

August 2004

# UNION COUNTY, NORTH CAROLINA

## DEPARTMENT OF PUBLIC WORKS



# WASTEWATER SYSTEM PERFORMANCE SUMMARY

(FISCAL YEAR 2003-2004)

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## 1.0 INTRODUCTION

House Bill 1160, the Clean Water Act of 1999, was ratified by the North Carolina General Assembly on July 20, 1999 and signed into law by the Governor on July 21, 1999. This legislation placed significant reporting requirements on entities that own or operate wastewater systems. This Performance Summary is intended to establish compliance with said rule.

The Union County Public Works Department is charged with the management, operation and maintenance of the County's sanitary sewer system. During the 2003-2004 fiscal year the wastewater system was comprised of 6 wastewater treatment plants (WWTP), over 60 wastewater pumping stations and over 400 miles of pipe with over 16,000 connections. In addition to the 6 WWTP's which have a combined rated treatment capacity of 4.9 million gallons per day (MGD), the County, through contractual agreement, has 1.95 MGD and 1.0 MGD of purchased capacity at the City of Monroe WWTP and Charlotte's McAlpine Creek WWTP respectively.

Public Works' Mission Statement is as follows:

*Develop water, sewer and solid waste infrastructure that supports residential, commercial, industrial and agricultural needs while meeting Federal/State regulations and providing our customer base with acceptable levels of service at cost effective rates*

## 2.0 DEFINITIONS

For the purposes of this Performance Report the following definitions apply:

- **Aerobic** – A condition in which atmospheric or dissolved molecular oxygen is present in the aquatic environment.
- **Automatic Telephone Dialer or ATD** – A device connected to the telephone system that will alert programmed telephone numbers of equipment status.
- **Biological Nutrient removal** – The process of removing nitrogen and phosphorus from wastewater using biological processes as opposed to chemical means.
- **Biosolids** – A primarily organic solid product, produced by wastewater treatment processes that can be beneficially recycled. The word *biosolids* is replacing the word *sludge*.
- **BOD – Biochemical Oxygen Demand** – The rate at which organisms use the oxygen in water or wastewater while stabilizing decomposable organic matter under aerobic conditions. The BOD Test is a procedure that measures the rate of oxygen use under controlled conditions of time and temperature. BOD is typically used to express the "strength" of wastewater.

- **CL<sub>2</sub> – Chlorine Residual** – The amount of chlorine present in the final effluent after disinfection. Typically measured in micrograms per liter or milligrams per liter.
- **D.O. – Dissolved Oxygen** – Molecular (atmospheric) oxygen dissolved in a liquid.
- **Effluent** – Treated wastewater flowing from the treatment system.
- **Extended Aeration** – A type of wastewater treatment facility in which the wastewater is retained and treated for a minimum of 24 hours at design flow before discharge occurs.
- **Impeller**- A rotating set of vanes in a pump designed to pump or lift water.
- **Inflow and Infiltration (I&I)** - extraneous water that enters the sanitary sewer system through openings and/or defects in the collection system.
- **Fecal Coliform** – The coliform (bacteria) found in the feces of warm blooded animals. The presence of coliform-group bacteria is an indication of possible pathogenic bacterial contamination.
- **MGD – Million Gallons per Day** – Volumetric measurement of flow converted to millions. Example .150 MGD x 1,000,000 = 150,000 gallons per day (gpd).
- **NH<sub>3</sub> – Nitrogen as Ammonia** – A compound found naturally in wastewater. The compound is produced by the deamination of organic nitrogen containing compounds.
- **NPDES Permit – National Pollutant Discharge Elimination System** - Permits, required by the Federal Water Pollution Control Act Amendments of 1972, which regulate discharges to surface waters.
- **pH** – The expression of the intensity of the basic or acidic condition of a liquid.
- **Pump Station** – A holding tank with pumps that forces wastewater uphill when flow by gravity is not possible.
- **SBR – Sequencing Batch Reactor** – A type of wastewater treatment facility that treats and discharges water in batches as opposed to continuous flow.
- **Telemetry** – A system by which information pertaining to remote equipment status is transmitted via radio waves to a central location.
- **TSS – Total Suspended Solids** – Particles suspended in a liquid.
- **Turbidity** – The measurement of the clearness or cloudiness of a liquid.

