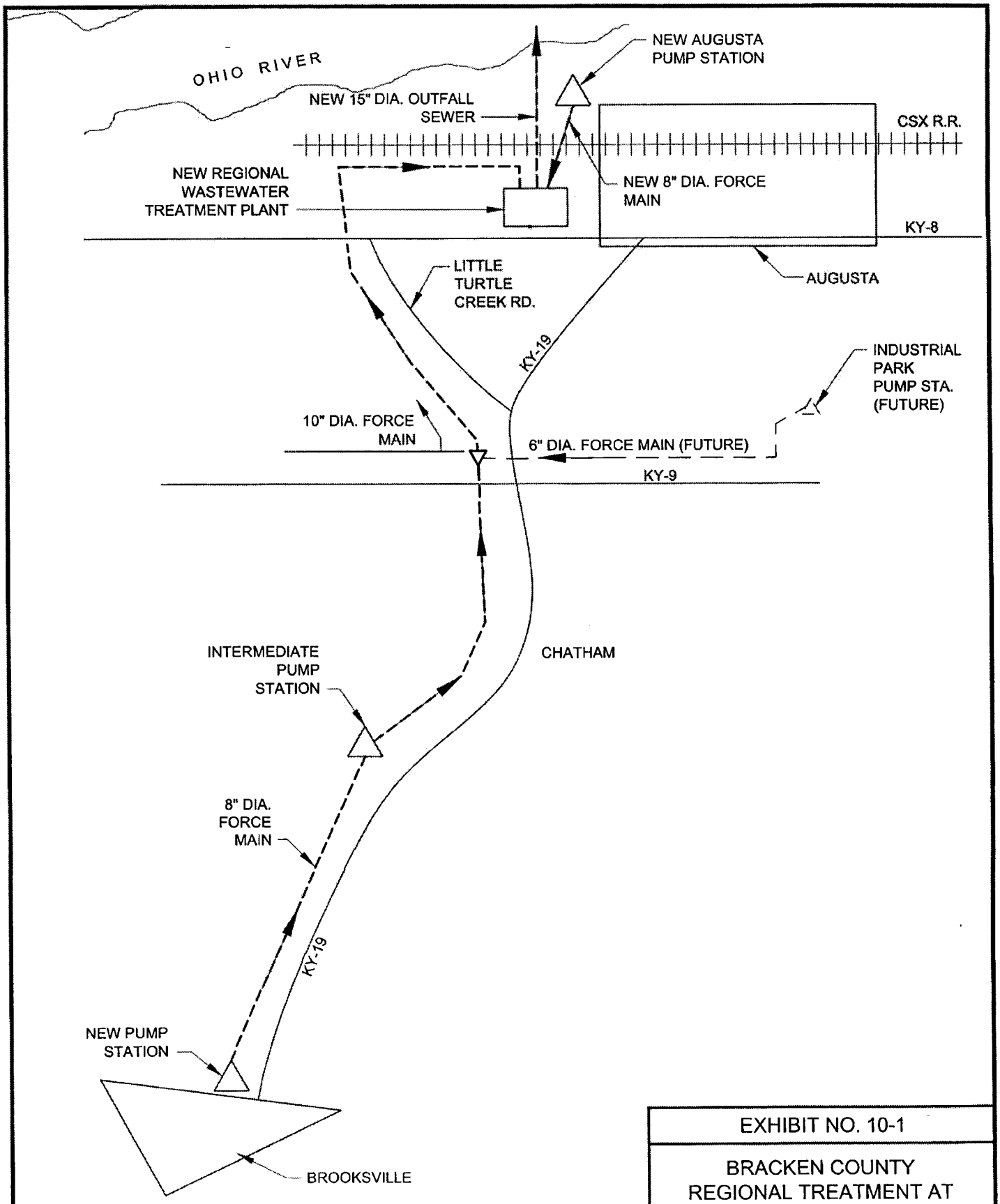
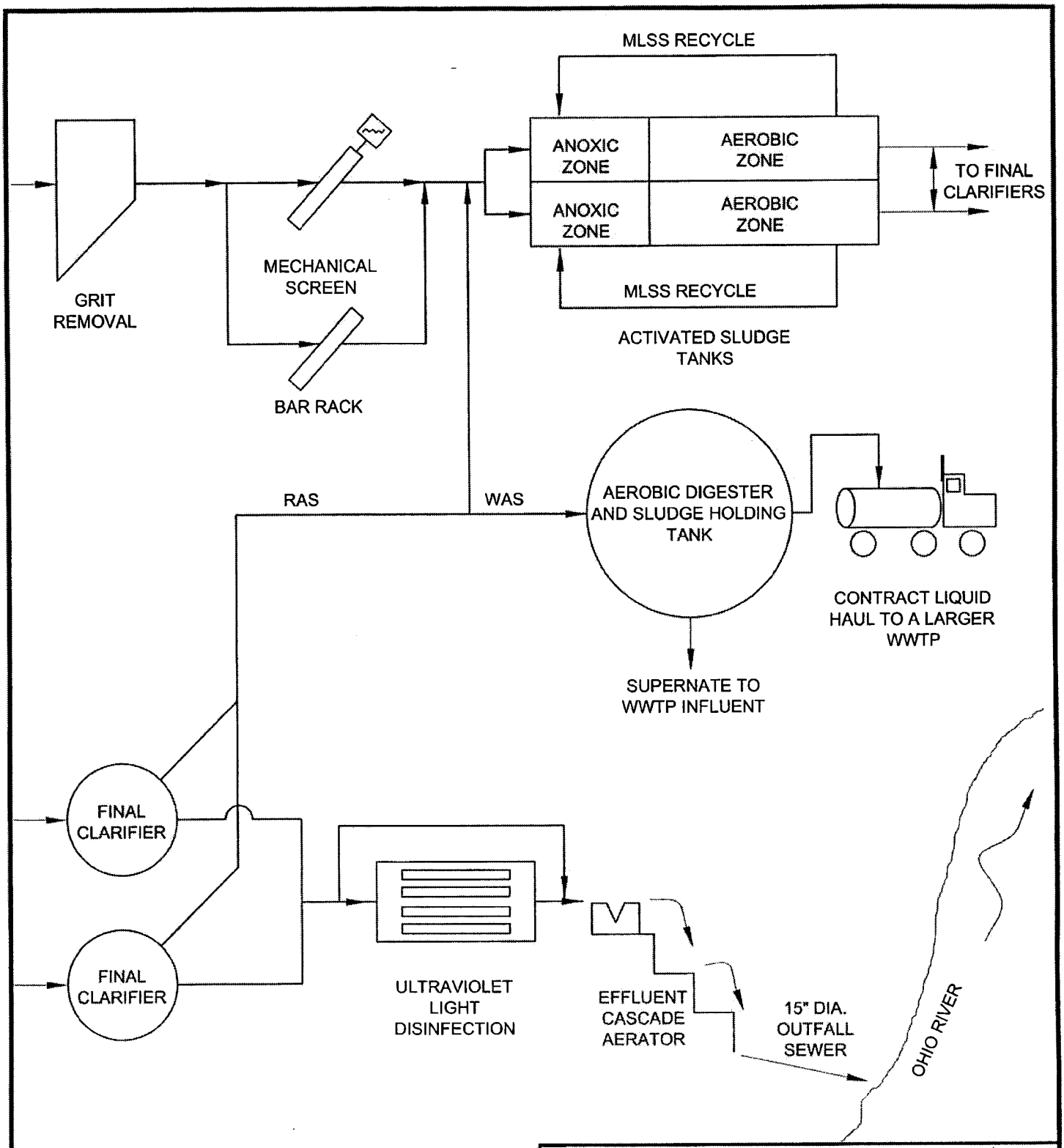


EXHIBIT NO. 10-1

BRACKEN COUNTY
REGIONAL TREATMENT AT
NEW AUGUSTA WWTP

BURGESS & NIPLE



NOTE:
ALL ITEMS SHOWN ARE PROPOSED.

EXHIBIT NO. 10-2

BRACKEN COUNTY REGIONAL WWTP
FLOW SCHEMATIC
SINGLE STAGE ACTIVATED SLUDGE PLANT
WITH BIOLOGICAL NITROGEN REMOVAL

BURGESS & NIPLE

- Two aeration tanks, each with an anoxic zone and an aerobic zone. Features include;
  - Anoxic zones having a nominal detention time of 4 hours
  - Aerobic zones having a nominal detention time of 19 hours
  - Two 880 gpm MLSS pumps
  - Two 450 scfm, 25 horsepower blowers
- Two 55 foot diameter final clarifiers
- Three 340 gpm RAS/WAS pumps
- Ultraviolet light disinfection
- Cascade aerator
- 195,000 gallon aerobic digester/sludge holding tank
- Tanker truck loading pad
- Control building built on top of the aeration tank structure

The construction cost for the new facilities are shown in previous report sections. The cost of pump stations and force mains from Brooksville to Augusta is $4,448,000 with an additional operation and maintenance cost of $53,100/yr. as shown in Table 7-2. The cost of the treatment plant, pump station and outfall sewer in Augusta is $4,920,000 with an additional operation and maintenance cost of $101,600/yr. as shown in Table 8-1.

10.2 Operation and Maintenance Requirements

Operation and Maintenance requirements will change. The operations of the Brooksville wastewater treatment will cease. Instead, the two pump stations to transport the wastewater to the regional treatment plant will have to be maintained. An operator would visit the pump stations once to three times weekly, depending on conditions, to record pump operating times, inspect the pump stations and perform housekeeping duties.

The proposed regional treatment plant in Augusta has more unit processes and pieces of equipment as compared to the current treatment plant. However, part time operation will still be sufficient at the plant. The plant should normally require about 4 hours of labor per day, 5 days per week. Work for that period of time would include record keeping, sampling, lab analysis for process control, equipment adjustments, inspection, housekeeping, sludge wasting, aerobic digester tank decanting and coordination with outside contractors. Additional time will have to be spent for periodic preventive maintenance activities and yard maintenance.

The cost effectiveness analysis in chapters 7 and 8 assumed design flows were occurring, which won't be the case during the first year of operation. Therefore, in computing revenue required to initially operate the system with fewer customers than full flow, the initial year O&M&R cost should be used. Table 10-1 is provided to show the expected initial year annual O&M&R cost.

TABLE 10-1

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
INITIAL YEAR ANNUAL O&M&R COST

Item	Design Flow Annual Cost	Factor for Initial Year	Initial Year Annual Cost
Existing Augusta Cost	-	-	$128,000 /yr.
Reduce Brooksville Cost for Collection System Only	-	-	30,000
Pump Stations – Force Main Costs			
Labor	$11,300	0.80	9,000
Power	28,000	0.40	11,200
Materials and Supplies	5,400	0.80	4,300
Equipment Replacement Fund	8,400	1.00	8,400
Regional WWTP Cost (Additional)			
Labor	10,300	0.80	8,200
Power	24,000	0.50	12,000
Materials and Supplies	5,500	0.80	4,400
Equipment Replacement Fund	16,800	1.00	16,800
Sludge Disposal	45,000	0.45	20,300
Estimated Initial Year Annual O&M&R Cost			$252,600 /yr.

The initial annual O&M&R cost to operate the system is estimated to be $252,600 per year. The current annual O&M&R cost to run Augusta and Brooksville systems now is about $248,000 ($128,000 and $120,000, respectively). Therefore, there is a slight increase in funding required for the initial O&M&R.

10.3 Financial Requirements

The revenue now generated in the Augusta sanitary sewer system is approximately $155,000 per year and in the Brooksville sanitary sewer system is approximately $116,000, for a total of about $271,000 per year. In calculating financial requirements to fund the system, existing bond retirement is not considered as both cities should have their bonds retired in the year 2008, and this project's payments can start, therefore, in the year 2011.

Several tables are provided to show the impact of financing methods including loans and grants from various sources. Table 10-2 shows a simple loan type financing using Kentucky's State Revolving Fund. Bracken County qualifies for the standard rate loan, which is 3%. The annual payment also includes a 0.2% payment on the unpaid balance of the loan. The revenue required is estimated to be 3.32 times the current revenue. Clearly grant funds are needed to make this project feasible.

TABLE 10-2

FINANCIAL REQUIREMENTS WITH 3% LOAN FROM THE STATE REVOLVING FUND

Item	Cost
Total Project Cost	$9,368,000
Estimated Annual Debt Retirement at 3% for 20 years (0.06722 x $9,368,000)	629,716 /yr.
Annual Payment on Principle, First Year (0.002 x $9,368,000)	18,736 /yr.
Initial Year O&M&R	252,600 /yr.
Total Annual Revenue Required	$901,052 /yr.
Current Revenue	271,000 /yr.
Revenue Increase Required	630,052 /yr.
Percent Increase in Revenue Required	232%
Multiplier Factor as Compared to Existing Revenue	3.32

Table 10-3 shows the monthly user cost breakdown of the capital and yearly treatment plant operation, maintenance and replacement costs based on various grant to loan ratios. A comparison to the existing sewer use fee is also shown. The average monthly household in Augusta and Brooksville uses approximately 6000 gallons per month. The average user fee as shown in Table 10-3 would range from $72.88 with a 100% loan to $32.74 with an 80% grant and 20% loan. A new sewer rate study should be completed following establishment of funding to determine new rates based on water usage records and residential versus commercial user information. Table 10-3 scenarios are based on existing customers presently using the Augusta and Brooksville sewer systems.

TABLE 10-3

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
MONTHLY COST PER FUNDING OPTIONS

	100% Loan	50/50 Grant/Loan	75/25 Grant/Loan	80/20 Grant/Loan		
Loan Amount	9,368,000	4,684,000	2,342,000	1,873,600		
Debt Service	629,677	314,838	157,419	125,935		
.2% loan service fee	18,736	9,368	4,684	3,747		
Debt Service Income required	648,413	324,206	162,103	129,683		
Estimated OM & R	244,200	244,200	244,200	244,200		
Total Revenue Required	892,613	568,406	406,303	373,883		
					Existing Augusta	Existing Brooksville
Unit Cost/1,000 Gals	$13.83	$8.81	$6.29	$5.79	$12.07	$15.79
Min Bill < 2000 gal	$27.66	$20.00	$18.00	$16.00	$14.14	$15.79
Bill for 4,000 Gals	$55.31	$35.22	$25.18	$23.17	$18.28	$24.89
Bill for 5,000 Gals	$69.14	$44.03	$31.47	$28.96	$20.35	$29.44
Bill for 6000 Gals	$82.97	$52.83	$37.77	$34.75	$22.42	$33.99
Bill for 7,000 Gals	$96.80	$61.64	$44.06	$40.55	$24.49	$38.54
Bill for 8,000 Gals	$110.63	$70.45	$50.36	$46.34	$26.56	$43.09

Loan - percentage rate 3 % term = 20 yrs (Based on State Revolving Loan financing)

Flow Estimate – Number of users =	882	Households		
Avg. water usage =	200.5	Gal/day/household	6,015	Gal/mo
	365	Days		
	64,549,520	Gal/year		

The possible funding sources to aid in the financing of the project are listed below. The list shows the various funding limits and interest rates currently being offered by the various organizations. If a regional treatment solution is approved, a joint application for funding would need to be completed by Augusta and Brooksville.

- Kentucky Infrastructure Authority – KIA – Various funding levels for grants through special State Legislature appropriation funds similar to Tobacco Funds. Loans are administered through Kentucky Division of Water State Revolving Loan Fund. Loan rates are currently at 3% for 20 years for the Bracken County area. A .2% annual loan servicing fee on the unpaid balance is charged on all loans. Tobacco Fund appropriation grants are usually limited to a maximum amount of $500,000.
- Community Development Block Grant – CDBG – $1,000,000 maximum grant, requires an income survey to determine eligibility 51% of the homes must be in the low to moderate income levels to qualify for the funding.
- USDA Rural Development – Funding levels are based on the 2000 census. Augusta is eligible for up to 45% grant and Brooksville is eligible for up to 75% grant. Actual loan to grant ratios over the last few years have been 65:35 and 70:30. Loan interest rates are currently at 4.25% for 40 years with the first 2 years being interest only payments. Loans require a debt coverage of 20% of annual cost for loan only financing and 10% of annual cost for loan/grant financing until a reserve of one year's payment is accumulated.
- Federal Budget Appropriation Grants – Grants are administered by Division of Water and are applied for through the local congressman. The grants range from 0 to 55% of the project cost depending on Congressional appropriation.

10.4 Sanitary Collection Systems

Renovation work is required on the sanitary sewer collection system in Augusta and Brooksville to reduce I&I as discussed in Chapter 4, Sections 4.2.2 and 4.3.2 of this report and the SSES report. This repair work as well as future I&I detection and repairs will require a means of financing. Since the search for funding of the regionalization may take several years to complete, it is recommended that the sewer repairs and search for additional I&I sources begin immediately. The funding of this work could be completed by increase in sewer user fee. If each city would concentrate on I&I removal projects over the next several years, many I&I sources could be corrected prior to the construction of the new treatment plant saving pumping cost and treatment capacity. Table 10-3 shows a cost breakdown of the repair work

along with the cost for additional search for undetected I&I sources. Work is assumed to be completed over a four year period. The table provides an estimate of the increase in monthly user fee required to complete the investigation work and repairs.

Table 10-4

AUGUSTA AND BROOKSVILLE, KY
SANITARY SEWER SYSTEM CORRECTIONS

Augusta

Work Description	Cost	Cost per year
I&I corrections	$52,800	$13,200
Manhole lid raising	$40,000	$10,000
Investigation & Future work		$24,000

Total = $47,200 / year

User cost increase - $47,200 / 560 customers / 12 mo. = $7.00 / mo.

Brooksville

Work Description	Cost	Cost per year
I&I corrections	$8,100	$2,025
Manhole lid raising and anchoring	$45,000	$11,250
Investigation & Future work		$19,000

Total = $32,275 / year

User cost increase – $32,275 / 434 customers / 12 mo. = $6.20 / mo.

A benefit of completing the additional sewer investigation work as soon as possible is that if substantial repair work is found to be necessary during the investigation, this repair work could be included in the overall financing of the regional treatment facility.

10.5 Schedule

The project is needed soon as the treatment plants do need replaced. However, the plants are currently in compliance with their KPDES permit limits, so time should be spent in obtaining low interest loans and grants. Also, time is needed in forming the legal entity to own and operate the expanded sewer system. It would be best for the two cities if the new loan payment could start in the year 2009, so that the existing bonds could be retired before taking on new debt. Table 10-5 shows the recommended schedule for this project.

TABLE 10-5

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
PROPOSED SCHEDULE

Task	Completion Date
I&I Investigation and Corrections	2005 - 2011
Obtain low interest loan and grant funding	October 1, 2010
Complete Design	October 1, 2011
Obtain Division of Water Approval	December 1, 2011
Receive bids	February 1, 2011
Award contracts and start construction	March 1, 2011
Complete construction	March 1, 2012
Complete start-up	May 1, 2012



BURGESS & NIPLE

RECEIVED
OCT 1 0 2007
FCB

Gary Johnson
Environmental Technologist II
Municipal Planning Section
Division of Water
14 Reilly Road
Frankfort, KY 40601

Re: Regional Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

October 8, 2007

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Johnson:

Attached are updated copies of the KPDES for the City of Augusta and the copy of the Resolution from the City of Brooksville.

The previous copy of the KPDES permit was not complete. The attached copy is a full permit copy. It is their existing permit even though the expiration date is listed at November 30, 2003.

The City of Brooksville ordinance attached is a clearer copy of the concurring resolution passed by the City of Brooksville.

Please review the attached information and let us know if there is additional information needed for your continued review of the Facilities Plan.

Sincerely,

Donald W. Bezold

RESOLUTION
OF
BROOKSVILLE, KENTUCKY

A RESOLUTION, in the name and on behalf of the residents of Brooksville, Kentucky, approving the City of Augusta and City of Brooksville and Northern Bracken County Plan dated June 2005.

BE IT RESOLVED BY THE CITY OF BROOKSVILLE, KENTUCKY, AS FOLLOWS:

WHEREAS, Brooksville, Kentucky desires to protect human health and the environment in the vicinity of Northern Bracken County, Kentucky and adjoining areas between City of Augusta and the City of Brooksville, Kentucky by providing a regional wastewater collection and transportation system meeting the State of Kentucky's requirements; and

WHEREAS, the Cities of Augusta and Brooksville, Kentucky have developed a plan to accomplish this goal as described in its 201 Facilities Plan dated June 2005; and

WHEREAS, the residents of the area to be served by the planned wastewater facilities have, during a Public Hearing on September 22, 2005, given general approval to the plan;

NOW, THEREFORE, BE IT RESOLVED that the City of Brooksville, Kentucky, endorse and approve this 201 Facilities Plan.

Publicly read and approved this 12 day of November, 2005

By City Council, Brooksville, Kentucky

John H. Corlis

Mayor
City of Brooksville

COMMONWEALTH OF KENTUCKY
COUNTY OF BRACKEN

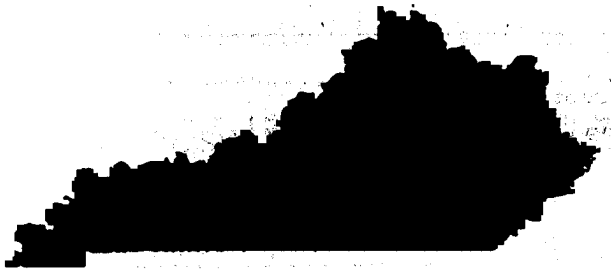
Witness my hand, this 12 day of November, 2005.

My Commission expires November 2008.

Sandra Reynolds

Notary Public

KPDES



KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT

PERMIT NO.: KY0021261

AUTHORIZATION TO DISCHARGE UNDER THE KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

Pursuant to Authority in KRS 224,

City of Augusta
P.O. Box 85
Augusta, Kentucky 41002

is authorized to discharge from a facility located at

Augusta Wastewater Treatment Plant
West Second Street
Augusta, Bracken County, Kentucky

to receiving waters named

Ohio River at mile point 554.3

in accordance with effluent limitations, monitoring requirements and other conditions set forth in PARTS I, II, and III hereof. The permit consists of this cover sheet, and PART I 2 pages, PART II 2 pages, and PART III 1 page.

This permit shall become effective on DEC 0 1 1998

This permit and the authorization to discharge shall expire at midnight,

NOV 3 0 2003

OCT 0 5 1998
Date Signed

Jack A. Wilson, Director
Division of Water

Robert W. Logan
Commissioner

10-03-'07 14:37 FROM-

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the term of this permit, the permittee is authorized to discharge from Outfall serial number: 001, Municipal Discharge.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS lbs/day Monthly Avg.	lbs/day Weekly Avg.	Other Units (Specify) Monthly Avg.	Other Units (Specify) Weekly Avg.	MONITORING REQUIREMENTS Measurement Frequency	Sample Type	Sampling Location
Flow, Design (0.330 mgd)	N/A	N/A	Report	Report	Continuous	N/A	Influent or Effluent
Biochemical Oxygen Demand (5-day)	82.6	124	30 mg/l	45 mg/l	1/Week	Composite	Influent & Effluent
Total Suspended Solids	82.6	124	30 mg/l	45 mg/l	1/Week	Composite	Influent & Effluent
Fecal Coliform Bacteria, N/100	N/A	N/A	200	400	1/Week	Grab	Effluent
Ammonia (as N)	55.0	82.5	20 mg/l	30 mg/l	1/Week	Composite	Influent & Effluent
Dissolved Oxygen shall not be less than 2 mg/l					1/Week	Grab	Effluent
Total Residual Chlorine (TRC)	N/A	N/A	0.019 mg/l	0.019 mg/l*	1/Week	Grab	Effluent
Additional Parameters				See PART I, Page I-2		Composite	Effluent

In addition to the specified limits, the monthly average effluent BOD_5 and suspended solids concentration shall not exceed 15% of the respective monthly average influent concentration (85% removal).
The pH of the effluent shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per Week by Grab sample.
There shall be no discharge of floating solids or visible foam in other than trace amounts.
The effluent shall not cause a visible sheen on the receiving water.
* Daily maximum limitation

T-076 P003/007 F-277

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUATION)

The effluent shall be monitored for the following parameters once per year by composite sample in both the total recoverable form and the dissolved form:

lead, copper, zinc, and cadmium.

The effluent shall be monitored for hardness as calcium carbonate ($CaCO_3$) by composite sample. Testing for these parameters shall be conducted according to 40 CFR Part 136.

Results shall be reported each year (See Part III-A. Page III-1).

B. SCHEDULE OF COMPLIANCE

The permittee shall achieve compliance with all requirements on the effective date of this permit.

STANDARD CONDITIONS FOR KPDES PERMIT

The permittee is also advised that all KPDES permit conditions in KPDES Regulation 401 KAR 5:065, Section 1, will apply to all discharges authorized by this permit.

This permit has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies.

It is the responsibility of the permittee to demonstrate compliance with permit parameter limitations by utilization of sufficiently sensitive analytical methods.

SPECIAL POTW REQUIREMENTS

NOTE: The following requirements apply only to Publicly-Owned Treatment Works.

1. Sludge Disposal

   Requirements will be imposed, as applicable, governing the disposal of sewage sludge in accordance with 401 KAR Chapters 30, 47, and 48.

2. Industrial Pretreatment Standards

   a. The permittee shall provide annual reports to the Permit Issuing Authority listing industrial users of the system and identifying any problems caused by these users. Yearly reports are due no later than December 31 of each year, unless otherwise specified by the permitting authority.

   b. The permittee may be required to develop a local pretreatment program to enforce the requirement of applicable industrial discharges to meet the Federal Categorical Standards of 40 CFR Part 403, and other requirements pursuant to state regulation 401 KAR 5:057, Section 6.

