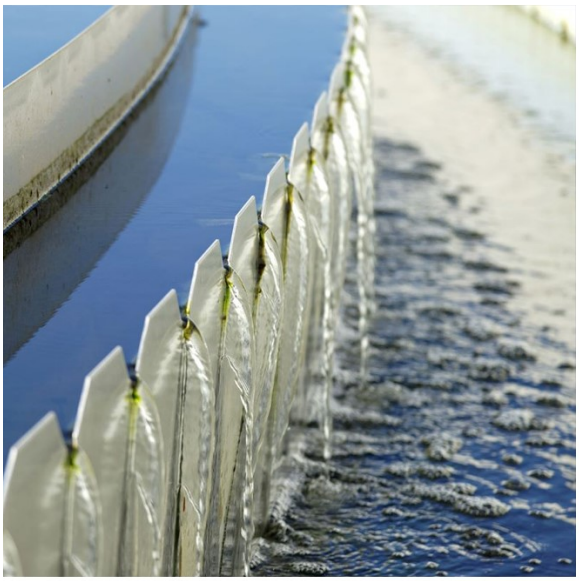


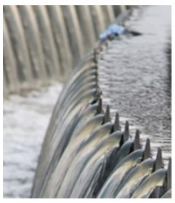
Union County Government
EST. 1842

Union County, NC
Department of Public Works
Wastewater Performance Summary
Fiscal Year 2019-2020

Wastewater Plants
Twelve Mile Creek WRF – NC0085359
Crooked Creek WRF – NC0069841
Olde Sycamore WRF – WQ0011928
Tallwood WWTP – NC0069523
Grassy Branch WWTP – NC0085812
Hunley WWTP – NC0072508

Collection System
WQCS00054

BioSolids – Land Application
WQ0007486 - NCDEQ
ND0089044 - SCDHEC





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Dear Customer,

We are proud to share this year's Annual Wastewater System Performance Summary with you. This report outlines last year's wastewater treatment efforts. Included are details about your treatment facilities, collection system performance, and how it compares to standards set by regulatory agencies.

Wastewater is all the water that leaves the inside of your home or business through sinks, toilets, washing machines, etc. and enters Union County's wastewater (sewage) collection system. Wastewater then flows through pipes into the County's regional sewage system, where it is treated to meet federal and state water quality standards.

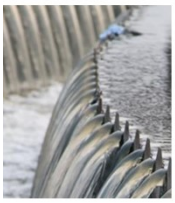
We have a responsibility to manage our water resources in a sustainable manner to ensure there is sufficient water and its quality is protected. While we are committed to conserving resources and protecting the environment through wastewater treatment, this can only occur if it is done in a safe manner. Protection of public health and safety is, and must remain, our first priority. We are proud of our achievements to date, but we aim to constantly improve the way we manage the wastewater generated by our residents.

If you have any questions about this report or concerning your water, please contact us at 704-296-4210. If you want additional information, please visit our website at www.unioncountync.gov.

Sincerely,

Andy

Andrew Neff, P.E.
Water & Wastewater Division Director
Union County Public Works
500 North Main Street
Monroe, NC 28112





1.0 INTRODUCTION

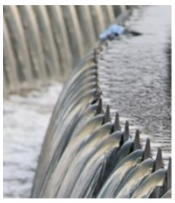
Nature has an amazing ability to cope with small amounts of water wastes and pollution, but it would be overwhelmed if we didn't treat the wastewater and sewage produced every day before releasing it back to the environment. Treatment plants reduce pollutants in wastewater to a level nature can handle.

Wastewater is used water. It includes substances such as human waste, food scraps, oils, soaps and chemicals. In homes, this may be water from sinks, showers, bathtubs, toilets, washing machines and dishwashers. Businesses and industries also contribute their share of used water that must be cleaned.

If wastewater is not properly treated, then the environment and human health can be negatively impacted. These impacts include harm to fish and wildlife populations, oxygen depletion, restrictions on recreational water use, and contamination of drinking water.

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 this rule.

Union County Public Works (UCPW) is charged with the management, operation and maintenance of the County's sanitary sewer system. During the 2019-2020 fiscal year the wastewater system was comprised of 5 active water reclamation facilities (WRF), 54 wastewater pumping stations, and over 710 miles of pipe with 38,257 connections. In addition to the 5 WRFs which have a combined rated treatment capacity of 9.65 million gallons per day (MGD), the County, through contractual agreement, has 2.65 MGD and 3.0 MGD of purchased capacity at the City of Monroe WRF and Charlotte's McAlpine Creek WRF respectively.

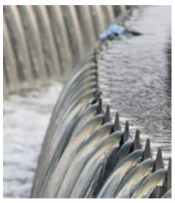




2.0 DEFINITIONS

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.
- **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* replaces 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_2 – 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.
- **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 150,000 gallons per day (gpd) / 1,000,000 = 0.150 MGD.
- **NH_3** – **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.
- **Reclaimed Water –** Highly treated wastewater that has undergone advanced treatment processes to remove solids, organics, and pathogens meeting the State's Health and Safety Standards for Beneficial Reuse.
- **SSO –** Acronym for **"sanitary sewer overflow"**
- **TSS – Total Suspended Solids –** Particles suspended in a liquid.
- **Turbidity –** The measurement of the clearness or cloudiness of a liquid.





