Union County, NC
Department of Public Works
Wastewater Performance Summary
Fiscal Year 2017-2018

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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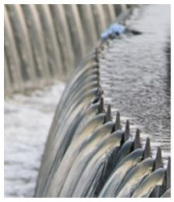




Dear Customer,

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.

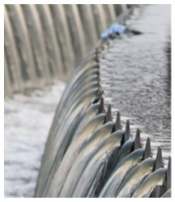
Sincerely,
Andrew Neff, P.E.
Water & Wastewater Division Director
Union County Public Works
500 North Main Street
Monroe, NC 28112

Public Works' Vision Statement:
We are recognized for providing exemplary service through the engagement of our employees in the efficient and effective management of our assets and resources.

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 this rule.

Union County Public Works (UCPW) is charged with the management, operation and maintenance of the County's sanitary sewer system. During the 2017-2018 fiscal year the wastewater system was comprised of 5 active wastewater treatment plants (WWTP), 80 wastewater pumping stations, and over 685 miles of pipe with 36,244 connections. In addition to the 5 WWTPs which have a combined rated treatment capacity of 8.15 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 WWTP and Charlotte's McAlpine Creek WWTP respectively.

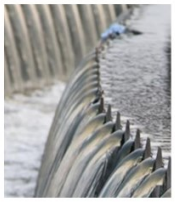




2.0 DEFINITIONS

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 WASTEWATER TREATMENT FACILITIES (Fiscal Year 2017-2018)

During the 2017-18 fiscal year the Department of Public Works operated and maintained a total of five (5) active wastewater treatment facilities and maintained one (1) inactive facility. 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. In addition to SCADA, 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 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 6.0 MGD of treated wastewater. Twelve Mile Creek WWTP 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.

3.2 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.

3.3 Hunley Creek Wastewater Treatment Plant

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 WWTP, there was no data to report to Table 3-3 for fiscal year 2016-2017.

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 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.

3.5 Tallwood Estates Wastewater Treatment Plant

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 2013 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.

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 (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 Subdivision. 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: 2017-2018 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '17	AUG '17	SEP '17	OCT '17	NOV '17	DEC '17	JAN '18	FEB '18	MAR '18	APR '18	MAY '18	JUN '18
FLOW	**6.0 MGD**	3.78	3.56	3.50	3.50	3.23	3.58	3.73	4.225	4.06	3.95	3.98	3.68
pH	**6-9 SU**	7.3-7.5	7.2-7.6	7.2-7.6	7.1-7.7	7.1-7.5	6.9-7.4	6.9-7.3	6.8-7.2	6.8-7.2	6.8-7.4	7-7.4	6.9-7.3
BOD_5 SUMMER (APR.1 - OCT.31)	**5 mg/l**	0.23	0.21	0.62	0	-	-	-	-	-	2.76	0	.323
WINTER (NOV.1 - MAR.31)	**10 mg/l**	-	-	-	-	0.48	0.57	2.32	1.115	.33	-	-	-
AMMONIA NITROGEN SUMMER	**1 mg/l**	0.095	0.022	0.021	0.018	-	-	-	-	-	0	.005	0
WINTER	**2 mg/l**	-	-	-	-	0.029	0.28	0.025	0.134	0	-	-	-
TOTAL SUSPENDED RESIDUE	**30 mg/l**	0	0.13	0	0	0	0	1.095	0.47	0	21.6	0	0
FECAL COLIFORM	**200/100 ml**	9.035	48.41	22.41	16.68	8.985	8.44	61.087	27.053	16.17	17.32	3.07	3.02
DISSOLVED OXYGEN	**≥ 6 mg/l**	8.18	8.13	8.3	8.56	9.047	9.43	9.9	9.555	9.7	9.32	8.74	8.39
COPPER	**13.2 ug/l**	2.5	2.2	2.6	2.3	0	0	2.7	3.1	3.4	3.5	63	3.1
ZINC	**175.0 ug/l**	25	33	40	23	47	49	54	44	57	51	52	49
TOTAL PHOSPHOROUS MAXIMIUM MONTH	**41.7 #/day**	0	0.70	5.84	1.02	1.32	2.69	4.49	4.93	1.95	.80	.80	.13
TOTAL PHOSPHORUS 12 MONTH ROLLING AVERAGE	**20.85#/day**	2.88	2.59	3.0	2.90	2.67	2.69	2.71	2.83	2.60	2.76	2.78	2.89

Permit Violations:

4/18 one reporting violation for failure to collect an ammonia sample.