3. Prohibitive Discharges

   Under no circumstances shall the permittee allow discharge of the following into the system:

   a. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW);

   b. Pollutants which will cause corrosive structural damage to the POTW, but in no case, discharges with a pH lower than 5.0;

   c. Solid or viscous pollutants in amounts which will cause obstruction to the flow in sewers, or other interference with operation of the POTW;

   d. Any pollutant, including oxygen demanding pollutants (BOD_5, etc.), released in a discharge at such a volume or strength as to cause interference in the POTW;

e. Heat in amounts which will inhibit biological activity in the POTW, but in no case, heat in such quantities that the influent to the sewage treatment works exceeds 104° F (40° C);

f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and,

h. Any trucked or hauled waste, except at discharge points designated by the POTW.

PART III

OTHER REQUIREMENTS

A. Reporting of Monitoring Results

Monitoring results obtained during each month must be reported on a preprinted Discharge Monitoring Report (DMR) Form which will be mailed to you. Each month's completed DMR must be sent to the Division of Water at the address listed below (with a copy to the appropriate Regional Office) postmarked no later than the 28th day of the month following the month for which monitoring results were obtained.

Division of Water
Florence Regional Office
7964 Kentucky Drive, Suite #8
Florence, Kentucky 41042
ATTN: Mr. Kevin Flowers

Kentucky Natural Resources and
Environmental Protection Cabinet
Dept. for Environmental Protection
Division of Water
Inventory & Data Management
14 Reilly Road, Frankfort Office Park
Frankfort, Kentucky 40601

B. Reopener Clause

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under 401 KAR 5:050 through 5:080 and KRS 224, if the effluent standard or limitation so issued or approved:

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of KRS Chapter 224 when applicable.



BURGESS & NIPLE

Courtney Sitz
KPDES Branch
Division of Water
14 Reilly Road
Frankfort, KY 40601

Re: Regional Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

September 27, 2007

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Sitz:

We are requesting a wasteload allocation for a proposed wastewater treatment plant (WWTP) for the Northern Bracken County area which includes the City of Augusta and City of Brooksville. A Regional Treatment Facilities Plan for the area is being reviewed by Gary Johnson of Facilities Construction Branch and they have requested a wasteload allocation for the proposed treatment plant. The proposed WWTP will be sized at 690,000 gallons per day for treating Augusta, Brooksville and portions of Northern Bracken County for design flow year 2025.

As part of the facilities planning process several alternative type treatment plants as well as treatment plant locations were reviewed to determining the cost effectiveness of regionalizing the wastewater treatment plants in the area. Through the facilities planning process it was determined the existing plants for Augusta and Brooksville will be abandoned and a new regional WWTP will be constructed. Wastewater will be pumped to the new WWTP located downstream of Augusta on the Ohio River. Plant discharge will be to the Ohio River near the location of the existing Augusta plant. The actual location of the new WWTP will be further away from the river and above the 100 year flood elevation. It is anticipated that 2 pump stations will be required to pump Brooksville and surrounding area wastewater flow to the new WWTP near Augusta.

The recommended WWTP will consist of the following treatment units:

- Gravity grit removal
- Mechanical screen with standby bar rack
- Two aeration basins with each having an anoxic zone and an aerobic zone
- Two final clarifiers
- Three return and waste activate sludge pumps
- Ultraviolet light disinfection
- Cascade aerator
- Aerobic digestor/sludge holding tank
- Sludge tank truck loading area
- Control building

A copy of the recommended plan chapter of the facilities plan which gives size of units and further description is attached for further clarification of the proposed WWTP. Also attached is the existing WWTP flows and pollutant loads for the existing plants and the year 2025 wastewater flow projections for the regional WWTP. This information is part of the Facilities Plan currently under review.

We have attached a copy of a USGS 7.5 minute topographic map with the projected service area outlined, the proposed location of the new Wastewater Treatment plant and the discharge point for the plant. The discharge location will be very close to the existing Augusta WWTP outfall sewer. Since the mapping is larger than 11x17 we have included an electronic copy of the mapping in PDF format.

Please review the above information and let us know if there is any additional information needed.

Sincerely,

Donald W. Bezold

Cc. Mayor Corlis – City of Brooksville
Mayor High – City of Augusta
Doug Padgett – Buffalo Trace Area Development District

Augusta / Brooksville Planning Meeting

Feb. 12, 2009

CR# 204D @ 1:00 P.M.

Name	Organization	Phone #
Hamid Bylgadar	DOW	564-3410 Ext. 4822
Mortaza Tabayeh	DOW	564-3410-4826
Donald W. Bezold	Burgess & Niple	(513) 579-0042
MARK WILLIS		(859) 273-0557
Gary L. Riggs	Bracken Judge Exc.	606-735-2300
Kevin CORNETTE	Buffalo Trace Area Dev. District	606-564-6894
Cynthia Thompson	City of Augusta	606-756-2183/2663
mayor Wardell Hill	City of Augusta	606-75-3381
Anshu Singh	DOW	502-564-3410 x 4805
Courtney Seitz	DOW	502-564-3410 x 4914
Harold Sparks	DOW Engineering Section	502-564-3410 x 4823

City of
AUGUSTA
KENTUCKY
John F. Laycock
Mayor

219 Main Street
P.O. Box 85
Augusta, KY 41002

Phone: (606) 756-2183
Fax: (606) 756-2185
jlaycock@augustaky.com
www.augustaky.com

Meeting 7/29/09
CR # 204B

Recd: - WLA (New) ✓
- Planning area Map Phasing
- Cross Cutter letter

KY0021261

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the term of this permit, the permittee is authorized to discharge from Outfall serial number: 001, Municipal Discharge.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS lbs/day		DISCHARGE LIMITATIONS Other Units (Specify)		MONITORING REQUIREMENTS		
	Monthly Avg.	Weekly Avg.	Monthly Avg.	Weekly Avg.	Measurement Frequency	Sample Type	Sampling Location
Flow, Design (0.330 mgd)	N/A	N/A	Report	Report	Continuous	N/A	Influent or Effluent
Biochemical Oxygen Demand (5-day)	82.6	124	30 mg/l	45 mg/l	1/Week	Composite	Influent & Effluent
Total Suspended Solids	82.6	124	30 mg/l	45 mg/l	1/Week	Composite	Influent & Effluent
Fecal Coliform Bacteria, N/100	N/A	N/A	200	400	1/Week	Grab	Effluent
Ammonia (as N)	55.0	82.5	20 mg/l	30 mg/l	1/Week	Composite	Influent & Effluent
Dissolved Oxygen shall not be less than 2 mg/l					1/Week	Grab	Effluent
Total Residual Chlorine (TRC)	N/A	N/A	0.019 mg/l	0.019 mg/l*	1/Week	Grab	Effluent
Additional Parameters				See PART I, Page I-2		Composite	Effluent

In addition to the specified limits, the monthly average effluent BOD_5 and suspended solids concentration shall not exceed 15% of the respective monthly average influent concentration (85% removal).
The pH of the effluent shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per Week by Grab sample.
There shall be no discharge of floating solids or visible foam in other than trace amounts.
The effluent shall not cause a visible sheen on the receiving water.
* Daily maximum limitation

BURGESS & NIPLE

Charles D. Hockensmith
Staff Archaeologist
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

Re: Regional Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

September 28, 2007

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Hockensmith:

We have attached a map based on electronic copy of several USGS maps showing the alignment of the force main between Augusta and Brooksville. The various USGS maps being used are labeled at the seams between individual maps. We are anticipating the force main running within the road right of way. The majority of the alignment will be along the newly relocated Route 19 from Brooksville to the AA Highway and just to the north of the AA Highway it will run along Old Route 19 down to the proposed wastewater treatment plant located along the Ohio River.

Once the project progresses into the design phase, updated mapping will be developed and the force main alignment can be tied down. At this time, the proposed improvements can be reviewed especially if outside road right of way and in undisturbed areas.

Please review the attached mapping and let us know if there are any potential historical sites along Rte 19 that will need to be protected.

If there are any questions, do not hesitate to call.

Sincerely,

Donald W. Bezold

Donald W. Bezold

Cc. Gary Johnson, DOW

Beykzadeh, Hamid (EEC)

From: Beykzadeh, Hamid (EEC)
Sent: Tuesday, October 06, 2009 12:09 PM
To: 'Bezold, Donald'
Subject: RE: Bracken County 201 Facilities Planning

Thanks so please let email me the rest of the comments when you have them, (U.S. fish and wild life, Army Corp Eng and user charge per 4000 gallons). Thanks Donald.

From: Bezold, Donald [mailto:dbezold@burnip.com]
Sent: Tuesday, October 06, 2009 11:59 AM
To: Bezold, Donald; Beykzadeh, Hamid (EEC)
Cc: John Laycock; Doug Padgett; 'kcornette@btadd.com'; 'cityclerk@maysvilleky.net'
Subject: RE: Bracken County 201 Facilities Planning

Hamid,
See attached letter from US Fish and Wildlife . Once a specific site is located for the WWTP and pump stations a survey by a qualified person will be completed to determine if the Indiana bat or running buffalo habitat is present at the sites. This will be completed in the next phase of the project as previously discussed once funding has been determined, preliminary design begins and potential sites are selected.

We are still waiting on reports from KY Fish and Wildlife and Army Corps of Engineers comments.

The user charge information you requested today was included in the chapter 10 pricing revisions submitted at our meeting with you in July. We have attached another copy for your reference see page 10-8 (rev 072809).

If you know of any other items missing let us know.

Thanks,
Don Bezold
Burgess & Niple, Inc
(513)579-0042
(513)615-6040 cell

Note:
These electronic documents are provided by Burgess & Niple (B&N) as a convenience to our clients.
The official document is available as a manually signed, initialed, or sealed hard copy. If there is a discrepancy between electronic files and the hard copies, the hard copies shall prevail.
It is our professional opinion that this electronic information provides information current as of the date of its release. Any use of this information is at the sole risk and liability of the user. The user is responsible for updating information to reflect any changes in the information following the preparation date of this transmittal.
The delivery of this information in electronic format is for the benefit of the owner for whom the services have been performed. Nothing in the transfer should be construed to provide any right to third parties to rely on the information provided, or that the use of this information implies the review and approval of Burgess & Niple.

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
COMMERCE CABINET

Ernie Fletcher
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

George Ward
Secretary

Dr. Jonathan W. Gassett
Commissioner

November 28, 2006

Rob Baskett
Municipal Planning Section
Facilities Construction Branch
KY Division of Water
14 Reilly Road
Frankfort, KY 40601

RECEIVED
NOV 30 2006
FACILITIES CONSTRUCTION BRANCH

RE: Regional Facilities Plan
City of Augusta & City of Brooksville
Northern Bracken County, Kentucky

Dear Mr. Baskett:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) have received your request for the above-referenced information. The Kentucky Fish and Wildlife Information System indicates that no federal/state threatened and/or endangered fish and wildlife species are known to occur within close proximity to the project area. KDFWR does not anticipate impacts to fish and wildlife resources from the project. Please be aware that our database system is a dynamic one that only represents our current knowledge of the various species distributions.

The KDFWR recommends the following for the portions of the project that cross intermittent and perennial streams:

1. Development/excavation during a low flow period to minimize disturbance;
2. When crossing a stream, the pipe should be laid perpendicular to the stream bank to minimize the direct impacts to the streambed;
3. Proper placement of erosion control structures below highly disturbed areas to minimize entry of silt to the stream;
4. Return all disturbed instream habitat to its original condition upon completion of construction in the area, and;
5. Preservation of tree canopy overhanging the stream.

Our agency does not anticipate any major impacts from the proposed project. The project will improve/enhance water quality of the streams in the area.

I hope this information will prove useful to you. If you have any questions or require additional comment, please call me at (800) 852-0942, ext. 366.

Sincerely,

Doug Dawson

Doug Dawson
Wildlife Biologist III

cc: Environmental Section File

STEVEN L. BESHEAR
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

ROBERT D. VANCE
SECRETARY

R. Bruce Scott
COMMISSIONER

April 22, 2008

Mr. Donald W. Bezold
Burgess & Niple, Incorporated
312 Plum Street
12th Floor
Cincinnati, Ohio 45202-2678

Re: Regional Facilities Plan for Augusta,
Brooksville and Northern Bracken County
A.I. No.: 387
Bracken County, Kentucky

Dear Mr. Bezold:

This is in response to your September 27, 2007 letter requesting a waste load allocation (WLA) for a new 0.69 MGD wastewater treatment plant (WWTP). Per your correspondence, the existing plants for Augusta and Brooksville are to be decommissioned once the new regional WWTP is constructed. The WLA information is to be utilized in preparation of a Regional Wastewater Facilities Plan. Discharge from the new WWTP will be to mile point 553.9 of the Ohio River (mile point 427.5 ACOE convention), segment 08206.

The wastewater treatment facility must be designed to produce the following effluent limitations:

	May 1 - October 31	November 1 - April 30
$CBOD_5$	25 mg/l	25 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	20 mg/l	20 mg/l
Dissolved Oxygen	2 mg/l	2 mg/l
Total Residual Chlorine	0.011 mg/l	0.011 mg/l
Total Phosphorus	Monitor	Monitor
Total Nitrogen	Monitor	Monitor

Reliability Classification = Grade 3

In addition to the above limitations, the monthly geometric mean and weekly geometric mean values of E. Coli shall be at or below 130 colonies per 100 ml or 240 colonies per 100 ml, respectively, the year around. If a form of chlorine is proposed for wastewater disinfection, then de-chlorination will be required by your Kentucky Pollutant Discharge Elimination System (KPDES) permit. Additional effluent limitations and water quality standards are contained in the Division of Water Regulations.

These preliminary design effluent limitations are valid for one (1) year from the date of this letter, and are subject to change as a result of additional information which may be presented during the public notice phase of the KPDES permitting process. Please note that this letter does not convey authorization or approval to proceed with the construction or operation of the proposed wastewater treatment facilities. Construction and KPDES permit applications must be submitted to request such authorization. Nor does this letter ensure the issuance of either permit. During the review processes of these permits the Division of Water will

further evaluate the viability of the project.

Should you have any questions regarding this letter, please contact me at (502) 564-8158, extension 465 or e-mail at Courtney.Seitz@ky.gov.

Sincerely,

Courtney Seitz

Courtney Seitz, WLA Coordinator
KPDES Branch
Division of Water

CS:me
c: Facilities Construction Branch
Florence Regional Office
Division of Water Files



BURGESS & NIPLE

Hamid Beykzahdeh
KPDES Branch
Division of Water
200 Fair Oaks Lane
Frankfort, KY 40601

Re: Regional Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

August 19, 2009

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Beykzahdeh:

As a result of our meeting on July 29, 2009, attached is additional updated information on the Wastewater Collection and Treatment System 201 Facility Plan Update report for the City of Augusta, City of Brooksville and Northern Bracken County. The following items are being addressed in this letter or by attachment:

1. Additional mapping of the Planning Area showing 0-5 year, 5 to 10 year and 10 to 20 year planning. (Attached half size map of planning area with full size pdf electronic copy on CD). USGS information was removed to make the plan more readable.
2. Letter from Mr. Courtney Sitz dated August 3, 2009 updating regional treatment plant waste load allocation and effluent limitations for discharge to the Ohio River.
3. Letter to Charles Hockensmith with Kentucky Heritage Council requesting Cross Cutters update review. Initial review found no concern with force main along its routing since it will be within the previously disturbed areas within road right of way. The Planning Area maps attached as noted in item 1 above can be used for additional review for anticipated treatment plant and intermediate pump station location. The treatment plant site has not been finalized but is anticipated to be within the relative area indicated.
4. Ownership Agreement – See attached letter from Bracken County, City of Augusta and City of Brooksville agreeing to joint ownership and maintenance responsibilities.
5. Per our recent discussions concerning the proposed regional treatment plant location and new antidegradation policy, the facilities plan as submitted did review alternate wastewater treatment plant WWTP locations. The Facilities plan looks at four alternatives, no action, separate new WWTP's at Brooksville and Augusta, and regional WWTP's at Augusta or Wellsburg. The no action alternative reviewed the consequences of maintaining the existing plants in Augusta and Brooksville as they now exist. The separate plant alternative looked at the construction of two new plants one in Brooksville and one in Augusta. The new WWTP for Brooksville would be in the approximate same location as the existing plant and discharge to the same low flow small stream as the existing plant resulting in a required higher quality effluent permit limitations. The WWTP for Augusta would require relocation since the existing plant is prone to flooding but discharge would still be to the Ohio River. The last two alternatives are regional

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treatment plants treating sewage from both cities as well as collecting existing development flows along the route between Brooksville, Augusta and the regional treatment plant. One plant would be located at Augusta and the other near Wellsburg down river from Augusta. The alternative comparison found the regional plant in Augusta to be the most beneficial for the planning area. From this information, you can see that alternative sites were reviewed as part of the facilities plan under review and new and different location alternatives seem redundant and unnecessary. WWTP outfall to the Ohio River as noted in the selected alternative would seem the most beneficial in reducing degradation of the smaller streams. It is our belief that this alternative analysis complies with the antidegradation regulations set forth in 401KAR10:030 Antidegradation Policy Implementation Methodology - Section 1 paragraph 3.b.1.c & 3.b.2.b as amended June 9, 2009 and that no other alternative analysis is warranted.

Please review the information and let us know if additional information is needed or if the Facility Plan with the attached information is acceptable.

Sincerely,

Donald W. Bezold

Cc. Mayor Laycock – City of Augusta
Mayor Corlis – City of Brooksville
Kevin Cornette – Buffalo Trace Area Development District

August 3, 2009

Division of Water
Frankfort, KY

RE: Bracken County 201 Facilities Plan
System Ownership and Management

Dear

The Cities of Augusta and Brooksville and the Bracken County Fiscal Court will share ownership and operation responsibilities of the proposed Waste Water Treatment Plant and collection system. It is our agreement that once the Facilities Plan is approved and funding has been approved, either a Sanitation District or Utility Commission will be formed to oversee the system.

Per our discussions on July 29, 2009, we are submitting this letter of agreement to help satisfy the ownership and management requirement of the submitted 201 Facilities Plan.

Sincerely,

John Laycock, Mayor	John Corlis, Mayor	Gary Riggs, Judge/Exec.
City of Augusta	City of Brooksville	Bracken County

STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

August 3, 2009

Mr. Donald W. Bezold
Burgess & Niple, Incorporated
312 Plum Street
12th Floor
Cincinnati, Ohio 45202-2678

Re: Waste Load Allocation (WLA) Update Request
Regional Facilities Plan for Augusta,
Brooksville and Northern Bracken County
Bracken County, Kentucky

Dear Mr. Bezold:

This is in response to your July 28, 2009 letter, requesting an updated WLA for the subject facility. A WLA was previously provided in Division of Water correspondence dated April 22, 2008. The design capacity of the proposed WWTP is to be 0.69 MGD, with discharge to mile point (mp) 553.9 of the Ohio River (mp 427.5 ACOE convention), segment 08206. The WLA information provided will be utilized in preparation of a Regional Wastewater Facilities Plan.

Effluent limitations applicable to the subject facility are stated below. The requirements specified are the same as those previously provided in DOW correspondence dated April 22, 2008, with the exception that limitations for BOD_5 and total residual chlorine have been corrected.

Parameter	May 1 - October 31	November 1 - April 30
BOD_5	30 mg/l	30 mg/l
Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	20 mg/l	20 mg/l
Dissolved Oxygen	2 mg/l	2 mg/l
Total Phosphorus, mg/l	Monitor	Monitor
Total Nitrogen, mg/l	Monitor	Monitor
Total Residual Chlorine	0.019 mg/l	0.019 mg/l

Reliability Classification = Grade 3

In addition to the above limits, the monthly average and maximum weekly average values of Escherichia coli shall be at or below 130 colonies per 100 milliliters or 240 colonies per 100 milliliters, respectively, the year around. Additional effluent limitations and water quality standards are contained in the Division of Water Regulations.

These preliminary design effluent limitations are valid for one (1) year from the date of this letter, and are subject to change as a result of additional information which may be presented during the public notice phase of the KPDES permitting process. Please note that this letter does not convey authorization or approval to proceed with the construction or operation of the proposed wastewater treatment facilities. Construction and KPDES permit

applications must be submitted to request such authorization. Nor does this letter ensure the issuance of either permit. During the review processes of these permits the Division of Water will further evaluate the viability of the project.

Should you have any questions regarding this correspondence, please contact me at (502) 564-8158, extension 4914 or E-mail at Courtney.Seitz@ky.gov.

Sincerely,

Courtney Seitz

Courtney Seitz, WLA Coordinator
Surface Water Permits Branch
Division of Water

CS
c: Compliance and Technical Assistance
Branch, Florence Section
Anshu Singh, Water Infrastructure Branch
Division of Water Files

BURGESS & NIPLE

Charles D. Hockensmith
Staff Archaeologist
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

Re: Regional Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

August 11, 2009

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Hockensmith:

We are requesting an update to the original historical site review of this project dated October, 2007. This facility plan has been in for review with Division of Water since that time and is nearing the approval stage but Division of Water reviewers have requested an update to your review.

We have included updated mapping which shows the anticipated location of the new wastewater treatment plant along KY 8 west of Augusta and as well as a new pump stations adjacent to KY 19 near Chatam. The attached mapping shows the northern portions of Bracken County. As previously stated we are anticipating the force main linking Brooksville and Augusta running within the road right of way. The majority of the alignment will be along the newly relocated Route 19 from Brooksville to the AA Highway and just to the north of the AA Highway it will run along Old Route 19 down to the proposed wastewater treatment plant located along the Ohio River.

Once the project progresses into the design phase, updated mapping will be developed and the force main alignment, pump station and wastewater treatment plant sites can be tied down to the exact location and reissued for your review.

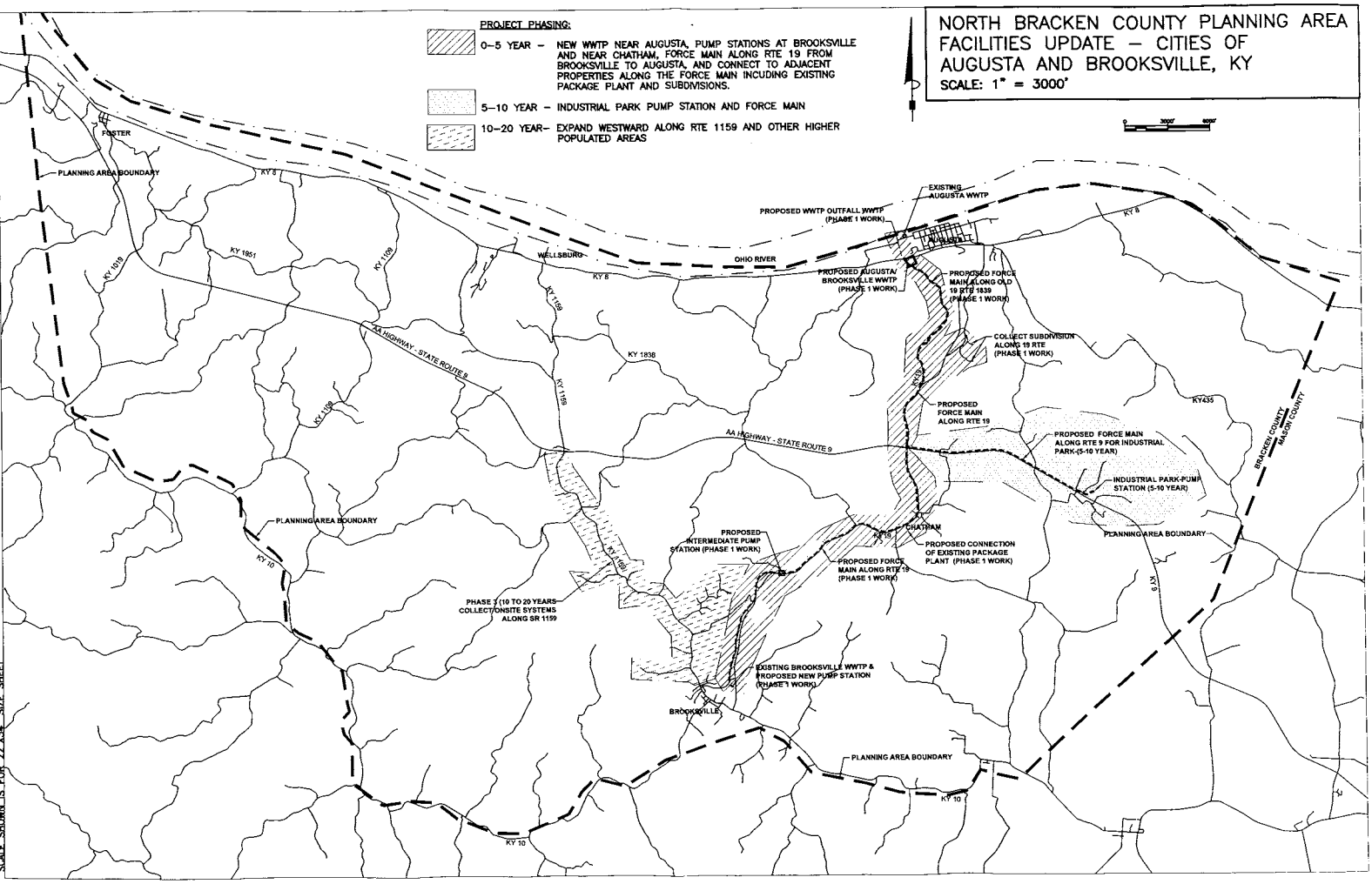
Please review the attached mapping and let us know if there are any potential historical sites along Rte 19 or at the anticipated treatment plant site that will need to be protected.