3.0 SYNOPSIS OF WATER RECLAMATION FACILTIES (Fiscal Year 2019-2020)

During the 2019-20 fiscal year the Department of Public Works operated and maintained a total of five (5) active water reclamation facilities and maintained one (1) inactive facility. Although each Permit requires facility visitation daily, excluding weekends and holidays, Public Works' water reclamation facilities are checked 7 days per week, 365 days per year. All treatment facilities are equipped with emergency back-up power generators. In addition to SCADA, each facility has both audible and visual trouble alarms. Water reclamation facility 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.

Twelve Mile Creek Water Reclamation Facility

Permit No. NC0085359. Twelve Mile Creek WRF 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 7.5 MGD of treated wastewater. Twelve Mile Creek WRF is located at 8299 Kensington Drive and serves Waxhaw as well as portions of Indian Trail, Stallings and Weddington. Please refer to Table 3-1.

Crooked Creek Water Reclamation Facility

Permit No. NC0069841. Crooked Creek WRF is an extended aeration facility utilizing tertiary filtration. Disinfection is accomplished via UV (ultraviolet light). 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.

Hunley Creek Water Reclamation Facility

Permit No. NC0072508. The facility was taken out of service May 10, 2006, via a flow diversion project and remains inactive. Hunley Creek is located at 6913 Stevens Mill Road. Due to "Inactive Status" of the Hunley Creek WRF, there was no data to report to Table 3-3 for fiscal year 2019-2020.

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 0.150 MGD (150,000 per gallons per day) of treated wastewater. Olde Sycamore was "up-fitted" in early 2012 to improve operating efficiency (reduced electrical consumption) by implementing usage of fine-bubble diffused aeration versus the former "coarse-bubble" aeration. Olde Sycamore serves the Olde Sycamore Golf Community located off Highway 218 and Rock Hill Church Road. Olde Sycamore effluent is discharged to a man-made impoundment from which it is then pumped onto the Olde Sycamore Golf Course as a source of irrigation. Please refer to Table 3-4.

Tallwood Estates Water Reclamation Facility

Permit No. NC0069523. Tallwood is an extended aeration facility with cloth-disc filtration. Disinfection is accomplished via UV (ultraviolet light). This facility is permitted to discharge up to 0.05 MGD (50,000 gallons per day) of treated wastewater. Tallwood plant was replaced in 2012 with a new facility. Tallwood is located within and serves the Tallwood Subdivision off Brief Road and Belk Boy Scout Camp. Tallwood effluent is discharged to Clear Creek, which lies in the Yadkin Pee Dee River Basin. Please refer to Table 3-5.

Grassy Branch Water Reclamation Facility

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 (50,000 gallons per day) of treated wastewater. Grassy Branch is located at 1629 Old Fish Road and currently serves the Unionville Elementary, Piedmont Middle and Piedmont High School as well as one individual residence, Loxdale Farms Subdivision, and Smith Field Sub- division. Grassy Branch effluent is discharged to Crooked Creek which lies in the Yadkin Pee Dee River Basin. Please refer to Table 3-6.

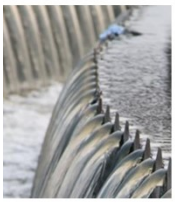




TABLE 3-1

Twelve Mile Creek Water Reclamation Facility
NPDES Permit #: NC0085359
Fiscal Year: 2019-2020 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '19	AUG '19	SEP '19	OCT '19	NOV '19	DEC '19	JAN '20	FEB '20	MAR '20	APR '20	MAY '20	JUN '20
FLOW	**6.0 MGD**	3.45	3.73	3.48	3.59	3.96	4.54	4.72	5.87	4.97	4.20	5.89	5.15
pH	**6-9 SU**	7.0-7.5	7.4-7.6	7.2-7.8	6.9-7.7	6.8-7.2	6.4-7.4	6.6-7.3	6.5-7.2	6.8-7.3	7.0-7.3	6.6-7.1	7.1-7.6
BOD_5 SUMMER (APR.1 - OCT.31)	**5 mg/l**	3.37	1.71	1.82	3.43	-	-	-	-	-	4.11	5.9	3.68
WINTER (NOV.1 - MAR.31)	**10 mg/l**	-	-	-	-	3.4	2.75	2.64	2.04	4.1	-	-	-
AMMONIA NITROGEN SUMMER	**1 mg/l**	0.028	0.020	0.070	0	-	-	-	-	-	0.15	.126	.64
WINTER	**2 mg/l**	-	-	-	-	0.013	0.032	0.0	0.194	0.054	-	-	-
TOTAL SUSPENDED RESIDUE	**30 mg/l**	2.45	0.83	3.4	0.11	0.95	2.51	2.65	2.28	3.85	4.16	3.98	2.47
FECAL COLIFORM	**200/100 ml**	20	3.03	4.22	7.01	4.01	2.56	1.36	1.15	1.35	1.500	1.65	1.59
DISSOLVED OXYGEN	**≥ 6 mg/l**	8.09	8.1	8.17	8.49	9.17	9.52	9.74	9.74	9.42	9.16	8.95	8.57
COPPER	**13.2 ug/l**	0	0	0	3.6	0	0	0	4.1	0	0	0	0
ZINC	**175.0 ug/l**	78	65	65	64	63	46	40	34	47	0	0	0
TOTAL PHOSPHOROUS MAXIMIUM MONTH	**41.7 #/day**	10.65	6.22	15.76	6.88	6.95	17.79	26.59	18.11	33.84	32.74	19.65	12.02
TOTAL PHOSPHORUS 12 MONTH ROLLING AVERAGE	**20.85#/day**	16.30	16.09	16.84	16.63	16.34	16.01	16.62	17.75	19.42	19.75	18.38	17.26

