TOWN OF CLARKTON - SEWER ASSET MANAGEMENT PLAN

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AMP	-	Asset Management Plan
CAS	-	Cast Iron Pipe
CIP	-	Capital Improvement Plan
DIP	-	Ductile Iron Pipe
EPA	-	Environmental Protection Agency
FY	-	Fiscal Year
GIS	-	Geographic Information System
GPM	-	Gallons per Minute
ISO	-	Insurance Services Office
LF	-	Linear Feet
LOS	-	Level of Service
LWSP	-	Local Water Supply Plan
MG	-	Million Gallons
MGD	-	Million Gallons per Day
NCAC	-	North Carolina Administrative Code
NCDEQ	-	North Carolina Department of Environmental Quality
O&M	-	Operation and Maintenance
PCCP	-	Prestressed Concrete Cylinder Pipe
PSI	-	Pounds per Square Inch
PVC	-	Polyvinyl Chloride Pipe
RPT	-	Reinforced Plastic Truss
SCADA	-	Supervisory Control and Data Acquisition
SSO	-	Sanitary Sewer Overflow
UGPJ	-	Underground Pipe Junction
VC	-	Vitrified Clay Pipe
WTP	-	Water Treatment Plant
WWTP	-	Wastewater Treatment Plant

1 Executive Summary

1.1 Introduction

The Town of Clarkton, with the assistance of WithersRavenel, developed a comprehensive Asset Management Plan (AMP) for its sewer collection system assets. The AMP for the collection system is funded through the North Carolina Division of Environmental Quality (NCDEQ) Asset Inventory and Assessment (AIA) Grant Program.

The scope of the Asset Management Plan is shown in Table 1 below, which outlines the Town's core collection system assets assessed and included in this AMP.

Table 1 - Town's Core Sewer Infrastructure Assets

Asset Category	Asset Type
Collection System	Gravity Mains, Manholes, Force Mains, Pump Stations (Inventory only)

1.2 Project Purpose

The purpose of this AMP is to deliver a near- and long-term roadmap for proactive management of the Town's sewer assets. The AMP will also provide data driven insights for the Town to make informed decisions for capital planning while maximizing value of existing infrastructure in the most cost-effective manner, all while ensuring enhanced levels of service for its residents.

The AMP is a compilation of four (4) key components:

1. Inventory of Assets
2. Condition of Assets
3. Capital Improvements Plan (CIP) with projected cost estimates
4. Operation and Maintenance (O&M) Plan

1.3 Key Components

1.3.1 Inventory of Assets

Table 2 below summarizes inventory of the Town's Sewer system assets and their replacement values.

Table 2 - Sewer System Inventory

Sewer System Inventory		
Asset Type	**Quantity**	**Total Replacement Value**
Gravity Mains	13.5 miles	$14,900,000
Force Mains	0.5 miles	$410,000
Manholes	239	$447,000
Pump Stations[1]	2	-

1 Pump stations were not assessed for their replacement values

1.3.2 Condition Assessment Summary

Figures 1-3 below illustrate the condition across each asset type.

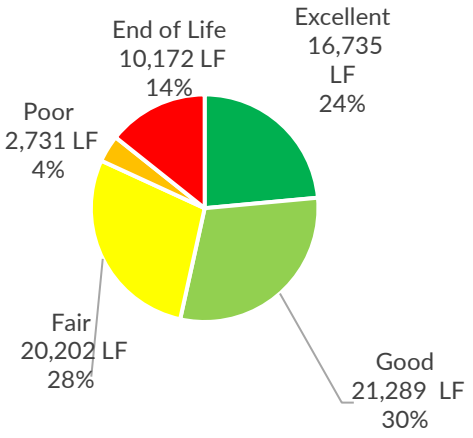

Figure 1 - Condition of Gravity Mains – Age Based

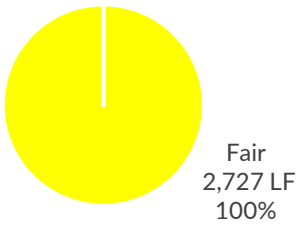

Figure 2 - Condition of Force Mains – Age Based

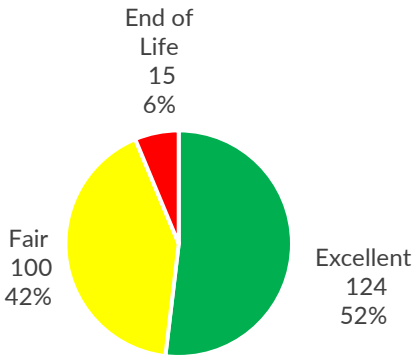

Figure 3 - Condition of Manholes – Based on Field Survey

1.3.3 10-Year Capital Improvement Plan

Table 3 below represents the CIP by year over a 10-year span with cost estimates adjusted for inflation.

Table 3 – 10-Year Capital Improvement Plan

Town of Clarkton
Capital Improvements Plan

Project Location	Current Cost	Year 1 2027	Year 2 2028	Year 3 2029	Year 4 2030	Year 5 2031	Year 6 2032	Year 7 2033	Year 8 2034	Year 9 2035	Year 10 2036	Year 11+ 2037
Sewer Collection System and Pump Station Improvements												
1. 10" Gravity Line Repair or Replacement North Railroad St	$256,000	$282,240										
2. 8" Gravity Line Repair or Replacement N Gooden St	$372,000	$410,130										
3. 8" Gravity Line Repair or Replacement N Elm St/Mid Aly	$321,000	$353,903										
4. 8" Gravity Line Repair or Replacement Page Rd	$248,000	$273,420										
5. Gravity Line Repair or Replacement Elm St, W Currie St, N Mitchell Ford Rd	$568,000	$626,220										
6. Gravity Line Repair or Replacement S Mid Aly and Misc.	$318,000						$447,458					
7. 8" Gravity Line Hwy221 From Pump Station	$315,000						$443,237					
8. 8" Gravity Line Misc Offshoots	$175,000						$246,243					
9. Repair 15 Manholes	$36,000	$3,308	$3,473	$3,647	$3,829	$4,020	$4,221	$4,432	$4,654	$4,887	$5,131	$5,388
10. Raise 5 Manholes and Replace Covers (Influent to Hwy211 Pump Station)	$30,000		$34,729									
11. Plant Pump Station Pump Replacements	$300,000	$330,750										
WWTP and Pump Station Improvements												
1. UV System Rehabilitation - FUNDED	$298,000	$328,545										
2. Hwy 211 Floodwall and Flood Gate Installation - FUNDED	$298,000	$328,545										
3. Grating and Piping System Replacement	$714,000	$787,185										
4. Blowers Replacement	$714,000						$1,004,670					
5. Solar Panel Installation	$595,000						$837,225					
6. HWY 211 Lift Station Pumps Replacement	$143,000											$256,807
7. Generator Replacement	$714,000											$1,282,241
8. UV System Replacement	$714,000											$1,282,241
9. Screw Screen Replacement	$714,000											$1,282,241
Maintenance Improvements												
1. Annual Clearing of ROW	$10,000	$11,025	$11,576	$12,155	$12,763	$13,401	$14,071	$14,775	$15,513	$16,289	$17,103	$17,959
Other Costs												
SRF Loan Fee	$64,639	$64,639										
TOTAL	$7,917,639	$3,799,910	$49,778	$15,802	$16,592	$17,421	$2,997,125	$19,207	$20,167	$21,176	$22,234	$4,126,877

1.3.4 Operation and Maintenance (O&M) Plan

Table 4 provides an O&M list prepared as a part of the project

Table 4 - Operations and Maintenance Plan

Collection System Maintenance		
Asset	Maintenance	Frequency
Collection System	Clean and video inspect at least 10% of the collection system. Record the date, location of cleaning, type of cleaning, and other general observations during cleaning (type of debris, quantities, etc.).	Annually
	Document all Sanitary Sewer Overflow (SSOs) using the State form or other similar form. All spills, reportable or not, must be documented. Spills that are reported to the State should be on the required form.	As Needed
	Incorporate information from new construction and rehabilitation projects, including line diameter, material, and scoring for other Key Performance Indicators (KPIs), into the collection system GIS within one (1) year of construction completion.	As Needed
	All high priority lines (including aerials, sub-waterway crossings, lines contacting surface waters, lines positioned parallel to stream banks and subject to eroding in such a manner that may threaten the line, and any other segment of the system that is designated as high priority) must be inspected every six (6) months. A log must document the area inspected, the date, method of inspection, and any corrective actions performed or initiated.	Semi-Annually
Pump Station System Maintenance		
Pump Station Maintenance	Inspecting, cleaning, and removing debris from the pump station structure, outside perimeter, and wet well.	Annually
	Inspecting and exercising all valves.	Annually
	Inspecting and lubricating pumps and other mechanical equipment.	Annually
	Verifying the proper operation of the alarms, telemetry system, and auxiliary equipment.	Annually
	Other testing procedures as recommended by the manufacturer.	Annually
	Annual flow meter calibration (at a minimum).	Annually
	NOTE: Pump stations not connected to telemetry systems must be inspected at least daily. Pump stations with telemetry must be inspected at least once per week.	Daily/Weekly
	Record hours of running time from elapsed time meters.	Weekly
	Check for equal run times on each pump.	Weekly
	Inspect control panel switches for proper positioning.	Annually
	Test alarms.	Annually

	Check valves for proper positioning (valves functioning, normally open valves are open, normally closed valves are closed).	Annually
	Confirm valve lever arms and weights are okay.	Annually
	Check for unusual pump noise or vibration.	Annually
	Check amp readings. Note discrepancies.	Annually
	Confirm pumps appear to be seated properly.	Annually
	Confirm that no leakage is observed.	Annually
	Confirm guide rails and brackets are aligned and fastened.	Annually
	Note any rust or loose parts.	Annually
	Confirm that piping and valves are not leaking, and that bolts and nuts are properly torqued.	Annually
	Confirm that any corroded or worn parts have been replaced, cleaned, painted, or restored.	Annually
	Record flow rate observed during site visit.	Annually
	Check and record pressure gauge readings during observed flow rate. Note any changes from normal readings.	Annually
	At least once per week, manually pump down the wet well to check for and remove debris.	Weekly
	Inspect floats, transducer, and cables. Remove all debris to ensure proper operation.	Annually
	Ensure all automatic cycle operation cables and appurtenances are free and clear of debris or obstructions and functioning as designed.	Annually
	Check control settings.	Annually
	If a pump is removed, place the lead pump selector switch on the number of the pump remaining in operation.	Annually
	Inspect the pump hand/off/automatic selector switch. Turn to off. Fill up wet well with water until high water is activated. Turn to auto and check if both pumps operate automatically with slight delay between each. Pump until pump shuts off. Fill water until the lead pump starts. When the lead pump starts, shut off water. Allow pump to lower the wet well until the pump shuts off.	Annually
	Check pumps for blockage and any abnormalities in operation.	Annually
	Confirm generator is automatically exercising on schedule at start-up. Manually throw main disconnect to check the Automatic Transfer Switch (ATS) and generator operation.	Annually
	Cut grass, pick up trash, remove debris, walk around perimeter, inspect fencing, landscaping, look for vandalism or evidence of trespassing or other security concerns.	Annually

2 Background and System Overview

2.1 Background

Town of Clarkton is in Eastern North Carolina in Bladen County, approximately 48 miles southeast of Fayetteville. The population of the Town is approximately 600 and accounts for approximately 2% of the total population in Bladen County.