If there are any questions, do not hesitate to call.

Sincerely,

Donald W. Bezold

Cc. Hamid Beykzahdeh, DOW
Mayor Laycock, Augusta
Mayor Corlis, Brooksville


PROJECT PHASING:
0–5 YEAR – NEW WWTP NEAR AUGUSTA, PUMP STATIONS AT BROOKSVILLE AND NEAR CHATHAM, FORCE MAIN ALONG RTE 19 FROM BROOKSVILLE TO AUGUSTA, AND CONNECT TO ADJACENT PROPERTIES ALONG THE FORCE MAIN INCUDING EXISTING PACKAGE PLANT AND SUBDIVISIONS.
5–10 YEAR – INDUSTRIAL PARK PUMP STATION AND FORCE MAIN
10–20 YEAR– EXPAND WESTWARD ALONG RTE 1159 AND OTHER HIGHER POPULATED AREAS
NORTH BRACKEN COUNTY PLANNING AREA FACILITIES UPDATE – CITIES OF AUGUSTA AND BROOKSVILLE, KY
SCALE: 1" = 3000'
FOSTER
PLANNING AREA BOUNDARY
KY 8
KY 1951
KY 1019
KY 1109
WELLSBURG
OHIO RIVER
EXISTING AUGUSTA WWTP
PROPOSED WWTP OUTFALL WWTP (PHASE 1 WORK)
AUGUSTA
PROPOSED AUGUSTA/ BROOKSVILLE WWTP (PHASE 1 WORK)
PROPOSED FORCE MAIN ALONG OLD 19 RTE 1839 (PHASE 1 WORK)
COLLECT SUBDIVISION ALONG 19 RTE (PHASE 1 WORK)
KY 1159
KY 1838
AA HIGHWAY - STATE ROUTE 9
KY 1839
PROPOSED FORCE MAIN ALONG RTE 19
KY435
PROPOSED FORCE MAIN ALONG RTE 9 FOR INDUSTRIAL PARK-(5-10 YEAR)
INDUSTRIAL PARK PUMP STATION (5-10 YEAR)
BRACKEN COUNTY/ MASON COUNTY
PLANNING AREA BOUNDARY
KY 10
PROPOSED INTERMEDIATE PUMP STATION (PHASE 1 WORK)
KY 1839
CHATHAM
PROPOSED CONNECTION OF EXISTING PACKAGE PLANT (PHASE 1 WORK)
PROPOSED FORCE MAIN ALONG RTE 19 (PHASE 1 WORK)
KY 1839
KY 9
PHASE 3 (10 TO 20 YEARS COLLECT/ONSITE SYSTEMS ALONG SR 1159
EXISTING BROOKSVILLE WWTP & PROPOSED NEW PUMP STATION (PHASE 1 WORK)
BROOKSVILLE
PLANNING AREA BOUNDARY
KY 10
KY 10



SCALE SHOWN IS FOR 22"X34" SIZE SHEET

Beykzadeh, Hamid (EEC)

From: Beykzadeh, Hamid (EEC)
Sent: Friday, September 11, 2009 7:43 AM
To: 'John Laycock'
Subject: RE: Augusta, Bracken Regional Waste Water Management Study

Dear Mayor,
I talked to Don and send him our new regulations about Anti-Deg about two weeks ago regarding the site location and the other items were discussed were cross-cutters, and public hearing and I am waiting to receive those items. Please let me know if you have any questions. My number is 502-564-3410 ext.4822.

From: John Laycock [mailto:jlaycock@augustaky.com]
Sent: Thursday, September 10, 2009 9:01 PM
To: Beykzadeh, Hamid (EEC)
Subject: Augusta, Bracken Regional Waste Water Management Study

Dear Mr. Beykzadeh,

I just wanted to drop you a quick line and check on the progress of our study. Is there any other information that you need? Hope all is well please let me know if I can do anything. I hope you have received the updated information from Don if not please let me know

Thanks

John Laycock
Mayor, City of Augusta

5. If the permit applicant does not accept the effluent limitations required by subparagraphs 2 and 3 of this paragraph, the applicant may request water quality based limitations permitted at standard design conditions. In making this request, the applicant shall demonstrate to the satisfaction of the cabinet that no technologically or economically feasible alternatives exist and that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the water is located. For purposes of this administrative regulation, the approval of a POTW's regional facility plan pursuant to 401 KAR 5:006 shall demonstrate compliance with the alternatives analysis and socioeconomic demonstration for a regional facility. The alternatives analysis and socioeconomic demonstration shall consider the following:

a. Discharge to other treatment facilities;
b. Use of other discharge locations;
c. Water reuse or recycle;
d. Process and treatment alternatives;
e. On-site or sub-surface disposal;
f. Any other examination of alternatives to lowering water quality to which the cabinet and the applicant can agree;
g. The positive or beneficial effect of the facility on an existing environmental or public health problem;
h. The increase or avoidance of a decrease in employment;
i. The increase in production level;
j. The increase in operational efficiency;
k. Industrial or commercial benefit to the community; and
l. Any other economic or social benefit to the community.

6. A permit applicant who has failed to demonstrate to the satisfaction of the cabinet the necessity for lowering water quality shall meet the effluent limitations required by this paragraph and additional requirements of the Kentucky Pollution Discharge Elimination System program.

7. A permit applicant who demonstrates to the satisfaction of the cabinet the necessity for lowering water quality shall meet the water quality based limitations as outlined in 401 KAR 5:031.

ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LAJUANA S. WILCHER
SECRETARY

July 24, 2006

Mr. David Morgan
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

Mr. Lee Andrews
U.S. Department of the Interior
3761 Georgetown Road
Frankfort, Kentucky 40601

Mr. Mike Hardin
Kentucky Department of Fish & Wildlife Resources
#1 Sportsman Lane
Frankfort, Kentucky 40601

Col. Dana R. Hurst
U.S. Army Corp of Engineers
502 Eighth Street
Huntington, WV 25701

Re: Regional Facilities Plan for
City of Augusta & City of Brooksville
Northern Bracken County, Kentucky

Dear Sirs:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, has received a Wastewater Facilities Planning document, which proposes the following described project:

Two cities of Northern Bracken County have proposed to solve their wastewater needs collectively by building a new regional wastewater treatment plant in Augusta and a force main connecting Brooksville to Augusta. Augusta and Brooksville currently have treatment plants that are in poor condition due to age and corrosion. A Sewer System Evaluation Survey (SSES) was completed to asses the inflow and infiltration condition in northern Bracken County. The cities have committed to repair current problems in the system, instead of constructing a new sewer system. The project calls for three new pump stations, two facilitating Brooksville effluent to Augusta and one to replace Augusta's current main pump station. The cities will be connected by an 8 inch force main from the new Brooksville pump station, along KY-19, to the KY-19 and KY-9 intersection. The force main will expand to 10 inches and follow KY-19 to Little Turtle Creek Rd. to the new regional wastewater treatment plant. The plan also considers the possibility of a pump station and force main to accommodate the new industrial park when needed.

Please provide us with written comments or concerns you may have regarding this project. This project will result in an improvement in water quality in the local area. If we do not hear from you in thirty days, we will assume you have no comments.

If you have any questions or need further information about this project, please contact Rob Baskett at (502) 564-3410, extension 460.

Sincerely,

Rob Baskett
Municipal Planning Section
Facilities Construction Branch
Division of Water

STATE PLANNING AND ENVIRONMENTAL ASSESSMENT REPORT
(SPEAR)
City of Augusta, City of Brooksville & Northern Kentucky, Bracken County, Kentucky
AI #387; PLN

A. Proposed Project and Funding Status

0.69

Proposed Facilities: The proposed project consists of the construction of a new ~~0.9~~ MGD wastewater treatment plant (WWTP), a new force main collecting wastewater from Brooksville and inflow and infiltration (I&I) rehabilitation. The need for this project is heavily influenced by the poor condition of the current WWTPs and the excessive I&I problems. The improvements are as followed:

Phase I (0-5 years): This phase includes the I&I correction and a new Augusta WWTP project. A Sewer System Evaluation Survey (SSES) was completed and found approximately 75% of I&I could be removed from the current system. During this phase the Brooksville WWTP will be abandoned with the wastewater being pumped to a new Augusta WWTP. This consists of replacing the Augusta influent pump station (PS) with a new one and constructing a new WWTP that will handle the flows of both Augusta and Brooksville. The major components of this project include a new 0.69 MGD regional WWTP, a new 465 gpm PS at Brooksville WWTP, a new 500 gpm PS south of Chatham next to KY 19, a new 8" force main (FM) from Brooksville along KY 19 to KY 9 intersection, a new 10" FM from KY 9 to the new WWTP, a new 765 gpm PS with a new 8" FM to the new WWTP to replace Augusta PS, a new 15" gravity outfall sewer to the Ohio River from the new WWTP.

The estimated cost for I&I correction is approximately $52,800 for Augusta and $8,100 for Brooksville. The estimated cost for the new Augusta WWTP project is $7,800,000.

The engineering firm that prepared the facilities plan is Burgess and Niple. The project is located in the Buffalo Trace Area Development District and within the area covered by the Florence Regional Office of the Division of Water (DOW).

Funding Status: The Cities of Augusta and Brooksville intend to fund Phase I of the project through a variety of possible loans and grants. They are currently looking at sources such as Kentucky Infrastructure Authority (KIA) grants, state revolving fund loans, Community Development Block Grant (CDBG), USDA Rural Development Loans and Federal Appropriation Grants.

B. Existing Environment

Topography and Soils: The topography of the planning area is generally hilly with narrow ridges and steep slopes to thin bed plains. A portion of the northeast and central portions of the planning area is comprised of slightly wider ridge tops with steep slopes to thin stream bed plains. There is a 450 feet elevation difference between the southern

portions of the planning area and northern portions. Ground elevations at the geographic divide in the southern portion of the planning area near Brooksville reach elevations around 950 feet and elevations to the north near the Ohio River in Augusta are 505 feet.

Soils in the planning area are generally one of three types, Wheeling-Nolin-Otwell, Lowell-Nicholson or Eden. The Wheeling-Nolin-Otwell soils are deep, very level, well drained and have loamy subsoils. This soil type is located adjacent to the Ohio River on the north side of the planning area. Lowell-Nicholson soils are deep to very deep, gently sloping to moderately steep, well to moderately drained with clayey or loamy subsoils located on ridge tops and upper side slopes. The Lowell-Nicholson soils are located on ridge tops and under side slopes. The Eden soils are moderately deep, sloping to very steep, well to moderately drained with clayey subsoils found on ridge tops and side slopes. The Eden soil is the most prevalent soil type in the planning area. Depending on the thickness of the soil and underlying subsoils on-site sewage disposal systems can and are being used in Bracken County. If percolation tests show soils will be inadequate for discharge due to inability to percolate to subsoils either a residential package extended aeration treatment plants are used or additional soil is imported with good percolation rates and leaching chambers are used. These are the common methods used in Bracken County for small individual treatment systems.

Surface Waters: The planning area is located within the Licking Basin Management Unit and the Ohio Brush-Whiteoak watershed (HUC8 05090201).

The Augusta WWTP discharges to the Ohio River at mile point 553.9, which has a 7 day-10-year low flow of 10,600 cubic feet per second (cfs). There are impaired streams listed on the *2008 Integrated Report to Congress on Water Quality in Kentucky.* Locust Creek from mile point 0-4.1 is not supporting of primary contact recreation due to fecal coliform with the source unknown. This section of Locust Creek fully supports warm water aquatic habitat. Locust Creek from mile point 4.1-12.2 is not supporting of warm water aquatic habitat with both the source and cause unknown. Goose Creek 0-1.9 partially supports warm water aquatic habitat with the cause unknown due to surface mining and natural sources. Snag Creek from mile point .5-5.5 is not supporting of primary contact recreation due to fecal coliform with the source unknown. Bracken Creek from mile point 2.8-11 is partially supporting warm water aquatic habitat with nutrient/eutrophication biological indicators as the cause due to animal feeding operations, grazing in riparian or shoreline zones, and crop production.

Groundwater: Groundwater is most prevalent along the Ohio River flood plain area with water wells supplying the county water system in this aquifer near Augusta. In the southern portion of the planning area, soil is covering limestone bedrock preventing the collection of groundwater. The planning area slopes to the north and surface waters drain steeply to the Ohio River.

C. Existing Wastewater Facilities

Augusta Treatment Plant

The wastewater treatment plant is located on the west side of Augusta on a one acre lot. The wastewater is pumped to the plant by means of a wetwell/drywell canned pump station located at the intersection of Ferry Street and Augusta-Berlin Pike. Sewage is treated at the WWTP to meet the requirements of the plant's KPDES discharge permit KY0021261. The treatment plant is designed for an average wastewater flow of 0.33 MGD and a peak flow of 0.72 MGD. Treated effluent is discharged to the Ohio River via a ten inch diameter outfall line.

The plant consists of one round package type plant, constructed above grade for the purpose of flood protection from the Ohio River. The package plant includes a raw wastewater screen and comminuter, an originally designed contact stabilization activated sludge aeration tank, final clarifier, effluent chlorination and dechlorination, effluent flow measurement, and aerobic digester. Two sand type sludge drying beds are also provided on the site. The plant does not meet current Kentucky regulatory requirements due to the single process train and a backup is necessary.

The WWTP received violations for Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD). These violations were attributed to an event that occurred in November of 2003, where the final clarifier could not contain the mixed liquor sent to it. It has also received multiple violations due to the chlorine content of the effluent. The package treatment plant, being 25 years old and constructed of steel, is in poor condition. The building is functional in keeping the equipment out of the weather and minimizing noise to the neighborhood from the blowers. The plant will be decommissioned and replaced by a new 0.69 MGD WWTP.

Augusta Collection System

The city of Augusta sanitary sewer collection system was mostly constructed in the 1930's. In 1980, the collection system was extended to cover more of the city and connected to the treatment plant. The older portion of the collection system is composed of 8" and 10" clay tile pipe with brick manholes. The new sections consist of precast concrete manholes with clay or PVC pipe with gasket joints. The system has five small pump stations ranging in pumping capacities of 40 to 500 gallons per minute (gpm).
A Sewer System Evaluation Survey (SSES) was completed as part of the facility plan update. The water usage per capita was found to be 92 gpd, while the treatment plant receives 123 gpd. The peak daily flow per capita based on treatment plant flow data in a 12 month period is 745 gpd, this is 2.7 times the 275 gpd standard. The SSES found that Augusta's I&I problems would be considered excessive. The SSES also found that many of the deficiencies were direct connections to the sanitary sewer system. It is anticipated that 75% of the I&I problems could be removed, though additional I&I detection work is needed.

Brooksville Treatment Plant

The wastewater treatment plant is located on the north side of Brooksville in a relatively deep valley. Wastewater flows from Brooksville via two gravity sewers. A wetwell/drywell canned pump station lifts the wastewater up into the WWTP. Sewage is treated at the WWTP to meet the requirements of the plant's KPDES discharge permit KY0025232. The treatment plant is designed for an average wastewater flow of 0.2 MGD and a peak hourly flow of 0.504 MGD. The plant effluent discharges to a small tributary which flows north to Locust Creek.

The plant consists of one round package type plant, constructed above ground. The package plant includes a raw wastewater screen and comminuter, originally designed contact stabilization activated sludge aeration tanks, final clarifier, effluent chlorination and dechlorination, effluent flow measurement, effluent channel type post-aeration and aerobic digestion. Like the Augusta plant, this plant has only one process train and two are now required. The WWTP received one violation in October of 2004 for the effluent ammonia concentration. The plant had higher than normal flows and pollutant loadings that month, which probably contributed to this violation.

Brooksville Collection System

The City of Brooksville sanitary system was constructed in 1970, only minor additions and extensions have been completed since that time. The sewer system is composed of 8" and 10" clay sewer pipe with gasket joints, precast concrete manholes and additions of PVC pipe. The system has 7 pump stations ranging from 30 to 350 gpm. The system has been extended to include the new school, a mobile home park, several homes and an apartment complex. Recent work on the collection system has been the upgrade of pump stations in Brooksville, a sewer and pump station replacement with roadway improvements on the west side of the city and a sewer replacement on the east side of the city.

A SSES was completed for Brooksville, as part of the facility plan update. The study found there was little I&I when monitoring the average daily flow. However, the SSES found Brooksville's peak day flow per capita is 275 gpd, which is 2.1 times the 275 gpd standard. The city is devoting $8,100 to correct the current deficiencies and is including $19,000 per year to cover the cost of additional investigations and corrections.

Other Treatment in the Area

Several package plants are located within the planning area. This type of plant is an alternative to septic tank-leaching chamber in areas where soil percolation rates are too low. There is treatment of 13,000 gpd in package plants within the planning area, most are individual residences. There is also a package plant serving the Bracken County Industrial Park that is permitted to treat 5,000 gpd. Developments outside the reach of Augusta and Brooksville collection systems primarily use on-site treatment systems. The Bracken County Health Department believes that existing systems are for the most part

working properly and there are no areas where a large number of systems are noncompliant.

D. Need for Proposed Project

The purpose of the proposed project is to provide reliable wastewater treatment and environmentally safe disposal of wastewater generated in the towns of Augusta and Brooksville. While doing this, if economically feasible, capacity should be provided to collect rural residential development wastewater and any new commercial, industrial, and residential wastewater for new development along KY 9. The wastewater treatment plants in Augusta and Brooksville, although performing well, are in poor condition. This is due to their age, Augusta's plant is 25 years old and Brooksville's plant is 35 years old. Being of all metallic construction, they have reached the end of their useful lives.

The Bracken County Comprehensive Plan reports that the Kentucky State Data Center expects Bracken County to increase population by only 1.6% to the year 2020. However, from 1990 to 1999 Bracken County's total estimated population growth was 9.2%. The rise in population of Bracken County is offset by the drop in population in the cities of Augusta and Brooksville. This is occurring because the County is close to the Cincinnati/Northern Kentucky Metropolitan Area and the new KY 9 makes the County more accessible for residential, commercial, and industrial development. Therefore the Facilities Plan Update proposes wastewater collection and treatment facilities that could accept flow from such new development.

E. Alternatives Analysis

No Action Alternative:
This alternative would include the continued use of the existing wastewater treatment plants in Augusta and Brooksville, the various package plants including the industrial park and rural on-site systems. This alternative is not feasible because of their condition; they will not be able to continue to meet their effluent limits in a few years without increased maintenance and equipment replacement. The industrial park package WWTP is currently operating within the permitted 5,000 gpd. Improvements for rural on-site systems would be beneficial, but not necessary.

Alternative No. 1 – Augusta and Brooksville Treatment Plant Replacement
This alternative proposes replacing the Augusta and the Brooksville treatment plants. The lot where the Augusta treatment plant is located is too small to both construct a new plant and keep the existing plant operational, therefore a new site is needed. The new selected site is located just behind the cemetery northeast of the current plant. This would be advantageous, because the current site is suffering from bank erosion and is 12 feet under the 100-year flood plain. It is recommended that the new WWTP be constructed to conform to the existing plant's permitted capacity of 0.33 MGD. The design peak hourly flow rate would be 695 gpm. The construction of the treatment plant would include a new influent PS, an 8" FM and a 10" outfall. A new treatment plant for Brooksville would be constructed on the site of the old plant, at the head of Locust Creek.

It is recommended that the new treatment plant be constructed to conform to the existing permitted capacity of 0.2 MGD. The design peak hourly flow rate is 465 gpm. The plant would also need a new influent pump station, since the current one is at the end of its useful life.

This alternative provides minimal ability to serve areas that were previously not serviced. This alternative would also provide little improvement to the surrounding environment. The estimated project cost for this alternative is $2,890,000 for Augusta and $2,330,000 for Brooksville, for a total cost of $5,220,000.

Alternative No. 2 – Regional Treatment at an Augusta WWTP

This alternative would construct a new WWTP in Augusta and a new FM connecting Brooksville to the Augusta WWTP. The lot where the Augusta treatment plant is located is too small to both construct a new plant and keep the existing plant operational, therefore a new site is needed. The new selected site is located just behind the cemetery northeast of the current plant. The plant would be sized to treat a wastewater flow of 0.69 MGD, which includes 0.33 MGD for Augusta, 0.2 MGD for Brooksville and 0.16 MGD for rural areas, including the industrial park. The outfall sewer to the Ohio River would be 15".

A new pump station would be constructed at the Brooksville WWTP site to start the transport of wastewater to Augusta. An 8" FM would be laid north next to KY-19. Just south of Chatham, an intermediate PS would be constructed to further push the wastewater up the hill. At KY-9, the FM would be enlarged to 10" so flow from the industrial park could be added to it. The FM would follow Little Turtle Creek Road to the new regional Augusta WWTP as this is a more direct and less costly route. Homes along KY-19 could be served by the new FM, however a pump for these homes would have to overcome the pressure present in the force main at that particular location. The proposed plant features include gravity grit removal, mechanical screen with standby bar rack, two aeration tanks each with an anoxic and an aerobic zone, two 55' final clarifiers, three 340 gpm RAS/WAS pumps, ultraviolet light disinfection, cascade aerator, 195,000 gallon aerobic digester/sludge holding tank and a control building built on top of the aeration tank structure.

Parameter	May 1 – Oct 31	Nov 1 – April 30
$CBOD_5$, mg/l	25	25
TSS, mg/l	30	30
Ammonia-Nitrogen, mg/l	20	20
Dissolved Oxygen, mg/l	2 (min.)	2 (min.)
Total Residual Chlorine, mg/l	0.011 (max.)	0.011 (max.)
E. Coli, colonies/100 ml	130 colonies/100 ml[1] 240 colonies/100 ml[2]	
Reliability Classification	Grade 3	Grade 3

The estimated total project cost is $7,800,000 with a 20-year present worth cost of $10,730,715. **Alternative No. 2 was selected.**

Alternative No. 3 – Regional Treatment at a Wellsburg Wastewater Treatment Plant
In this alternative a new treatment plant would be constructed east of Wellsburg and wastewater from Augusta and Brooksville would be sent to there. The plant would be sized to treat a wastewater flow of 0.595 MGD, which includes 0.33 MGD for Augusta, 0.2 MGD for Brooksville and 65,000 gpd for rural areas. Four new PS would be required to transport wastewater from Brooksville to Wellsburg. There would also be a section of gravity sewer at KY-9 and KY-1159, so a small amount of commercial growth could be supported. There is good potential to serve new homes along KY-1159, they are close to town and clustered close together. One PS in Augusta would be adequate to transport the wastewater from Augusta to Wellsburg.

The estimated total project cost is $9,630,000 with a 20-year present worth cost of $12,007,420.

F. Environmental Consequences, Mitigative Measures

Impacts on Historic Properties and Archeological Sites:
The Kentucky Heritage Council states that there are no recorded archeological sites along the proposed force main route. This concurrence document is dated November 1, 2007.

Impacts on Threatened and Endangered Species:
In a letter dated November 28, 2006, the Kentucky Department of Fish & Wildlife Resources indicated the no federally threatened fish and wildlife are known to occur within close proximity to the project area.

Impacts on Wetland and Streams:
In a letter dated December 19, 2006, the U.S. Fish and Wildlife Services (FWS# 2007-B-0331) stated that no significant adverse impacts to wetlands or federally listed endangered or threatened species are anticipated.

If the project could impact streams or wetlands, a request for a jurisdictional determination should be submitted to the U.S. Army Corps of Engineers (USACE) Louisville District office. If construction activities require discharges of dredged or fill material within delineated boundaries of wetlands and/or below the Ordinary High Water Mark of "waters of the U.S." identified by the USACE, then a Department of the Army (DA) permit application should be submitted to the USACE Louisville District office and an application for a Water Quality Certification pursuant to Section 401 of the Clean Water Act should be submitted to the Division of Water's Water Quality Branch, Water Quality Certification Section.

Impacts on Floodplains:
A floodplain construction permit is required from the DOW's Water Resources Branch, Floodplain Management Section, if there are any disturbances in the 100-year floodplain.

G. Public Participation and User Rates

A public hearing was held on September 22, 2005 at the Watson Community Building/Brooksville City Building. This meeting was attended by no participants. The public hearing was advertised in The Bracken County News on September 8, 2005.

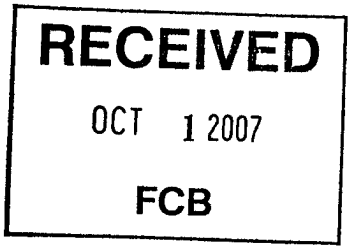
A sewer rate change is necessary to enable the city to repay the loan needed to finance this project. The proposed rate will set a flat rate of $48.59 (100% loan), $31.86 (50% grant), $23.50 (75% grant), $21.82 (80% grant) per 4,000 gallons.

H. Sources Consulted

Kentucky Department for Public Health
Kentucky Department of Fish & Wildlife Resources
Kentucky Division for Air Quality
Kentucky Division of Conservation
Kentucky Division of Forestry
Kentucky Division of Waste Management
Kentucky Division of Water
Kentucky Division of Plumbing
Kentucky Heritage Council
Kentucky State Clearinghouse
Kentucky State Nature Preserves Commission
Kentucky Transportation Cabinet
Natural Resources Conservation Service Web Soil Survey
U.S. Fish & Wildlife Service
City of Augusta and Brooksville
Burgess & Niple
Gary L. Riggs Judge-Executive, Bracken County
Buffalo Trace Area Development District



BURGESS & NIPLE



Gary Johnson
Environmental Technologist II
Municipal Planning Section
Division of Water
14 Reilly Road
Frankfort, KY 40601

Re: Regional Facilities Plan for City of Augusta, City of Brooksville and Northern Bracken County
Bracken County, KY

September 27, 2007

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Johnson:

We are attaching the following information for your review of the above referenced Facilities Plan as requested by your letter dated July 10, 2007.