Permit Violations:

There were no permit violations in FY20

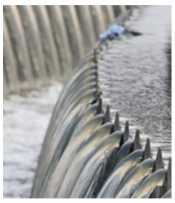




TABLE 3-2

Crooked Creek Water Reclamation Facility
NPDES Permit #: NC0069841
Fiscal Year: 2019-2020 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '19	AUG '19	SEP '19	OCT '19	NOV '19	DEC '19	JAN '20	FEB '20	MAR '20	APR '20	MAY '20	JUN '20
FLOW	**1.900 MGD**	1.11	1.22	1.07	1.14	1.25	1.20	1.20	1.35	1.11	1.00	1.55	1.05
pH	**6-9 SU**	6.9-7.9	6.7-7.5	5.9-7.7	6.8-7.4	6.6-7.5	6.5-7.6	6.7-7.6	6.5-7.4	6.9-7.4	6.8-7.5	6.9-7.4	6.8-7.4
Cl_2	**17 ug/l**	0	0	0	0	0	0	0	0	0	0	0	0
BOD_5 SUMMER (APR.1 - OCT.31)	**5 mg/l**	0.0	0.0	0.0	0.0	-	-	-	-	-	0.68	0.44	0.89
WINTER (NOV.1 - MAR.31)	**10 mg/l**	-	-	-	-	2.6	0.171	1.35	1.43	0.82	-	-	-
AMMONIA NITROGEN SUMMER	**2 mg/l**	0.178	0.0	0.0	0.0	-	-	-	-	-	0	0	0.0
WINTER	**4 mg/l**	-	-	-	-	0.0	0	0.0	0.03	0	-	-	-
TOTAL SUSPENDED RESIDUE	**30 mg/l**	0.0	0.0	0.0	0.0	0.49	4.89	2.23	1.84	0.98	2.75	1.54	0.864
FECAL COLIFORM	**200/100 ml**	5.79	4.27	2.43	1.96	1.47	5.96	2.23	2.08	1.89	3.5	2.13	4.76
DISSOLVED OXYGEN	**≥ 6 mg/l**	8.02	8.01	8.19	8.62	9.61	10.07	10.24	10.15	9.87	9.55	9.12	8.34

Permit Violations:

There were no permit violations in FY20

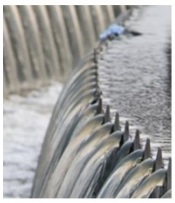




TABLE 3-3

Hunley Creek Water Reclamation Facility
NPDES Permit #: NC0072508
Fiscal Year: 2019-2020 Effluent Limits and Performance

PARAMETER	LIMIT	
FLOW	**0.231 MGD**	**Hunley Creek WRF is currently not in service. This facility was listed as inactive as of May 2006; therefore, there is no data reported for this fiscal year**
pH	**6-9 SU**	
Cl_2	**20 ug/l**	
BOD_5 SUMMER (APR.1 - OCT.31)	**5 mg/l**	
WINTER (NOV.1 - MAR.31)	**10 mg/l**	
AMMONIA NITROGEN SUMMER	**2 mg/l**	
WINTER	**4 mg/l**	
TOTAL SUSPENDED RESIDUE	**30 mg/l**	
FECAL COLIFORM	**200/100 ml**	
DISSOLVED OXYGEN	**≥ 5 mg/l**	

Permit Violations:

No violations for fiscal year

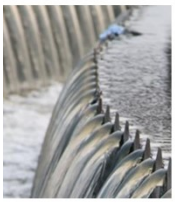




TABLE 3-4

Olde Sycamore Water Reclamation Facility
NPDES Permit #: WQ0011928
Fiscal Year: 2019-2020 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '19	AUG '19	SEP '19	OCT '19	NOV '19	DEC '19	JAN '20	FEB '20	MAR '20	APR '20	MAY '20	JUN '20
FLOW	0.150 MGD	0.047	.044	.041	.046	.055	.071	.055	.055	.049	.046	.051	.047
pH	6-9 SU	7.1-7.5	6.9-7.5	7.2-7.5	7.0-7.4	6.9-7.5	6.7-7.3	6.8-7.2	6.9-7.4	7.0-7.4	6.9-7.2	6.9-8.1	7.0-7.3
BOD_5	10 mg/l	0	0	0	0	0	2.2	<2	<2	<2	<2	<2	<2
AMMONIA NITROGEN	4 mg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.08	<0.10	<0.10
TOTAL SUSPENDED RESIDUE	5 mg/l	0	0	0	0	0	1.4	<2.7	<2.6	<2.7	<2.7	<2.6	<2.6
FECAL COLIFORM	14/100 ml	<1	<1	1	<1	1	1	0	0	2	<1	<1	0.24
TURBIDITY	≤ 10 NTU	0.2	.2	.2	.2	0.3	0.4	.3	.9	.4	.3	.7	.3

Permit Violations:

In February 2020 there was one daily violation for fecal coliform.