The Town received an AIA grant award of $240,000 to study its sewer collection system in the Spring 2022 funding cycle. The Town, with the help of WithersRavenel, reviewed their sewer system assets by performing a Geographic Information System (GIS) data review and populating manhole attribute information. Data collected from this review was used to classify critical assets, perform a risk assessment, identify critical projects to include in the Town's Capital Improvements Plan (CIP), and determine operation and maintenance strategies to mitigate future risk of failure. This study resulted in the development of this AMP. The elements of the AMP framework include:

- Level of Service (LOS) Statement
- Asset Inventory
- Risk Analysis using Likelihood of Failure (LoF) and Consequences of Failure (CoF)
- 10-Year Capital Improvements Plan (CIP)
- Operation and Maintenance (O&M) Plan

This AMP is intended to be a living document that is updated regularly. It is recommended that the data stored within the Town's GIS database be continually validated and updated to ensure that the most relevant and accurate representations of the current system are captured.

2.2 System Overview

2.2.1 Sewer System

The sewer collection system collects wastewater from 508 residential, commercial, industrial, and institutional customers and conveys it to the Town's Wastewater Treatment Plant (WWTP) where it is treated and discharged into Brown Marsh Swamp in the Waccamaw River Basin. The WWTP operates under permit number NC0021610. The sewer system assets include approximately:

- 13.5 miles Gravity Mains
- 0.5 miles Force Mains
- 239 Manholes
- 2 Pump Stations

The sewer collection system inventories are stored and maintained in the Town's GIS database. The following sections break down the current state of the inventory. Maps of sewer system assets can be found in Appendix I.

3 Level of Service

Level of Service (LOS) criteria define the goals and standards the Town will strive to attain. LOS criteria reflect the mission of the Town and are expressed in terms of quality, quantity, reliability, responsiveness, cost, and environmental impact. Taking all these considerations into account, the Town is adopting the following LOS criteria:

Table 5 - Clarkton, NC Level of Service Criteria

Category	Level of Service	Performance Measure	Target
	1. Residential Back-ups and SSOs No adverse events will cause residential sewer back-ups and sanitary sewer overflows (SSOs)	Number of violations per year	0 events/year
	2. Sewer System Performance	Main break frequency per year	≤ 15/100 miles
		Full leak detection survey - water	Every 5 years
		CCTV inspection	10% every year
Customer Service	**3. Response Time** Respond to customer complaints/requests in a timely manner	Emergency (breaks)	1-2 hours
		Leaks	1-2 hours
		Meter repair	1-5 days
	4. Communication Notification of planned shutdown will be provided	Number of days	≥ 7 days
Financial	**5. Financial Capability** Rates are reviewed on an annual basis and revised as needed to ensure full cost recovery	Revise, review rates	Once/year

With the LOS criteria developed, the Town must establish sustainable business processes to ensure information required for measuring LOS is readily available and cost effective. The processes for collecting the information must be integrated into existing workflows.

3.1 Sewer System

The prevention of residential sewer back-ups and sanitary sewer overflows were designated as important metrics for the sewer system analysis, and Table 6 summarizes the sewer system design standards per NCAC. These standards were used to identify assets within the collection system that require updates to become compliant.

Table 6 - Sewer System Design Standards per NCAC

System Parameter	Evaluation Criterion	Value	Design Standard/Guideline
Design Capacity	Daily Flow	Various[1]	15A NCAC 02T.0114
Minimum Separation	Storm Sewer	18 inches	15A NCAC 02T.0305
	Water Mains - Vertical	18 inches	
	Water Mains - Horizontal	10 feet	

	Reclaimed Water Lines - Vertical	18 inches	
	Reclaimed Water Lines - Horizontal	2 feet	
	Drinking Water Source	100 feet	
	Classified Waters[2] or Wetlands[3]	50 feet	
	Stream, Lake, Impoundment, Wetlands[4], Waters[5]	10 feet	
	Building Foundation	5 feet	
	Basement	10 feet	
	Top slope[6]	10 feet	
	Drainage System	5 feet	
	Swimming Pool	10 feet	
	Final Earth Grade	36 inches	
Minimum Nominal Diameter	Public Gravity	8-inch	15A NCAC 02T.0305
	Private Gravity	6-inch	
Minimum Slope, in feet/100 feet, by Diameter of Gravity Pipe[7]	6-inch	0.6	15A NCAC 02T.0305
	8-inch	0.4	
	10-inch	0.28	
	12-inch	0.22	
	14-inch	0.17	
	16-inch	0.15	
	18-inch	0.14	
	21-inch	0.1	
Minimum Slope, in feet/100 feet, by Diameter of Gravity Pipe[7]	24-inch	0.08	
	27-inch	0.07	
	30-inch	0.06	
	36-inch	0.05	
Manholes	Maximum Distance	425 feet	15A NCAC 02T.0305
	Minimum Diameter	4 feet	
	Minimum Bench Slope	4%	
Force Mains	Minimum Nominal Diameter	4-inch	15A NCAC 02T.0305
	Air Release Valves for Vertical Distance	> 10 feet	

1. Refer to NCAC Standard for detailed list of values.
2. Classified WS-II, WS-III, WS-IV, B, SA, ORW, HQW, SB from normal high water or tide elevation.
3. Classified as UWL or SWL or directly abutting the waters classified above.
4. Classified as WL.
5. Classified as C, SC, or WS-V, or ground water lowering and surface drainage ditches.
6. Embankment or cuts of 2 feet or more vertical height.
7. Based upon a mean velocity of 2.0 feet per second and Manning's "n" of 0.0013.

4 Sewer System Inventory

4.1 Gravity Mains

The Town's sewer collection system consists of thirteen and a half (13.5) miles of gravity mains, serving approximately 508 customers which includes residential, commercial, industrial, and institutional classifications.

Gravity main diameters range from 6 to 12 inches and materials include asbestos cement (AC), cast iron (CIP), ductile iron (DIP), high density polyethene (HDPE), polyvinyl chloride (PVC), reinforced concrete (RCP), and vitrified clay pipe (VCP).

Table 7 provides a summary of the diameter and materials of the gravity main pipes in the system in linear feet (LF).

Table 7 - Collection System Inventory in Linear Feet

Material / Diameter	AC	CIP	DIP	HDPE	PVC	RCP	VCP	Unknown /Other	Total	Percent of Total
6-inch	378	-	38	-	43	-	124	-	583	0.82%
8-inch	19,076	-	2,481	9,518	26,841	83	998	507[1]	59,504	83.66%
10-inch	2,374	118	789	121	2,449	-	-	195[2]	6,046	8.50%
12-inch	4,419	-	68	220	-	-	-	-	4,706	6.62%
Unknown	-	-	-	-	-	-	-	290	290	0.41%
Total	26,246	118	3,376	9,859	29,333	83	1,122	992	**71,129**	
Percent of Total	36.90%	0.17%	4.75%	13.86%	41.24%	0.12%	1.58%	1.39%		

Notes:

1 Represents pipe materials transitioned from: AC to DIP.

2 Two lines representing pipe materials transitioned from VCP to DIP and DIP to PVC.

Over 98% of the system has known material and diameter. The most commonly used pipe material within the system is PVC, which accounts for approximately 41%, followed by AC pipe, which makes up 37% of the system. In terms of pipe size, the most prevalent diameter is 8 inches, representing approximately 84% of the entire network.

Figure 4 illustrates gravity mains by materials and sizes summarized by length in feet, and Figure 5 illustrates gravity mains by material types presented in percentages.

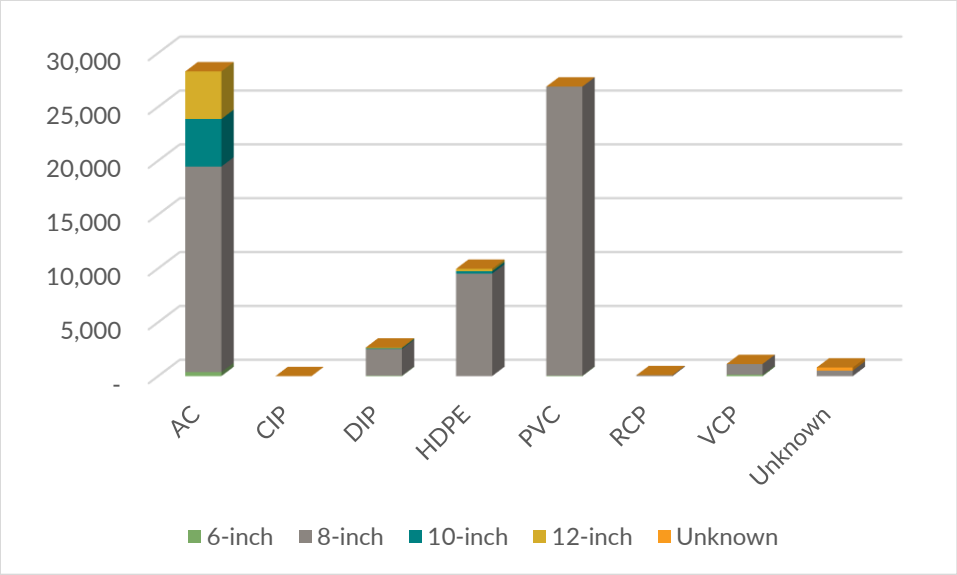

Figure 4 - Distribution of Sewer Mains by Diameter and Material

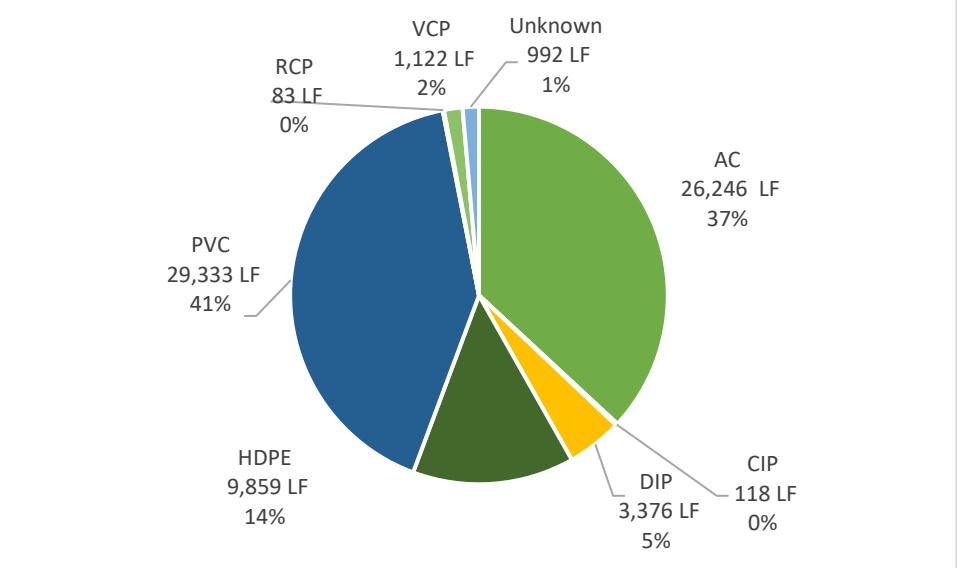

Figure 5 - Summary of Sewer Main by Material Types

4.2 Force Mains

The Town's collection system consists of approximately one-half (0.5) mile of force mains, all constructed of six (6)-inch diameter PVC pipe.