1. Copies of KPDES Permits for existing WWTP's for Augusta and Brooksville
2. Letter requesting wasteload allocation for proposed WWTP to Courtney Seitz. An electronic map file is being submitted along with the request to show the full area since the maps at 1"= 2000' are a larger size than 11x17.
3. Copies of the concurring resolutions from the City of Augusta and Brooksville.
4. Copy of public hearing notices.
5. Copy of updated planning area mapping at 1"=2000' scale showing the alignment of the force main between Agusta and Brooksville (paper copy and electronic pdf copy).
6. Letter to Kentucky Heritage Council explaining the alignment of the force main.

Please review the attached information and let us know if there is additional information needed for your continued review of the Facilities Plan.

Sincerely,

Donald W. Bezold

Cc. Mayor Corlis – City of Brooksville
Mayor High – City of Augusta
Doug Padgett – Buffalo Trace Area Development District

Augusta WWTP

Bookmark Help

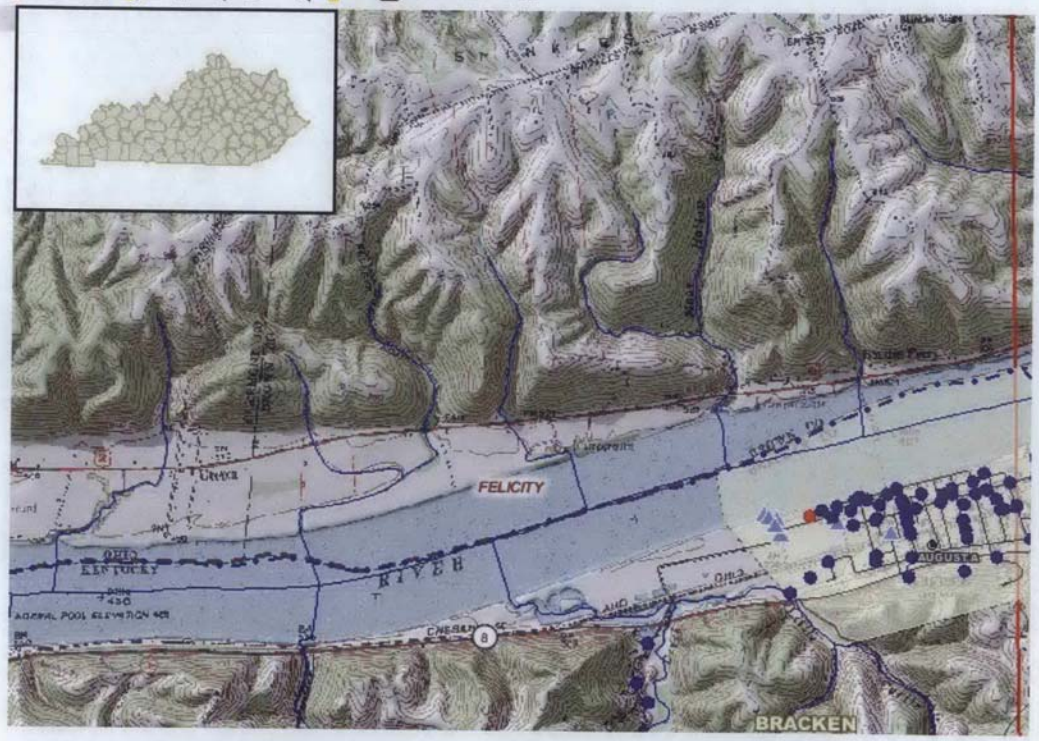
LAYERS

- All Layers
  - Tempo Data
  - Base Map
  - Base Imagery

Refresh Map

Help:

- A closed group, click to open.
- An open group, click to close.
- A map layer.
- A hidden group/layer, click to make visible.
- A visible group/layer, click to hide.
- A visible layer, but not at this scale.
- A partially visible group, click to make visible.
- An inactive layer, click to make active.
- The active layer.



Zoom In

Enter Coordinates

Choose a County...

Brooksville WWTP

Bookmark Help

LAYERS

- All Layers
  - Tempo Data
  - Base Map
  - Base Imagery

Refresh Map

Help:

- A closed group, click to open.
- An open group, click to close.
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- A hidden group/layer, click to make visible.
- A visible group/layer, click to hide.
- A visible layer, but not at this scale.
- A partially visible group, click to make visible.
- An inactive layer, click to make active.
- The active layer.



Distribution/Collection System Components

Rec	AI_ID	AI_NAME	SI_TYPE	SI_ID	SI_DESIG	X_COORD	Y_COORD
1	391	Brooksville WWTP	Pump Station	1	Brooksville	-84.073611	38.690833

Watersheds (HUC11)

Total

ID Visible Features

Enter Coordinates

Choose a County...

Augusta / Brooksville Planning Meeting

Feb. 12, 2009

CR# 204D @ 1:00 P.M.

Donald Bagwell

Name	Organization	Phone #
Hamid Bylgaln	DOW	564-3410 Ext 4822
Mortaza Tabayeh	DOW	564-3410-4826
Donald W Bezold	Burgess & Niple	(513) 579-0042
MARK WILLIS	"	(859) 273-0557
Gary L. Riggs	Bracken Judge Exc.	606-735-2300
Kevin CORNETTE	Buffalo Trace Area Dev. District	606-564-6894
Cynthia Thompson	City of Augusta	606-756-2183/2663
mayor Wendell Hill	City OF Augusta	600-75-3381
Anshu Singh	DOW	502-564-3410 X 4805
Courtney Seitz	DOW	502-564-3410 X 4914
Harold Sparks	DOW Engineering Section	502-564-3410 X 4823

They need to submit: (Their Eng.)

- ⊙ New updated WLA
- ⊙ Planning area map (phasing all)
  - update about I/I removal at sewer Rehb.
  - Who's going to Maintain and Operate the August/ Brooksville systems.
  - User Rate for each Communities/funding sources.
- ⊙ Cross Cutting Letter

7.4.3 KY-9 Area

This alternative does not include any pump station and force main to serve the industrial park. It is not justified at this time due to current low flows at the park. Also, it should be otherwise funded, since the purpose of such a pump station and force main would be job creation. If a residential development were proposed, it would be expected that the developer would contribute to, or even construct this pump station and force main.

7.4.4 Cost Summary

Table 7-2 exhibits the estimate of costs. The estimated total project cost is $7,800,000. The estimated design flow annual O&M&R cost is $303,100 per year, as compared to the current sum of $248,000 for both communities. Since new customers could be added to the system, this cost could be spread further so as to lessen the impact to existing customers. Of course, to implement this system, a regional type sewer district would have to be established.

TABLE 7-2

ALTERNATIVE NO. 2
REGIONAL TREATMENT AT AN AUGUSTA
WASTEWATER TREATMENT PLANT
ESTIMATE OF COSTS

Construction and Project Costs

Item	Estimated Construction Cost	Year 20 Salvage Value
Brooksville to Augusta Pump Stations and Force Main		
Force Main	$2,090,000	$1,110,000
Brooksville Pump Station	225,000	19,000
Intermediate Pump Station	180,000	19,000
Subtotal	$2,495,000	$1,148,000
Mobilization (3%)	75,000	
Contingencies (10%)	250,000	115,000
Total Estimated Construction Cost	$2,820,000	$1,263,000

Pump Station Property	5,000	5,000
Temporary Easements	60,000	
Permanent Easements	120,000	
Project Related Costs (25%)	705,000	
Estimated Project Cost	$3,710,000	$1,268,000
Augusta Regional Wastewater Treatment Plant (650,000 GPD)		
Site Work and Control Building	$800,000	$300,000
Influent Pump Station	260,000	80,000
Screening and Grit Removal	155,000	19,000
Activated Sludge Aeration Tank	700,000	225,000
Final Clarifiers/RAS Pump Station	480,000	130,000
Ultraviolet Light Disinfection/Effluent Aeration	175,000	17,000
Aerobic Digester and Sludge Storage Tank	305,000	92,000
Subtotal	$2,875,000	$863,000
Mobilization (3%)	85,000	
Contingencies (10%)	290,000	85,000
Total Estimated Construction Cost	$3,250,000	$948,000
Pump Station Property	5,000	5,000
WWTP Property	25,000	25,000
Project Related Costs (25%)	810,000	
Estimated Project Cost	$4,090,000	$978,000
Total Estimated Project Cost	$7,800,000	
Total Estimated Salvage Value		$2,246,000
Total Estimated Project Cost per Gallon per Day Capacity ($7,800,000/(690,000 gpd))	= $11.30/GPD	

Annual Operating, Maintenance and Equipment Replacement Costs

Existing Augusta System Cost	$128,000 /yr.	
Reduce Brooksville Cost to Collection System Only	30,000 /yr.	
Pump Stations – Force Main Costs		
Labor	9,400	
Power	28,000	
Materials and Supplies	4,500	
Equipment Replacement Fund	7,000	

Augusta Regional WWTP Cost	
Additional Labor	8,600
Additional Power	24,000
Additional Materials & Supplies	4,600
Equipment Replacement Fund	14,000
Sludge Disposal (4¢/gallon)	45,000
Total Estimated Annual O&M&R	$303,100 /yr.

7.5 Alternative No. 3 – Regional Treatment at a Wellsburg Wastewater Treatment Plant

The concept of this alternative is to allow for the construction of a force main north of Brooksville along KY-1159 to Wellsburg, to allow for the collection of wastewater from residences along that road.

7.5.1 Wellsburg Wastewater Treatment Plant

The treatment plant would be located east of Wellsburg. The plant site in this location, still below the 100-year flood elevation, is at a slightly higher elevation than the site west of Augusta. The plant would be sized to treat a wastewater flow of 595,000 gpd, which includes 330,000 gpd for Augusta, 200,000 gpd for Brooksville and 65,000 gpd for rural areas. The industrial park, being too distant from the proposed force main, is not included.

7.5.2 Force Mains

Exhibit 7-2 shows this alternative schematically. Four pump stations would be needed to transport wastewater from Brooksville to Wellsburg. One, at the old wastewater treatment plant, one up the hill and in the City limits to overcome the change in elevation, one at KY-9 and KY-1159 intersection to push the wastewater over the hill south of Wellsburg and one at Wellsburg to transport the wastewater to the plant. A section of gravity sewer is included at KY-9 and KY-1159, so a small amount of commercial growth could be supported.

Homes along KY-1159 could be served by the new force main, but on a case by case basis as described for Alternative No. 2. There are more homes along KY-1159 near Brooksville. There is good potential to serve these with this alternative as these homes are close to town and are clustered closer together here as compared to other parts of the planning area.

FWS#2007-B-0331

ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LAJUANA S. WILCHER
SECRETARY

November 14, 2006

Mr. Lee Andrews
U.S. Department of the Interior
3761 Georgetown Road
Frankfort, Kentucky 40601

RECEIVED
JAN 2 2007
FACILITIES CONSTRUCTION BRANCH

Re: Regional Facilities Plan for
City of Augusta & City of Brooksville
Northern Bracken County, Kentucky

Dear Sirs:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, has received a Wastewater Facilities Planning document, which proposes the following described project:

Two cities of Northern Bracken County have proposed to solve their wastewater needs collectively by building a new regional wastewater treatment plant in Augusta and a force main connecting Brooksville to Augusta. Augusta and Brooksville currently have treatment plants that are in poor condition due to age and corrosion. A Sewer System Evaluation Survey (SSES) was completed to asses the inflow and infiltration condition in northern Bracken County. The cities have committed to repair current problems in the system, instead of constructing a new sewer system. The project calls for three new pump stations, two facilitating Brooksville effluent to Augusta and one to replace Augusta's current main pump station. The cities will be connected by an 8 inch force main from the new Brooksville pump station, along KY-19, to the KY-19 and KY-9 intersection. The force main will expand to 10 inches and follow KY-19 to Little Turtle Creek Rd. to the new regional wastewater treatment plant. The plan also considers the possibility of a pump station and force main to accommodate the new industrial park when needed.

Please provide us with written comments or concerns you may have regarding this project. This project will result in an improvement in water quality in the local area. If we do not hear from you in thirty days, we will assume you have no comments.

If you have any questions or need further information about this project, please contact Rob Baskett at (502) 564-3410, extension 460.

Sincerely,

Rob Baskett
Municipal Planning Section
Facilities Construction Branch
Division of Water

No significant adverse impacts to wetlands or federally listed endangered or threatened species are anticipated from this proposal.

for Leroy W. Koch Dec. 19, 2006
Field Supervisor **Date**
U. S. Fish and Wildlife Service
Frankfort, KY 40601

COMMERCE CABINET
KENTUCKY HERITAGE COUNCIL

Ernie Fletcher
Governor

The State Historic Preservation Office
300 Washington Street
Frankfort, Kentucky 40601
Phone (502) 564-7005
Fax (502) 564-5820
www.kentucky.gov

George Ward
Secretary

RECEIVED
JAN 3 2007
FACILITIES CONSTRUCTION BRANCH

December 15, 2006

Mr. Robert Baskett
Municipal Planning Section
Facilities Construction Branch
Division of Water
Fort Boone Plaza
14 Reilly Road
Frankfort, Kentucky 40601

Dear Mr. Baskett:

Thank you for your letter of November 14, 2006 (received November 17, 2006) concerning the Regional Facilities Plan for the City of Augusta and City of Brooksville in Bracken County, Kentucky. The project includes three new pump stations and a force main along KY 19 to connect the City of Brooksville with the new regional wastewater plant at Augusta. The project has potential for impacting archaeological sites eligible for listing in the National Register of Historic Places. Consequently, an archaeological survey should be conducted for the three proposed pump station tracts and any undisturbed segments of the force main outside highway right-of-ways by a professional archaeologist to determine if there are any sites eligible for listing in the National Register of Historic Places which might be affected. The proposed sewer lines that will be constructed in disturbed highway right-of-ways do not require an archaeological survey. The archaeological report must be submitted for my review, comment, and approval.

Should you have any questions, feel free to contact Charles Hockensmith of my staff at (502) 564-7005.

Sincerely,

David L. Morgan, Director
Kentucky Heritage Council and
State Historic Preservation Officer

RECEIVED
JUL 18 2007
FCB

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
COMMERCE CABINET

Ernie Fletcher
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

George Ward
Secretary

Dr. Jonathan W. Gassett
Commissioner

November 28, 2006

Rob Baskett
Municipal Planning Section
Facilities Construction Branch
KY Division of Water
14 Reilly Road
Frankfort, KY 40601

RE: Regional Facilities Plan
City of Augusta & City of Brooksville
Northern Bracken County, Kentucky

Dear Mr. Baskett:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) have received your request for the above-referenced information. The Kentucky Fish and Wildlife Information System indicates that no federal/state threatened and/or endangered fish and wildlife species are known to occur within close proximity to the project area. KDFWR does not anticipate impacts to fish and wildlife resources from the project. Please be aware that our database system is a dynamic one that only represents our current knowledge of the various species distributions.

The KDFWR recommends the following for the portions of the project that cross intermittent and perennial streams:

1. Development/excavation during a low flow period to minimize disturbance;
2. When crossing a stream, the pipe should be laid perpendicular to the stream bank to minimize the direct impacts to the streambed;
3. Proper placement of erosion control structures below highly disturbed areas to minimize entry of silt to the stream;
4. Return all disturbed instream habitat to its original condition upon completion of construction in the area, and;
5. Preservation of tree canopy overhanging the stream.

Our agency does not anticipate any major impacts from the proposed project. The project will improve/enhance water quality of the streams in the area.

I hope this information will prove useful to you. If you have any questions or require additional comment, please call me at (800) 852-0942, ext. 366.

Sincerely,

Doug Dawson

Doug Dawson
Wildlife Biologist III

cc: Environmental Section File

ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LAJUANA S. WILCHER
SECRETARY

November 14, 2006

Mr. Mike Hardin
Kentucky Department of Fish & Wildlife Resources
#1 Sportsman Lane
Frankfort, Kentucky 40601

Re: Regional Facilities Plan for
City of Augusta & City of Brooksville
Northern Bracken County, Kentucky

Dear Sirs:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, has received a Wastewater Facilities Planning document, which proposes the following described project:

Two cities of Northern Bracken County have proposed to solve their wastewater needs collectively by building a new regional wastewater treatment plant in Augusta and a force main connecting Brooksville to Augusta. Augusta and Brooksville currently have treatment plants that are in poor condition due to age and corrosion. A Sewer System Evaluation Survey (SSES) was completed to asses the inflow and infiltration condition in northern Bracken County. The cities have committed to repair current problems in the system, instead of constructing a new sewer system. The project calls for three new pump stations, two facilitating Brooksville effluent to Augusta and one to replace Augusta's current main pump station. The cities will be connected by an 8 inch force main from the new Brooksville pump station, along KY-19, to the KY-19 and KY-9 intersection. The force main will expand to 10 inches and follow KY-19 to Little Turtle Creek Rd. to the new regional wastewater treatment plant. The plan also considers the possibility of a pump station and force main to accommodate the new industrial park when needed.

Please provide us with written comments or concerns you may have regarding this project. This project will result in an improvement in water quality in the local area. If we do not hear from you in thirty days, we will assume you have no comments.

If you have any questions or need further information about this project, please contact Rob Baskett at (502) 564-3410, extension 460.

Sincerely,

Rob Baskett
Municipal Planning Section
Facilities Construction Branch
Division of Water

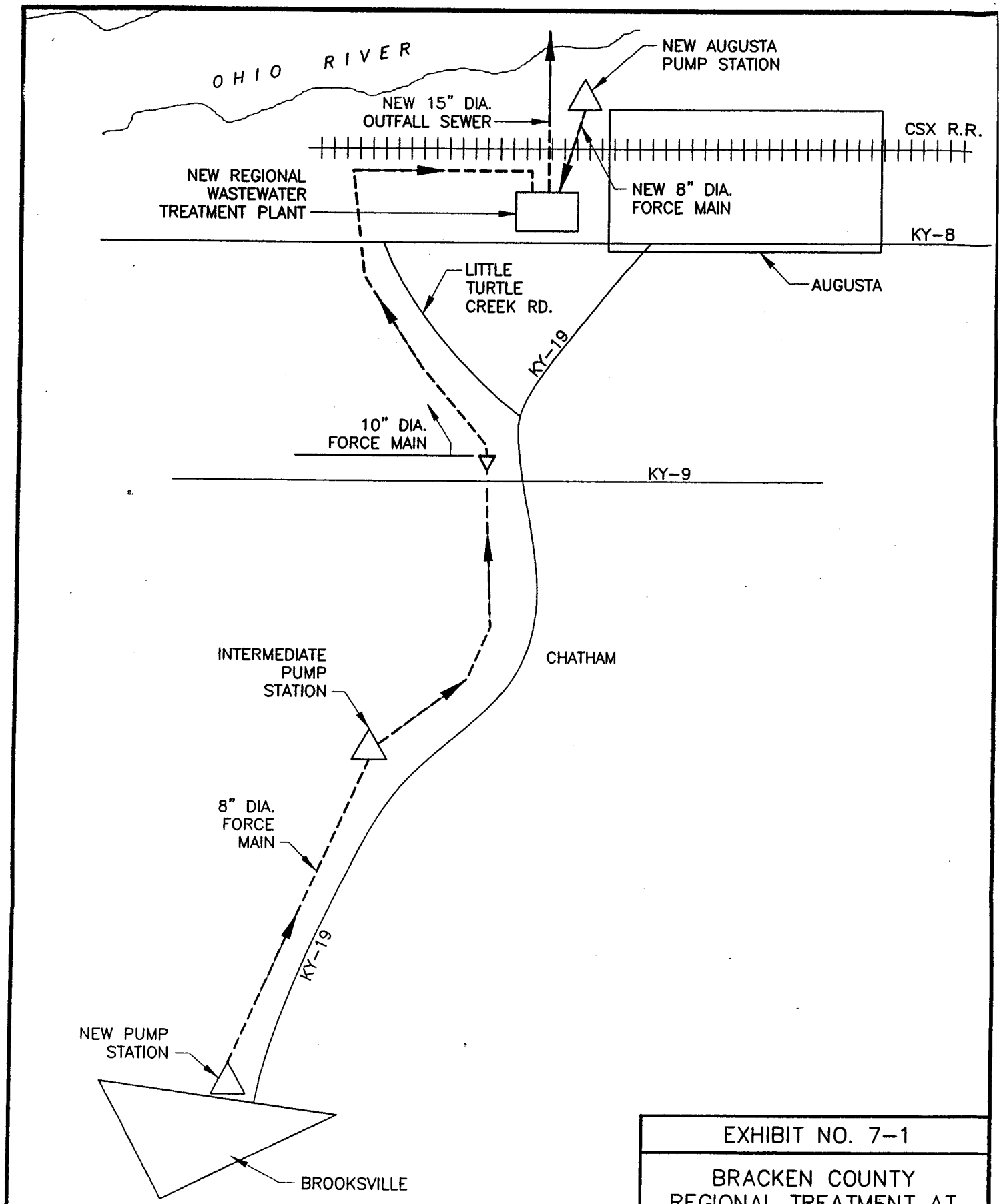
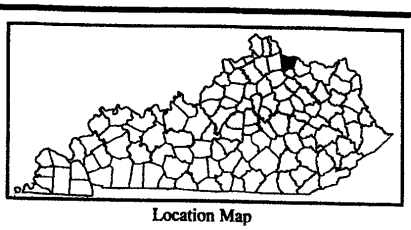
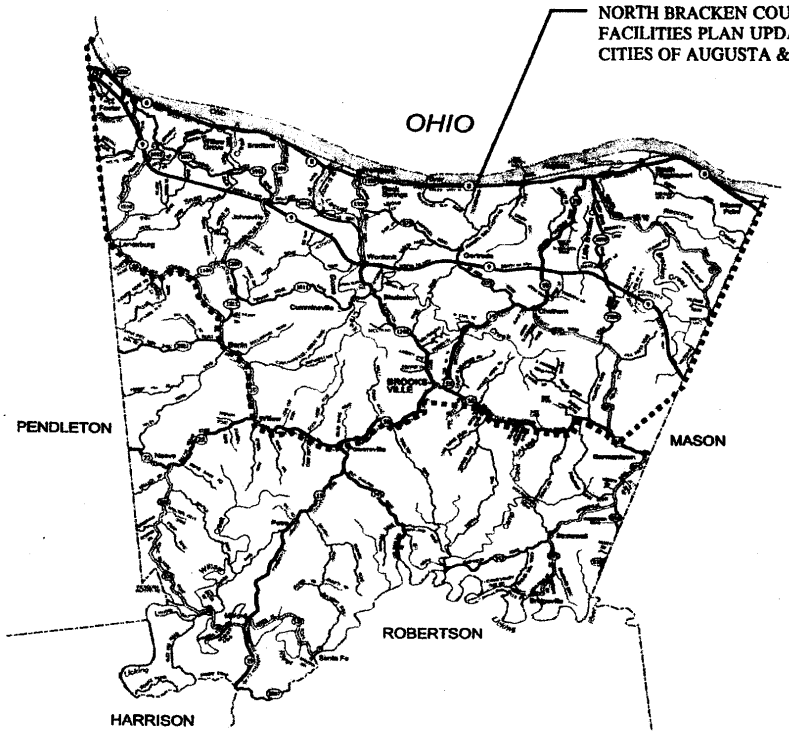


EXHIBIT NO. 7-1
BRACKEN COUNTY REGIONAL TREATMENT AT NEW AUGUSTA WWTP
BURGESS & NIPLE

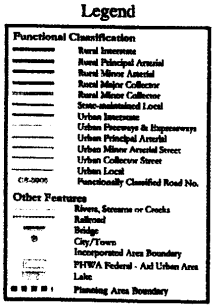


Location Map



NORTH BRACKEN COUNTY PLANNING AREA
FACILITIES PLAN UPDATE
CITIES OF AUGUSTA & BROOKSVILLE

Legend





BURGESS & NIPLE

EXHIBIT 3-1

NORTH BRACKEN COUNTY PLANNING AREA
FACILITIES PLAN UPDATE
CITIES OF AUGUSTA & BROOKSVILLE

RECEIVED
JUL 16 2007
FCB

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES
COMMERCE CABINET

Ernie Fletcher
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

George Ward
Secretary

Dr. Jonathan W. Gassett
Commissioner

November 28, 2006

Rob Baskett
Municipal Planning Section
Facilities Construction Branch
KY Division of Water
14 Reilly Road
Frankfort, KY 40601

RE: Regional Facilities Plan
City of Augusta & City of Brooksville
Northern Bracken County, Kentucky

Dear Mr. Baskett:

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The KDFWR recommends the following for the portions of the project that cross intermittent and perennial streams:

1. Development/excavation during a low flow period to minimize disturbance;
2. When crossing a stream, the pipe should be laid perpendicular to the stream bank to minimize the direct impacts to the streambed;
3. Proper placement of erosion control structures below highly disturbed areas to minimize entry of silt to the stream;
4. Return all disturbed instream habitat to its original condition upon completion of construction in the area, and;
5. Preservation of tree canopy overhanging the stream.

FAX

COMMERCE CABINET
Department of Fish & Wildlife Resources
fw.ky.gov

TO: Jill Bertelson

FROM: Doug Dawson

DATE: 7/16/07

RE: Northern Bracken County Wastewater Project (3 Pages)

Our agency does not anticipate any major impacts from the proposed project. The project will improve/enhance water quality of the streams in the area.