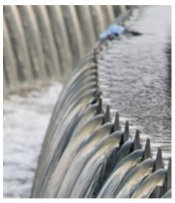




TABLE 3-5

Tallwood Estates Water Reclamation Facility
NPDES Permit #: NC0069523
Fiscal Year: 2019-2020 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '19	AUG '19	SEP '19	OCT '19	NOV '19	DEC '19	JAN '20	FEB '20	MAR '20	APR '20	MAY '20	JUN '20
FLOW	**0.050 MGD**	.014	.014	.012	.015	.021	.045	.055	.062	.048	.033	.065	.026
pH	**6-9 SU**	7.2-7.6	7.3-7.6	7.4-7.7	7.4-7.7	7.4-7.7	6.9-7.6	7.1-7.4	7.2-7.9	7.4-7.1	7.2-7.5	7.0-7.5	7.2-7.6
BOD_5 SUMMER(APR 1-OCT 31)	**5 mg/l**	0	0	0	0	-	-	-	-	-	0	0	0
WINTER (NOV.1 - MAR.31)	**10 mg/l**	-	-	-	-	0	0	0	0	0	-	-	-
AMMONIA NITROGEN SUMMER	**2 mg/l**	0	0	0	0	-	-	-	-	-	0	0	0
WINTER	**4 mg/l**	-	-	-	-	.1855	.04	0	.18	0	-	-	-
TOTAL SUSPENDED RESIDUE	**30 mg/l**	0	0	0	0	0	0	.7550	.725	0	0	0	0
FECAL COLIFORM	**200/100 ml**	1.93	1	1	1	3.08	1.80	1.62	1	1	1	4.3	1
DISSOLVED OXYGEN	**≥ 6 mg/l**	6.8	7.09	7.03	7.68	9.33	9.44	10.34	10.2	10.35	9.1	9.08	8.08

Permit Violations: Jul 2019 one daily violation for DO, Jan 2020 monthly flow violation, Feb 2020 monthly flow violation, Apr 2020 monthly flow violation

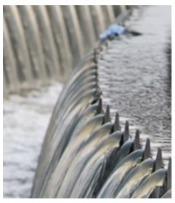


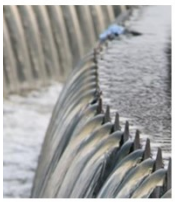


TABLE 3-6

Grassy Branch Water Reclamation Facility
NPDES Permit #: NC0085812
Fiscal Year: 2018-2019 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '19	AUG '19	SEP '19	OCT '19	NOV '19	DEC '19	JAN '20	FEB '20	MAR '20	APR '20	MAY '20	JUN '20
FLOW	0.050 MGD	.021	.025	.029	.032	.038	..051	.057	.062	.038	.027	.043	.017
pH	6-9 SU	7.3-7.6	7.3-7.7	6.9-7.4	6.9-7.4	6.9-7.3	6.7-7.1	6.5-7.5	6.8-7.5	6.7-7.5	7.1-7.7	6.9-7.3	6.7-7.4
Cl_2	17 ug/l	0	0	0	0	0	0	0	0	0	0	0	0
BOD_5 SUMMER (APR.1 - OCT.31)	5 mg/l	0	0	0	0	-	-	-	-	-	.55	.95	.44
WINTER (NOV.1 - MAR.31)	10 mg/l	-	-	-	-	0	8.12	3.02	3.52	14.48	-	-	-
AMMONIA NITROGEN SUMMER	2 mg/l	0	.21	.512	.12	-	-	-	-	-	0	0	.028
WINTER	4 mg/l	-	-	-	-	.332	4.86	.467	.725	.488	-	-	-
TOTAL SUSPENDED RESIDUE	30 mg/l	0	0	0	0	0	7.6	4.9	3.12	26.48	3.6	3.3	2.72
FECAL COLIFORM	200/100 ml	1.24	1	1	1	1.68	1448.5	3.28	1.77	5.78	1.73	1.94	4.98
DISSOLVED OXYGEN	≥ 6 mg/l	7.50	8.43	7.70	8.20	9.69	30.5	11.03	10.62	10.61	9.74	9.46	8.31

Permit Violations: Dec 2019 Monthly flow violation, Jan 2020 Monthly flow violation, Feb 2020 monthly flow violation, Mar 2020 Monthly BOD/Weekly BOD/ Weekly TSS violations





4.0 BIOSOLIDS MANAGEMENT (Fiscal Year 2019-2020)

Biosolids are managed and disposed of in accordance with Permit No's. WQ0007486 issued by the North Carolina Department of Environmental Quality and ND0089044 issued by South Carolina Department of Health and Environmental Control. Biosolids are stored at both the Crooked Creek and Twelve Mile Creek WRFs. 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 cannot be achieved, then alkaline stabilization, injection or incorporation is employed to insure permit compliance. Union County Public Works, through its biosolids contractor, land applied approximately 7.99 million gallons of biosolids, which equates to 1,068 dry tons.

What Are Biosolids?