### **3.0 SYNOPSIS OF WASTEWATER TREATMENT FACILITIES (Fiscal Year 2003-2004)**

During the 2003-2004 fiscal year the Department of Public Works operated and maintained a total of six (6) wastewater treatment facilities. Although each Permit requires facility visitation daily, excluding weekends and holidays, Public Works' wastewater treatment facilities are checked 7 days per week 365 days per year. All treatment facilities are equipped with emergency back-up power generators. Each treatment facility is equipped with an automated telephone dialer (ATD). In addition to an ATD, each facility has both audible and visual trouble alarms. Wastewater treatment plant staff rotate "call duty" for after hour situations that may arise.

A brief overview of each facility and a performance summary table for each facility is provided herein.

#### **3.1 Twelve Mile Creek Water Reclamation Facility**

Permit No. NC0085359. Twelve Mile is an extended aeration facility utilizing biological nutrient removal and tertiary filtration. Disinfection is accomplished via UV (ultraviolet light). Twelve Mile effluent is discharged into Twelve Mile Creek, which is part of the Catawba River Basin. The facility is permitted to discharge up to 2.5 MGD of treated wastewater. Twelve Mile is located at 3104 Providence Road South and serves Waxhaw as well as portions of Indian Trail and Stallings. Please refer to Table 3-1.

#### **3.2 Crooked Creek Water Reclamation Facility**

Permit No. NC0069841. Crooked Creek is an extended aeration facility utilizing tertiary filtration. Disinfection is accomplished via chlorination/dechlorination. Crooked Creek effluent is pumped over 17,000 feet to discharge into the North Fork Crooked Creek which lies in the Yadkin Pee Dee River Basin. This facility is permitted to discharge up to 1.9 MGD of treated wastewater. Crooked Creek is located at 4015 Sardis Church Road and serves the Indian Trail, Lake Park and Stallings areas. Please refer to Table 3-2.

#### **3.3 Hunley Creek Wastewater Treatment Plant**

Permit No. NC0072508. Hunley Creek is a Sequencing Batch Reactor. Disinfection is accomplished via chlorination/dechlorination. Hunley Creek effluent is discharged into Goose Creek, which lies in the Yadkin Pee Dee River Basin. This facility is permitted to discharge up to .231 MGD of treated wastewater. Hunley Creek is located at 6913 Stevens Mill Road and serves the subdivisions of Shanamara, Hunley Creek and Stevens Mill. Please refer to Table 3-3.

### **3.4 Olde Sycamore Water Reclamation Facility**

Permit No. WQ0011928. Olde Sycamore is an extended aeration facility with tertiary filtration. Disinfection is accomplished via UV (ultraviolet light). This facility is permitted to discharge up to .150 MGD of treated wastewater. Olde Sycamore is located within and serves the Olde Sycamore Golf Community located off Highway 218 and Rock Hill Church Road. Olde Sycamore effluent is discharged to a manmade impoundment where it is then pumped onto the Olde Sycamore Golf Course as a source of irrigation. Please refer to Table 3-4.

### **3.5 Tallwood Estates Wastewater Treatment Plant**

Permit No. NC0069523. Tallwood is an extended aeration facility with tertiary filtration. Disinfection is accomplished via tablet chlorination. This facility is permitted to discharge up to .05 MGD of treated wastewater. Tallwood is located within and serves the Tallwood Subdivision off Brief Road. Tallwood effluent is discharged to Clear Creek, which lies in the Yadkin Pee Dee River Basin. Please refer to Table 3-5.

### **3.6 Grassy Branch Wastewater Treatment Plant**

Permit No. NC0085812. Grassy Branch is an extended aeration facility with tertiary filtration. Disinfection is accomplished via UV (ultraviolet light). This facility is permitted to discharge up to .05 MGD of treated wastewater. Grassy Branch is located at 1629 Old Fish Road and currently serves the Unionville Elementary, Piedmont Middle and Piedmont High Schools. Grassy Branch effluent is discharged to Crooked Creek which lies in the Yadkin Pee Dee River Basin. Please refer to Table 3-6.