I hope this information will prove useful to you. If you have any questions or require additional comment, please call me at (800) 852-0942, ext. 366.

Sincerely,

Doug Dawson

Doug Dawson
Wildlife Biologist III

cc: Environmental Section File

ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LAJUANA S. WILCHER
SECRETARY

July 24, 2006

Mr. David Morgan
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

Mr. Lee Andrews
U.S. Department of the Interior
3761 Georgetown Road
Frankfort, Kentucky 40601

Mr. Mike Hardin
Kentucky Department of Fish & Wildlife Resources
#1 Sportsman Lane
Frankfort, Kentucky 40601

Col. Dana R. Hurst
U.S. Army Corp of Engineers
502 Eighth Street
Huntington, WV 25701

Re: Regional Facilities Plan for
City of Augusta & City of Brooksville
Northern Bracken County, Kentucky

Dear Sirs:

The Municipal Planning Section of the Facilities Construction Branch, Division of Water, has received a Wastewater Facilities Planning document, which proposes the following described project:

Two cities of Northern Bracken County have proposed to solve their wastewater needs collectively by building a new regional wastewater treatment plant in Augusta and a force main connecting Brooksville to Augusta. Augusta and Brooksville currently have treatment plants that are in poor condition due to age and corrosion. A Sewer System Evaluation Survey (SSES) was completed to asses the inflow and infiltration condition in northern Bracken County. The cities have committed to repair current problems in the system, instead of constructing a new sewer system. The project calls for three new pump stations, two facilitating Brooksville effluent to Augusta and one to replace Augusta's current main pump station. The cities will be connected by an 8 inch force main from the new Brooksville pump station, along KY-19, to the KY-19 and KY-9 intersection. The force main will expand to 10 inches and follow KY-19 to Little Turtle Creek Rd. to the new regional wastewater treatment plant. The plan also considers the possibility of a pump station and force main to accommodate the new industrial park when needed.

Please provide us with written comments or concerns you may have regarding this project. This project will result in an improvement in water quality in the local area. If we do not hear from you in thirty days, we will assume you have no comments.

If you have any questions or need further information about this project, please contact Rob Baskett at (502) 564-3410, extension 460.

Sincerely,

Rob Baskett
Municipal Planning Section
Facilities Construction Branch
Division of Water

PCS DISCHARGE MONITORING REPORT DATA: BY DISTRICT / COUNTY

NOTE: ALL DATA FOR NON-SEASONAL PARAMETERS ARE LISTED UNDER THE WINTER COLUMN SEPTEMBER 15, 2004

NAME: WALTON VERONA ELEM SCHOOL NPID: 0035327 DISCHARGE: 001 REGIONAL OFFICE: FLORENCE COUNTY: BOONE

	EFF-BOD		INF	NH3		DIS-OXY		PH		EFF	INF	FECAL	TRC		FLOW(MGD)	
DATE	WINTER*	SUMMER	BOD	WINTER*	SUMMER	WINTER*	SUMMER	MAX	MIN	TSS	TSS	COLI	AVG	MAX	AVG	MAX
JAN03	28.0			13.10		13.3		6.62	6.62	65.0		10			0.004	0.004
FEB03																
MAR03	15.0			40.90		14.3		7.67	7.67	28.0		10			0.004	0.004
APR03	6.0			5.72		12.1		7.27	7.27	13.0		144			0.004	0.004
MAY03	6.0				0.03	7.0		8.73	8.73	10.0		10			0.040	0.040
JUN03																
JUL03																
AUG03	6.0				15.60	6.8		6.97	6.97	8.0		10			0.002	0.002
SEP03	16.0				0.23	8.0		7.55	7.55	26.0		10			0.003	0.003
OCT03	6.0				0.03	7.0		7.79	7.79	23.0		10			0.003	0.003
NOV03	6.0			4.40		7.2		7.50	7.50	5.0		10			0.003	0.003
DEC03	10.0			13.50		8.0		6.57	6.57	10.0		10			0.004	0.004
LIMITS	30.0		NONE	10.00	4.00	7.0		9.00	6.00	30.0	NONE	200			0.011	
AVG	11.0			15.52	3.97	9.3		NONE	NONE	20.9		NONE			0.007	0.007

NAME: AUGUSTA STP NPID: 0021261 DISCHARGE: 001 REGIONAL OFFICE: FLORENCE COUNTY: BRACKEN

	EFF-BOD		INF	NH3		DIS-OXY		PH		EFF	INF	FECAL	TRC		FLOW(MGD)	
DATE	WINTER*	SUMMER	BOD	WINTER*	SUMMER	WINTER*	SUMMER	MAX	MIN	TSS	TSS	COLI	AVG	MAX	AVG	MAX
JAN03	4.0		162.0	0.86		8.0		7.56	7.23	5.0	195.0	11	0.011	0.200	0.127	0.323
FEB03	4.0		108.0	1.10		10.1		7.42	7.26	9.0	68.0	10	0.018	0.019	0.310	0.712
MAR03	3.0		242.0	0.97		8.7		7.15	6.76	7.0	283.0	13	0.015	0.019	0.162	0.324
APR03	6.0		178.0	1.36		8.1		7.05	6.98	9.0	174.0	28	0.016	0.020	0.138	0.258
MAY03	7.0		71.0	0.73		8.1		7.21	6.80	11.0	160.0	15	0.160	0.200	0.250	0.662
JUN03	4.0		114.0	0.83		7.0		7.15	6.87	5.0	96.0	13	0.011	0.014	0.205	0.508
JUL03	5.0		152.0	0.62		6.1		7.15	6.30	6.0	150.0	74	0.013	0.017	0.163	0.730
AUG03	5.0		183.0	0.90		5.8		7.16	6.90	5.0	168.0	10	0.018	0.020	0.134	0.369
SEP03	3.0		122.0	1.23		5.0		7.23	6.90	6.0	67.0	11	0.008	0.011	0.162	0.462
OCT03	3.0		134.0	0.74		5.7		7.54	6.95	7.0	104.0	12	0.016	0.020	0.114	0.231
NOV03	62.0		103.0	2.83		6.5		7.13	6.95	802.0	110.0	88	0.017	0.020	0.140	0.518
DEC03	3.0		106.0	1.10		7.2		7.33	7.05	8.0	113.0	10	0.180	0.020	0.119	0.250
LIMITS	30.0		NONE	20.00		2.0		9.00	6.00	30.0	NONE	200	0.019	0.019	0.330	
AVG	9.1		139.6	1.11		7.2		NONE	NONE	73.3	140.7	NONE	0.040	0.048	0.169	0.446
CSI:	4.0			0.10						6.0						

CSI REPORT DATE: 05/31/90 BY: BOB WELLS REPORT NO: A0210547

PCS DISCHARGE MONITORING REPORT DATA: BY DISTRICT / COUNTY

OTE: ALL DATA FOR NON-SEASONAL PARAMETERS ARE LISTED UNDER THE WINTER COLUMN SEPTEMBER 15, 2004

AME: BRACKEN CO INDUSTRIAL PARK NPID: 0103187 DISCHARGE: 001 REGIONAL OFFICE: FLORENCE COUNTY: BRACKEN

DATE	EFF-BOD WINTER*	EFF-BOD SUMMER	INF BOD	NH3 WINTER*	NH3 SUMMER	DIS-OXY WINTER*	DIS-OXY SUMMER	PH MAX	PH MIN	EFF TSS	INF TSS	FECAL COLI	TRC AVG	TRC MAX	FLOW(MGD) AVG	FLOW(MGD) MAX
AR03																
PR03																
UN03																
EP03																
CT03																
EC03																
IMITS			NONE								NONE	200			0.005	
VG								NONE	NONE			NONE				

AME: BROOKSVILLE UTIL STP NPID: 0025232 DISCHARGE: 001 REGIONAL OFFICE: FLORENCE COUNTY: BRACKEN

DATE	EFF-BOD WINTER*	EFF-BOD SUMMER	INF BOD	NH3 WINTER*	NH3 SUMMER	DIS-OXY WINTER*	DIS-OXY SUMMER	PH MAX	PH MIN	EFF TSS	INF TSS	FECAL COLI	TRC AVG	TRC MAX	FLOW(MGD) AVG	FLOW(MGD) MAX
AN03	5.0		380.0	1.00		9.7		8.00	7.46	8.3	293.0	10	0.010	0.010	0.066	0.124
EB03	5.0		215.0	1.50		10.0		7.80	6.60	9.8	115.0	53	0.010	0.010	0.103	0.200
AR03	9.0		308.0	7.35		10.0		8.58	7.40	10.5	276.5	77	0.010	0.010	0.082	0.210
PR03	4.0		348.0	1.14		7.1		7.44	6.97	7.0	258.8	10	0.010	0.010	0.058	0.099
AY03	6.0		260.0		2.50	9.9		7.47	7.38	17.3	226.5	13	0.010	0.010	0.102	0.341
UN03	5.0		224.0		1.00	9.1		7.46	6.53	8.0	161.0	10	0.010	0.010	0.080	0.159
UL03	8.0		260.0		1.00	8.5		7.25	6.72	9.2	255.4	10	0.010	0.010	0.063	0.178
UG03	6.0		240.0		1.00	8.1		7.53	7.19	8.8	205.5	78	0.010	0.010	0.059	0.100
EP03	3.0		352.0		1.00	8.3		7.52	7.20	6.4	245.0	30	0.001	0.001	0.063	0.120
CT03	5.0		398.0		1.00	8.9		7.42	7.23	4.3	356.5	10	0.010	0.010	0.042	0.055
OV03	3.0		221.0	1.00		7.6		7.35	6.85	5.8	150.0	10	0.010	0.010	0.069	0.089
EC03	2.0		139.0	1.00		7.5		7.30	7.13	10.6	144.8	12	0.010	0.010	0.062	0.082
IMITS	10.0		NONE	10.00	4.00	7.0		9.00	6.00	30.0	NONE	200	0.010	0.019	0.200	
VG	5.1		278.8	2.17	1.25	8.7		NONE	NONE	8.8	224.0	NONE	0.009	0.009	0.071	0.146
SI:	0.1			19.						35						

SI REPORT DATE: 05/01/90 BY: B WELLS / M RICE REPORT NO: A0210393

ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601-1190
www.kentucky.gov

LAJUANA S. WILCHER
SECRETARY

April 26, 2004

Judge Leslie Newman
Bracken County Fiscal Court
P.O. Box 460
Maysville KY 41056

Dear Judge Newman:

The Kentucky Division of Water is pleased to offer twenty thousand dollars ($20,000) to Bracken County Fiscal Court for an updated Regional Wastewater Facilities Plan. This work will be funded under the Water Quality Management Planning program authorized by Section 604(b) of the Clean Water Act. Please review the enclosed memorandum of agreement between the Environmental and Public Protection Cabinet and Bracken County Fiscal Court. Please note that the payment of these funds cannot be made for work completed prior to the execution of the enclosed agreement.

The memorandum of agreement enclosed represents an agreement for the period of August 15, 2004 through June 30, 2006. The Finance Cabinet will mail a fully executed copy of this agreement to you upon approval. You should not begin work before August 15, 2004 or before you receive the approved contract from the Finance Cabinet.

If you have any questions or comments regarding this agreement, please notify Tim Miller, Supervisor of the Financial Management and Budget Section, at (502) 564-3410. If you agree to the terms, please sign as indicated on page sixteen and return the signed originals to Teresa Sanders at the Kentucky Division of Water, 14 Reilly Road, Frankfort. For technical information or assistance with your project, please contact Bill Chlebowy, Supervisor of the Municipal Planning Section at the Division of Water, also at (502) 564-3410.

Thank you for your leadership in planning for water quality improvement in Bracken County. Our staff looks forward to working with you on this project.

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Sincerely,

Jeffrey W. Pratt, Director
Division of Water

JWP:TMS

Enclosures

c: Bill Chlebowy, Supervisor, Municipal Planning Section, KY DOW
Tim Miller, Supervisor, Financial Management and Budget Section, KY DOW
Pam Wood, Supervisor, Basin Coordination Section, KY DOW
Margaret Shanks, Branch Manager, Watershed Section, KY DOW

B 11 C-

ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
14 REILLY ROAD
FRANKFORT, KENTUCKY 40601-1190
www.kentucky.gov

LAJUANA S. WILCHER
SECRETARY

March 19, 2004

Leslie Newman
Bracken County Judge Executive
Bracken County Fiscal Court
PO Box 460
Maysville KY 41056

Dear Judge Newman:

Due to recent events the Division of Water has obtained additional Water Quality Management Planning Grant funds (CWA Sec. 604(b)) to pass through to regional planning bodies. Your agency had submitted a letter requesting 604(b) funds on November 24, 2003. The Division of Water would like to verify that your agency is still interested in being considered for this funding.

If your agency is still interested in 604(b) funds you will need to further clarify the areas that your 201 Regional Wastewater Facilities Plan Update will cover. At a minimum, conventional sewer service and plans to serve Augusta and Brooksville need to be covered in a facilities plan. (Germantown is part of the approved facilities plan for Western Mason County). Please submit a map outlining all areas that will be covered by your 201 plan. For those areas not covered by your facilities plan the Division of Water will work with your agency to define what planning must be completed.

Please submit this information to the Division by March 31, 2004. If you have any questions regarding this matter, please contact William Chlebowy of the Facilities Construction Branch at 502-564-3410.

Sincerely

Jeffrey W. Pratt, Director
Division of Water

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cc: Tim Miller, Supervisor, Financial Mgmt & Budget Section
William Chlebowy, Supervisor, Municipal Planning Section
Margaret Shanks, Branch Manager, Watershed Branch
Roger Recktenwald, KIA

BRACKEN COUNTY, KENTUCKY
FACILITIES PLAN UPDATE

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Bertelson, Jill (EPPC DEP DOW)

From: Bezold, Donald [DBezold@burnip.com]
Sent: Wednesday, January 19, 2005 5:32 PM
To: bill.chlebowy@ky.gov
Cc: Willis, Mark; Tiefert, Thomas
Subject: Bracken County 201 Facilities Plan

Dear Mr. Chlebowy;

We are in the process of preparing a Facilities Plan for the Cities of Augusta and Brooksville and the adjoining portions of Bracken County. As part of the process we would like to meet with you and your staff to make sure we are heading in the right direction and using the standards with which you will be reviewing the plan.

We would like to set this meeting up as soon as possible.

This past summer we completed flow monitoring in each of the communities along with smoke testing and dye testing to determine inflow sources. We are in the process of establishing a couple of collection and treatment alternatives that may be feasible which we could share with you at the meeting.

Could you let us know what your availability is and whether we should meet in Bracken County or in Frankfort?

Thank you for your help,
Don Bezold
Burgess & Niple, Inc.
(513)579-0042



Note:
These electronic documents are provided by Burgess & Niple (B&N) as a convenience to our clients.

- The official document is available as a manually signed, initialed, or sealed hard copy. If there is a discrepancy between electronic files and the hard copies, the hard copies shall prevail.
- It is our professional opinion that this electronic information provides information current as of the date of its release. Any use of this information is at the sole risk and liability of the user. The user is responsible for updating information to reflect any changes in the information following the preparation date of this transmittal.

The delivery of this information in electronic format is for the benefit of the owner for whom the services have been performed. Nothing in the transfer should be construed to provide any right to third parties to rely on the information provided, or that the use of this information implies the review and approval of Burgess & Niple.

Bertelson, Jill (EPPC DEP DOW)

From: Bezold, Donald [DBezold@burnip.com]
Sent: Friday, August 26, 2005 8:55 AM
To: bill.chlebowy@ky.gov
Subject: Facility Plan Update Public Hearing

Bill,
Can you forward any information concerning requirements for advertising and conducting the Public Hearing for the Bracken County Facility Plan Update.

Thanks,
Don Bezold
(513)579-0042

Note:
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Bertelson, Jill (EPPC DEP DOW)

From: Chlebowy, William (EPPC DEP DOW)
Sent: Friday, August 26, 2005 9:24 AM
To: 'DBezold@burnip.com'
Subject: FW: Facility Plan Update Public Hearing

Don - Here's a sample Notice and the requirements for a Public Hearing from our regs. If an EPA Special Appropriations Project (SPAP) grant will be used for the project, we recommend you publish the Notice 15-21 days before the Hearing so you satisfy both EPA and state requirements.

-----Original Message-----
From: Bezold, Donald [mailto:DBezold@burnip.com]
Sent: Friday, August 26, 2005 8:55 AM
To: bill.chlebowy@ky.gov
Subject: Facility Plan Update Public Hearing

Bill,
Can you forward any information concerning requirements for advertising and conducting the Public Hearing for the Bracken County Facility Plan Update.

Thanks,
Don Bezold
(513)579-0042

[redacted]
BURGESS & NIPLE

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Bertelson, Jill (EPPC DEP DOW)

From: Bezold, Donald [DBezold@burnip.com]
Sent: Wednesday, September 28, 2005 10:46 AM
To: Chlebowy, William (EPPC DEP DOW)
Subject: Bracken County-Augusta-Brooksville 201 Facilities Plan Update

Bill,

I received a call from Buffalo Trace Area Development District which just received a copy of a letter to Bracken County dated August 26, 2005 stating the 201 Facilties Plan would need to be submitted by September 15, 2005 in order to receive a $20,000 Planning Grant. We have not submitted the Plan since we were waiting on the completion of the Public Hearing.

Last week, Thursday September 22, 2005 the public hearings were conducted in Augusta and Brooksville for the 201 Facilities Plan Update. We are preparing the meeting minutes to include in the report. We should have these items included and the Plan submitted to you within the next week.

If there are any questions do not hesitate to call.

Thanks,
Don Bezold
Burgess & NIple, Inc
(513)579-0042

Note:
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Bertelson, Jill (EPPC DEP DOW)

From: Chlebowy, William (EPPC DEP DOW)
Sent: Thursday, September 29, 2005 9:45 AM
To: 'Bezold, Donald'
Subject: RE: Bracken County 201 Facilities Plan

We prefer three but two copies are good enough. If you want to solicit the State Clearinghouse for comments, that would be great. Ron Cook is the contact at the Clearinghouse. I'm leaving DOW next week so the easier you can make it during the transition, the better.

-----Original Message-----
From: Bezold, Donald [mailto:DBezold@burnip.com]
Sent: Wednesday, September 28, 2005 11:35 AM
To: Chlebowy, William (EPPC DEP DOW)
Subject: Bracken County 201 Facilities Plan

Bill,
How many copies of the plan do you need?
Will DOW submit to State Clearinghouse or should we submit to them directly?
If we submit directly, what is the contact information?

Thanks,
Don Bezold

[redacted]
BURGESS & NIPLE

Note:
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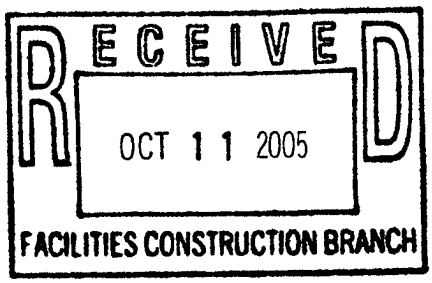


Mr. William Chlebowy
Municipal Planning Section
Facilities Construction Branch
Division of Water
14 Reilly Road
Frankfort, KY 40601

Re: Bracken County / Augusta / Brooksville
201 Facilities Plan

October 7, 2005

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Mr. Chlebowy:

Attached are 3 copies of the 201 Facilities Plan Update for City of Augusta and Brooksville for your review. A public hearing was held on September 22, 2005 in Augusta and Brooksville. A copy of the plan is also being submitted to the Clearing House for their review. Each community is in the process of approving a resolution accepting the Plan. We will forward you a copy once they are passed.

If there are any questions concerning the 201 Facilities Plan, please call.

Sincerely,

Donald W. Bezold, P.E.

Cc: Mayor Laycock - City of Augusta
Mayor Corlis – City of Brooksville
Doug Padgett – Buffalo Trace Area Development District



BURGESS & NIPLE

Ms. Jennifer McDonald
EPPC DEP DOW
14 Reilly Road
Frankfort, KY 40601

Re: Bracken County
201 Facilities Plan
Grant Agreement # 04633456

Sent via fax – (502)564-0111

September 29, 2005

Burgess & Niple, Inc.
312 Plum Street
12th Floor
Cincinnati, OH 45202-2678
513 579.0042
Fax 513 579.0321

Dear Ms. McDonald:

Bracken County Fiscal Court, City of Augusta and City of Brooksville are requesting payment on the grant for the amount of $20,000.00 for the completion of the 201 Facilities Plan for the wastewater system. The Public Hearing on the Plan was completed last week on September 22, 2005 in Augusta and Brooksville. The minutes of the Public Hearing are being prepared for inclusion into the Plan. We will be submitting the Plan to Division of Water next week for review.

If there are any questions concerning the above, please call.

Sincerely,

Donald W Bezold

Donald W. Bezold, P.E.

Approval Recommended By:

Bill Chlebowy ____
Shafiq Amani ____
Jim Miller ____
Ron Price ____

BRACKEN CO.
PLANNING MEETING
FEB 4, 2005

BILL CHLEBOWN	KY DOW	502-564-3410 x460
Tim Boyd	CITY of BROOKSVILLE	606-735-2078
Tom CORTNER	" "	606-735-3235
Don Bezold	Burgess & Niple	(513) 579-0042
Tom Gilpert	Burgess & Niple	(513) 579-0042
Ron Shelton	City of Augusta	606-756-2183

FACILITIES PLAN ADMINISTRATIVE REVIEW CHECKLIST

PROJECT: Augusta - Bracken Co PROJECT NO. _____

COUNTY: _____ REVIEWER: _____

AI NAME & AI NUMBER: 387 Augusta WWTP

RECEIVED:	YES	NO	SECTION
Three copies of the facilities plan	☑	☐	
Completed Checklist, including page numbers	☐	☐	
Current land use map	☐	☐	
Copy of current KPDES permit	☐	☐	
Copy of any court or enforcement order	☐	☐	
Copy of wasteload allocation for each proposed new site or expansion	☐	☐	
Map showing the 100 year floodplain in relation to the planning area	☐	☐	
Schematic showing the number of units/tanks in each process (for plants)	☑	☐	
Schematic flow diagram showing all major process features (for plants)	☑	☐	
Copies of concurring resolutions from legally formed entities within the planning area	☐	☐	
Discussion of current and projected user costs	☑	☐	
Discussion of project sources of funding	☑	☐	
Funding Sources: SRF, CDBG, RD, SPAP considered. None applied/committed			
Copy of public hearing transcript	☑	☐	
Copy of public hearing notice w/affidavit need	☐	☑	need paper's page and affidavit
Copies of written comments as a result of the hearing	☑	☐	
PE Stamp and signature on plan	☐	☑	
Is the project on current priority list?	☐	☐	

COMMENTS: includes SSES for both cities

PROJECT ADMINISTRATOR: _____ Date: _____

Review Process for Facility Plan receiving SPEAR

Pre-submission

Request Applicant/Consultant to send project description and project map to following agencies for comment:

US Fish & Wildlife Service
KY Fish & Wildlife Service (may be included in Clearinghouse Funding review)
KY Heritage Council (may be included in Clearinghouse Funding review)

Applicant does Public Notice and holds Public Hearing

Facility Plan Submission

(3) Copies of Facility Plan with original P.E. stamp
Facility Plan Checklist
Copies of Clearinghouse comments if already sent
Copies of correspondence with US FWS, KY FWS, and KHC if no CH review
Public notice/hearing info
Design Criteria Form (for WWTP projects)
Unit Process Criteria Form (for WWTP projects)

Administrative Processing

Administrative Checklist
TEMPO Scan sheet

Technical Review

Follow SPEAR/FNSI Checklist
Draft SPEAR and supporting docs

Internal Review

Send email to MPS Supervisor to forward to Internal Review recipients with following attachments. PDF files of maps can be created from TEMPO scanned images.

Draft SPEAR Sections A-F
Section G Sources Consulted
General Certification Nationwide Permit #12 for stream crossings
Figure 1 Project Area Map
Figure 2 Existing WWTP schematic/plant layout (for WWTP projects)
Figure 3 Proposed WWTP schematic/plant layout (for WWTP projects)
Figure 4 Proposed Sewer Lines Map (for sewer line projects)

Commissioner Signature

Coordination Sheet
4-sign off Memo on DEP letterhead

SPEAR Cover on Commissioner letterhead
SPEAR Sections A-F
Section G Sources Consulted
General Certification Nationwide Permit #12 for stream crossings
Figure 1 Project Area Map
Figure 2 Existing WWTP schematic/plant layout (for WWTP projects)
Figure 3 Proposed WWTP schematic/plant layout (for WWTP projects)
Figure 4 Proposed Sewer Lines Map (for sewer line projects)

Clearinghouse Review

Send email to MPS Supervisor to forward to email to Clearinghouse (or submit in e-Clearinghouse) with following attachments.

Signed SPEAR Cover on Commissioner letterhead
SPEAR Sections A-F
Section G Sources Consulted
General Certification Nationwide Permit #12 for stream crossings
Figure 1 Project Area Map
Figure 2 Existing WWTP schematic/plant layout (for WWTP projects)
Figure 3 Proposed WWTP schematic/plant layout (for WWTP projects)
Figure 4 Proposed Sewer Lines Map (for sewer line projects)

Approval

Approval letter on DEP letterhead to be signed by MPS Supervisor (in TEMPO) (include list of mitigative measures from SPEAR and appropriate additional comments from Clearinghouse review)

Copy of signed SPEAR Cover on Commissioner letterhead
SPEAR Sections A-F
Section G Sources Consulted
General Certification Nationwide Permit #12 for stream crossings
Figure 1 Project Area Map
Figure 2 Existing WWTP schematic/plant layout (for WWTP projects)
Figure 3 Proposed WWTP schematic/plant layout (for WWTP projects)
Figure 4 Proposed Sewer Lines Map (for sewer line projects)

Finish review

Update TEMPO with all documents to be scanned or attached
Update TEMPO Work Activity Log
Prepare file (can use File cover sheets) and give to Kelli Rice's section

Codes and Attributes for

305(b) Use Support GIS Data

What are codes and attributes?