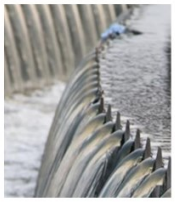




TABLE 3-2

Crooked Creek Water Reclamation Facility
NPDES Permit #: NC0069841
Fiscal Year: 2017-2018 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '17	AUG '17	SEP '17	OCT '17	NOV '17	DEC '17	JAN '18	FEB '18	MAR '18	APR '18	MAY '18	JUN '18
FLOW	**1.900 MGD**	0.85	.862	.924	.844	.901	.962	1.08	1.04	1.21	1.07	1.108	1.077
pH	**6-9 SU**	7.3-7.7	7-7.6	6.9-7.5	6.8-7.3	6.7-7.4	7.1-7.5	6.8-7.6	6.8-7.6	7-7.7	6.5-7.6	6.7-7.5	6-7.4
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	.273	.308	0	-	-	-	-	-	2.36	2.13	2.04
WINTER (NOV.1 - MAR.31)	**10 mg/l**	-	-	-	-	0	.325	1.2	1.44	2.68	-	-	-
AMMONIA NITROGEN SUMMER	**2 mg/l**	0	0	0	0	-	-	-	-	-	0	.048	.143
WINTER	**4 mg/l**	-	-	-	-	0	0	.277	.017	0	-	-	-
TOTAL SUSPENDED RESIDUE	**30 mg/l**	0	.18	.625	0	0	1.283	1.49	2.03	8.62	4.65	7.48	6.5
FECAL COLIFORM	**200/100 ml**	105.07	10.76	13.458	2.983	3.134	6.22	5.08	15.80	11.23	111.87	114.43	78.439
DISSOLVED OXYGEN	**≥ 6 mg/l**	8.039	8.07	8.3	8.76	9.584	9.98	11.02	9.76	9.90	9.26	8.36	8.04

Permit Violations:

5/18 Exceeded weekly geometric mean for fecal coliform

TABLE 3-3

Hunley Creek Wastewater Treatment Plant
NPDES Permit #: NC0072508
Fiscal Year: 2017-2018 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '16	AUG '16	SEP '16	OCT '16	NOV '16	DEC '16	JAN '17	FEB '17	MAR '17	APR '17	MAY '17	JUN '17
FLOW	**0.231 MGD**	**Hunley Creek WWTP 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

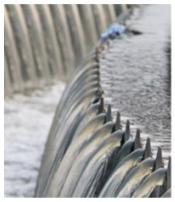




TABLE 3-4

Olde Sycamore Water Reclamation Facility
NPDES Permit #: WQ0011928
Fiscal Year: 2017-2018 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '17	AUG '17	SEP '17	OCT '17	NOV '17	DEC '17	JAN '18	FEB '18	MAR '18	APR '17	MAY '18	JUN '18
FLOW	**0.150 MGD**	0.038	.039			.047	.053	.057	.046	.053	.049	.042	.047
pH	**6-9 SU**	6.7-7.3	6.3-7.7			6.1-7.8	6.8-7.5	6.4-7.2	6.6-7.1	6.8-7.4	6.1-8	5.3-7.5	6.1-7.8
BOD_5	**10 mg/l**	0	0			0	0	0	3.6	0	6.4	0	0
AMMONIA NITROGEN	**4 mg/l**	0	0			0	1.40	0	0	0	.38	0	0
TOTAL SUSPENDED RESIDUE	**5 mg/l**	0	0			0	0	0	0	0	0	0	0
FECAL COLIFORM	**14/100 ml**	2	2			1	2	1	1	1	0	1	1
TURBIDITY	**≤ 10 NTU**	0.2	.8			1.1	.7	.7	.6	.8	.9	1	.7