TABLE 3-1

**Twelve Mile Creek Water Reclamation Facility**  
**NPDES Permit #: NC0085359**  
**Fiscal Year: 2003-2004 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '03	AUG '03	SEP '03	OCT '03	NOV '03	DEC '03	JAN '04	FEB '04	MAR '04	APR '04	MAY '04	JUN '04
<b>FLOW</b>	<b>2.500 MGD</b>	1.600	1.180	1.410	1.420	1.390	1.500	1.490	2.040	2.050	1.750	1.680	1.710
<b>pH</b>	<b>6-9 SU</b>	7.26-7.62	7.31-7.81	7.37-7.80	7.55-7.83	7.52-7.73	7.39-7.70	7.44-7.68	7.20-9.67 <sup>3</sup>	7.29-7.60	7.37-7.76	7.18-7.84	7.54-7.89
<b>BOD<sub>5</sub></b>	<b>5 mg/l</b>	1.44	1.34	0.00	0.00						0.00	0.17	0.61
	<b>10 mg/l</b>					0.00	0.21	0.00	1.36	0.65			
<b>AMMONIA NITROGEN</b>	<b>2 mg/l</b>	1.35	1.87	0.00	0.00						0.00	0.00	0.00
	<b>4 mg/l</b>					0.00	0.00	0.00	0.00	0.00			
<b>TOTAL SUSPENDED RESIDUE</b>	<b>30 mg/l</b>	1.84	1.68	1.06	0.75	0.07	0.89	0.23	4.28	1.32	0.34	0.51	2.50
<b>FECAL COLIFORM</b>	<b>200/100 ml</b>	6 <sup>1</sup>	64 <sup>2</sup>	3	1	1	12	16	2 <sup>4</sup>	7	3	2	2
<b>DISSOLVED OXYGEN</b>	<b>≥ 6 mg/l</b>	7.74	7.66	7.92	8.39	8.57	9.49	10.00	10.30	9.61	9.09	8.37	7.94
<b>TOTAL PHOSPHOROUS</b>	<b>41.7 #/day</b>	27.22	35.33	26.93	3.20	8.35	7.38	3.60	38.96	28.89	11.97	18.07	15.54

<sup>1</sup> Monthly Average Fecal Coliform for July 2003 was compliant. Daily Fecal Coliform limit was exceeded July 14, 2003.

<sup>2</sup> Monthly Average Fecal Coliform for August 2003 was compliant. Daily Fecal Coliform parameter limit was exceeded August 6-8, 2003.

<sup>3</sup> Daily pH parameter limit was exceeded on Feb. 16, 2004.

<sup>4</sup> Monthly Average Fecal Coliform for February 2004 was compliant. Daily Fecal Coliform parameter limit was exceeded Feb. 16, 2004.

TABLE 3-2

**Crooked Creek Water Reclamation Facility**  
**NPDES Permit #: NC0069841**  
**Fiscal Year: 2003-2004 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '03	AUG '03	SEP '03	OCT '03	NOV '03	DEC '03	JAN '04	FEB '04	MAR '04	APR '04	MAY '04	JUN '04
<b>FLOW</b>	<b>1.900 MGD</b>	1.402	1.267	0.941	0.976	0.925	1.027	0.986	1.229	0.999	0.841	0.685	0.863
<b>pH</b>	<b>6-9 SU</b>	6.38-7.20	6.49-8.17	6.00-8.53	6.56-7.23	6.64-7.59	6.21-7.42	6.23-7.53	6.45-7.29	6.62-7.43	6.26-7.41	6.14-7.53	6.13-7.48
<b>Cl<sub>2</sub></b>	<b>17 ug/l</b>	4.93	12.60	8.79	0.00	2.08	1.43	1.33	2.00	0.80	3.83	1.75	2.00
<b>BOD<sub>5</sub></b> SUMMER (APR.1 - OCT.31)	<b>5 mg/l</b>	2.74	4.43	2.54	3.25						8.91 <sup>1</sup>	5.19 <sup>2</sup>	1.76
WINTER (NOV.1 - MAR.31)	<b>10 mg/l</b>					5.70	5.98	9.08	6.04	4.56			
<b>AMMONIA NITROGEN</b> SUMMER	<b>2 mg/l</b>	0.00	0.08	1.52	0.00						0.34	0.00	0.00
WINTER	<b>4 mg/l</b>					0.00	0.00	0.38	0.00	0.07			
<b>TOTAL SUSPENDED RESIDUE</b>	<b>30 mg/l</b>	3.22	5.30	2.47	2.48	3.02	4.76	5.27	3.23	3.21	6.92	6.78	1.59
<b>FECAL COLIFORM</b>	<b>200/100 ml</b>	6	12	2	3	5	4	12	5	5	3	1	3
<b>DISSOLVED OXYGEN</b>	<b>≥ 6 mg/l</b>	7.86	7.75	7.78	8.74	9.02	10.30	10.47	10.53	10.02	9.29	8.34	8.12

<sup>1</sup> Weekly BOD5 parameter exceeded 3 weeks of April 2004 leading to an April 2004 monthly BOD5 violation.