305(b) Use Support Codes – An explanation

Source Codes

Cause (Pollutant) Codes

What are codes and attributes? In a Geographic Information System (GIS), you can view different types of "mapping" information, laid one upon the other, much as you might lay various transparencies one upon the other. In a GIS, these "transparencies" are called themes (or layers, maps, or data sets – depending upon what you call them). A GIS also provides the ability to see additional information about the themes. For example, a theme might show shapes, or polygons, indicating the location of the county lines; another theme might show points for each of the permitted discharges. Using the "Identify" button on the GIS software, you can then click on one of the features to see more information, or "attributes" about it. Clicking on a county might produce a table of information, including the size of the county in square miles, the name of the county seat, the area development district that this county belongs to, etc. Clicking on the discharger might indicate the name of the facility, the size of the discharge, and other information. Since the information for each theme is usually stored in a database, some of the data is coded, requiring that you know what the codes stand for in order to understand the information.

305(b) Use Support Codes: While some GIS theme presented as shapes or points, the 305(b) use support data is presented as line segments. These Support data show various segments of streams and lakes as either red (no support), yellow (partial support), or green (fully supports); if you click on the "Identify" button on the Watershed Viewer, then click on a particular red, yellow, or green stream segment, you will see a set of attributes (or row(s) of information as a table) below the on-line map.

The tables below are intended to explain the various codes in this theme. The table for Source Codes explains codes related to the sources of the pollutants; that is, where the impairment is likely to be coming from. The table for the Cause Codes explains codes related to the pollutants or contaminants observed in the impaired waterbody. Codes that are bold are considered higher-level category codes and are used when specific types of sources may not be known. Codes indented under the bold codes may be used when more specificity is needed to represent the source or pollutant type.

More assistance:

- For more assistance in interpreting this information you can contact the Division of Water's Watershed Management Branch.
- Back to "What is the condition of your stream or lake?"
- Link to Watershed Viewer – an on-line GIS mapping tool

Source Codes

0100 Industrial Point Sources
- 0110 Major Industrial Point Sources
- 0120 Minor Industrial Point Sources

0200 Municipal Point Sources
- 0210 Major Municipal Point Sources – dry and/or wet weather discharges
- 0212 Major Municipal Point Sources – dry weather discharges
- 0214 Major Municipal Point Sources – wet weather discharges
- 0220 Minor Municipal Point Sources – dry and/or wet weather discharges
- 0224 Minor Municipal Point Sources – wet weather discharges
- 0230 Package Plants (Small Flows)

0400 Combined Sewer Overflow

0500 Collection system Failure

0900 Domestic Wastewater Lagoon

1000 Agriculture
- **1050 Crop-related Sources**
- 1100 Nonirrigated Crop Production
- 1200 Irrigated Crop Production
- 1300 Specialty Crop Production (e.g., horticulture, citrus, nuts, fruits)
- **1350 Grazing-related Sources**
- 1400 Pasture Grazing – Riparian and/or Upland
- 1410 Pasture Grazing – Riparian
- 1420 Pasture Grazing – Upland
- 1500 Range Grazing – Riparian and/or Upland
- 1510 Range Grazing – Riparian
- 1520 Range Grazing – Upland
- **1600 Intensive Animal Feeding Operations**
- 1620 Concentrated Animal Feeding Operations (CAFOs; permitted, PS)
- 1640 Confined Animal Feeding Operations (NPS)
- 1700 Aquaculture

2000 Silviculture
- 2100 Harvesting, Restoration, Residue Management
- 2200 Forest Management (e.g., pumped drainage, fertilization, pesticide application)
- 2300 Logging Road Construction/Maintenance
- 2400 Silvicultural Point Sources

3000 Construction
- 3100 Highway/Road/Bridge Construction
- 3200 Land Development

4000 Urban Runoff/Storm Sewers
- 4100 Nonindustrial Permitted
- 4200 Industrial Permitted
- 4300 Other Urban Runoff
- 4400 Illicit connections/illegal hook-ups/dry weather flows
- 4500 Highway/Road/Bridge Runoff
- 4600 Erosion and Sedimentation

5000 Resource Extraction
- 5100 Surface Mining
- 5200 Subsurface Mining
- 5300 Placer Mining
- 5400 Dredge Mining
- 5500 Petroleum Activities
- 5600 Mill Tailings
- 5700 Mine Tailings
- 5800 Acid Mine Drainage
- 5900 Abandoned Mining
- 5950 Inactive Mining

6000 Land Disposal
- 6100 Sludge
- 6200 Wastewater
- 6300 Landfills
- 6350 Inappropriate Waste Disposal/Wildcat Dumping
- 6400 Industrial Land Treatment

CHAPTER 10 – RECOMMENDED PLAN

10.1 Recommended Plan

Exhibit 10-1 shows the recommended regional solution for wastewater collection, transport and treatment for the planning area. The treatment plant for Brooksville should be abandoned and the wastewater pumped to Augusta to a new regional wastewater treatment plant. In Augusta, the existing influent pump station should be replaced with a new one and the existing wastewater treatment plant abandoned. A future project recommended is the pump station and force main from the industrial park to the regional system. This should be constructed when sufficient development occurs so that the industrial park's package plant would be of insufficient capacity to treat the wastewater generated. Features of the initial recommended project to implement include the following;

- A new 465 gpm pump station located on the current Brooksville Wastewater Treatment property.
- A new 500 gpm pump station located next to Ky 19, just south of Chatham.
- A new 8 inch diameter force main from Brooksville along Ky 19 to the Ky 19 - Ky 9 intersection.
- A new 10 inch diameter force main laid north from Ky 9 alongside Ky 19 and Little Turtle Creek Road and then to the new regional wastewater treatment plant.
- A new 765 gpm pump station to replace Augusta's main pump station and a new 8 inch diameter force main to the new regional wastewater treatment plant.
- A new 690,000 gpd regional wastewater treatment plant.
- A new 15 inch diameter gravity outfall sewer to the Ohio River from the new regional wastewater treatment plant.

The new regional wastewater treatment plant uses technology that will not only provide a high quality effluent, but also one that has had most nitrogen removed. The effluent produced from this treatment plant should consistently produce an effluent with a water quality of $CBOD_5 \leq 5$ mg/l, TSS ≤ 10 mg/l, Ammonia N ≤ 1 mg/l and total nitrogen ≤ 5 mg/l. Exhibit 10-2 shows a schematic of the proposed plant. Plant features include;

- Gravity Grit Removal
- Mechanical Screen with standby bar rack

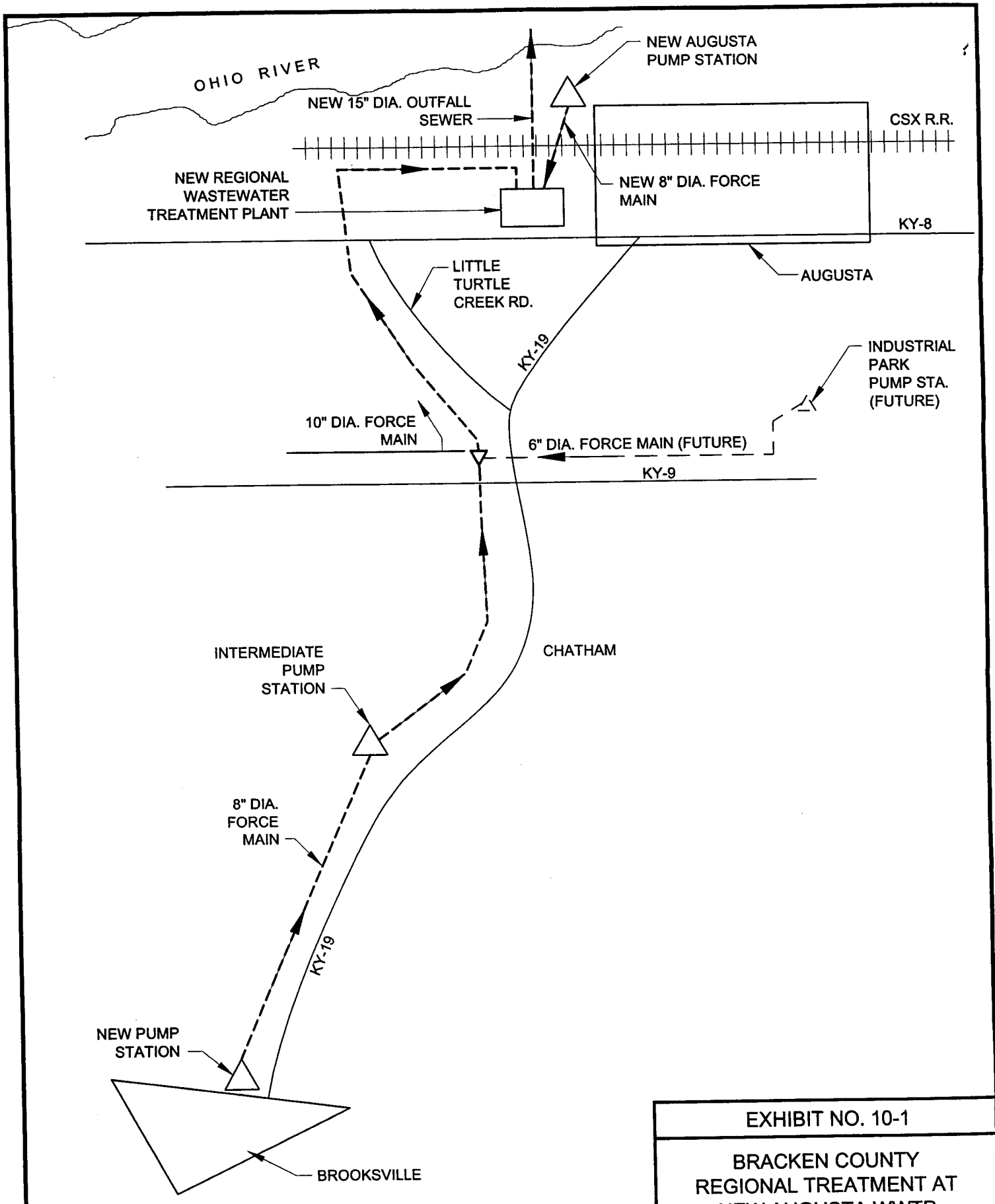
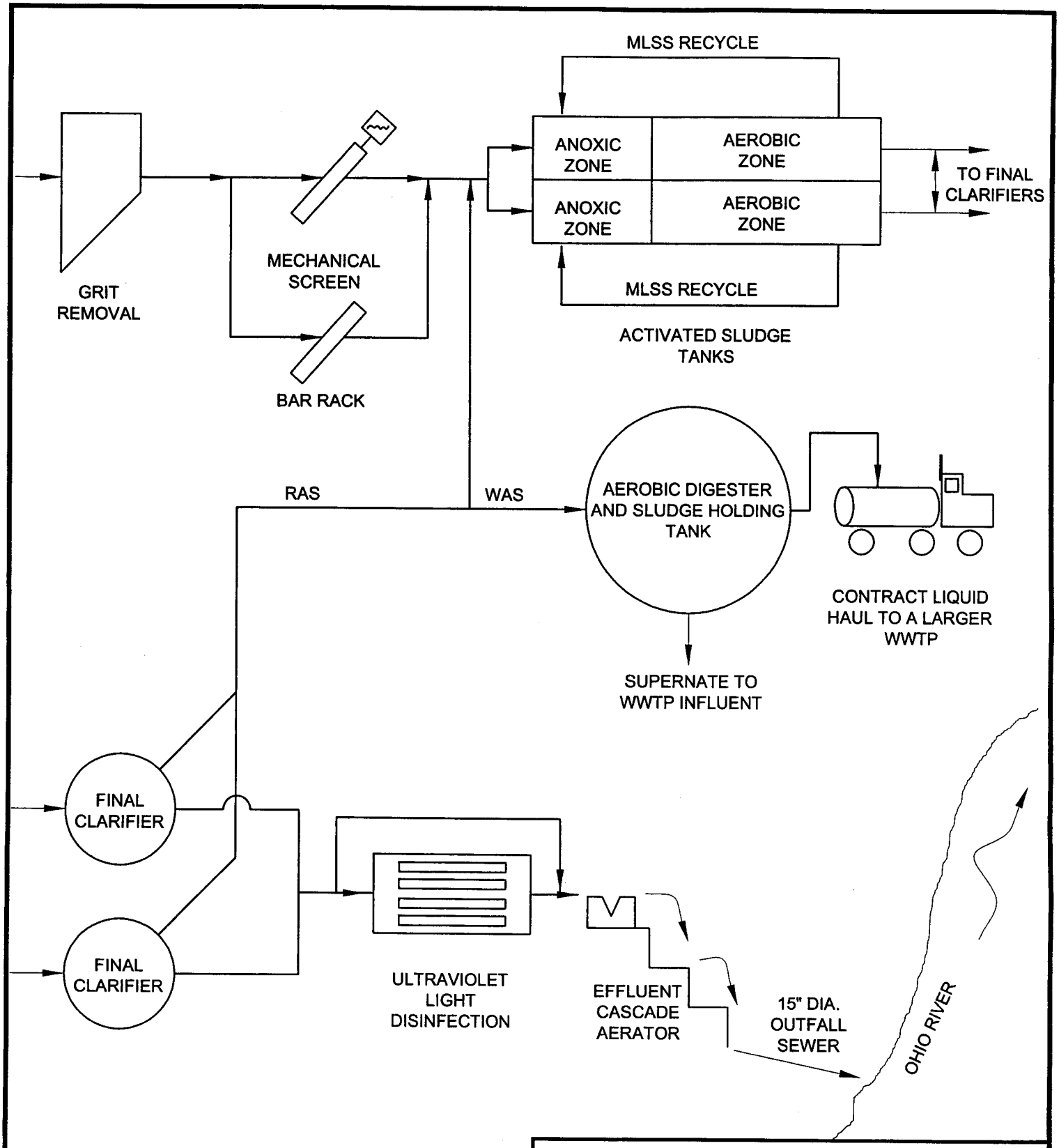


EXHIBIT NO. 10-1

BRACKEN COUNTY
REGIONAL TREATMENT AT
NEW AUGUSTA WWTP

BURGESS & NIPLE



NOTE:
ALL ITEMS SHOWN ARE PROPOSED.

EXHIBIT NO. 10-2

BRACKEN COUNTY REGIONAL WWTP
FLOW SCHEMATIC
SINGLE STAGE ACTIVATED SLUDGE PLANT
WITH BIOLOGICAL NITROGEN REMOVAL

BURGESS & NIPLE

- Two aeration tanks, each with an anoxic zone and an aerobic zone. Features include;
  - Anoxic zones having a nominal detention time of 4 hours
  - Aerobic zones having a nominal detention time of 19 hours
  - Two 880 gpm MLSS pumps
  - Two 450 scfm, 25 horsepower blowers
- Two 55 foot diameter final clarifiers
- Three 340 gpm RAS/WAS pumps
- Ultraviolet light disinfection
- Cascade aerator
- 195,000 gallon aerobic digester/sludge holding tank
- Tanker truck loading pad
- Control building built on top of the aeration tank structure

The construction cost for the new facilities are shown in previous report sections. The cost of pump stations and force mains from Brooksville to Augusta is $4,448,000 with an additional operation and maintenance cost of $53,100/yr. as shown in Table 7-2. The cost of the treatment plant, pump station and outfall sewer in Augusta is $4,920,000 with an additional operation and maintenance cost of $101,600/yr. as shown in Table 8-1.

10.2 Operation and Maintenance Requirements

Operation and Maintenance requirements will change. The operations of the Brooksville wastewater treatment will cease. Instead, the two pump stations to transport the wastewater to the regional treatment plant will have to be maintained. An operator would visit the pump stations once to three times weekly, depending on conditions, to record pump operating times, inspect the pump stations and perform housekeeping duties.

The proposed regional treatment plant in Augusta has more unit processes and pieces of equipment as compared to the current treatment plant. However, part time operation will still be sufficient at the plant. The plant should normally require about 4 hours of labor per day, 5 days per week. Work for that period of time would include record keeping, sampling, lab analysis for process control, equipment adjustments, inspection, housekeeping, sludge wasting, aerobic digester tank decanting and coordination with outside contractors. Additional time will have to be spent for periodic preventive maintenance activities and yard maintenance.

The cost effectiveness analysis in chapters 7 and 8 assumed design flows were occurring, which won't be the case during the first year of operation. Therefore, in computing revenue required to initially operate the system with fewer customers than full flow, the initial year O&M&R cost should be used. Table 10-1 is provided to show the expected initial year annual O&M&R cost.

TABLE 10-1

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
INITIAL YEAR ANNUAL O&M&R COST

Item	Design Flow Annual Cost	Factor for Initial Year	Initial Year Annual Cost
Existing Augusta Cost	-	-	$128,000 /yr.
Reduce Brooksville Cost for Collection System Only	-	-	30,000
Pump Stations – Force Main Costs			
Labor	$11,300	0.80	9,000
Power	28,000	0.40	11,200
Materials and Supplies	5,400	0.80	4,300
Equipment Replacement Fund	8,400	1.00	8,400
Regional WWTP Cost (Additional)			
Labor	10,300	0.80	8,200
Power	24,000	0.50	12,000
Materials and Supplies	5,500	0.80	4,400
Equipment Replacement Fund	16,800	1.00	16,800
Sludge Disposal	45,000	0.45	20,300
Estimated Initial Year Annual O&M&R Cost			$252,600 /yr.

The initial annual O&M&R cost to operate the system is estimated to be $252,600 per year. The current annual O&M&R cost to run Augusta and Brooksville systems now is about $248,000 ($128,000 and $120,000, respectively). Therefore, there is a slight increase in funding required for the initial O&M&R.

10.3. Financial Requirements

The revenue now generated in the Augusta sanitary sewer system is approximately $155,000 per year and in the Brooksville sanitary sewer system is approximately $116,000, for a total of about $271,000 per year. In calculating financial requirements to fund the system, existing bond retirement is not considered as both cities should have their bonds retired in the year 2008, and this project's payments can start, therefore, in the year 2011.

Several tables are provided to show the impact of financing methods including loans and grants from various sources. Table 10-2 shows a simple loan type financing using Kentucky's State Revolving Fund. Bracken County qualifies for the standard rate loan, which is 3%. The annual payment also includes a 0.2% payment on the unpaid balance of the loan. The revenue required is estimated to be 3.32 times the current revenue. Clearly grant funds are needed to make this project feasible.

TABLE 10-2

FINANCIAL REQUIREMENTS WITH 3% LOAN FROM THE STATE REVOLVING FUND

Item	Cost
Total Project Cost	$9,368,000
Estimated Annual Debt Retirement at 3% for 20 years (0.06722 x $9,368,000)	629,716 /yr.
Annual Payment on Principle, First Year (0.002 x $9,368,000)	18,736 /yr.
Initial Year O&M&R	252,600 /yr.
Total Annual Revenue Required	$901,052 /yr.
Current Revenue	271,000 /yr.
Revenue Increase Required	630,052 /yr.
Percent Increase in Revenue Required	232%
Multiplier Factor as Compared to Existing Revenue	3.32

Table 10-3 shows the monthly user cost breakdown of the capital and yearly treatment plant operation, maintenance and replacement costs based on various grant to loan ratios. A comparison to the existing sewer use fee is also shown. The average monthly household in Augusta and Brooksville uses approximately 6000 gallons per month. The average user fee as shown in Table 10-3 would range from $72.88 with a 100% loan to $32.74 with an 80% grant and 20% loan. A new sewer rate study should be completed following establishment of funding to determine new rates based on water usage records and residential versus commercial user information. Table 10-3 scenarios are based on existing customers presently using the Augusta and Brooksville sewer systems.

TABLE 10-3

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
MONTHLY COST PER FUNDING OPTIONS

	100% Loan	50/50 Grant/Loan	75/25 Grant/Loan	80/20 Grant/Loan		
Loan Amount	9,368,000	4,684,000	2,342,000	1,873,600		
Debt Service	629,677	314,838	157,419	125,935		
.2% loan service fee	18,736	9,368	4,684	3,747		
Debt Service Income required	648,413	324,206	162,103	129,683		
Estimated OM & R	244,200	244,200	244,200	244,200		
Total Revenue Required	892,613	568,406	406,303	373,883		
					Existing Augusta	Existing Brooksville
Unit Cost/1,000 Gals	$13.83	$8.81	$6.29	$5.79	$12.07	$15.79
Min Bill < 2000 gal	$27.66	$20.00	$18.00	$16.00	$14.14	$15.79
Bill for 4,000 Gals	$55.31	$35.22	$25.18	$23.17	$18.28	$24.89
Bill for 5,000 Gals	$69.14	$44.03	$31.47	$28.96	$20.35	$29.44
Bill for 6000 Gals	$82.97	$52.83	$37.77	$34.75	$22.42	$33.99
Bill for 7,000 Gals	$96.80	$61.64	$44.06	$40.55	$24.49	$38.54
Bill for 8,000 Gals	$110.63	$70.45	$50.36	$46.34	$26.56	$43.09

Loan - percentage rate 3 % term = 20 yrs (Based on State Revolving Loan financing)

Flow Estimate – Number of users =	882	Households		
Avg. water usage =	200.5	Gal/day/household	6,015	Gal/mo
	365	Days		
	64,549,520	Gal/year		

The possible funding sources to aid in the financing of the project are listed below. The list shows the various funding limits and interest rates currently being offered by the various organizations. If a regional treatment solution is approved, a joint application for funding would need to be completed by Augusta and Brooksville.

- Kentucky Infrastructure Authority – KIA – Various funding levels for grants through special State Legislature appropriation funds similar to Tobacco Funds. Loans are administered through Kentucky Division of Water State Revolving Loan Fund. Loan rates are currently at 3% for 20 years for the Bracken County area. A .2% annual loan servicing fee on the unpaid balance is charged on all loans. Tobacco Fund appropriation grants are usually limited to a maximum amount of $500,000.
- Community Development Block Grant – CDBG – $1,000,000 maximum grant, requires an income survey to determine eligibility 51% of the homes must be in the low to moderate income levels to qualify for the funding.
- USDA Rural Development – Funding levels are based on the 2000 census. Augusta is eligible for up to 45% grant and Brooksville is eligible for up to 75% grant. Actual loan to grant ratios over the last few years have been 65:35 and 70:30. Loan interest rates are currently at 4.25% for 40 years with the first 2 years being interest only payments. Loans require a debt coverage of 20% of annual cost for loan only financing and 10% of annual cost for loan/grant financing until a reserve of one year's payment is accumulated.
- Federal Budget Appropriation Grants – Grants are administered by Division of Water and are applied for through the local congressman. The grants range from 0 to 55% of the project cost depending on Congressional appropriation.

10.4 Sanitary Collection Systems

Renovation work is required on the sanitary sewer collection system in Augusta and Brooksville to reduce I&I as discussed in Chapter 4, Sections 4.2.2 and 4.3.2 of this report and the SSES report. This repair work as well as future I&I detection and repairs will require a means of financing. Since the search for funding of the regionalization may take several years to complete, it is recommended that the sewer repairs and search for additional I&I sources begin immediately. The funding of this work could be completed by increase in sewer user fee. If each city would concentrate on I&I removal projects over the next several years, many I&I sources could be corrected prior to the construction of the new treatment plant saving pumping cost and treatment capacity. Table 10-3 shows a cost breakdown of the repair work

along with the cost for additional search for undetected I&I sources. Work is assumed to be completed over a four year period. The table provides an estimate of the increase in monthly user fee required to complete the investigation work and repairs.

Table 10-4

AUGUSTA AND BROOKSVILLE, KY
SANITARY SEWER SYSTEM CORRECTIONS

Augusta

Work Description	Cost	Cost per year
I&I corrections	$52,800	$13,200
Manhole lid raising	$40,000	$10,000
Investigation & Future work		$24,000

Total = $47,200 / year

User cost increase - $47,200 / 560 customers / 12 mo. = $7.00 / mo.

Brooksville

Work Description	Cost	Cost per year
I&I corrections	$8,100	$2,025
Manhole lid raising and anchoring	$45,000	$11,250
Investigation & Future work		$19,000

Total = $32,275 / year

User cost increase – $32,275 / 434 customers / 12 mo. = $6.20 / mo.

A benefit of completing the additional sewer investigation work as soon as possible is that if substantial repair work is found to be necessary during the investigation, this repair work could be included in the overall financing of the regional treatment facility.

10.5 Schedule

The project is needed soon as the treatment plants do need replaced. However, the plants are currently in compliance with their KPDES permit limits, so time should be spent in obtaining low interest loans and grants. Also, time is needed in forming the legal entity to own and operate the expanded sewer system. It would be best for the two cities if the new loan payment could start in the year 2009, so that the existing bonds could be retired before taking on new debt. Table 10-5 shows the recommended schedule for this project.