Table 8 - provides a summary of the diameter and materials of the force main pipes in the system.

Table 8 - Force Mains by Diameter and Material (summarized by length in feet)

Material / Diameter	PVC	Unknown	Total	Percent of Total
6-inch	2,488	-	2,488	91%
Unknown	-	238	238	9%
Total	2,488	238	2,727	

4.3 Manholes

The collection system contains 239 manholes, ranging in approximate depth from 1.45 to 11.5 feet and materials including brick, concrete, concrete reinforced, and precast concrete.

Table 9 provides a summary of the depth and material of the manholes in the system. Approximately, 15% of manholes have unknown depth or material.

Table 9 - Manholes by Depth

Depth	Count
<5'	56
5-10'	140
10'+	8
Unknown	35
Total	239

4.4 Pump Stations

The collection system contains two (2) pump stations that are an integral part of the conveyance of wastewater to the WWTP. Pump station assessments were not performed as part of this project; however, the Town performed an independent drawdown test on the Plant Pump Station. Table 10 - gives a summary of year built, design flow, known pump data, and drawdown testing results.

Table 10 - Pump Station Inventory Information

Name	No. of Pumps	Pump Design Capacity	Model	Manufacturer	Pump Type	Year Built	Year of Last Upgrade	Force Main Size	Discharge Location	Drawdown Capacity Results
Hwy 211 PS	2	Unknown	Unknown	Unknown	Unknown	1984	Pump and Control Panel Replacement 2022	Unknown	Unknown	Not performed
WWTP Influent PS	2	400 GPM (each)	Unknown	Cornell	Submersible	1963	Pump Replacement 2012, Wet Well lined 2012, Influent screw screen 2020	Unknown	WWTP	Pump 1: 200 GPM Pump 2: 185 GPM

5 Risk Assessment

As infrastructure ages, it becomes increasingly more challenging to assign limited capital expenditures to the repair, rehabilitation, or replacement of the assets. This section describes how the Town's risk model was used in decision making and preparing the Town's capital improvement programs for the prioritization for sewer infrastructure.

The intent of the risk model is to answer questions such as "which sewer mains will have the greatest impact if a failure is to occur?" This allows staff to focus resources and effort on these assets before they fail.

The risk associated with a given asset failing can be determined by multiplying Likelihood of Failure (LoF), based on asset's condition, and the Consequence of Failure (CoF), based on its criticality.

Risk = LoF x CoF

The following summarizes the LoF and CoF criteria and methodologies used to calculate risk for project prioritization for capital planning.

5.1 Likelihood of Failure (LoF)

The Likelihood of Failure (LoF) is a numerical metric used to represent the probability of an asset's failure, based on quantifiable factors such as asset age, condition assessments, historical break data, and input from operations staff.

For this project, the condition of gravity mains was primarily determined using asset age or available condition inspections such as closed-circuit television (CCTV) and Town conducted smoke testing results. The condition of force mains was assessed based on pipe age and industry-standard life expectancies for force main materials. Each gravity and force main segment were assigned a condition rating according to its CCTV and/or smoke testing results or estimated remaining useful life, as outlined in Table 12. The age-related estimates were developed using asset age and material information in accordance with NCDEQ-recommended lifespans presented in Table 11. The CCTV and Town provided Smoke Testing results are included in Appendix II.

Manhole condition ratings were derived from visual inspections conducted by WithersRavenel survey staff, with the rating criteria detailed in Table 13.

Although pump stations were not directly assessed as part of this project, Town staff input and Town conducted drawdown testing results were used to support future recommendations for condition and capacity evaluations, as well as operations and maintenance (O&M) planning.

Table 11 - Pipe Life Expectancy by Material Types

Material	Life Expectancy (years)
Asbestos Cement	60
Cast Iron	60
Ductile Iron	100
High density Polyethylene	80
Polyvinyl Chloride	80
Reinforce Concrete	100
Vitrified Clay	50
Unknown	50

Reference: Recommended Life Spans, sourced from 2022 AMP DWI Guidance Document

Table 12 - Condition Criteria for Gravity and Force Mains

Likelihood of Failure (LoF) based on Pipe Age		
Asset Category	Condition Rating	Description
Pipe Condition (% of Estimated Useful Life)	5	>3 Category 5 NASSCO/PACP Defects, Smoke Observed. Or for lines without CCTV <5% Remaining Useful Life. End of Life. Requires complete rehabilitation.
	4	1-3 Category 5 NASSCO/PACP Defects. Or for lines without CCTV >=5, <15% Remaining Useful Life. Poor, unable to meet level of service.
	3	Category 3 or 4 NASSCO/PACP Defects, Localized smoke observed at isolated defects. Or for lines without CCTV >=15, <50% Remaining Useful Life. Fair, major wear, impacting level of service.
	2	Category 1 or Category 2 NASSCO/PACP. Or for lines without CCTV >=50, <95% Remaining Useful Life. Good, minor wear.
	1	No Structural Defects, No Smoke Observed. Or for lines without CCTV >=95%. Excellent, New or Nearly New.

Table 13 - Condition Criteria for Manholes.

Likelihood of Failure (LoF) based on Manhole Visual Assessment		
Asset Category	Condition Rating	Description
Manhole Condition	5	End of Life. Severe defects, failure imminent
	4	-
	3	Fair. Moderate defects, maintenance necessary soon. (Cracking, aggregate and reinforcement exposure, minor root intrusions)
	2	-
	1	Excellent. Like New

Table 12 and Table 13 summarize the condition criteria for each asset category on a scale of 1 through 5 with 1 being the lowest LoF and 5 being the highest.

Using these categories, each sewer main, force main, and manhole in the system were assigned a condition score. A summary of the overall condition of each asset category by percentage is listed in Table 14 below and stored in the Town's GIS database. Collection mains were listed in linear feet and manholes and pump stations were summarized by asset count.

Table 14 - Summary of Overall Condition of Collection System Assets

Asset / LoF	1 - Excellent	2 – Good	3 – Fair	4 – Poor	5 – End of Life
Gravity Mains	16,735	21,289	20,202	2,731	10,172
Force Mains	-	-	2,727	-	-
Manholes	124	-	100	-	15

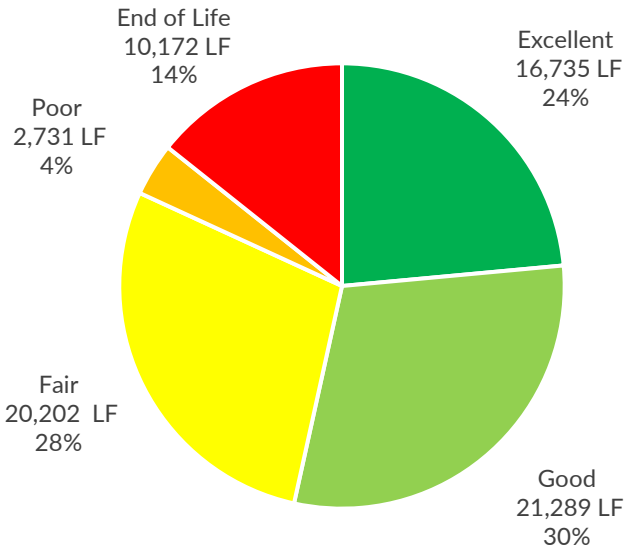

Figure 6 - Percentage of Gravity Main According to Assessed Condition

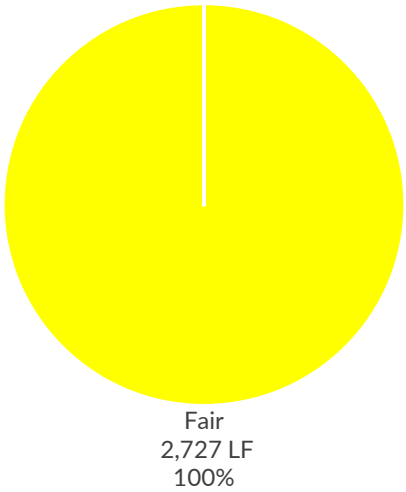

Figure 7 - Percentage of Force Mains According to Assessed Condition

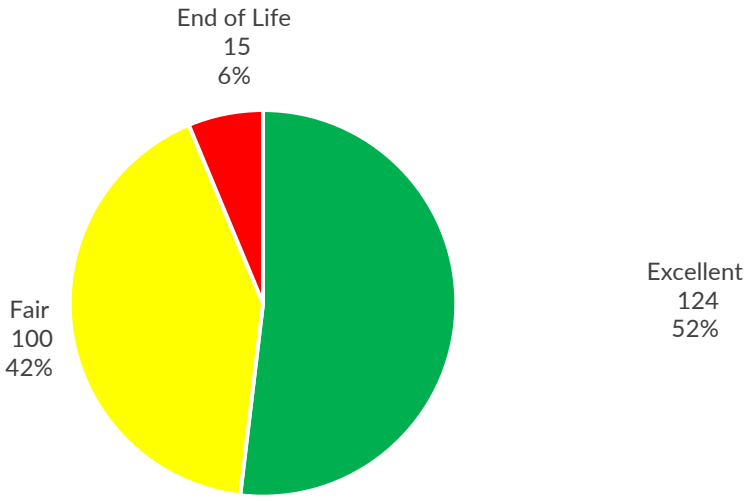

Figure 8 - Percentage of Manholes According to Assessed Condition

Table 14 shows approximately 14% of gravity mains and 6% of manholes were given a rating of 5 "Very Poor" indicating that the assets have or nearly have surpassed their useful life and are likely to fail in the immediate future. These respective assets were considered for rehabilitation/ replacement projects on the CIP, discussed in Section 7.

5.1.1 Additional Recommended Assessments

The forecasted state of the sewer asset condition assessment is focused on increasing the known condition information of the collection system assets.

Closed-Circuit Television (CCTV) inspection

Performing additional CCTV inspections on the collection system would provide condition information used to prioritize rehabilitation and replacement needs. Regular CCTV inspections to gather updated condition information would help the Town prevent residential back-ups and sanitary sewer overflows (SSOs) by rehabilitating or replacing assets before they fail.

Manhole Inspection

Manhole inspections are typically performed along with CCTV inspection initiatives. Regular manhole inspections would help the Town identify corrosion, inflow and infiltration, fat and grease build up, and other issues that could cause residential back-ups, SSOs, or clogs in the collection system.