Biosolids are the nutrient-rich, organic by-product of the wastewater treatment process. When treated and managed appropriately, they can be beneficially used for a number of purposes, such as a fertilizer to improve and maintain productive soils and stimulate plant growth. Biosolids are one of the most studied materials that have ever been regulated by the U.S. Environmental Protection Agency (USEPA).

5.0 SYNOPSIS OF WASTEWATER COLLECTION SYSTEM (Fiscal Year 2019-2020)

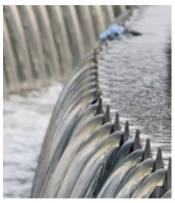
Permit No. WQCS00054. UCPW currently operates and maintains over 710 linear miles of sewer mains, including force mains, and 54 wastewater pumping stations providing service to population of approximately 109,500 customers. All pump stations are equipped with both audible and visual alarms as well as either automated telephone dialers (ATD) or telemetry which alert staff when alarm conditions are present. Inspections of all pump stations meet or exceed State requirements. Emergency auxiliary power is provided to all stations via portable or permanent mounted generators. Union County personnel are on call rotation and available 24 hours a day, 7 days a week, and 365 days a year.

Public Works is required by State permit to clean a minimum of 10% of the collection system annually to prevent and/or reduce backups and overflows. Staff has consistently surpassed that requirement, cleaning more than the required 10%. UCPW cleaned approximately 12.71% (80.59 miles of 634 total gravity miles) of the collection system last year. Staff also conducts inspections of the collection system with the utilization of underground closed-circuit television (CCTV) inspection equipment. These cleaning and inspection efforts allow staff to determine areas in the system that require repairs or increased maintenance to provide the proper service to our customers.

FOG (Fats, Oils, and Grease) program is aimed at reducing grease-related back-ups and overflows by educating the public of the hazards associated with the disposal of grease and grease related by-products into the wastewater system. Union County Public Works has also developed a comprehensive list of food service establishments (FSE) and commercial establishments. This effort has resulted in developing an important and successful grease trap inspection and enforcement program ensuring that restaurants and other food preparation facilities properly maintain grease traps and interceptors.

This fiscal year, 326 of 373 FSEs have been inspected, including 34 Union County public school facilities.

	FEET	MILES	SYSTEM TOTAL (In Miles)
SEWER LINES CLEANED	425,528	81	710
SMOKE TESTING	269,869	51	710
EASEMENT MAINTENANCE	824,806	156	165





Utility easements and right-of-ways are maintained by UCPW staff to ensure access for staff and equipment to conduct routine maintenance as well as respond to emergencies, such as sanitary sewer overflows. The easements require round-the-clock access and should not be impeded by structures such as pools (above or below ground), buildings, etc. as well as gardens, trees, shrubs, plantings, fences, etc. Public Works staff inspects and conducts necessary maintenance, including mowing, to these easements and right-of-ways once a year.

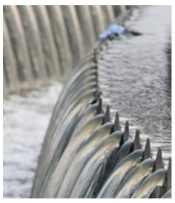
An Easement Awareness, Education, and Enforcement Program has been established to improve accessibility to UCPW's sanitary sewer easements. This is accomplished by educating customers on the allowable uses of the easement and describing prohibitions, as well as procedures regarding enforcement when it is required for access.

High priority lines such as aerial creek crossings, lines subject to erosion and/or problematic areas are visually inspected at a minimum semi-annually. High priority lines are inspected more frequently after periods of heavy rain and flooding.

UCPW 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, pumps, and backhoes. Workers safety is of utmost importance. Safety equipment such as night lighting, gas monitors, trenching and shoring equipment, and reflective cones/signs are always readily available.

UCPW continuously works to improve its infrastructure and service provided to its customers. This involves consistent inspections and system examinations to ensure that our system is operating properly. Additionally, Union County has Capital Improvement Projects (CIP) to identify and correct deficiencies within the wastewater system. The following pages have a sample of projects:

	INSPECTED	SYSTEM TOTAL
Manhole Inspections	993	16,842
Pump Station Inspections	4059	N/A
CCTV Connections	949	N/A
Point Repairs	491	N/A





12 Mile Creek WRF Expansion

Union County Public Works has completed the upgrades to the 12 Mile Creek Water Reclamation Facility. The project involved various advancements to the plant, taking the treatment capacity from 6.0 million gallons per day (MGD) to 7.5 MGD.

These improvements have increased the treatment capacity of the plant to meet future short-term anticipated wastewater flows. The improvements have also prepared the facility for future expansions: first to 9.0 MGD, and then to

12.0 MGD. These expansion projects will meet the projected long-term wastewater treatment needs for the southwestern portion of the County.

The expansion project includes:

Upgrade and expansion of the influent pump station

Replacement of the existing preliminary treatment facility with a new grit removal and odor control system

Conversion of the existing biological treatment process to a diffused aeration system to enhance biological nutrient re- moval and provide additional capacity

Replacement of the effluent disinfection system with a new high efficiency ultraviolet disinfection process

Construction of a new residuals handling facilities which serves to stabilize and dewater the residual solids pro- duced in the treatment process

The County awarded the contract to Adams Robinson Enterprises, Inc. in the amount of $36,673,000.00, which is the County's largest capital improvement project in the last two decades.

Construction began September 2016 and was completed in the spring of 2020.