TABLE 10-5

NORTHERN BRACKEN COUNTY SEWER SYSTEM PROJECT
PROPOSED SCHEDULE

Task	Completion Date
I&I Investigation and Corrections	2005 - 2011
Obtain low interest loan and grant funding	October 1, 2010
Complete Design	October 1, 2011
Obtain Division of Water Approval	December 1, 2011
Receive bids	February 1, 2011
Award contracts and start construction	March 1, 2011
Complete construction	March 1, 2012
Complete start-up	May 1, 2012

JAMES E. BICKFORD
SECRETARY

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

MAY 2 2 1998

The Honorable Betty C. Rudd
Mayor, City of Brooksville
Post Office Box 216
Brooksville, Kentucky 41004

Re: NPDES No.: KY0025232
Brooksville Utilities WWTP
Bracken County, Kentucky

Dear Mayor Rudd:

Enclosed is the Kentucky Pollutant Discharge Elimination System (KPDES) permit for Brooksville Utilities Wastewater Treatment Plant. This action constitutes a final permit issuance under 401 KAR 5:075 pursuant to KRS 224.16-050.

This permit will become effective on the date indicated in the attached permit provided that no request for adjudication is granted. All provisions of the permit will be effective and enforceable in accordance with 401 KAR 5:075 unless stayed by the Hearing Officer under Sections 11 and 13.

Any demand for a hearing on the permit shall be filed in accordance with the procedures specified in KRS 224.10-420, 224.10-440, 224.10-470 and any regulations promulgated thereto. Any person aggrieved by the issuance of a permit final decision may demand a hearing pursuant to KRS 224.10-420(2) within thirty (30) days from the date of the issuance of this letter. Two copies of request for hearing should be submitted in writing to the Natural Resources and Environmental Protection Cabinet, Office of Administrative Hearings, 35-36 Fountain Place, Frankfort, Kentucky 40601 and the Commonwealth of Kentucky, Natural Resources and Environmental Protection Cabinet, Division of Water, 14 Reilly Road, Frankfort, Kentucky 40601. For your record keeping purposes, it is recommended that these requests be sent by certified mail. The written request must conform to the appropriate statutes referenced above.

If you have any questions regarding the KPDES decision, please contact Ms. Judy Zeigler, Inventory and Data Management Section, KPDES Branch, at (502) 564-2225, extension 465.

Further information on procedures and legal matters pertaining to the hearing request may be obtained by contacting the Hon. Barbara Foster, Division of Hearings, at (502) 564-7312.

Sincerely,

Jack A. Wilson, Director
Division of Water

JAW:NG
Enclosure
c: Mr. Eddie Morford
Florence Regional Office

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KPDES



KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT

PERMIT NO.: KY0025232

AUTHORIZATION TO DISCHARGE UNDER THE KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

Pursuant to Authority in KRS 224,

City of Brooksville
P.O. Box 216
Brooksville, Kentucky 41004

is authorized to discharge from a facility located at

Brooksville Utilities Wastewater Treatment Plant
Kentucky Highway 19
Brooksville, Bracken County, Kentucky

to receiving waters named

Unnamed tributary at mile point 1.5 to Locust Creek at mile point 8.92

in accordance with effluent limitations, monitoring requirements and other conditions set forth in PARTS I, II, and III. The permit consists of this cover sheet, and PART I 2 pages, PART II 2 pages, and PART III 1 page.

This permit shall become effective on JUL 01 1998

This permit and the authorization to discharge shall expire at midnight,

~~JUN 30 2003~~

June 30 - 2008

MAY 22 2003
~~MAY 22 1998~~
Date Signed

Jack A. Wilson, Director
Division of Water

Robert W. Logan
Commissioner

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
Division of Water, Frankfort Office Park, 14 Reilly Road, Frankfort, Kentucky 40601

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the term of this permit, the permittee is authorized to discharge from outfall serial number: 001, Municipal Discharge.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS lbs/day		Other Units (Specify)		MONITORING REQUIREMENTS		
	Monthly Avg.	Weekly Avg.	Monthly Avg.	Weekly Avg.	Measurement Frequency	Sample Type	Sampling Location
Flow, Design (0.200 mgd)	N/A	N/A	Report	Report	Continuous	N/A	Influent or Effluent
Biochemical Oxygen Demand (5-day), Carbonaceous	16.7	25.0	10 mg/l	15 mg/l	1/Week	Composite	Influent & Effluent
Total Suspended Solids	50.0	75.0	30 mg/l	45 mg/l	1/Week	Composite	Influent & Effluent
Fecal Coliform Bacteria, N/100	N/A	N/A	200	400	1/Week	Grab	Effluent
Ammonia (as N)	6.67 16.7	10.0 25.0	4 mg/l* 10 mg/l**	6 mg/l* 15 mg/l**	1/Week	Composite	Influent & Effluent
Dissolved Oxygen shall not be less than 7 mg/l					1/Week	Grab	Effluent
Total Residual Chlorine (TRC)	N/A	N/A	0.010 mg/l	0.019 mg/l***	1/Week	Grab	Effluent
Additional Parameters				See PART I, Page I-2		Composite	Effluent

In addition to the specified limits, the monthly average effluent $CBOD_5$ and suspended solids concentration shall not exceed 15% of the respective monthly average influent concentration (85% removal).

The pH of the effluent shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per week by grab sample.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

The effluent shall not cause a visible sheen on the receiving water.

* Effective May 1 - October 31
** Effective November 1 - April 30
*** Daily maximum limitation

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUATION)

The effluent shall be monitored for the following parameters once per year by composite sample in both the total recoverable form and the dissolved form:

lead, copper, zinc, and cadmium.

The effluent shall be monitored for hardness as calcium carbonate ($CaCO_3$) by composite sample. Testing for these parameters shall be conducted according to 40 CFR Part 136.

Results shall be reported each year (See PART III-A. Page III-1).

B. SCHEDULE OF COMPLIANCE

The permittee shall achieve compliance with all requirements on the effective date of this permit.

STANDARD CONDITIONS FOR KPDES PERMIT

The permittee is also advised that all KPDES permit conditions in KPDES Regulation 401 KAR 5:065, Section 1 will apply to all discharges authorized by this permit.

This permit has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies.

It is the responsibility of the permittee to demonstrate compliance with permit parameter limitations by utilization of sufficiently sensitive analytical methods.

SPECIAL POTW REQUIREMENTS

NOTE: The following requirements apply only to Publicly-Owned Treatment Works.

1. Sludge Disposal

   Requirements will be imposed, as applicable, governing the disposal of sewage sludge in accordance with 401 KAR Chapters 30, 47, and 48.

2. Industrial Pretreatment Standards

   a. The permittee shall provide annual reports to the Permit Issuing Authority listing industrial users of the system and identifying any problems caused by these users. Yearly reports are due no later than December 31 of each year, unless otherwise specified by the permitting authority.

   b. The permittee may be required to develop a local pretreatment program to enforce the requirement of applicable industrial discharges to meet the Federal Categorical Standards of 40 CFR Part 403, and other requirements pursuant to state regulation 401 KAR 5:057, Section 6.

3. Prohibitive Discharges

   Under no circumstances shall the permittee allow discharge of the following into the system:

   a. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW);

   b. Pollutants which will cause corrosive structural damage to the POTW, but in no case, discharges with a pH lower than 5.0;

   c. Solid or viscous pollutants in amounts which will cause obstruction to the flow in sewers, or other interference with operation of the POTW;

   d. Any pollutant, including oxygen demanding pollutants (BOD_5, etc.), released in a discharge at such a volume or strength as to cause interference in the POTW;

e. Heat in amounts which will inhibit biological activity in the POTW, but in no case, heat in such quantities that the influent to the sewage treatment works exceeds 104° F (40° C);

f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and,

h. Any trucked or hauled waste, except at discharge points designated by the POTW.

PART III

OTHER REQUIREMENTS

A. Reporting of Monitoring Results

Monitoring results obtained during each month must be reported on a preprinted Discharge Monitoring Report (DMR) Form which will be mailed to you. Each month's completed DMR must be sent to the Division of Water at the address listed below (with a copy to the appropriate Regional Office) postmarked no later than the 28th day of the month following the month for which monitoring results were obtained.

Division of Water
Florence Regional Office
7964 Kentucky Drive, Suite 8
Florence, Kentucky 41042
ATTN: Mr. Kevin Flowers

Kentucky Natural Resources and
Environmental Protection Cabinet
Dept. for Environmental Protection
Division of Water
Inventory & Data Management
14 Reilly Road, Frankfort Office Park
Frankfort, Kentucky 40601

B. Reopener Clause

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under 401 KAR 5:050 thru 5:080 and KRS 224, if the effluent standard or limitation so issued or approved:

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of KRS Chapter 224 when applicable.

JAMES E. BICKFORD
SECRETARY

PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

STATEMENT OF BASIS

KPDES No.: KY0025232 **Permit Writer:** Daymond Talley **Date:** April 2, 1998

Facility Name:	Brooksville Utilities Wastewater Treatment Plant
Facility Location:	Kentucky Highway 19 Brooksville, Bracken County, Kentucky
Permitting Action:	This is a reissuance of a permit for a municipality.
Permit Duration:	Five (5) years
Receiving Stream:	Unnamed tributary at mile point 1.5 to Locust Creek at mile point 8.92
Stream Segment Use Classification:	Warmwater Aquatic Habitat and Primary/Secondary Contact Recreation
Stream Low Flow Condition:	0.00 cfs

Justification of Permit Conditions:

The following regulations are pursuant to KRS 224.70-100 and KRS 224.70-110.

Biochemical Oxygen Demand (5-day), Total Suspended Solids, Fecal Coliform and pH
The effluent limitations for the above permit parameters are consistent with 401 KAR 5:045.

Ammonia Nitrogen, Dissolved Oxygen, and Total Residual Chlorine (TRC)
The effluent limitations for the above permit parameters are consistent with 401 KAR 5:031.

Sludge Management
Requirements will be imposed, as applicable, governing the disposal of sewage sludge in accordance with 401 KAR Chapters 30, 47, and 48.

Nondegradation
The conditions of 401 KAR 5:029, Section 2(1) and (3) have been satisfied by this permit action. A review under Section 2(2) and (4) is not applicable.

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Cause (Pollutant) Codes

0000 Cause Unknown
0100 Unknown Toxicity
0200 Pesticides
0300 Priority Organics
0400 Nonpriority Organics
0410 PCBs
0420 Dioxins
0500 Metals
- 0510 Arsenic
- 0520 Cadmium
- 0530 Copper
- 0540 Chromium
- 0550 Lead
- 0560 Mercury
- 0570 Selenium
- 0580 Zinc

0600 Ammonia (un-ionized)
0700 Chlorine
0720 Cyanide
0750 Sulfates
0800 Other Inorganics
0900 Nutrients
- 0910 Phosphorus
- 0920 Nitrogen
- 0990 Other

1000 pH
1100 Siltation
1200 Organic Enrichment/Low Dissolved Oxygen
1300 Salinity/Total Dissolved/ Solids/Chlorides/Sulfates
1400 Thermal Modifications
1500 Flow Alterations
1600 Habitat Alterations (other than flow)
1700 Pathogens
1800 Radiation
1900 Oil and Grease
2000 Taste and Odor
2100 Suspended Solids
2200 Noxious Aquatic Plants (native macrophytes)
2210 Excessive Algal Growth/ Chlorophyll a
2400 Total Toxics
2500 Turbidity
2600 Exotic Species

6500 Onsite Wastewater Systems (Septic Tanks)
6600 Hazardous Waste
6700 Septage Disposal

7000 Hydromodification
7100 Channelization
7200 Dredging
7300 Dam Construction
7350 Upstream Impoundment
7400 Flow Regulations/Modification

7550 Habitat Modification (other than Hydromodification)
7600 Removal of Riparian Vegetation
7700 Bank or Shoreline Modification/Destabilization
7800 Drainage/Filling of Wetlands

7900 Marinas and Recreational Boating
7910 In-water releases
7920 On-land releases

8050 Erosion from derelict land
8100 Atmospheric Deposition
8200 Waste Storage/Storage Tank Leaks (above ground)
8250 Leaking underground storage tanks
8300 Highway Maintenance and Runoff
8400 Spills (Accidental)
8500 Contaminated Sediments
8520 Debris and bottom deposits
8530 Internal nutrient cycling (primarily lakes)
8540 Sediment resuspension
8600 Natural Sources
8700 Recreation and Tourism Activities (other than Boating; see 7900)
8710 Golf Courses

8900 Salt Storage Sites
8910 Groundwater Loadings
8920 Groundwater Withdrawal

8950 Other
9000 Unknown Source
9050 Sources outside State Jurisdiction or Borders



WRIS Geospatial Data

The data provided on this page is a subset of the water and wastewater - related layers in the Water Resource Information System (WRIS). The information is a compilation of work performed since mid-1998 by Kentucky's ADDs and the WRIS with updates through early 2006.

All geospatial data is provided Zipped in ESRI's Shapefile format and is projected to the Kentucky Single Zone Cooridnate System. For more information about the Cooridnate System, visit the link to the right under the Resources Tab.

Please note that this data is considered a "work in progress" and that updates will be made as data becomes available.

Water Layers

Water Lines
(ZIP - 29.7MB) - updated 07/26/06

Water Tanks
(ZIP - 159KB) - updated 07/26/06

Water Treatment Plants
(ZIP - 38.4KB) - updated 07/26/06

Spring and Surface Sources
(ZIP - 38.5KB) - updated 07/26/06

Well Sources
(ZIP - 24.2KB) - updated 07/26/06

Purchase Sources
(ZIP - 71.8KB) - updated 07/26/06

Water Meters
(ZIP - 97.2KB) - updated 07/26/06

Pump Stations
(ZIP - 84.6KB) - updated 07/26/06

Water Pumps
(ZIP -199KB) - updated 07/26/06

Non Community Points
(ZIP - 19.4KB) - updated 07/26/06

Water Projects - Line
(ZIP - 4.50MB) - updated 07/26/06

Water Projects - Point
(ZIP - 60.7KB) - updated 07/26/06

Wastewater Layers

Wastewater Treatment Plants
(ZIP - 39.7KB) - updated 07/26/06

Sewer Lines
(ZIP - 9.05MB) - updated 07/26/06

Wastewater Treatment Plant Outfalls
(ZIP - 53.3KB) - updated 07/26/06

Lift Stations
(ZIP - 224KB) - updated 07/26/06

Package Treatment Plants
(ZIP - 74.3KB) - updated 07/26/06

KIMOP Points
(ZIP - 15.2KB) - updated 07/26/06

[redacted]
(ZIP - 2.45MB) - updated 07/26/06

[redacted]
(ZIP - 48.3KB) - updated 07/26/06

[redacted]
(ZIP - 1.13MB) - updated 07/26/06

Sanitary Sewer Service Planning Areas
(ZIP - 4.40MB) - updated 07/26/06

See Also...

Find us on the KYGEONET
Keyword = WRIS

Contact Person

Rusty Anderson
502-573-0260 x239

Resources

Water GeoDatabase Items
(PDF - 28.2KB)

Wastewater GeoDatabase Items
(PDF - 19.9KB)

Kentucky Single Zone State Plane Coordinate System





Last Updated 7/26/2006

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PRIORITY RANKING CRITERIA

1. Is the project necessary to achieve full or partial compliance with a court order, or a judicial or administrative consent decree?

2. a. Will the project implement an approved Total Maximum Daily Load (TMDL) for impaired waterbodies?
   b. Is the point source project for treating or eliminating a combined sewer overflow?
   c. Does the nonpoint source project conform with the goals and objectives outlined in the Kentucky NPS management program and include appropriate water quality Best Management Practices (BMP)?
   d. Is the project for complying with stricter discharge limits as a result of revised wasteload allocations?
   e. Is the project for correcting inflow or infiltration problems that are causing sewer overflows and treatment problems?
   f. Is the project for rehabilitating or replacing equipment to comply, or ensure continued compliance, with existing permit limits?
   g. Is the project for complying with a National Pollutant Discharge Elimination System Phase I or II stormwater permit?
   h. Is the project for eliminating one or more straight pipes or failing onsite systems in populations to be served that presently do not have sewer systems available?
   i. Will the project implement any part of an approved Watershed Plan? -need plans -None

3. Will the project make reasonable progress towards eliminating identified pollutant sources for waterbodies that appear on the 305(b) report or 303(d) list?

4. Will the project make reasonable progress towards eliminating identified pollutant sources of water quality impairments within an identified Priority Watershed?

5. Will the project correct a public health or water quality problem as documented by applicant, for waterbodies that have not been monitored and assessed?

6. Does the project eliminate existing or potential sources of pollution in groundwater sensitivity areas?

7. Is the project located within an identified SWAPP zone or WHPA?

8. Will the project address a contaminant source that is causing or may cause a drinking water supply to use higher-than-conventional treatment?

9. Will the project have a positive effect on Special Use Waters?

GIS Feature Class Name	Item Names	Item Width	Item Type	# of Decimals	Description	Domain/Valid Ranges
ALL ITEMS BELOW THIS POINT ARE RELATED TO METADATA						
Metadata Item (On all coverages, except ncommpts, watprop, watproppt, watfut, wma, wpa and watdist)						
	AGENCY	6	Text		Agency where update was made	BGADD, BRADD, BSADD, BTADD, CVADD, FIV KIPDA, KRADD, LCADD, LTADD, NKADD, PEADI
	CONTACT	75	Text		Person who made the update	NO DOMAIN/RANGE
	XY_SOURCE	75	Text		Source of location (DRG/DOQ/GPS/County Road Map/As-Builts/...) Do not use 'Other'	NO DOMAIN/RANGE
	XY_ISSUES	250	Text		Any issues with accuracy of location	NO DOMAIN/RANGE
	ATT_SOURCE	75	Text		Source of attribute (System Manager/System Engineer/Superintendent/System Reports/ . . .) Do not use 'Other'	NO DOMAIN/RANGE
	ATT_ISSUES	250	Text		Any issues with accuracy of attribute	NO DOMAIN/RANGE
	COMMENTS	500	Text		Any comments on boundary or location	NO DOMAIN/RANGE
	ADDNAME	6	Text		Name of ADD feature is located within, use UPPERCASE abbreviations (PEADD, PUADD)	BGADD, BRADD, BSADD, BTADD, CVADD, FIV KIPDA, KRADD, LCADD, LTADD, NKADD, F
ALL ITEMS BELOW THIS POINT ARE RELATED TO PROPOSED OR FUTURE INFORMATION - See Guidance for additional information or explanations.						
Sanitary Sewer Service Expansion/Development - SEWPROP (0-2 Projects)						
	PNUM	10	Text		Discrete Project Number (use SX + the state FIPS code + the county FIPS code + a sequential number: Woodford County Example – SX21239001 would be the first area designated in that county)	NO DOMAIN/RANGE
	OWNER	75	Text		OWNER of the system	PULL FROM MASTER LIST
Sanitary Sewer Service Expansion/Development - SEWPROPPT (all proposed points)						
	PNUM	10	Text		Discrete Project Number (use SX + the state FIPS code + the county FIPS code + a sequential number: Woodford County Example – SX21239001 would be the first area designated in that county)	NO DOMAIN/RANGE
	OWNER	75	Text		OWNER of the system	PULL FROM MASTER LIST
	TYPE	25	Text		Type of Feature (STP, PTP, LIFTSTATION, ...)	STP, PTP, LIFTSTAT, OTHEI
	OTHTYPE	50	Text		If Other, what is the type?	NO DOMAIN/RANGE
Sanitary Sewer Service Expansion/Development - SEWPROPPOLY (3-20 Projects & Future Service Areas)						
	PNUM	10	Text		Discrete Project Number (use SX + the state FIPS code + the county FIPS code + a sequential number: Woodford County Example – SX21239001 would be the first area designated in that county)	NO DOMAIN/RANGE
	OWNER	75	Text		OWNER of the system	PULL FROM MASTER LIST

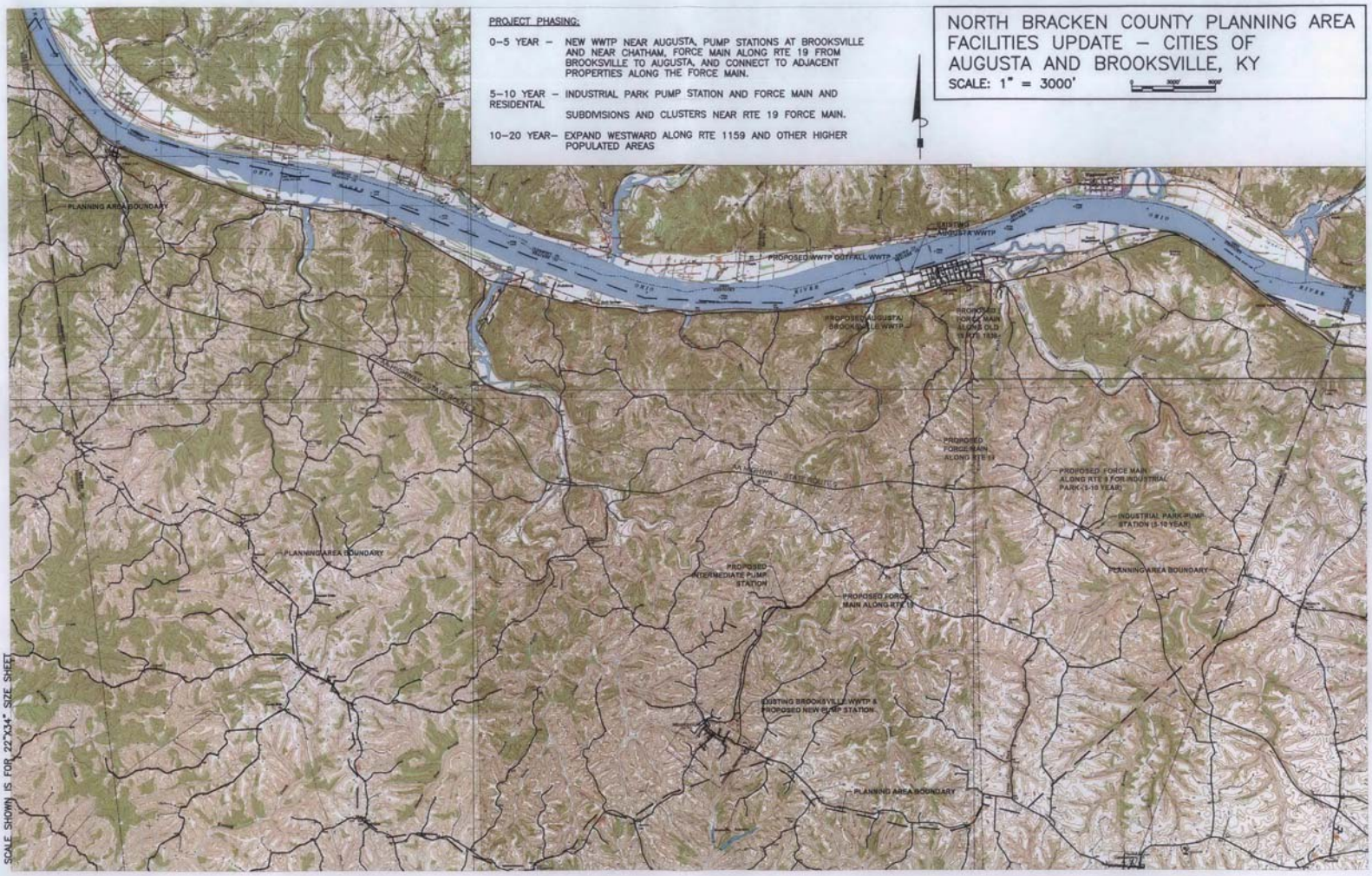
IPPRS Criteria	2007-99	2007-98	2007-97	2007-96
1-Is the project necessary to achieve full or partial compliance with a court order, or a judicial or administrative consent decree?				
2a-Will the project implement an approved Total Maximum Daily Load (TMDL) for impaired waterbodies				
2b-Is the point source project for treating or eliminating a combined sewer overflow				
2c-Does the nonpoint source project conform with the goals and objectives outlined in the Kentucky NPS management program and include appropriate water quality Best Management Practices (BMP)				
2d-Is the project for complying with stricter discharge limits as a result of revised wasteload allocations				
2e-Is the project for correcting inflow or infiltration problems that are causing sewer overflows and treatment problems				
2f-Is the project for rehabilitating or replacing equipment to comply, or ensure continued compliance, with existing permit limits				
2g-Is the project for complying with a National Pollutant Discharge Elimination System Phase I or II stormwater permit				
2h-Is the project for eliminating one or more straight pipes or failing onsite systems in populations to be served that presently do not have sewer systems available				
2i-Will the project implement any part of an approved Watershed Plan				
3-Will the project make reasonable progress towards eliminating identified pollutant sources for waterbodies that appear on the 305(b) report or 303(d) list?				
4-Will the project make reasonable progress towards eliminating identified pollutant sources of water quality impairments within an identified Priority Watershed?				
5-Will the project correct a public health or water quality problem as documented by applicant, for waterbodies that have not been monitored and assessed?				
6-Does the project eliminate existing or potential sources of pollution in groundwater sensitivity areas?				
7-Is the project located within an identified SWAPP zone or WHPA?				
8-Will the project address a contaminant source that is causing or may cause a drinking water supply to use higher-than-conventional treatment?				
9-Will the project have a positive effect on Special Use Waters?				