<sup>2</sup> Monthly BOD5 exceeded limit by 0.19 mg/l for May 2004. Weekly BOD5 maximum exceeded second week of May 2004.

TABLE 3-3

**Hunley Creek Wastewater Treatment Plant  
NPDES Permit #: NC0072508  
Fiscal Year: 2003-2004 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '03	AUG '03	SEP '03	OCT '03	NOV '03	DEC '03	JAN '04	FEB '04	MAR '04	APR '04	MAY '04	JUN '04
<b>FLOW</b>	<b>0.231 MGD</b>	0.194	0.191	0.177	0.176	0.179	0.183	0.185	0.203	0.201	0.182	0.168	0.178
<b>pH</b>	<b>6-9 SU</b>	6.30-7.20	6.40-7.20	6.40-7.00	6.10-7.10	6.20-7.20	6.40-7.10	6.40-7.20	6.40-6.80	6.40-6.80	6.10-6.90	6.10-7.10	6.20-6.60
<b>Cl<sub>2</sub></b>	<b>20 ug/l</b>	1.11	12.00	2.56	0.00	22.70 <sup>1</sup>	6.90	4.38	8.00	2.70	4.00	0.00	6.70
<b>BOD<sub>5</sub></b>	<b>30 mg/l</b>	9.99	8.66	8.44	7.06						30.10 <sup>3</sup>	15.20	12.60
	<b>30 mg/l</b>					9.20	23.30	42.5 <sup>2</sup>	22.50	24.40			
<b>AMMONIA NITROGEN</b>	<b>2 mg/l</b>	0.28	0.35	0.83	0.00						0.05	0.00	0.00
	<b>4 mg/l</b>					0.25	0.44	0.65	1.55	0.35			
<b>TOTAL SUSPENDED RESIDUE</b>	<b>30 mg/l</b>	9.74	6.99	12.90	5.06	7.25	20.20	22.30	15.40	13.50	16.30	11.60	13.00
<b>FECAL COLIFORM</b>	<b>200/100 ml</b>	1	17	8	2	22	4	27	4	142	132	12	7
<b>DISSOLVED OXYGEN</b>	<b>≥ 5 mg/l</b>	5.66	5.46	5.61	5.54	6.04	6.32	6.30	5.84	5.79	6.08	5.64	5.39

<sup>1</sup> Daily maximum Cl<sub>2</sub> parameter exceeded Nov. 11, 2003.

<sup>2</sup> Last two weeks of Jan. exceeded weekly BOD<sub>5</sub> parameter resulting in monthly BOD<sub>5</sub> violation for Jan. 2004.

<sup>3</sup> No weekly BOD<sub>5</sub> parameter exceeded; however monthly average BOD<sub>5</sub> exceeded by 0.1 mg/l.

TABLE 3-4

**Olde Sycamore Water Reclamation Facility  
NPDES Permit #: WQ0011928  
Fiscal Year: 2003-2004 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '03	AUG '03	SEP '03	OCT '03	NOV '03	DEC '03	JAN '04	FEB '04	MAR '04	APR '04	MAY '04	JUN '04
<b>FLOW</b>	<b>0.150 MGD</b>	0.057	0.052	0.054	0.049	0.044	0.048	0.047	0.051	0.048	0.046	0.047	0.052
<b>pH</b>	<b>6-9 SU</b>	6.00-7.20	6.30-7.50	6.10-7.50	6.20-7.60	6.40-7.70	6.30-7.60	6.40-7.50	6.40-7.40	6.20-7.40	6.60-7.40	6.70-7.40	6.30-7.50
<b>BOD<sub>5</sub></b>	<b>10 mg/l</b>	1.06	0.00	0.00	0.00	0.81	0.74	3.24	0.81	2.80	1.36	0.00	0.00
<b>AMMONIA NITROGEN</b>	<b>4 mg/l</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOTAL SUSPENDED RESIDUE</b>	<b>5 mg/l</b>	0.28	0.98	0.00	1.56	1.43	0.92	1.15	0.56	0.60	1.92	0.42	0.64
<b>FECAL COLIFORM</b>	<b>14/100 ml</b>	1	1	0	0	0	1	1	1	1	3 <sup>1</sup>	0	2
<b>TURBIDITY</b>	<b>≤ 10 NTU</b>	0.30	0.20	0.30	0.40	0.80	0.50	0.50	0.70	0.30	1.10	0.80	0.90