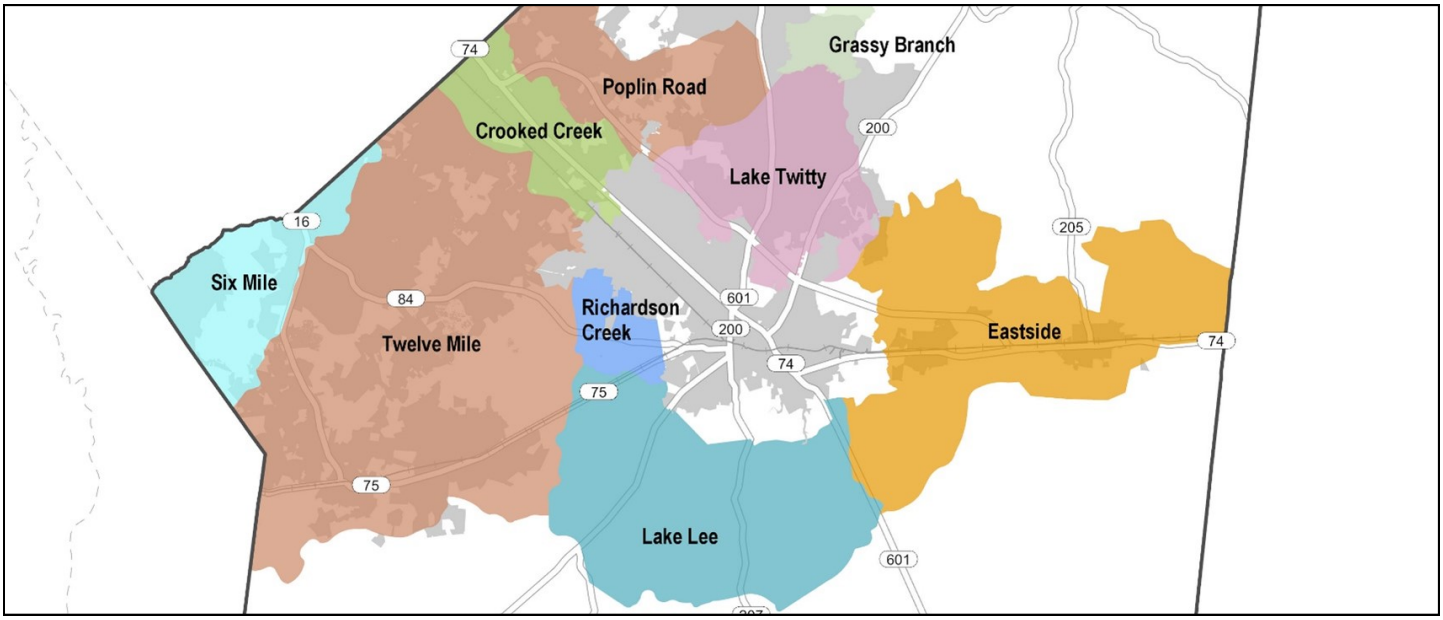
Ongoing Sanitary Sewer Evaluation Studies

Studies are being done throughout the collection system to identify problems, conduct flow monitoring, and need for rehabilitation.

- Tallwood WRF basin – A contract was issued to address inflow and infiltration (I&I) repairs needed in this basin. We are utilizing micro-metering to further reduce I&I in this basin.

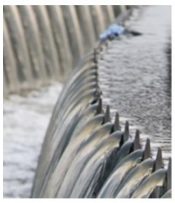
- Crooked Creek WRF Basin – A significant I&I study has been underway since FY17. The project has identified areas of I&I entering the system and a contract was issued to repair these defects. The work started in FY19 with the use of CIP funds, and is ongoing.

- Grassy Brach WRF Basin – UCPW has worked extensively with UCPS staff to eliminate Sanitary Sewer Overflows (SSOs) in the basin. During FY18 Piedmont High School completed construction repairs during summer break to reduce I&I. Efforts are continuing into FY20 to continually reduce the impacts of I&I. We currently have multiple micrometers installed to monitor any I&I during FY20/21.



Crooked Creek WRF Headworks Improvements

The project was completed in May 2019. The project includes the construction of a new headworks facility, influent pump station, three million gallon flow equalization tank, and appurtenant yard piping, mechanical, and electrical system improvements. Construction of the flow equalization tank allows for greater operational control of the facility and offsets the need to expand treatment capacity to handle peak flows that occur on an irregular basis or for short time periods during any given day. Improvements to the headworks and influent pumping facilities ensure adequate capacity to convey incoming flows is available and reduces the risk of sanitary sewer overflows at the plant site and in the upstream collections system.





During the Fiscal Year 2019-2020, Union County's wastewater system collected and conveyed approximately 3.55 billion gallons of wastewater. There were 43 sanitary sewer overflows with a combined estimated volume of 399,560 gallons that occurred within the collection system. Union County Public Works conveyed 99.996% of the total volume of wastewater without incident.