Pump Station Assessment

For the purposes of this project, pump station information was gathered from the Town. Pump drawdown testing would provide the existing capacity for each pump to compare to the design capacity, allowing the Town to determine the remaining efficiency of the pump. Complete pump

station assessment would also provide condition information for the pumps and pump accessories within the pump stations, and help the Town identify maintenance, rehabilitation, and replacement needs.

5.2 Consequence of Failure (CoF)

CoF is a numerical representation of the impact of an asset's failure to the community. Assets with higher CoF scores have been determined to be the most critical components of the Town's sewer system in terms of maintaining the performance and integrity of the entire system.

The CoF scores were determined using economic, environmental, and social impacts as described in Table 15 below. Various CoF criteria were presented to the Town and the selected ones are listed below based on their applicability to the Town's system. The weighting for each category was equally distributed among the five (5) criteria selected.

Table 15 - Consequence of Failure Criteria for Gravity and Force Mains

Consequence of Failure Criteria for Sewer Mains		
Asset Category	Criticality Rating	Description
Cost of Repair (Pipe Size)	5	12"+ pipe diameter
	4	10" pipe diameter
	3	8" pipe diameter
	2	6" pipe diameter
	1	<6" pipe diameter
Cost of Repair (Pipe Depth)	5	>20 ft depth
	4	15 ft-20 ft depth
	3	10 ft-15 ft depth
	2	5 ft-10 ft depth
	1	<5 ft depth
Proximity to Critical Infrastructure[1]	5	<50 ft of railroad or NCDOT state road, significant impact on traffic flow and access issue
	4	50-100 ft railroad or NCDOT state road, major impact on traffic flow and access issue
	3	100-150 ft railroad or NCDOT state road, moderate impact on traffic flow, some access issue
	2	150-200 ft railroad or NCDOT state road, minimal impact on traffic flow, easy access for repair
	1	>200 ft railroad or NCDOT state road, no/minimal impact on traffic flow, easy access for repair
Critical Users[2]	5	Health and Safety, Public Utilities (Hospitals, Schools, Treatment Plant, etc.) and all Force Mains
	4	Public Services / Administration (Town Office)
	3	Industrial / Commercial
	2	Businesses
	1	Residential

Proximity to a Water Body	5	<25 ft of a water body or crossing
	4	25-50 ft of a water body or crossing
	3	50-100 ft of a water body or crossing
	2	100-150 ft of a water body or crossing
	1	>150 ft of a water body or crossing

Notes:

1. *Critical Infrastructure selected for analysis includes:*
    - *E Green Street (NC-211)*
    - *US-701*
    - *Business 701 (College Street)*
    - *North Railroad Street*
    - *South Railroad Street*
    - *Housing Authority Outfall*
    - *Wood Street Outfall*
2. *Critical Users selected for analysis includes:*
    - *Sewer Treatment Plant*
    - *Fire Department*
    - *Bladen Medical Associates*
    - *Clarkton Health Center - Church Street*
    - *Peach Street / S Smith Street Nursing Home*
    - *Booker T. Washington Primary School*
    - *Clarkton School of Discovery*
    - *Town Hall*
    - *Gildan Yarns*
    - *Harriet and Henderson Yarns, Inc.*
    - *E. J. Cox Peanut Factory*
    - *El Torito Restaurant*
    - *Subway*
    - *Burger Shack*
    - *IGA*
    - *Dollar General*
    - *Clarkton Drug*

Using these categories, each sewer asset was assigned a CoF rating, which is stored in the GIS geodatabase. These categories were summarized by linear foot for gravity and force mains and by asset count for manholes.

Manholes were prioritized for replacement by the risk value of their connected mains. Pump station criticality was not assessed as a part of this project.

Table 16 - Summary of Sewer Criticality

Asset / Criticality	5 – Very high	4 - High	3 - Moderate	2 - Low	1 – Very Low
Gravity Mains	344	14,388	29,037	27,316	43
Force Mains	2,727	-	-	-	-

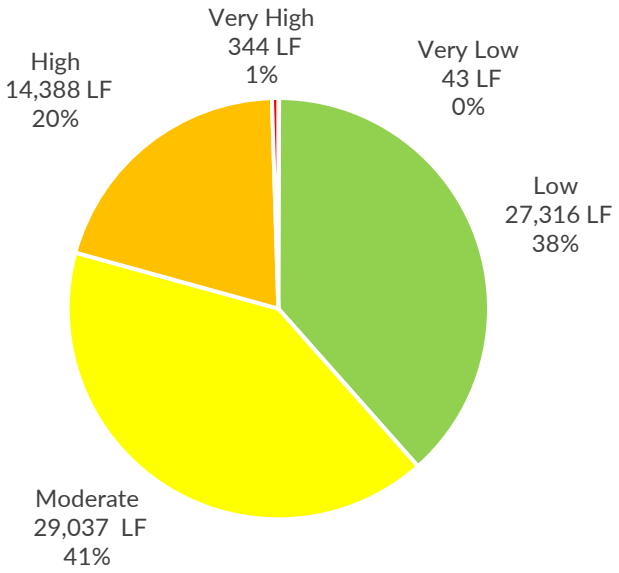

Figure 9 - Percentage of Gravity Mains According to Assessed Criticality

As shown in Table 16, approximately 20% of gravity mains were assigned a criticality rating of 4, or "High," and above, indicating that failure of these assets would have a significant impact on Town operations. All force mains were assigned a criticality rating of 5, or "Very High," as the failure of any force main is expected to result in equally severe operational consequences. These criticality ratings were used in conjunction with condition ratings to help prioritize rehabilitation and replacement projects included in the Capital Improvement Plan (CIP), discussed in Section 7.

5.2.1 Additional Analysis Recommendations

Regulatory Considerations

NCDEQ adopted the Minimum Design Criteria for the permitting of Gravity Sewers in February 1996 and updated the design criteria to the 15A NCAC 2T Regulations in March 2008. NCDEQ adopted the Minimum Design Criteria for the permitting of pump stations and force mains in June 2000. The purpose of the standards described in these regulations is to protect the health and safety of the community and environment. Table 7 contains a summary of these NCAC sewer system design standards. Using these standards, the collection system assets could be evaluated to determine the assets that are not in compliance with these NCAC design standards. As the collection system assets are upgraded, rehabilitated, or replaced, the new assets are required to comply with these standards.

5.3 Risk Score Analysis

The quantification of risk using LoF and CoF scores was used to identify priority projects for preparation of the Town's Capital Improvements Plan (CIP).

Risk = LoF x CoF

The results of multiplying the LoF and CoF scores for each asset were jointly analyzed on the risk matrix shown in Table 13 below.

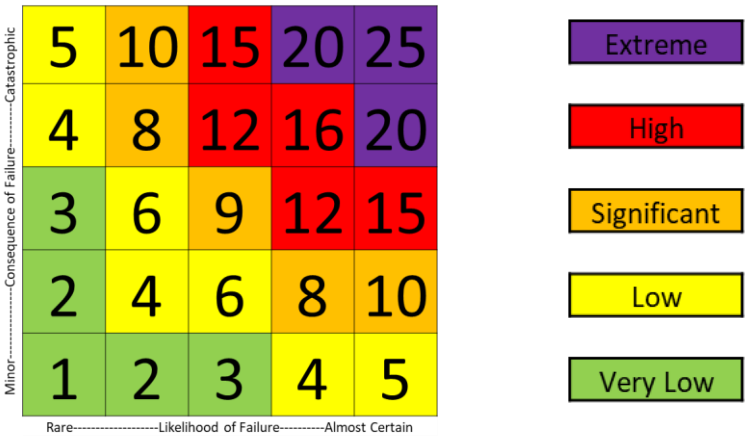

Figure** 10 - **Risk Matrix

Assets with a high likelihood of failure, as indicated by their poor condition, and high consequences of failure, as indicated by their criticality, score in the extreme risk category and have been prioritized for replacement on the Town's CIP. Assets with very low to significant risk could contribute to replacement at a later year and/or operation and maintenance activities, etc.

The risk scores for each asset are stored in the GIS database. Mains are summarized in linear feet while manholes are summarized in asset count. Pump stations were not assessed as a part of this project.

Table 17 - Sewer Collection System Risk Matrix

Asset / Risk	Extreme	High	Significant	Low	Very Low
Gravity Mains	-	9,535	11,300	29,750	20,543
Force Mains	-	2,727	-	-	-

As shown in Table 17, approximately 13% of gravity mains and 100% of force mains were assigned a high-risk rating, indicating that failure of these assets would have a significant impact on Town operations. These high-risk assets were used to prioritize rehabilitation and replacement projects included in the CIP, as discussed in Section 7.

Manholes were prioritized for replacement based on the risk ratings of the gravity mains to which they are connected.

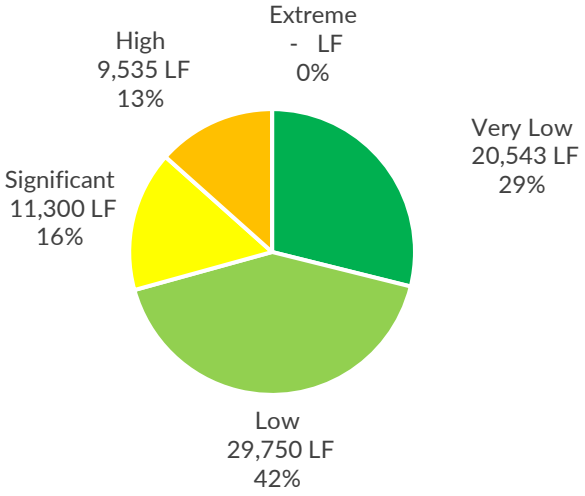

Figure 11 - Percentage of Gravity Mains According to Assessed Risk

6 Collection System Operation and Maintenance (O&M) Plan

Operation and Maintenance (O&M) for the wastewater system focuses on upkeep of the gravity mains, force mains, manholes, and pump stations. Maintenance consists of "Emergency Maintenance," which is corrective action needed quickly to keep the system operational, and "Preventative Maintenance," which is routine, scheduled tasks to prevent problems before they arise. The items below represent routine maintenance items performed throughout the collection system.

6.1 Pump Station Maintenance

The routine Pump Station Operation and Maintenance Program will include the following items:

- Inspecting, cleaning, and removing debris from the pump station structure, outside perimeter, and wet well.
- Inspecting and exercising all valves.
- Inspecting and lubricating pumps and other mechanical equipment.
- Verifying the proper operation of the alarms, telemetry system, and auxiliary equipment.
- Other testing procedures as recommended by the manufacturer.
- Annual flow meter calibration (at a minimum).
- NOTE: Pump stations not connected to telemetry systems must be inspected at least daily. Pump stations with telemetry must be inspected at least once per week.

In addition, a Pump Station Check List Form should be created and utilized for each inspection. The inspection form should cover the following items:

- Check wet well level periodically, more frequently when high flows are expected or have occurred.
- Record hours of running time from elapsed time meters at least once per week and check for equal running times on each pump.
- Inspect control panel switches for proper positioning.
- Test alarms.
- Check valves for proper positioning (valves functioning, normally open valves are open, normally closed valves are closed).
- Confirm valve lever arms and weights are okay.
- Check for unusual pump noise or vibration.
- Check amp readings. Note discrepancies.
- Confirm pumps appear to be seated properly.
- Confirm that no leakage is observed.
- Confirm guide rails and brackets are aligned and fastened.
- Note any rust or loose parts.
- Confirm that piping and valves are not leaking, and that bolts and nuts are properly torqued.