Score	Project ID	Al Name	Project Name	County	Type	Total Cost	Loan Amount	1	2a	2b	2c	2d	2e	2f	2g	2h	2i	3	4	5	6	7	8	9
80	2007-38	Murray WWTP	Southwest Annexation Sewer	Calloway	WW	$1,123,237.00	$1,123,237.00	0	0	0	0	0	0	0	0	40	0	20	20	0	0	0	0	0
78	2007-31	Rockhouse Creek WWTP	North Fork/Rockhouse Creek WWTP and Sanitary Sewer Project	Letcher	WW	$2,548,000.00	$100,000.00	0	40	0	0	0	0	10	0	10	0	0	0	0	5	13	0	0
76	2007-65	Jessamine Creek Environmental Control WWTP	North End Sewer Extensions	Jessamine	WW	$9,554,625.00	$7,467,225.00	0	0	0	0	0	0	0	0	40	0	20	0	0	10	6	0	0
73	2007-4	Hardin Co Water District 2	East Rhodes Creek Watershed Wastewater Collection & Treatment	Hardin	WW	$4,879,000.00	$4,879,000.00	0	0	0	0	0	0	0	0	40	0	20	0	0	10	3	0	0
73	2007-40	Hopkinsville Hammond Wood WWTP	SRF Phase 6	Christian	WW	$6,800,000.00	$6,800,000.00	0	0	0	0	0	40	10	0	10	0	0	0	0	10	3	0	0
73	2007-7	Hardin Co Water District 2	Rose Run Watershed Wastewater Collection & Treatment	Hardin	WW	$3,590,000.00	$3,590,000.00	0	0	0	0	0	0	0	0	40	0	20	0	0	10	3	0	0
72	2007-29	Vine Grove WWTP	Wastewater System Improvements	Hardin	WW	$600,000.00	$600,000.00	0	0	0	0	0	40	10	0	0	0	0	0	0	10	7	0	5
70	2007-2	Hardin Co Water District 2	Mill Creek Branch Watershed Watewater collection & treatment	Hardin	WW	$5,481,000.00	$5,481,000.00	0	0	0	0	0	0	0	0	40	0	20	0	0	10	0	0	0
64	2007-17	Carrollton Regional WWTP	Ghent WWTP Elimination & Force Main	Carroll	WW	$986,000.00	$686,000.00	0	0	0	0	0	0	40	0	0	0	0	0	0	10	14	0	0
64	2007-22	Warsaw WWTP	Warsaw Storm Water System Improvements	Gallatin	SW/NP	$721,000.00	$721,000.00	0	0	0	40	0	0	0	0	0	0	0	0	0	10	14	0	0
60	2007-35	Prestonsburg WWTP & Landfarm	Wastewater Treatment Plant Upgrade	Floyd	WW	$650,000.00	$650,000.00	0	0	0	0	0	0	40	0	0	0	20	0	0	0	0	0	0
60	2007-88	Bowling Green WWTP	Sewer Interceptors & Cleaning Inspection	Warren	WW	$225,000.00	$225,000.00	0	0	0	0	0	40	0	0	0	0	0	0	0	10	10	0	0
60	2007-26	Oldham Co Sewer District	Orchard Grass WWTP Elimination	Oldham	WW	$1,500,000.00	$1,500,000.00	0	40	0	0	0	0	0	0	0	0	0	0	0	10	10	0	0
55	2007-6	Hardin Co Water District 2	Brushy Fork Creek Watershed Collection & treatment	Hardin	WW	$8,112,000.00	$8,112,000.00	0	0	0	0	0	0	0	0	40	0	0	0	0	10	3	0	5
57	2007-25	Oldham Co Sewer District	Willow Creek WWTP Elimination	Oldham	WW	$430,000.00	$430,000.00	0	40	0	0	0	0	0	0	0	0	0	0	0	10	7	0	0
55	2007-23	Campton WWTP	Campton Wastewater System Improvements	Wolfe	WW	$1,000,000.00	$1,000,000.00	0	0	0	0	0	0	0	0	40	0	0	0	10	5	0	0	0
55	2007-56	Southern Water & Sewer District	Pride on the River (Harold Wastewater project)	Floyd	WW	$6,773,000.00	$850,000.00	0	0	0	0	0	0	0	0	40	0	0	0	0	5	10	0	0
55	2007-16	Carrollton Regional WWTP	Eagle Creek Resort Wastewater Improvements	Owen	WW	$1,500,000.00	$750,000.00	0	0	0	0	0	0	40	0	10	0	0	0	0	5	0	0	0
55	2007-107	Saint Charles Wastewater Collection System	St. Charles Sanitary Sewer System	Hopkins	WW	$3,400,000.00	$2,000,000.00	0	0	0	0	0	40	0	0	10	0	0	0	0	5	0	0	0
55	2007-15	Hardinsburg WWTP	Blancett Lake - Airport Road Sewers	Breckinridge	WW	$710,000.00	$710,000.00	0	0	0	0	0	0	0	0	40	0	0	0	0	10	0	0	5
55	2007-14	Hardinsburg WWTP	Breckwood Area Sewers	Breckinridge	WW	$476,300.00	$476,300.00	0	0	0	0	0	0	0	0	40	0	0	0	0	10	0	0	5
55	2007-12	Louisa WWTP	Louisa Comprehensive Sewer System	Lawrence	WW	$3,600,000.00	$1,000,000.00	0	0	0	0	0	0	0	0	40	0	0	0	0	5	10	0	0
53	2007-68	Hardin Co Water District 2	Upper Otter Creek Watershed and Pawley Creek Watershed Wastewater Collection and Treatment	Hardin	WW	$11,424,000.00	$11,424,000.00	0	0	0	0	0	0	0	0	40	0	0	0	0	10	3	0	0
53	2007-5	Hardin Co Water District 2	North Upper Nolin River Watershed Wastewater Collection & Treatment	Hardin	WW	$20,945,000.00	$20,945,000.00	0	0	0	0	0	0	0	0	40	0	0	0	0	10	3	0	0
52	2007-27	KY State Reformatory	Kentucky State Reformatory WWTP Expansion - Phase 1	Oldham	WW	$1,000,000.00	$1,000,000.00	0	40	0	0	0	0	0	0	0	0	0	0	0	5	7	0	0
52	2007-37	Boyd Co Sanitation District 4 Wastewater Collection	Route 5 Area Sewers	Boyd	WW	$2,787,000.00	$2,462,000.00	0	0	0	0	0	0	0	0	40	0	0	0	0	5	7	0	0
50	2007-34	Carlisle Co WWTP	Cunningham Force Main and Collection System	Carlisle	WW	$2,492,599.00	$2,492,599.00	0	0	0	0	0	0	0	0	40	0	0	0	0	0	10	0	0
50	2007-33	Carlisle Co WWTP	Milburn Force main and Collection System	Carlisle	WW	$2,964,030.00	$2,964,030.00	0	0	0	0	0	0	0	0	40	0	0	0	0	0	10	0	0
50	2007-32	Clinton WWTP	Clinton Sewer Rehabilitation Project	Hickman	WW	$2,700,000.00	$1,000,000.00	0	0	0	0	0	40	0	0	0	0	0	0	0	0	10	0	0
50	2007-30	Mercer Co Sanitation District	Kentucky Agricultural Heritage Center/McAfee Wastewater Conveyance Project	Mercer	WW	$1,988,044.00	$988,044.00	0	0	0	0	0	0	0	0	40	0	0	0	0	10	0	0	0
48	2007-50	Calvert City WWTP	Sewer Rehab Phase III	Marshall	WW	$750,000.00	$750,000.00	0	0	0	0	0	40	0	0	0	0	0	0	0	5	3	0	0
48	2007-48	Calvert City WWTP	WWTP Expansion	Marshall	WW	$2,000,000.00	$1,500,000.00	0	0	0	0	0	40	0	0	0	0	0	0	0	5	3	0	0
48	2007-47	Calvert City WWTP	On Site Sewer Treatment Abatement Phase I	Marshall	WW	$100,000.00	$100,000.00	0	0	0	0	0	0	0	0	40	0	0	0	0	5	3	0	0
46	2007-51	Calvert City WWTP	641 Corridor Sewer Extension, Phase 1	Marshall	WW	$2,500,000.00	$2,500,000.00	0	0	0	0	0	0	40	0	0	0	0	0	0	0	6	0	0
45	2007-55	Grant Co Sanitary Sewer District WWTP	Grant County Sewer Extension, Phase 1	Grant	WW	$2,870,000.00	$1,701,300.00	0	0	0	0	0	0	0	0	40	0	0	0	0	5	0	0	0
43	2007-49	Calvert City WWTP	Sewer Rehab Phase II	Marshall	WW	$500,000.00	$250,000.00	0	0	0	0	0	40	0	0	0	0	0	0	0	0	3	0	0
40	2007-64	Williamstown WWTP & Landfarm	Williamstown Regional Wastewater System improvements	Grant	WW	$16,600,000.00	$13,700,000.00	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0
40	2007-91	Bowling Green WWTP	Emergency Power for WWTP	Warren	WW	$700,000.00	$700,000.00	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0
40	2007-8	Fancy Farm WWTP	Fancy Farm	Graves	WW	$2,500,000.00	$1,500,000.00	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0
40	2007-28	Princeton WWTP	Sanitary Sewer Improvements Project	Caldwell	WW	$500,000.00	$500,000.00	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0
40	2007-24	Prestonsburg WWTP & Landfarm	US 23 Corridor Sewer Improvements Project	Floyd	WW	$1,100,000.00	$1,100,000.00	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0
20	2007-20	Warsaw WWTP	Warsaw Wastewater System improvements	Gallatin	WW	$3,100,000.00	$3,000,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0	0
20	2007-63	Elizabethtown Valley Creek WWTP	Valley Creek WWTP Expansion	Hardin	WW	$17,654,000.00	$17,654,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0	0
20	2007-92	Bowling Green WWTP	Relief Sewer to Pioneer Dwe	Warren	WW	$325,000.00	$325,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0	0
17	2007-21	Warsaw WWTP	Warsaw Wastewater System Improvements	Gallatin	WW	$230,000.00	$115,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	7	0	0
17	2007-19	Carrollton Regional WWTP	I-71 Interchange Sewer	Carroll & Gallatin	WW	$2,340,000.00	$1,000,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	7	0	0
17	2007-18	Carrollton Regional WWTP	Markland Dam & Gallatin Steel sewers	Gallatin	WW	$725,000.00	$625,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	7	0	0
17	2007-89	Bowling Green WWTP	Cave Mill Road Pump Station & Force Main	Warren	WW	$3,700,000.00	$3,700,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	7	0	0
17	2007-90	Bowling Green WWTP	Lover Lane Sewage System	Warren	WW	$2,400,000.00	$2,400,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	7	0	0
15	2007-13	Louisa WWTP	Louisa WWTP Expansion	Lawrence	WW	$4,000,000.00	$2,000,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	5	10	0	0
10	2007-93	West Co WWTP	South Waterson Trail Sewer	Jefferson	WW	$2,662,000.00	$1,639,300.00	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
3	2007-85	Bowling Green WWTP	Pascoe Pump Station & Force Main	Warren	WW	$630,000.00	$630,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
0	2007-86	Bowling Green WWTP	Hydraulic Sewer Model	Warren	WW	$120,000.00	$120,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	2007-87	Bowling Green WWTP	BGMU WWTP Facility Plan	Warren	WW	$150,000.00	$150,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	2007-39	Murray WWTP	641 North/Hwy 80 Sanitary Sewers	Calloway	WW	$1,230,000.00	$1,230,000.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ranked Priority List

11/6/20

Score	Project ID	AI Name	Project Name	County	Type	Total Cost	Loan Amount	1	2a	2b	2c	2d	2e	2f	2g	2h	2i	3	4	5	6	7	8	9
195	2007-53	Paducah WWTP	Paducah Wastewater Treatment Plant Expansion, Phase 1	McCracken	WW	$2,875,000.00	$1,075,000.00	100	0	40	0	0	10	10	0	0	0	0	0	0	10	20	0	5
182	2007-52	Paducah WWTP	Paducah Wastewater Treatment Plant Grit Removal and Headwork Improvements, Phase II	McCracken	WW	$1,962,500.00	$529,500.00	100	0	40	0	0	10	0	0	0	0	0	0	0	7	20	0	5
170	2007-41	Irvine WWTP	Irvine Municipal Utilities - Estill County Regional Wastewater Project	Estill	WW	$8,525,000.00	$2,000,000.00	100	0	0	0	0	40	10	0	0	0	0	0	10	0	10	0	0
170	2007-66	Jessamine Creek Environmental Control WWTP	City of Nicholasville Wastewater System Improvements	Jessamine	WW	$9,621,000.00	$9,521,000.00	100	0	0	0	0	0	40	0	0	0	0	0	0	10	20	0	0
168	2007-36	Whitesburg WWTP (new)	Whitesburg Wastewater Improvement Project	Letcher	WW	$6,433,374.00	$500,000.00	100	40	0	0	0	0	10	0	10	0	0	0	0	5	3	0	0
164	2007-99	Morris Forman WWTP (MSD)	River Road Interceptor Sanitary Sewer Project	Jefferson	WW	$4,800,000.00	$4,800,000.00	100	40	0	0	0	0	0	0	0	0	0	0	0	7	17	0	0
161	2007-97	North Hunting Creek WWTP	Bass Avenue/River Road Sanitary Sewer Assessment Project	Jefferson	WW	$4,250,000.00	$2,650,000.00	100	40	0	0	0	0	0	0	0	0	0	0	0	7	14	0	0
160	2007-61	Max Rhoads WWTP	Devins Ditch Ph 1	Daviess	SW	$1,056,000.00	$1,056,000.00	100	0	40	0	0	0	0	10	0	0	0	0	0	10	0	0	0
160	2007-57	Max Rhoads WWTP	Goetz Ditch Phases 3 & 4	Daviess	SW	$3,224,000.00	$3,000,000.00	100	0	40	0	0	0	0	10	0	0	0	0	0	10	0	0	0
160	2007-58	Max Rhoads WWTP	Harsh Ditch Phase 1	Daviess	SW	$2,622,000.00	$2,480,000.00	100	0	40	0	0	0	0	10	0	0	0	0	0	10	0	0	0
160	2007-59	Max Rhoads WWTP	Harsh Ditch Phase 2	Daviess	SW	$8,438,801.00	$8,438,801.00	100	0	40	0	0	0	0	10	0	0	0	0	0	10	0	0	0
160	2007-60	Max Rhoads WWTP	Scherm Ditch Phases 1 & 3	Daviess	SW	$7,971,000.00	$7,971,000.00	100	0	40	0	0	0	0	10	0	0	0	0	0	10	0	0	0
160	2007-104	Morris Forman WWTP (MSD)	CSO 206 Sewer Separation and Downspout Disconnection	Jefferson	WW	$4,158,750.00	$4,158,750.00	100	0	40	0	0	0	10	0	0	0	0	0	0	10	0	0	0
157	2007-100	Morris Forman WWTP (MSD)	Harrods Creek Sanitary Sewer Pump Station and Force Main	Jefferson	WW	$6,000,000.00	$6,000,000.00	100	40	0	0	0	0	0	0	0	0	0	0	0	7	10	0	0
157	2007-101	Morris Forman WWTP (MSD)	Harrods Creek Interceptor Sanitary Sewer Project, Phase 1	Jefferson	WW	$3,400,000.00	$3,400,000.00	100	40	0	0	0	0	0	0	0	0	0	0	0	7	10	0	0
157	2007-98	Morris Forman WWTP (MSD)	Harrods Creek Interceptor Sanitary Sewer Project, Phase 2	Jefferson	WW	$3,000,000.00	$3,000,000.00	100	40	0	0	0	0	0	0	0	0	0	0	0	7	10	0	0
157	2007-44	Max Rhoads WWTP	Glenview Sewer Installation Project	Daviess	WW	$650,000.00	$350,000.00	100	0	0	0	0	0	0	0	40	0	0	0	0	10	7	0	0
155	2007-78	Northern KY Sanitation District 1 W Regional WWTP	Gunpowder Interceptor Sewer Western Regional Collection System	Boone	WW	$13,725,000.00	$12,278,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	10	0	0
155	2007-1	Clay WWTP	City of Clay Wastewater System Improvements	Webster	WW	$2,200,000.00	$2,200,000.00	100	0	0	0	0	0	40	0	10	0	0	0	0	5	0	0	0
155	2007-67	Northern Madison Co Sanitation District WWTP	Madison Village Wastewater Collection System Rehabilitation	Madison	WW	$3,600,000.00	$2,300,000.00	0	0	0	0	0	40	10	0	0	0	80	0	0	7	13	0	5
155	2007-54	Stanford WWTP	Equalization Basin for the Stanford STP	Lincoln	WW	$2,620,000.00	$2,460,000.00	100	0	0	0	0	40	10	0	0	0	0	0	0	5	0	0	0
154	2007-69	Sanitation District 1 Eastern Regional - Alexandria WWTP	Floatables Control	Kenton	WW	$450,000.00	$360,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	7	7	0	0
152	2007-74	Northern KY Sanitation District 1 W Regional WWTP	Turkeyfoot/Industrial Road Forcemain Western Regional Collection System	Boone/Kenton	WW	$3,045,000.00	$2,350,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	7	0	0
152	2007-79	Northern KY Sanitation District 1 W Regional WWTP	Narrows Road Diversion Pump Station Station Western Regional Collection System	Kenton	WW	$11,565,000.00	$9,900,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	7	0	0
152	2007-71	Northern KY Sanitation District 1 W Regional WWTP	Longbranch Trunk Sewer Western Regional Collection System	Boone	WW	$3,096,000.00	$2,664,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	7	0	0
152	2007-80	Northern KY Sanitation District 1 W Regional WWTP	South Fork Gunpowder Interceptor sewer Western Regional Collection System	Boone	WW	$15,578,000.00	$13,545,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	7	0	0
152	2007-81	Northern KY Sanitation District 1 W Regional WWTP	Frogtown Interceptor Western Regional Collection System	Boone	WW	$6,430,000.00	$5,366,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	7	0	0
152	2007-82	Northern KY Sanitation District 1 W Regional WWTP	Sunnybrook Sewer Western Regional Collection Sytem	Boone	WW	$8,178,000.00	$7,143,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	7	0	0
152	2007-77	Northern KY Sanitation District 1 W Regional WWTP	Richwood Sewer Force Main Western Regional Collection System	Boone	WW	$5,734,000.00	$4,700,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	7	0	0
150	2007-42	Max Rhoads WWTP	Frederica Street Tunnel Sewer Relining (20th Street to 22nd Street)	Daviess	WW	$600,000.00	$600,000.00	100	0	0	0	0	40	0	0	0	0	0	0	0	10	0	0	0
150	2007-45	Max Rhoads WWTP	Broadacre Subdivision Sewer Extension	Daviess	WW	$400,000.00	$400,000.00	100	0	0	0	0	0	0	0	40	0	0	0	0	10	0	0	0
149	2007-46	Richmond Otter Creek WWTP	Otter Creek WWTP & Trunk Sewers	Madison	WW	$40,000,000.00	$40,000,000.00	0	0	0	0	0	40	10	0	0	0	80	0	0	10	9	0	0
148	2007-109	(New) Falmouth WWTP	Falmouth Regional Wastewater Treatment Plant	Pendleton	WW	$2,056,830.00	$2,411,830.00	100	0	0	0	0	0	40	0	0	0	0	0	0	5	3	0	0
148	2007-75	Sanitation District 1 Eastern Regional - Alexandria WWTP	Allen Fork Collection System-Phase II	Boone	WW	$34,444,000.00	$28,062,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	3	0	0
148	2007-108	Beaver Dam WWTP	Sanitary Sewer Rehabilitation, Beaver Dam, Kentucky	Ohio	WW	$1,300,000.00	$650,000.00	100	0	0	0	0	40	0	0	0	0	0	0	0	5	3	0	0
147	2007-70	Northern KY Sanitation District 1 W Regional WWTP	Western Regional Treatment Plant (WWTP)	Boone	WW	$57,735,000.00	$45,000,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	0	7	0	0
147	2007-106	Morris Forman WWTP (MSD)	Real Time control at Southwestern Outfall Phase II	Jefferson	WW	$5,300,000.00	$5,300,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	7	0	0	0
147	2007-105	West Co WWTP	Real Time Control at Main Diversion Structure	Jefferson	WW	$871,000.00	$871,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	7	0	0	0
147	2007-103	Morris Forman WWTP (MSD)	Real Time Controls at CSO 108	Jefferson	WW	$668,000.00	$668,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	7	0	0	0
145	2007-43	Max Rhoads WWTP	Masonville Sewer Installation Project	Daviess	WW	$1,000,000.00	$780,000.00	100	0	0	0	0	0	0	0	40	0	0	0	0	5	0	0	0
145	2007-96	West Co WWTP	Northern Ditch Interceptor	Jefferson	WW	$15,000,000.00	$11,250,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	0	0	0
145	2007-102	Morris Forman WWTP (MSD)	Real Time Control at Wheeler	Jefferson	WW	$521,000.00	$521,000.00	100	0	40	0	0	0	0	0	0	0	0	0	0	5	0	0	0
115	2007-110	Sturgis WWTP	Sturgis Sewer Rehab	Union	WW	$4,500,000.00	$1,500,000.00	100	0	0	0	0	0	0	0	0	0	0	0	0	5	10	0	0
114	2007-9	Ohio Co Regional WWTP	Ohio Co Regional	Ohio	WW	$15,955,752.00	$6,607,612.00	100	0	0	0	0	0	0	0	0	0	0	0	0	5	9	0	0
110	2007-95	West Co WWTP	Zabel Way Pump Station Elimination Project	Jefferson	WW	$525,000.00	$525,000.00	100	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
110	2007-94	West Co WWTP	Watterson Woods Sanitary Sewer Project	Jefferson	WW	$780,000.00	$780,000.00	100	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0
107	2007-73	Sanitation District 1 Eastern Regional - Alexandria WWTP	Riley Road #2 Pump Station Eastern Regional Collection System	Campbell	WW	$5,580,000.00	$4,212,000.00	100	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0
107	2007-72	Sanitation District 1 Eastern Regional - Alexandria WWTP	Alex-Licking Pump Station Eastern Regional Collection System	Campbell	WW	$2,846,000.00	$2,145,000.00	100	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0
103	2007-76	Sanitation District 1 Eastern Regional - Alexandria WWTP	US 27/AA Sewer Pump Station Forcemain (Old Area 2) Eastern Regional Collection System	Campbell	WW	$7,785,000.00	$5,811,000.00	100	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
99	2007-62	Sanitation District 1 Eastern Regional - Alexandria WWTP	US 27 Enzwieler Sewer Project	Owen	WW	$1,500,000.00	$750,000.00	0	0	0	0	0	0	0	0	40	0	40	0	0	5	14	0	0
95	2007-10	Bath Co Sanitation District Wastewater Collection	Olympia Watershed Improvement	Bath	NPS	$900,000.00	$290,000.00	0	0	0	40	0	0	0	0	10	0	40	0	0	5	0	0	0
95	2007-11	Perry Co Sanitation District Wastewater Collection	Chavies Collection Sytem & WWTP	Perry	WW	$4,925,000.00	$1,640,000.00	0	40	0	0	0	0	0	0	10	0	20	20	0	5	0	0	0
93	2007-3	Hardin Co Water District 2	Dorsey Run & Sandy Creek Watershed Collection & Treatment	Hardin	WW	$7,329,000.00	$7,329,000.00	0	0	0	0	0	0	0	0	40	0	40	0	0	10	3	0	0
93	2007-83	Ewing Wastewater Collection	City of Ewing Wastewater Collection Sytem	Fleming	WW	$5,300,000.00	$3,318,000.00	0	40	0	0	0	0	0	0	10	0	20	20	0	0	3	0	0
85	2007-84	Perry Co Sanitation District Wastewater Collection	Pump Station Rehabilitation	Perry	WW	$770,000.00	$770,000.00	0	40	0	0	0	0	0	0	0	0	20	20	0	5	0	0	0


PROJECT PHASING:
0-5 YEAR - NEW WWTP NEAR AUGUSTA, PUMP STATIONS AT BROOKSVILLE AND NEAR CHATHAM, FORCE MAIN ALONG RTE 19 FROM BROOKSVILLE TO AUGUSTA, AND CONNECT TO ADJACENT PROPERTIES ALONG THE FORCE MAIN.
5-10 YEAR - INDUSTRIAL PARK PUMP STATION AND FORCE MAIN AND RESIDENTAL SUBDIVISIONS AND CLUSTERS NEAR RTE 19 FORCE MAIN.
10-20 YEAR- EXPAND WESTWARD ALONG RTE 1159 AND OTHER HIGHER POPULATED AREAS
NORTH BRACKEN COUNTY PLANNING AREA FACILITIES UPDATE - CITIES OF AUGUSTA AND BROOKSVILLE, KY
SCALE: 1" = 3000'
PLANNING AREA BOUNDARY
EXISTING AUGUSTA WWTP
PROPOSED WWTP OUTFALL WWTP
PROPOSED AUGUSTA/ BROOKSVILLE WWTP
PROPOSED FORCE MAIN ALONG RTE 19
PROPOSED FORCE MAIN ALONG RTE 9 FOR INDUSTRIAL PARK (5-10 YEAR)
INDUSTRIAL PARK PUMP STATION (5-10 YEAR)
PLANNING AREA BOUNDARY
PROPOSED INTERMEDIATE PUMP STATION
PROPOSED FORCE MAIN ALONG RTE 19
EXISTING BROOKSVILLE WWTP & PROPOSED NEW PUMP STATION
PLANNING AREA BOUNDARY
SCALE SHOWN IS FOR 22"X34" SIZE SHEET

NORTH BRACKEN COUNTY PLANNING AREA
EASTERN REGION
FACILITIES UPDATE – CITIES OF AUGUSTA AND BROOKSVILLE, KY
SCALE: 1" = 2000'



SCALE SHOWN IS FOR 22"X34" SIZE SHEET

NORTH BRACKEN COUNTY PLANNING AREA
WESTERN REGION
FACILITIES UPDATE – CITIES OF AUGUSTA AND BROOKSVILLE, KY
SCALE: 1" = 2000'




EXISTING BROOKSVILLE
PLANNING AREA
PROPOSED
AREA