Sanitary Sewer Overflow Report

Start Date	MH or Main Asset ID	Address	Water Body	Gal to Surface Waters	Gal On Ground	Total Gallons	Primary Cause	Secondary Cause
07/07/2019	9527	2103 Lytton Lane	West Fork 12 Mile	500	0	500	Pump Station Failure	
07/10/2019	S-ARV-31	1805 Ansonville Road	No Water Body Impact		300	300	Force Main Break	
07/14/2019	20069	5012 Lydgate Drive	No Water Body Impact	0	8,500	8,500	Debris	Rocks
07/21/2019	30766	417 Vintage Creek		0	875	875	Debris	Rocks
07/23/2019	5231	4015 Sardis Church Road	South Fork Crooked Creek	9,000	0	9,000	Severe Weather	Inflow/Infiltration
07/25/2019	Force Main	211 Cupped Oak Drive	North Fork Crooked Creek Tributary 4	100	2,400	2,500	Force Main Break	
08/13/2019	20068	5012 Lydgate Drive	12 Mile Tributary 2	20	150	150	Debris	Rocks
08/23/2019	5231	4015 Sardis Church Road	South Fork Crooked Creek	6,750	0	6,750	Severe Weather	Inflow/Infiltration
11/06/2019	5286	5715 Stockbridge	South Fork Crooked Creek	500	400	900	Grease	Debris
11/23/2019	5231	4015 Sardis Church Road	South Fork Crooked Creek	11,500	0	11,500	Severe Weather	Inflow/Infiltration
12/13/2019	5231-5226-5223-5222	4015 Sardis Church Road	South Fork Crooked Creek	59,435	0	59,435	Severe Weather	Inflow/Infiltration
12/13/2019	Marvin PS Wetwell	2722 Waxhaw Marvin Road	Trakhill Branch	1,980	0	1,980	Severe Weather	Inflow/Infiltration
12/23/2019	Marvin PS Wetwell	2722 Waxhaw Marvin Road	Trakhill Branch	18,300	0	18,300	Severe Weather	Inflow/Infiltration
12/23/2019	7456	910 Sharon Drive	Rone Branch	1,400	0	1,400	Severe Weather	Inflow/Infiltration
12/23/2019	5231-5226-5223-5222-5206-5225	4015 Sardis Church Road	South Fork Crooked Creek	24,430	0	24,430	Severe Weather	Inflow/Infiltration
01/13/2020	5231	4004 Sardis Church Road	South Fork Crooked Creek	13,800	0	13,800	Severe Weather	Inflow/Infiltration
01/24/2020	5232	4015 Sardis Church Road	South Fork Crooked Creek	16,560	0	16,560	Severe Weather	Inflow/Infiltration
02/06/2020	5231	4015 Sardis Church Road	South Fork Crooked Creek	49,800	0	49,800	Severe Weather	Inflow/Infiltration
02/06/2020	Poplin Road PS Wetwell	7011 Sedgewick Road	North Fork Crooked Creek	32,300	0	32,300	Severe Weather	Inflow/Infiltration
02/06/2020	Western Union PS Wetwell	5306 Lee Massey	No Water Body Impact	0	1500	1,500	Severe Weather	Inflow/Infiltration
02/06/2020	Funderburk PS Wetwell	630 Funderburk Road	No Water Body Impact	0	800	800	Severe Weather	Inflow/Infiltration
02/07/2020	Force Main	6652 Stoney Ridge Road	Goose Creek	1,875	0	1,875	Force Main Break	
02/09/2020	2107	8299 Kensington Park	Twelve Mile Tributary 8	21,150	0	21,150	Debris	Severe Weather
02/12/2020	6414	1015 Dairy Glen Road	No Water Body Impact	0	1800	1,800	Grease	Debris
03/02/2020	13440	2034 Iverson Lane	12 Mile Creek	850	0	850	Grease	Debris