- Confirm that any corroded or worn parts have been replaced, cleaned, painted, or restored.
- Record flow rate observed during site visit.
- Check and record pressure gauge readings during observed flow rate. Note any changes from normal readings.
- At least once per week, manually pump down the wet well to check for and remove debris.
- Inspect floats, transducer, and cables. Remove all debris to ensure proper operation.
- Ensure all automatic cycle operation cables and appurtenances are free and clear of debris or obstructions and functioning as designed.
- Check control settings.
- If a pump is removed, place the lead pump selector switch on the number of the pump remaining in operation.
- Inspect the pump hand/off/automatic selector switch. Turn to off. Fill up wet well with water until high water is activated. Turn to auto and check if both pumps operate automatically with slight delay between each. Pump until pump shuts off. Fill water until the lead pump starts. When the lead pump starts, shut off water. Allow pump to lower the wet well until the pump shuts off.
- Check pumps for blockage and any abnormalities in operation.
- Confirm generator is automatically exercising on schedule at start-up. Periodically manually throw main disconnect to check the Automatic Transfer Switch (ATS) and generator operation.
- Cut grass, pick up trash, remove debris, walk around perimeter, inspect fencing, landscaping, look for vandalism or evidence of trespassing or other security concerns.

6.2 Collection System Maintenance

The routine Collection System Operation and Maintenance Program will include the following items:

- Clean and video inspect at least 10% of the collection system each year. At the time of cleaning, record the date, location of cleaning, type of cleaning, and other general observations during cleaning (type of debris, quantities, etc.).
- Document all Sanitary Sewer Overflow (SSOs) using the State form or other similar form. All spills, reportable or not, must be documented. Spills that are reported to the State should be on the required form.
- Incorporate information from new construction and rehabilitation projects, including line diameter, material, and scoring for other KPIs, into the collection system GIS within one (1) year of construction completion.
- All high priority lines (including aerials, sub-waterway crossings, lines contacting surface waters, lines positioned parallel to stream banks and subject to eroding in such a manner that may threaten the line, and any other segment of the system that is designated as high priority) must be inspected every six (6) months. A log must document the area inspected, the date, method of inspection, and any corrective actions performed or initiated.

Table 18 - Summary of Operation and Maintenance Recommendations

Collection System Maintenance		
Asset	Maintenance	Frequency
Collection System	Clean and video inspect at least 10% of the collection system. Record the date, location of cleaning, type of cleaning, and other general observations during cleaning (type of debris, quantities, etc.).	Annually
	Document all Sanitary Sewer Overflow (SSOs) using the State form or other similar form. All spills, reportable or not, must be documented. Spills that are reported to the State should be on the required form.	As Needed
	Incorporate information from new construction and rehabilitation projects, including line diameter, material, and scoring for other Key Performance Indicators (KPIs), into the collection system GIS within one (1) year of construction completion.	As Needed
	All high priority lines (including aerials, sub-waterway crossings, lines contacting surface waters, lines positioned parallel to stream banks and subject to eroding in such a manner that may threaten the line, and any other segment of the system that is designated as high priority) must be inspected every six (6) months. A log must document the area inspected, the date, method of inspection, and any corrective actions performed or initiated.	Semi-Annually
Pump Station System Maintenance		
Pump Station Maintenance	Inspecting, cleaning, and removing debris from the pump station structure, outside perimeter, and wet well.	Annually
	Inspecting and exercising all valves.	Annually
	Inspecting and lubricating pumps and other mechanical equipment.	Annually
	Verifying the proper operation of the alarms, telemetry system, and auxiliary equipment.	Annually
	Other testing procedures as recommended by the manufacturer.	Annually
	Annual flow meter calibration (at a minimum).	Annually
	NOTE: Pump stations not connected to telemetry systems must be inspected at least daily. Pump stations with telemetry must be inspected at least once per week.	Daily/Weekly
	Record hours of running time from elapsed time meters.	Weekly
	Check for equal run times on each pump.	Weekly
	Inspect control panel switches for proper positioning.	Annually
	Test alarms.	Annually
	Check valves for proper positioning (valves functioning, normally open valves are open, normally closed valves are closed).	Annually

	Confirm valve lever arms and weights are okay.	Annually
	Check for unusual pump noise or vibration.	Annually
	Check amp readings. Note discrepancies.	Annually
	Confirm pumps appear to be seated properly.	Annually
	Confirm that no leakage is observed.	Annually
	Confirm guide rails and brackets are aligned and fastened.	Annually
	Note any rust or loose parts.	Annually
	Confirm that piping and valves are not leaking, and that bolts and nuts are properly torqued.	Annually
	Confirm that any corroded or worn parts have been replaced, cleaned, painted, or restored.	Annually
	Record flow rate observed during site visit.	Annually
	Check and record pressure gauge readings during observed flow rate. Note any changes from normal readings.	Annually
	At least once per week, manually pump down the wet well to check for and remove debris.	Weekly
	Inspect floats, transducer, and cables. Remove all debris to ensure proper operation.	Annually
	Ensure all automatic cycle operation cables and appurtenances are free and clear of debris or obstructions and functioning as designed.	Annually
	Check control settings.	Annually
	If a pump is removed, place the lead pump selector switch on the number of the pump remaining in operation.	Annually
	Inspect the pump hand/off/automatic selector switch. Turn to off. Fill up wet well with water until high water is activated. Turn to auto and check if both pumps operate automatically with slight delay between each. Pump until pump shuts off. Fill water until the lead pump starts. When the lead pump starts, shut off water. Allow pump to lower the wet well until the pump shuts off.	Annually
	Check pumps for blockage and any abnormalities in operation.	Annually
	Confirm generator is automatically exercising on schedule at start-up. Periodically manually throw main disconnect to check the Automatic Transfer Switch (ATS) and generator operation.	Annually
	Cut grass, pick up trash, remove debris, walk around perimeter, inspect fencing, landscaping, look for vandalism or evidence of trespassing or other security concerns.	Annually

7 Capital Improvement Plan

7.1 Capital Costs

The capital improvement cost includes the material cost and labor cost for the rehabilitation, replacement, or installation of a new or existing sewer system asset. This cost can be determined for an asset with direct price quotes provided by a supplier or general cost estimates based on an evaluation of recent construction bids across North Carolina and the RSMeans Catalog.

7.2 Capital Improvement Projects

Based on input from Town staff and results of the risk analysis, the projects listed in Table 19 below are recommended for inclusion in the CIP budget for the sewer system over the next ten (10) years.

8 Total CIP Estimates

Table 19 - List of Proposed Projects for the Next 10 Years

Town of Clarkton
Capital Improvements Plan

Project Location	Current Cost	Year 1 2027	Year 2 2028	Year 3 2029	Year 4 2030	Year 5 2031	Year 6 2032	Year 7 2033	Year 8 2034	Year 9 2035	Year 10 2036	Year 11+ 2037
Sewer Collection System and Pump Station Improvements												
1. 10" Gravity Line Repair or Replacement North Railroad St	$256,000	$282,240										
2. 8" Gravity Line Repair or Replacement N Gooden St	$372,000	$410,130										
3. 8" Gravity Line Repair or Replacement N Elm St/Mid Aly	$321,000	$353,903										
4. 8" Gravity Line Repair or Replacement Page Rd	$248,000	$273,420										
5. Gravity Line Repair or Replacement Elm St, W Currie St, N Mitchell Ford Rd	$568,000	$626,220										
6. Gravity Line Repair or Replacement S Mid Aly and Misc.	$318,000						$447,458					
7. 8" Gravity Line Hwy221 From Pump Station	$315,000						$443,237					
8. 8" Gravity Line Misc Offshoots	$175,000						$246,243					
9. Repair 15 Manholes	$36,000	$3,308	$3,473	$3,647	$3,829	$4,020	$4,221	$4,432	$4,654	$4,887	$5,131	$5,388
10. Raise 5 Manholes and Replace Covers (Influent to Hwy211 Pump Station)	$30,000		$34,729									
11. Plant Pump Station Pump Replacements	$300,000	$330,750										
WWTP and Pump Station Improvements												
1. UV System Rehabilitation - FUNDED	$298,000	$328,545										
2. Hwy 211 Floodwall and Flood Gate Installation - FUNDED	$298,000	$328,545										
3. Grating and Piping System Replacement	$714,000	$787,185										
4. Blowers Replacement	$714,000						$1,004,670					
5. Solar Panel Installation	$595,000						$837,225					
6. HWY 211 Lift Station Pumps Replacement	$143,000											$256,807
7. Generator Replacement	$714,000											$1,282,241
8. UV System Replacement	$714,000											$1,282,241
9. Screw Screen Replacement	$714,000											$1,282,241
Maintenance Improvements												
1. Annual Clearing of ROW	$10,000	$11,025	$11,576	$12,155	$12,763	$13,401	$14,071	$14,775	$15,513	$16,289	$17,103	$17,959
Other Costs												
SRF Loan Fee	$64,639	$64,639										
TOTAL	$7,917,639	$3,799,910	$49,778	$15,802	$16,592	$17,421	$2,997,125	$19,207	$20,167	$21,176	$22,234	$4,126,877

9 Lifecycle Model Results

The Lifecycle Model created for Clarkton's Sewer Systems utilized the Town's data which contains installation date, material, diameter, and condition. Appendix III, the Lifecycle Model Documentation Report, provides a technical explanation of how the data was used to develop the model. Appendix IV, the Lifecycle Model Results Narrative, provides a detailed explanation of the scenarios explored, treatment costs, future investigations, and next steps. This section summarizes the recommended funding scenario for each asset type.

9.1 Sewer System

Within the sewer collection system, the gravity mains, force mains, and manholes were included in the lifecycle model analysis.

9.1.1 Gravity Mains

The condition categories determined in Section 5 were used as the input for the model simulations for the gravity mains. The treatment scenario recommended for the gravity mains is annual funding of $175,000, including annual inflation, to maintain a service state equivalent to a fair condition throughout the system. This treatment scenario will result in the rehabilitation or replacement of approximately 875 linear feet of pipe each year.

9.1.2 Force Mains

The condition categories determined in Section 5 were used as the input for the model simulations for the force mains. The data received for Clarkton's two (2) force mains indicates no immediate need for replacement in the first 25 years to maintain a service state equivalent to a good condition throughout the system.

9.1.3 Manholes

The condition categories determined in Section 5 were used as the input for the model simulations for the manholes. The treatment scenario recommended for the manholes is an annual funding of $10,000, including annual inflation, to maintain a service state equivalent to a fair condition throughout the system. This treatment scenario will result in the rehabilitation or replacement of approximately three (3) manholes each year.