<sup>1</sup> No April monthly violations for Fecal Coliform. April 7, 2004, daily Fecal Coliform parameter exceeded.

TABLE 3-5

**Tallwood Estates Wastewater Treatment Plant  
NPDES Permit #: NC0069523  
Fiscal Year: 2003-2004 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '03	AUG '03	SEP '03	OCT '03	NOV '03	DEC '03	JAN '04	FEB '04	MAR '04	APR '04	MAY '04	JUN '04
<b>FLOW</b>	<b>0.050 MGD</b>	0.020	0.016	0.014	0.014	0.014	0.016	0.015	0.019	0.018	0.017	0.017	0.016
<b>pH</b>	<b>6-9 SU</b>	6.20-8.00	6.40-7.90	6.30-7.50	6.10-8.00	6.20-7.70	6.70-7.50	6.20-7.40	6.50-7.30	6.20-8.00	6.40-7.40	6.00-7.70	6.20-7.50
<b>BOD<sub>5</sub></b>	<b>5 mg/l</b>	3.13 <sup>1</sup>	4.05	3.41	2.48						4.85	4.11	2.34
	<b>10 mg/l</b>					1.94	1.57	1.41	1.56	4.13			
<b>AMMONIA NITROGEN</b>	<b>2 mg/l</b>	0.00	0.00	0.00	0.00						0.00	0.00	0.00
	<b>4 mg/l</b>					0.00	0.00	0.00	0.00	0.00			
<b>TOTAL SUSPENDED RESIDUE</b>	<b>30 mg/l</b>	0.24	1.20	1.36	1.45	1.20	2.12	2.00	5.15	11.22	11.20	4.51	1.36
<b>FECAL COLIFORM</b>	<b>200/100 ml</b>	1	2	1	0	0	1	3	5	1	2	1	2
<b>DISSOLVED OXYGEN</b>	<b>≥ 6 mg/l</b>	7.31	7.01	7.72	7.84	8.37	9.38	10.11	9.87	8.59	8.54	7.57	7.52

<sup>1</sup> No monthly BOD5 violation for July 2003. BOD5 parameter exceeded last week of July.

TABLE 3-6

**Grassy Branch Wastewater Treatment Plant  
NPDES Permit #: NC0085812  
Fiscal Year: 2003-2004 Effluent Limits and Performance**

PARAMETER	LIMIT	JUL '03	AUG '03	SEP '03	OCT '03	NOV '03	DEC '03	JAN '04	FEB '04	MAR '04	APR '04	MAY '04	JUN '04
<b>FLOW</b>	<b>0.050 MGD</b>	0.005	0.012	0.009	0.011	0.006	0.006	0.005	0.009	0.007	0.006	0.004	0.002
<b>pH</b>	<b>6-9 SU</b>	7.00-8.2	7.10-7.80	6.80-7.20	6.20-8.60	7.20-7.70	6.90-7.50	7.20-7.30	7.20-7.20	7.10-7.30	7.30-7.70	7.50-7.80	7.20-8.00
<b>Cl<sub>2</sub></b>	<b>17 ug/l</b>	-	-	-	2.33	-	-	-	-	-	-	-	-
<b>BOD<sub>5</sub></b> SUMMER (APR.1 - OCT.31)	<b>5 mg/l</b>	0.56	0.00	1.66	1.01						5.09 <sup>1</sup>	5.05 <sup>2</sup>	3.48
WINTER (NOV.1 - MAR.31)	<b>10 mg/l</b>					1.95	9.20	4.62	6.03	3.44			
<b>AMMONIA NITROGEN</b> SUMMER	<b>2 mg/l</b>	0.00	1.20	1.88	0.72						0.00	0.00	0.00
WINTER	<b>4 mg/l</b>					0.00	0.74	0.00	2.90	0.88			
<b>TOTAL SUSPENDED RESIDUE</b>	<b>30 mg/l</b>	1.20	1.40	1.60	0.68	2.30	11.60	5.88	5.07	4.98	8.42	3.75	3.00
<b>FECAL COLIFORM</b>	<b>200/100 ml</b>	12	11	21	84	24	5	4	3	14	15	184	1
<b>DISSOLVED OXYGEN</b>	<b>≥ 6 mg/l</b>	7.38	6.73	6.57	7.11	8.35	8.92	9.98	8.79	8.57	7.72	7.81	7.41