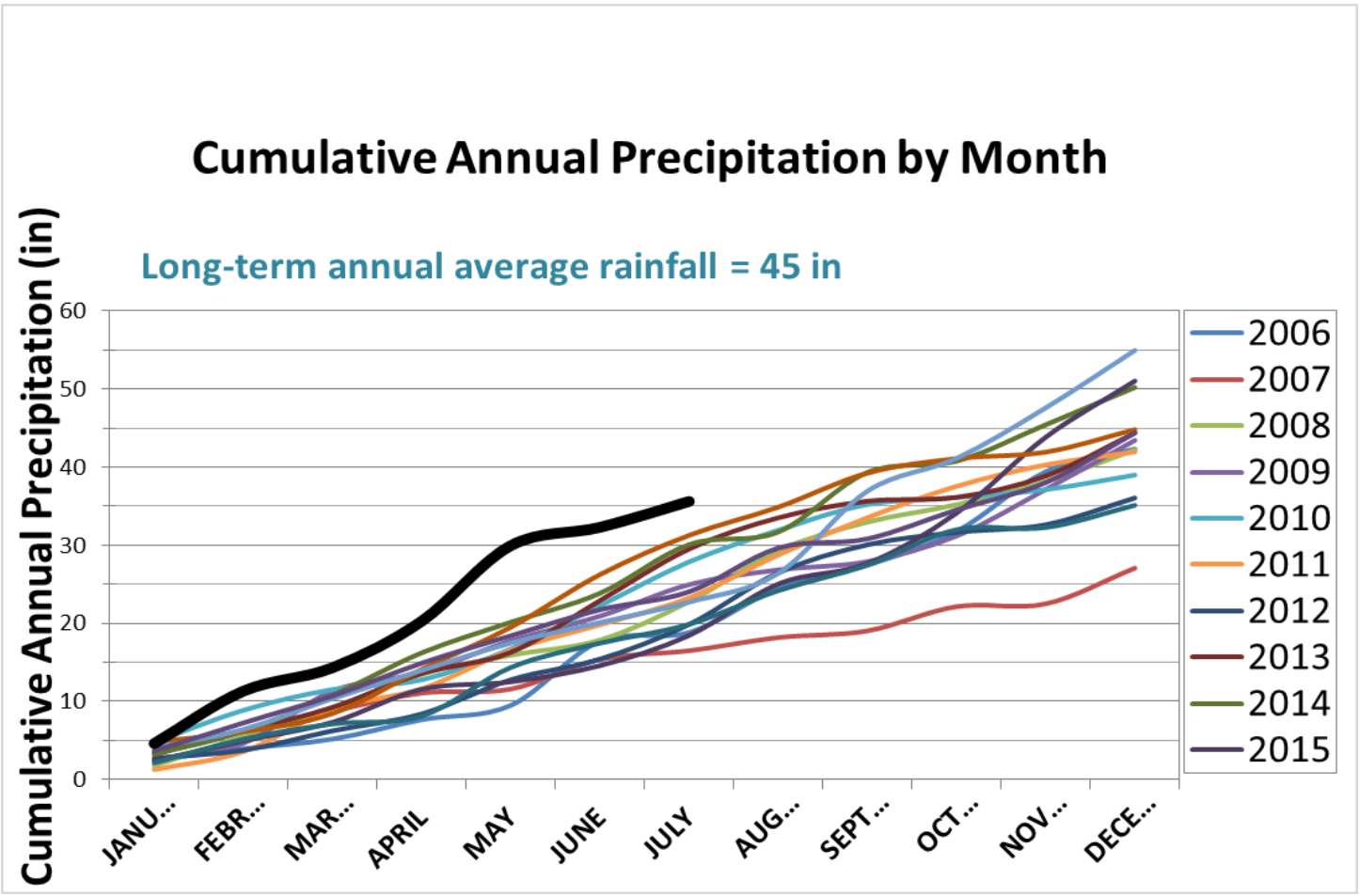
Continued on Next Page





Sanitary Sewer Overflow Report (continued)

Start Date	MH or Main Asset ID	Address	Water Body	Gal to Surface Waters	Gal On Ground	Total Gallons	Primary Cause	Secondary Cause
03/03/2020	5231	4004 Sardis Church Road	South Fork Crooked Creek	1,800	0	1,800	Severe Weather	Inflow/Infiltration
03/06/2020	2646	1909 Hwy 205	Salem Creek	1,500	0	1,500	Pump Station Failure	
03/25/2020	5231	4004 Sardis Church Road	South Fork Crooked Creek	6,750	0	6,750	Severe Weather	Inflow/Infiltration
04/13/2020	5231	4015 Sardis Church Road	South Fork Crooked Creek	7,200	0	7,200	Severe Weather	Inflow/Infiltration
04/29/2020	10992	3020 Arsdale Road	12 Mile Creek	810	0	810	Grease	Debris
04/30/2020	5231	4004 Sardis Church Road	South Fork Crooked Creek	9,120		9,120	Inflow/Infiltration	Severe Weather
05/11/2020	9124	6913 Plainview Road	East Fork 12 Mile Creek	200	0	200	Debris	Rocks
05/19/2020	Funderburk PS Wetwell	630 Funderburk Road	Spring Branch	1,350	0	1,350	Severe Weather	Inflow/Infiltration
05/20/2020	5231	4004 Sardis Church Road	South Fork Crooked Creek	5,400	0	5,400	Severe Weather	Inflow/Infiltration
05/20/2020	5231-5223-5206	4004 Sardis Church Road	South Fork Crooked Creek	48,855	0	48,855	Severe Weather	Inflow/Infiltration
05/20/2020	Funderburk PS Wetwell	630 Funderburk Road	Spring Branch	900	0	900	Severe Weather	Inflow/Infiltration
05/24/2020	Funderburk PS Wetwell	630 Funderburk Road	Spring Branch	0	150	150	Severe Weather	Inflow/Infiltration
05/27/2020	Rone Branch PS Wetwell	910 Sharon Drive	Rone Branch	4,950		4,950	Severe Weather	Inflow/Infiltration
05/27/2020	5231	4004 Sardis Church Road	South Fork Crooked Creek.	19,800		19,800	Severe Weather	Severe Weather
05/27/2020	Poplin Road PS Wetwell	7010 Sedgewick Road	North Fork Crooked Creek	1,440		1,440	Severe Weather	Severe Weather
05/29/2020	Rone Branch PS Wetwell	910 Sharon Drive	No Water Body Impact	0	750	750	Severe Weather	Inflow/Infiltration
05/29/2020	Funderburk PS Wetwell	630 Funderburk	No Water Body Impact	0	555	555	Severe Weather	Inflow/Infiltration
06/17/2020	Operation Center PS Wetwell	4600 Goldmine Rd	No Water Body Impact		750	750	Pump Station Failure	
Total Spills: 43								
Total Annual Volume				**380,325**	**18,930**	**399,560**		
Miles of Pipe in System: 710								
Reportable SSOs Per 100 Miles: 5.14								



For questions concerning this Wastewater System Performance Summary or additional information please contact UCPW:

(704) 296-4210

Or write to:

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