APPENDIX I – GIS Maps

Sewer System Overall Map

Town of Clarkton, NC

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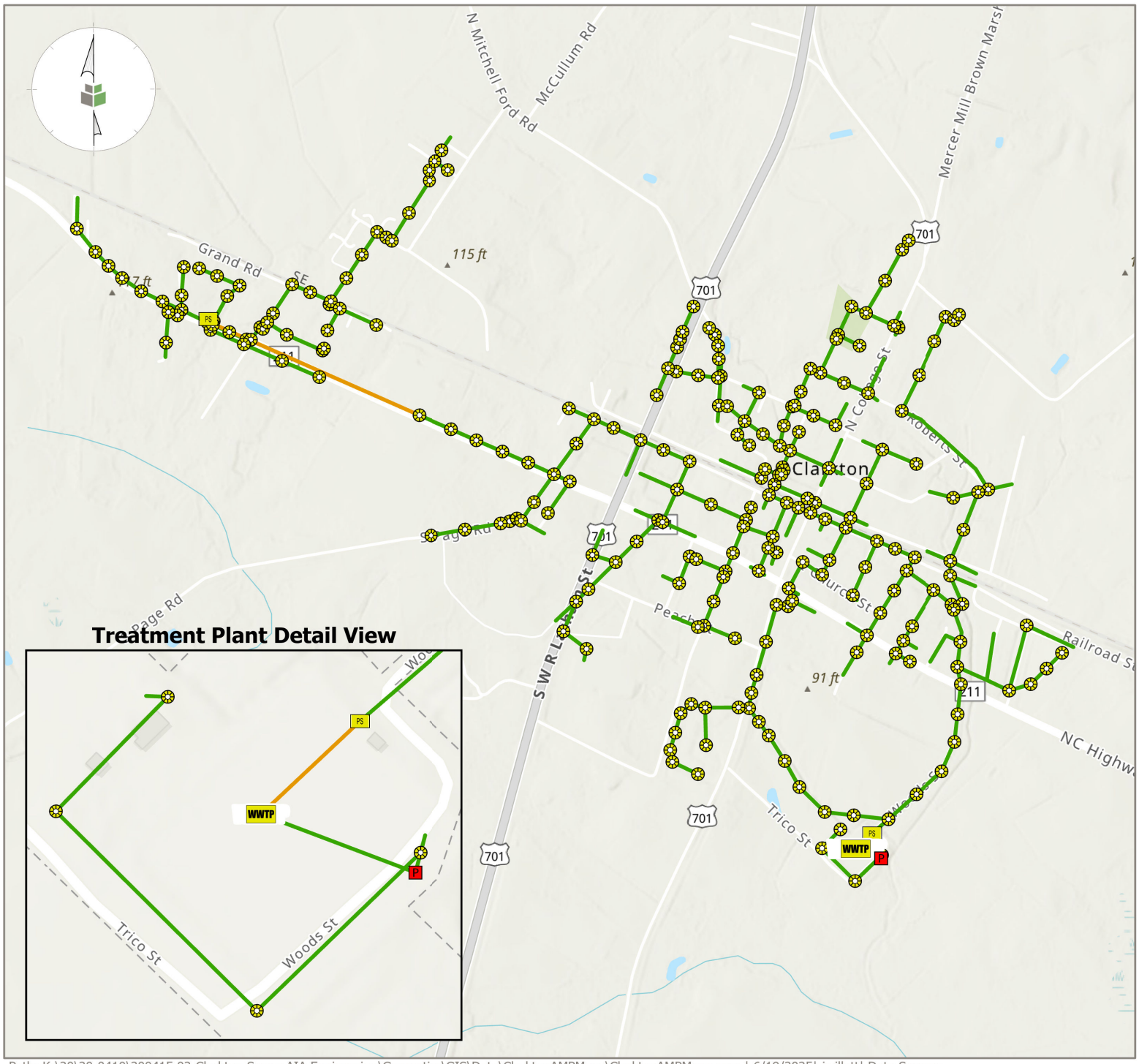
This map is for informational purposes only. All feature locations displayed are approximate based on available data sources.

Data features are not based on professional field survey unless stated otherwise.

Legend

- Manholes
- Lift Station
- Sewer Treatment Plant
- Unknown Production Well
- Sewer Gravity Main
- Sewer Force Main



Treatment Plant Detail View

0 750 1,500 Feet

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Sewer System Materials Map

Town of Clarkton, NC

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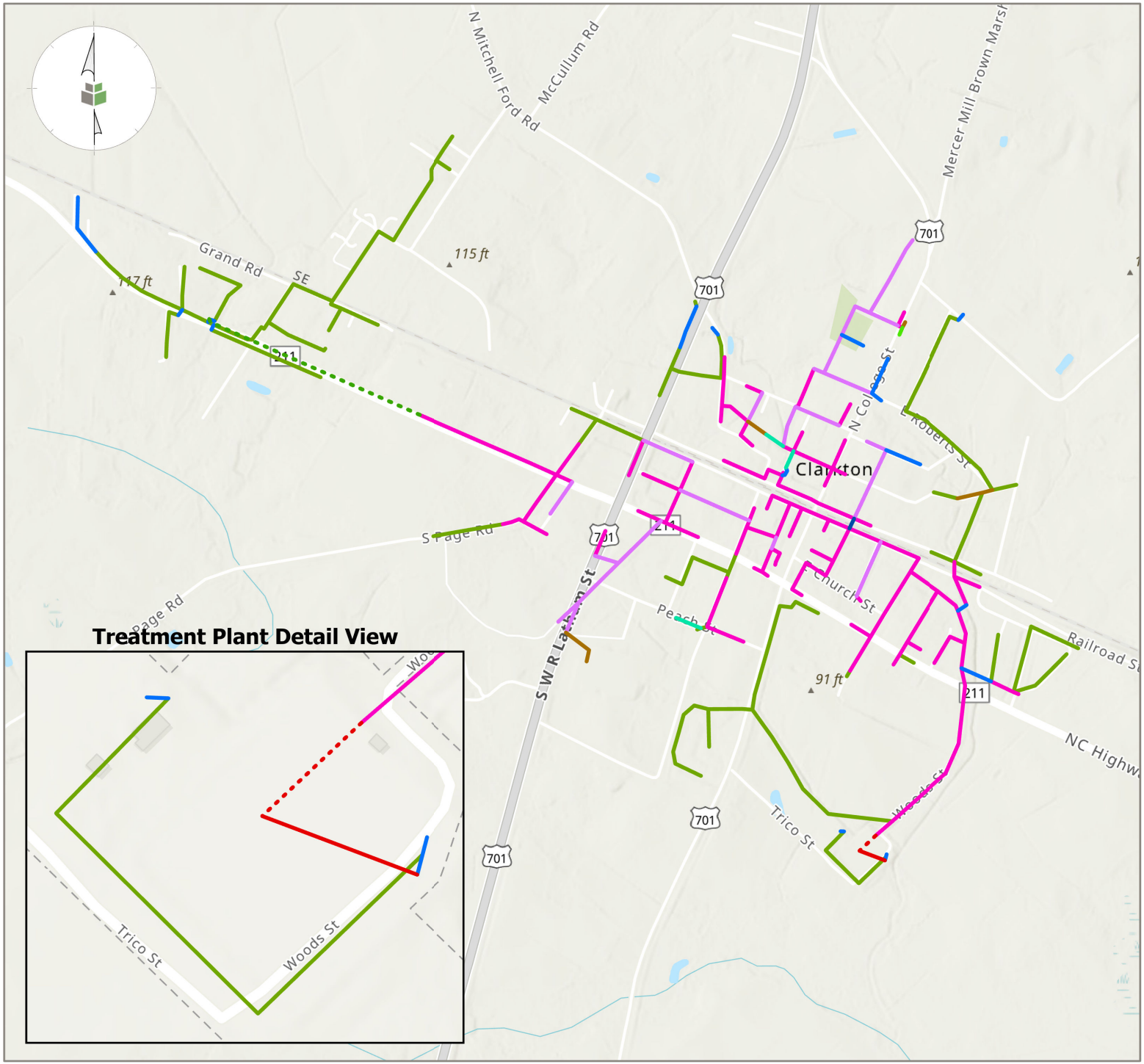

Legend

Sewer Gravity Main

Material

- Polyvinyl Chloride
- Asbestos Cement
- High Density Polyethylene
- Ductile Iron
- Vitrified Clay
- Other
- Reinforced Concrete
- Cast Iron
- Unknown

Sewer Force Main

Material

- PVC
- UNK

0 750 1,500 Feet

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Sewer System Diameter Map

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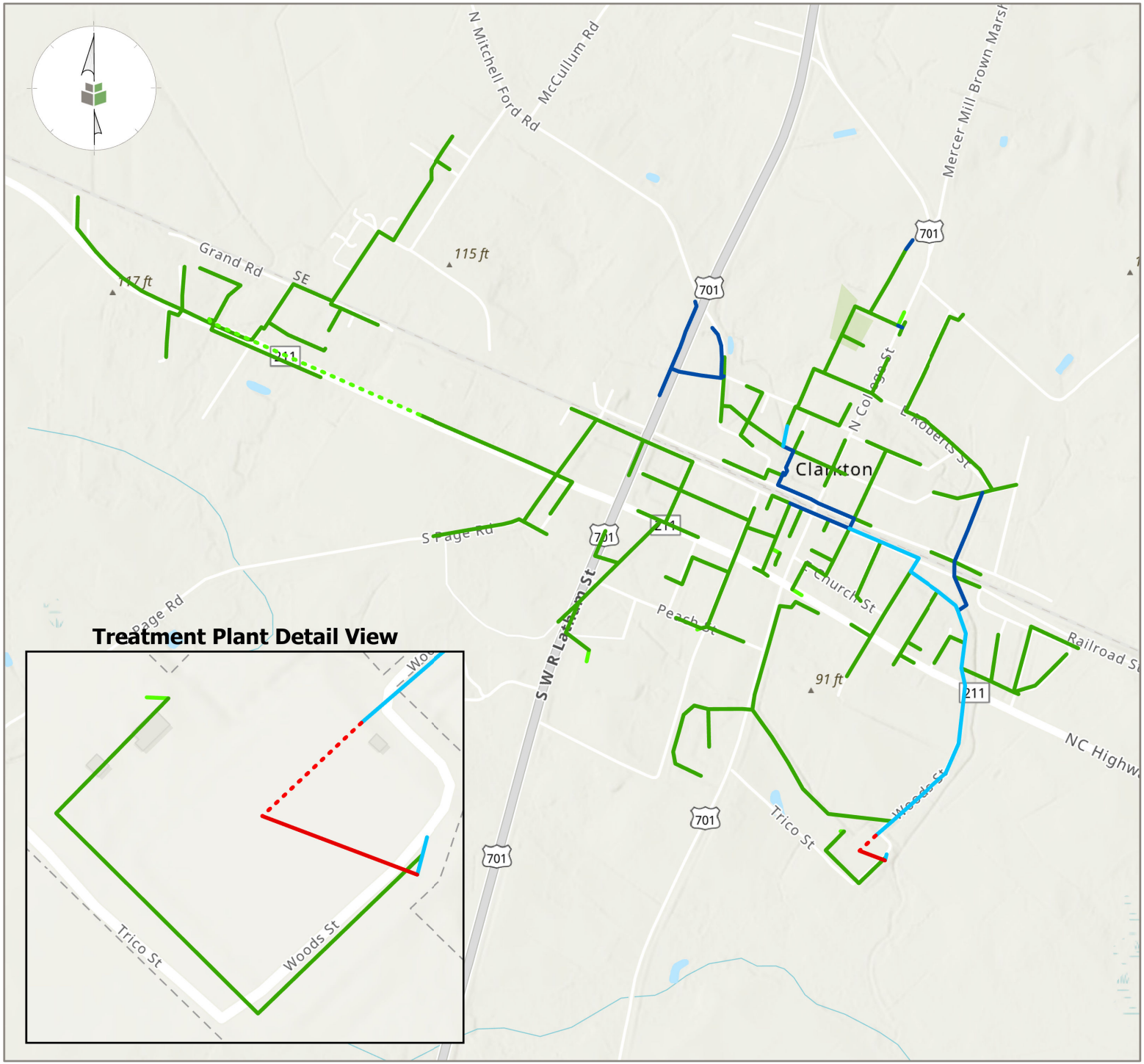