<sup>1</sup> No weekly BOD5 parameter violations for April 2004. April 2004 monthly BOD5 parameter exceeded by 0.09 mg/l.

<sup>2</sup> Weekly BOD5 parameter exceeded third week of May 2004. May 2004 monthly BOD5 parameter exceeded by 0.05 mg/l.

#### **4.0 BIOSOLIDS MANAGEMENT**

Biosolids are managed and disposed of in accordance with Permit No. WQ 0007486 issued by the North Carolina Department of Environment and Natural Resources. Biosolids are stored at both the Crooked Creek and Twelve Mile Creek WWTP's. The solids are aerobically digested and then applied as "fertilizer" to permitted sites. The solids are considered stabilized, and thus suitable for land application, when the volatile solids content is reduced by 38%. If this 38% volatile solids reduction can not be achieved, then alkaline stabilization, injection or incorporation is employed to ensure Permit compliance.

#### **5.0 SYNOPSIS OF WASTEWATER COLLECTION SYSTEM (Fiscal Year 2003-2004)**

Currently the Department of Public Works operates and maintains over 60 wastewater pumping stations and over 400 miles of pipe with approximately 16,000 connections. The pumping stations are equipped with both audible and visual alarms. In addition to audible and visual alarms, many stations are equipped with ATD's or telemetry. All stations without ATD's or telemetry are checked daily, including weekends and holidays. Pump stations with ATD's or telemetry are checked once per week at a minimum. Emergency back-up power is available via a combination of permanent and portable generators. Wastewater collection staff rotate "call duty" for after hour situations that may occur.

Public Works maintains emergency response equipment in a ready state at all times. This emergency equipment varies in nature from spare electrical parts and plumbing supplies to vacuum trucks and backhoes. Worker safety is of utmost importance. Safety equipment such as night lighting, gas monitors, and reflective cones/signs are also maintained in a ready state.

Public Works has ongoing programs to identify and correct problems associated with the inflow and infiltration (I&I) of storm water into the sanitary sewer system and to inspect and clean sewer lines. During the fiscal year 2003-2004 over 105,000 feet of pipe were smoke tested to identify potential sources of I&I and 48,000 feet of main lines were viewed via CCTV to isolate source(s) of I&I. Over 500 manholes were inspected, and repaired when appropriate. Approximately 33 miles of pipe were cleaned throughout the system.

Major system improvements during the fiscal year 2003-2004 include:

- Engineering plans were finalized and monies were appropriated by the Union County Board of Commissioners to rehabilitate approximately 20,000 linear feet of sewer lines serving the east side of Union County.

- Engineering plans were finalized and monies were appropriated by the Union County Board of Commissioners to rehabilitate approximately 17,000 linear feet of sewer lines serving the Town of Waxhaw.
- The development of a comprehensive sewer system map was initiated.

During the Fiscal Year 2003-2004, the County's wastewater system collected and conveyed for treatment in excess of 1 billion gallons. Forty-two spills, with a combined estimated volume of 1.18 million gallons, occurred within the system. A brief description of each spill is presented below:

DATE	LOCATION	CAUSE	VOLUME (GALLONS)	SURFACE WATER
7/2/03	Manhole 2403 & Manhole 2404	I & I - Heavy Rain	2,100	South Fork Crooked Creek
7/2/03	MH# 2698 & MH# 2699 (Station 2)	I & I - Heavy Rain	93,780	Meadows Branch
7/18/03	MH # 2707(Station 1)	I & I - Heavy Rain	7,500	Rays Fork Branch
7/19/03	MH # 2697(Station 2)	I & I - Heavy Rain	900	None
7/21/03	Meadows Mobile Home PS	Grease	75	None
8/1/03	MH# 2698 & MH# 2699 (Station 2)	I & I - Heavy Rain	1,200	Meadows Branch
8/5/03	Manhole # 2646 (Station 3)	I & I - Heavy Rain	675	None
8/5/03	MH # 2707(Station 1)	I & I - Heavy Rain	277,500	Rays Fork Branch
8/5/03	MH# 2698 & MH# 2699 (Station 2)	I & I - Heavy Rain	97,320	Meadows Branch
8/15/03	MH# 2699 (Station 2)	I & I - Heavy Rain	34,500	Meadows Branch
8/15/03	MH# 1 off Fincher Road	I & I - Heavy Rain	70,000	Davis Mine Creek
8/17/03	MH# 2699 (Station 2)	I & I - Heavy Rain	19,800	Meadows Branch
8/17/03	MH# 1 off Fincher Road	I & I - Heavy Rain	22,350	Davis Mine Creek
8/17/03	MH # 2707(Station 1)	I & I - Heavy Rain	123,000	Rays Fork Branch
8/23/03	MH# 2698 (Station 2)	I & I - Heavy Rain	23,700	Meadows Branch
8/24/03	MH # 2707(Station 1)	I & I - Heavy Rain	3,600	Rays Fork Branch
9/15/03	Trellis Pump Station	Control Panel Failure	27,000	Rays Fork Branch
9/22/03	MH# 2699 (Station 2)	I & I - Heavy Rain	61,350	Meadows Branch
9/23/04	MH # 2707(Station 1)	I & I - Heavy Rain	2,100	Rays Fork Branch
11/4/03	White Oak Lane & Cupped Oak Lane	Force main break	1,500	North Fork Crooked Creek
12/10/03	MH# 2699 (Station 2)	I & I - Heavy Rain	2,100	None
2/6/04	Manhole # 55	I & I - Heavy Rain	7,500	Rone Branch
2/7/04	MH # 2707(Station 1)	I & I - Heavy Rain	29,400	Rays Fork Branch
2/7/04	MH# 2697 & MH# 2699 (Station 2)	I & I - Heavy Rain	14,400	Meadows Branch
2/9/04	Manhole # 70-A	Debris	1,500	South Fork Crooked Creek
2/11/04	Manhole # 1	Debris & Grease	900	North Fork Crooked Creek
2/12/04	MH# 2699 (Station 2)	I & I - Heavy Rain	15,600	Meadows Branch
2/13/04	MH # 2707(Station 1)	I & I - Heavy Rain	49,020	Rays Fork Branch
2/14/04	MH# 2698 & MH# 2699 (Station 2)	I & I - Heavy Rain	1,350	Meadows Branch
2/15/04	MH# 2699 (Station 2)	I & I - Heavy Rain	2,460	Meadows Branch
2/15/04	MH # 2707(Station 1)	I & I - Heavy Rain	24,150	Rays Fork Branch
2/15/04	MH # 2707(Station 1)	I & I - Heavy Rain	10,020	Rays Fork Branch
2/28/04	MH # 2707(Station 1)	I & I - Heavy Rain	15,600	Rays Fork Branch
3/1/04	MH # 2707(Station 1)	I & I - Heavy Rain	23,100	Rays Fork Branch
5/14/04	MH # 26	Other (Plug)	800	West Fork 12 Mile Creek

DATE	LOCATION	CAUSE	VOLUME (GALLONS)	SURFACE WATER
5/25/04	MH # 1559	Debris & Grease	900	Twelve Mile Creek
6/3/04	MH # 5209	Debris	3,000	Crooked Creek
6/10/04	Meadows Mobile Home PS	PS Equipment Failure	5	None
6/19/04	Shannamara MH # 3635	Debris	800	Hunley Creek
6/24/04	MH # 2707(Station 1)	I & I - Heavy Rain	49,380	Rays Fork Branch
6/24/04	MH# 2697 & MH# 2699 (Station 2)	I & I - Heavy Rain	55,800	Meadows Branch
6/24/04	P. S. #2125 Waxhaw	Power Outage	50	None

For questions concerning this Wastewater System Performance Summary or additional information, please contact the Public Works Department at (704) 296-4210 or write to Union County Public Works Department, 400 North Church Street, Monroe, NC 28112-4804.