Permit Violations:

4/18 Exceeded daily maximum limit for biological oxygen demand (BOD) , 5/18 Below daily minimum limit for PH

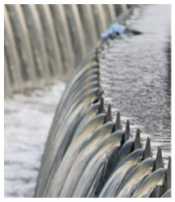




TABLE 3-5

Tallwood Estates Wastewater Treatment Plant
NPDES Permit #: NC0069523
Fiscal Year: 2017-2018 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '17	AUG '17	SEP '17	OCT '17	NOV '17	DEC '17	JAN '18	FEB '18	MAR '18	APR '18	MAY '18	JUN '18
FLOW	**0.050 MGD**	.025	.022	.024	.018	.019	.019	.025	.031	.049	.025	.020	.018
pH	**6-9 SU**	7-7.6	7.1-7.6	7.1-7.4	7-7.6	7.1-7.6	7.2-7.6	7.1-7.6	7.3-7.5	7.1-7.9	6.6-8.1	6.3-7.5	6.7-7.7
BOD_5 SUMMER(APR 1-OCT 31)	**5 mg/l**	0	0	0	0	-	-	-	-	-	0	1.07	0
WINTER (NOV.1 - MAR.31)	**10 mg/l**	-	-	-	-	0	.7	1.52	0	0	-	-	-
AMMONIA NITROGEN SUMMER	**2 mg/l**	.165	0	0	0	-	-	-	-	-	0	0	0
WINTER	**4 mg/l**	-	-	-	-	.07	.1	.058	0	0	-	-	-
TOTAL SUSPENDED RESIDUE	**30 mg/l**	0	0	0	0	0	1.67	0	0	0	0	0	0
FECAL COLIFORM	**200/100 ml**	1	2.29	3.562	1	1	1.93	1.64	1	3.30	3.99	0	2.05
DISSOLVED OXYGEN	**≥ 6 mg/l**	7.33	7.57	7.61	7.48	7.84	7.61	8.84	8.32	8.1	7.88	7.46	7.13

Permit Violations:

No violations for the year

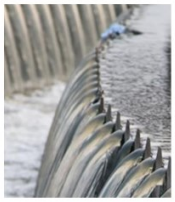




TABLE 3-6

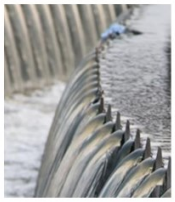
Grassy Branch Wastewater Treatment Plant
NPDES Permit #: NC0085812
Fiscal Year: 2017-2018 Effluent Limits and Performance

PARAMETER	LIMIT	JUL '17	AUG '17	SEP '17	OCT '17	NOV '17	DEC '17	JAN '18	FEB '18	MAR '18	APR '18	MAY '18	JUN '18
FLOW	**0.050 MGD**	.05	.037	.043	.029	.028	.035	.057	.069	.067	.047	.036	.029
pH	**6-9 SU**	7.2-7.7	6.1-8	7.1-7.8	6.7-7.7	6.3-7.9	6.3-6.9	6-8.5	7-8	6.4-9	7-8	6.7-7.8	6.5-7.6
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**	.54	1.95	2.1	0	-	-	-	-	-	4.02	2.7	4.96
WINTER (NOV.1 - MAR.31)	**10 mg/l**	-	-	-	-	.55	.675	3.85	6.56	16.3	-	-	-
AMMONIA NITROGEN SUMMER	**2 mg/l**	0	.53	1.36	.12	-	-	-	-	-	.9	1.48	.484
WINTER	**4 mg/l**	-	-	-	-	0	.38	1.58	3.51	3.96	-	-	-
TOTAL SUSPENDED RESIDUE	**30 mg/l**	.72	4.17	4.62	0	0	0	3.42	7.32	4.86	3.88	2.3	7.64
FECAL COLIFORM	**200/100 ml**	2.29	4.202	6.96	1.93	1.93	2.11	4.23	220	218	28.46	18.84	127.55
DISSOLVED OXYGEN	**≥ 6 mg/l**	6.91	7.72	7.88	8.17	8.48	8.53	9.65	9.49	10.36	9.24	6.78	7.21