Legend

Sewer Gravity Main

- 6"
- 8"
- 10"
- 12"
- Unknown

Sewer Force Main

- 6"
- Unknown

0 750 1,500
Feet

Sewer System Condition Map

Town of Clarkton, NC

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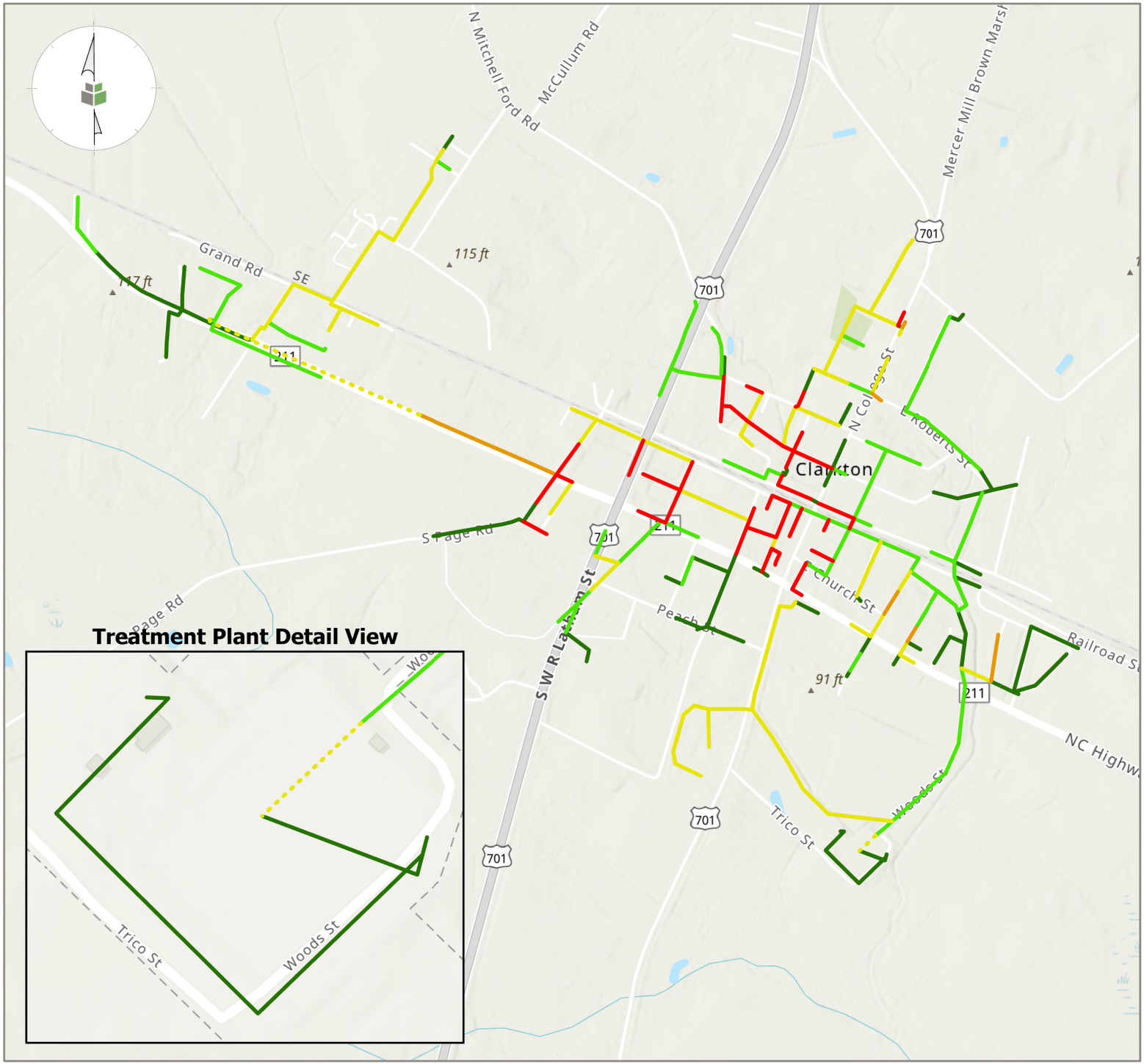

Legend

Sewer Gravity Main

- Excellent
- Good
- Fair
- Poor
- End of Life

Sewer Force Main

- Fair

0 750 1,500 Feet

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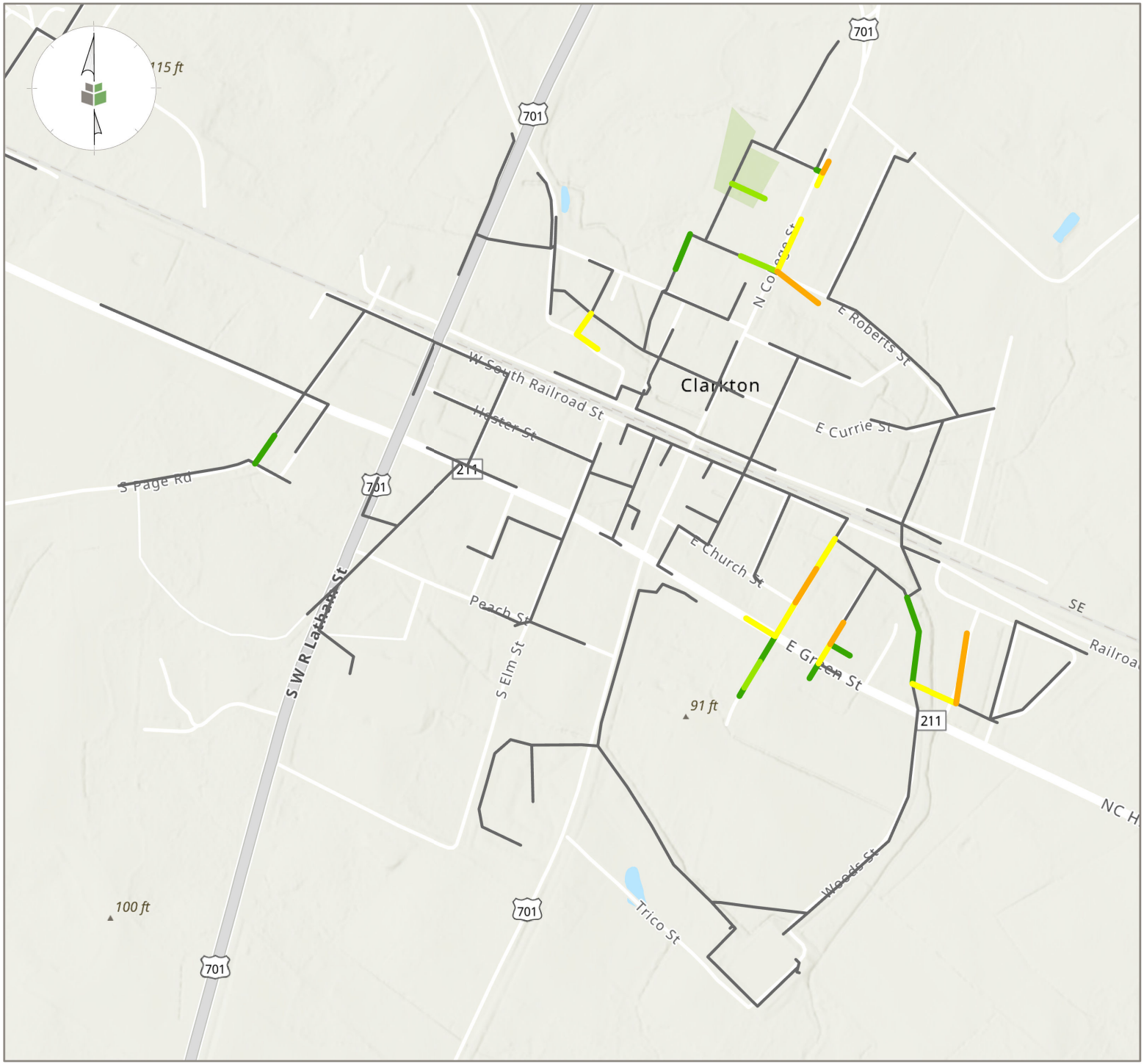

Sewer System CCTV Condition Map

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Data features are not based on professional field survey unless stated otherwise.