Permit Violations:

1/18- Exceeded monthly flow limit; 2/18- Exceeded monthly flow limit, exceeded weekly average ammonia limit, exceeded 2 weekly and 1 monthly limits for fecal coliform geometric mean; 3/18 Exceeded monthly flow limit, exceeded 2 weekly and 1 monthly biological oxygen demand (BOD) limits, exceeded monthly fecal coliform geometric mean limit; 4/18 Exceeded weekly BOD limit; 6/18 Exceeded weekly fecal coliform geometric mean limit.

Heavy rainfall for three months resulted in repeated plant upsets which contributed to several compliance violations. Inflow and infiltration remediation work carried out by UCPW staff has greatly reduced the chance of this occurring again.





4.0 BIOSOLIDS MANAGEMENT (Fiscal Year 2017-2018)

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 8.31 million gallons of biosolids, which equates to 1,340 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 2017-2018)

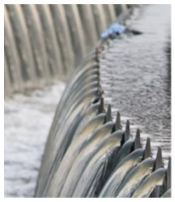
Permit No. WQCS00054. UCPW currently operates and maintains over 685 linear miles of sewer mains, including force mains, and 80 wastewater pumping stations providing service to population of approximately 102,348 customers. All pump stations are equipped with both audible and visual alarms as well as 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 18.25% (110.8 miles of 607 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, 350 of 350 FSEs have been inspected, including 34 Union County public school facilities.

	FEET	MILES	SYSTEM TOTAL
SEWER LINES CLEANED	585,091	110.8	607
SMOKE TESTING	129,994	24.62	N/A
EASEMENT MAINTENANCE	594,528	112.6	120





	INSPECTED	SYSTEM TOTAL
MANHOLE INSPECTIONS	998	15,306
PUMP STATION INSPECTIONS	4,632	N/A
CCTV CONNECTIONS	1,564	N/A
POINT REPAIRS	219	N/A

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, at a minimum.

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.

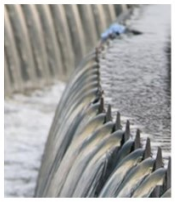
High priority lines such as aerial creek crossings, lines subject to erosion and/or problematic areas are visually inspected at a minimum semi-annually. High priority lines are inspected more frequently after periods of heavy rain and flooding.

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 has Capital Improvement Projects (CIP) to identify and correct deficiencies within the wastewater system. Below is a sample of projects:

Crooked Creek WRF Headworks Improvements

The project completed its design phase in January 2016. The construction contract was awarded in February 2016 with construction commencing in July 2016. The contract allows 425 days to attain completion and, with changes to date, is scheduled to be completed in fall 2018. 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.





12 Mile Creek WRF Expansion

The project completed its design phase in April 2016 with construction commencing in September 2016. The contract allows 1,095 days to attain completion and is presently scheduled to be completed in September 2019. The project will expand the plant's treatment capacity from 6.0 MGD to 7.5 MGD to ensure demand will be met under projected growth scenarios. Improvements to the 12-Mile Creek WRF include upgrading the mechanical screens at the influent pump station; replacement of the headworks facility including new grit removal and odor control systems; conversion of the existing oxidation ditch treatment process to a diffused aeration system to provide for biological nutrient removal; replacement of the existing ultra-violet disinfection system for treated wastewater; construction of a new solids handling facility including gravity belt thickeners and belt filter press; and conversion of the existing aerobic digesters to utilizing a jet aeration system.

Helmsville Road Pump Station Replacement

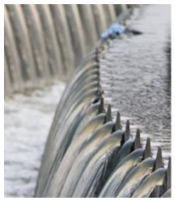
The project completed its construction during April 2018. The Project primarily consisted of construction of the following: a new duplex 0.9 million gallons per day (mgd) submersible pump station, valve vault, metering vault and standby generation system with all associated electrical, instrumentation, and site improvements.

Ongoing sanitary sewer evaluation studies (SSES)

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 I&I repairs needed in this basin. The work will be completed in the FY19 budget year.
- Crooked Creek WRF Basin – A significant inflow and infiltration (I&I) project has been underway in since FY17. The project has identified areas of I&I entering the system and a contract was issued to repair these defects. The work will start in the FY19 with the use of CIP funds.
- Grassy Brach WRF Basin – UCPW has worked extensively with UCPS staff to eliminate SSO's in the basin. During FY18 Piedmont High School completed construction repairs during summer break to reduce (I&I). Efforts are continuing into FY19 to continually reduce the impacts of (I&I). We currently have 5 micro meters installed to monitor any (I&I) during FY19. 18 manholes were repaired during FY18 along the truck line to the WRF with the use of chemical grout.

During the Fiscal Year 2017-2018, Union County's wastewater system collected and conveyed approximately 3.02 billion gallons of wastewater. There were fifteen (15) sanitary sewer overflows with a combined estimated volume of 67,445 gallons that occurred within the collection system. Union County Public Works conveyed 99.997% of the total volume of wastewater without incident.





DATE	MH ID#	ADDRESS	WATER BODY	VOUME DATA		TOTAL VOLUME (GALS)	PRIMARY CAUSE OF SSO	SECONDARY CAUSE OF SSO (IF ANY)	ADDITIONAL INFORMATION (IF ANY)
				GALLONS TO SURFACE WATERS	GALLONS ON GROUND				
07/01/17	7214	21-25	Rone Branch	0	100	100	PS Equipment Failure		
07/01/17	5231&5226	4004 Sardis Church Rd	Crooked Creek	21,320	0	21,720	Severe Natural	I&I	
07/03/17	7214	900 Sharon Drive	Rone Branch	2,000	850	2,850	Severe Natural	I&I	
09/12/17	5231	4004 Sardis Church Rd	Crooked Creek	9,600	0	9,600	Severe Natural Condition		Hurricane Irma
09/19/17	4141	4602 Foggy Glen Pl.	None		550	550	Vandalism	Debris	Rebar in MH. Likely by kids through the vent holes of the lid
10/06/17	NA	ARV - Helmsville PS	Crooked Creek	500	250	750	ARV Failure		
10/06/17	NA	1306 Wesley Chapel Rd	None		500	500	Force Main Failure	Third Party Damage	All wastewater was recovered
10/12/17	NA	13615 Hwy 74	None		400	400	Force Main Failure	Third Party Damage	All wastewater was recovered
01/23/18	5231	4004 Sardis Church	Crooked Creek	8,000		8,000	I&I		
03/06/18	NA	Suburban Estates FM	Crooked Creek	100	0	100	Pipe Failure (Break)		Damaged while conducting
04/03/18	N/A	2208 Younts Rd	Crooked Creek	175		175	Debris		
04/24/18	5231	4004 Sardis Church Rd	Crooked Creek	2,000	0	2,000	I&I		
05/16/18	5231	4004 Sardis Church Rd	Crooked Creek	12,000	200	12,200	I&I		
05/25/18	7214	910 Sharon Dr	Rone Branch	400	0	400	Grease		
05/29/18	5231	4004 Sardis Church Rd	Crooked Creek	8,100	0	8,100	Severe Natural	I&I	
						0			
						0			
						0			
15	TOTAL SPILLS	TOTAL ANNUAL VOLUMES		64,195	2,850	67,445			
		MILES OF PIPE IN SYSTEM		635.00					
		SSO's PER 100 MILES		2.36					

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

(704) 296-4210

Or write to:

Union County Public Works
500 North Main Street, Suite 600
Monroe, NC 28112-4730

This document can also be viewed at: http://www.co.union.nc.us/LivingHere/PublicWorks.aspx