Legend

Sewer Gravity Main

- Excellent
- Good
- Fair
- Poor
- End of Life
- No Score

0 500 1,000
Feet

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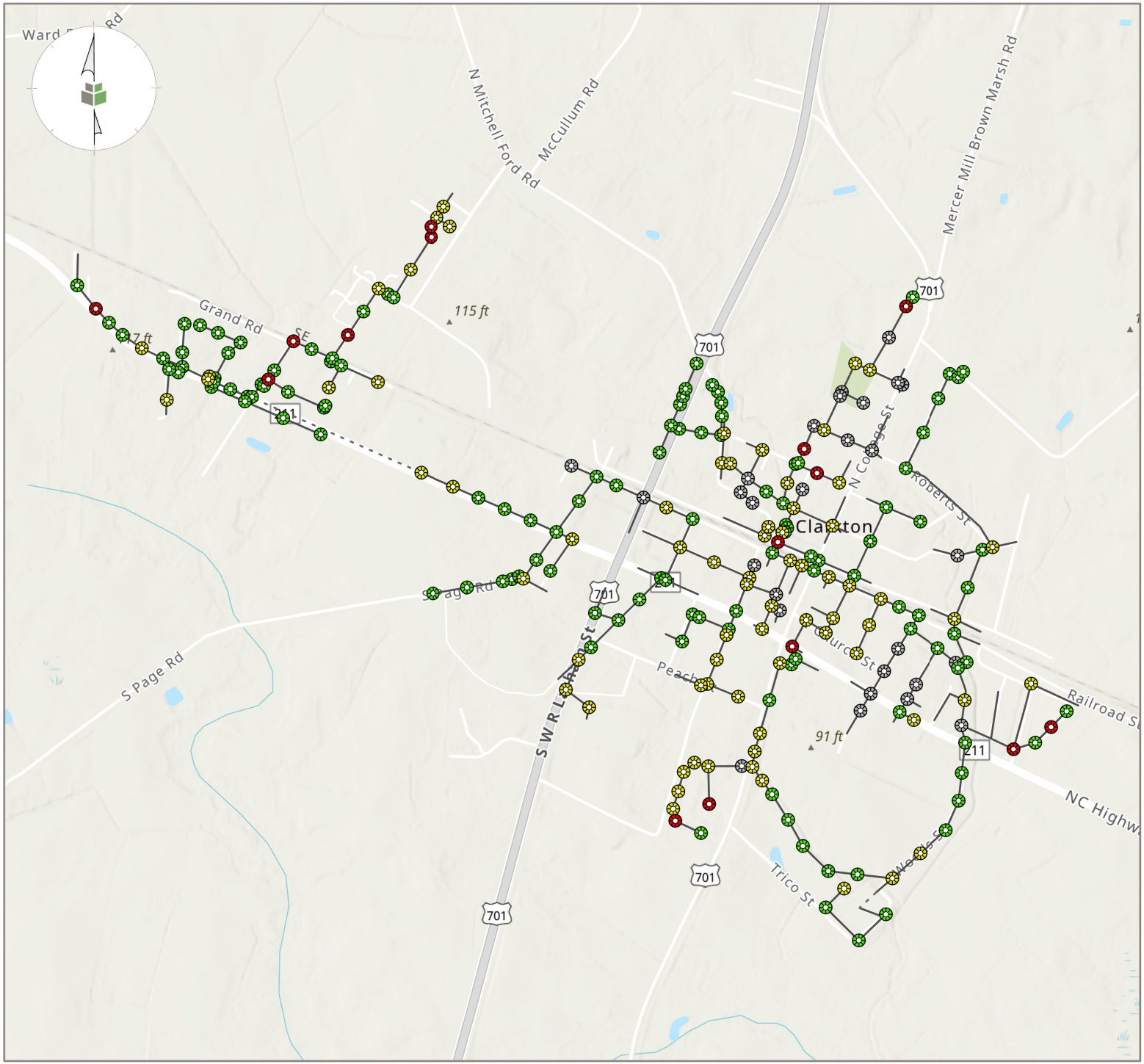

Sewer System Manhole Condition Map

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Data features are not based on professional field survey unless stated otherwise.

Legend

Manholes - Condition

- Good
- Fair
- Poor
- No Condition Data

- Sewer Mains
- Sewer Force Main

0 750 1,500
Feet

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Sewer System Criticality Map

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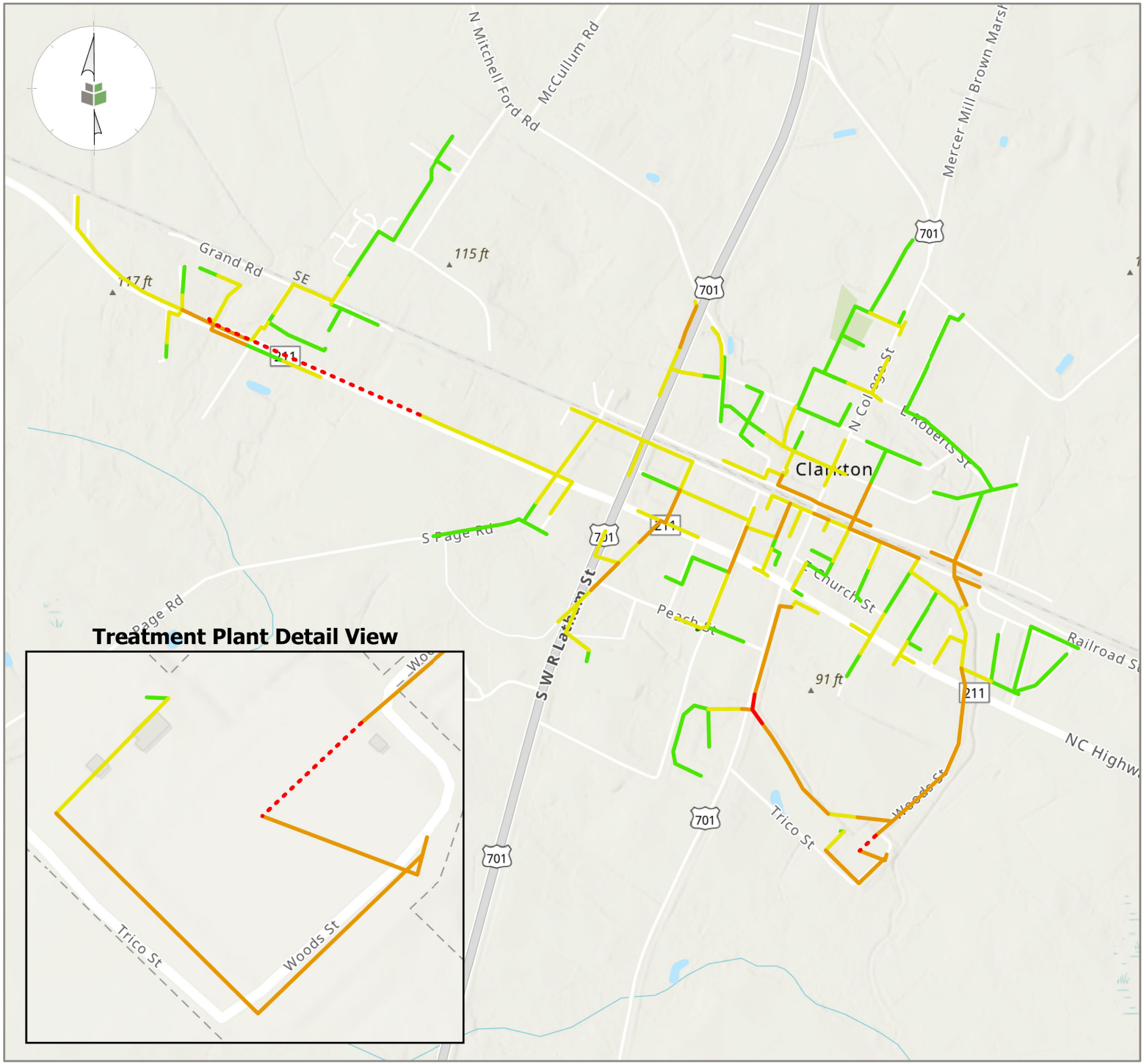

Legend

Sewer Gravity Main

- Very Low
- Low
- Moderate
- High
- Very High

Sewer Force Main

- Very Low
- Low
- Moderate
- High
- Very High

0 750 1,500
Feet

Path: K:\20\20-0410\200415.02-Clarkton Sewer AIA Engineering\Geomatics\GIS\Data\ClarktonAMPMaps\ClarktonAMPMaps.aprx | 6/19/2025| jwillett| Data Source:

Sewer System Risk Map

Town of Clarkton, NC

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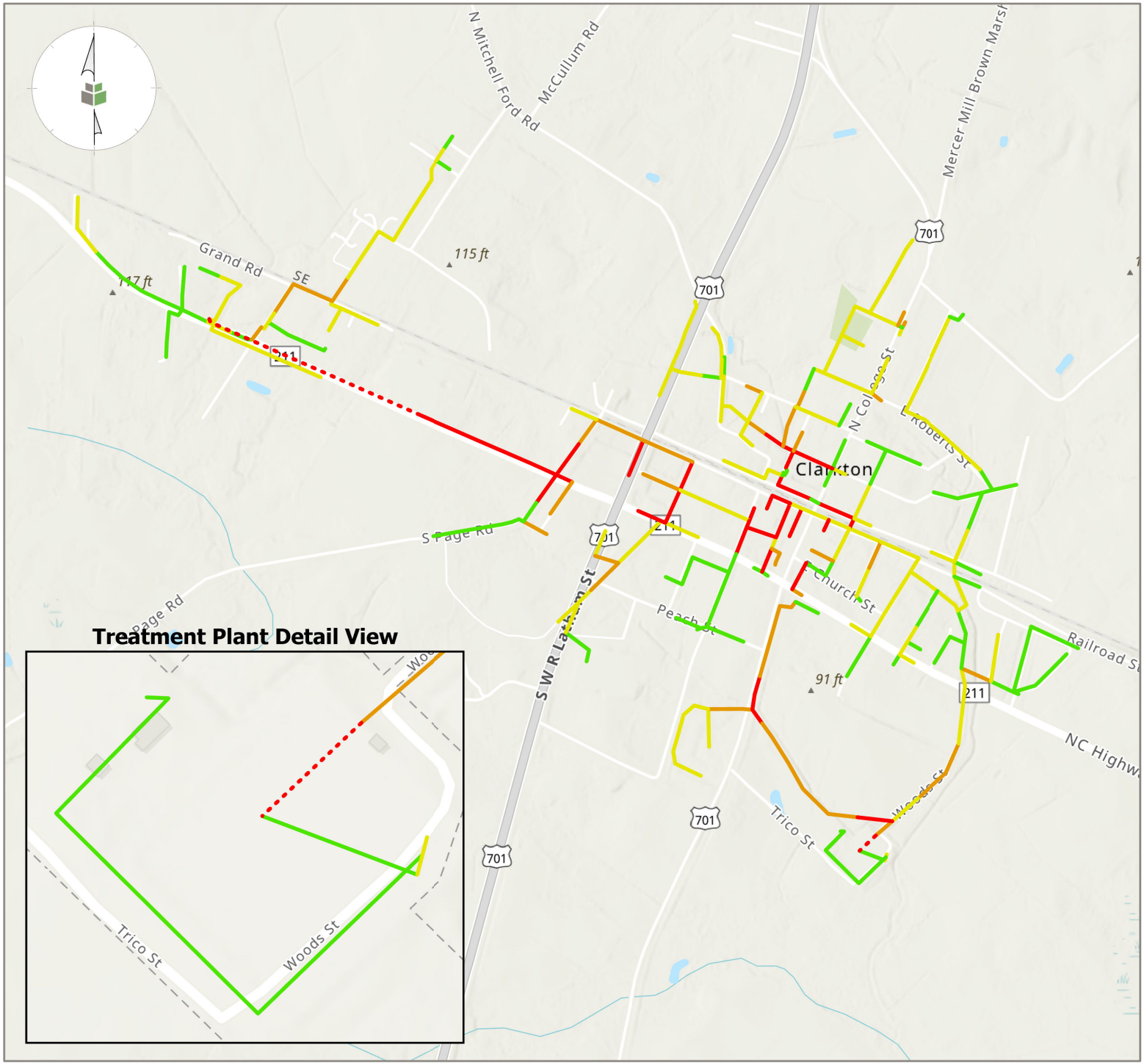

Legend

Sewer Gravity Main

- Very Low
- Low
- Significant
- High
- Extreme

Sewer Force Main

- Very Low
- Low
- Significant
- High
- Extreme

0 750 1,500 Feet

Path: K:\20\20-0410\200415.02-Clarkton Sewer AIA Engineering\Geomatics\GIS\Data\ClarktonAMPMaps\ClarktonAMPMaps.aprx | 6/26/2025| jwillett| Data Source:

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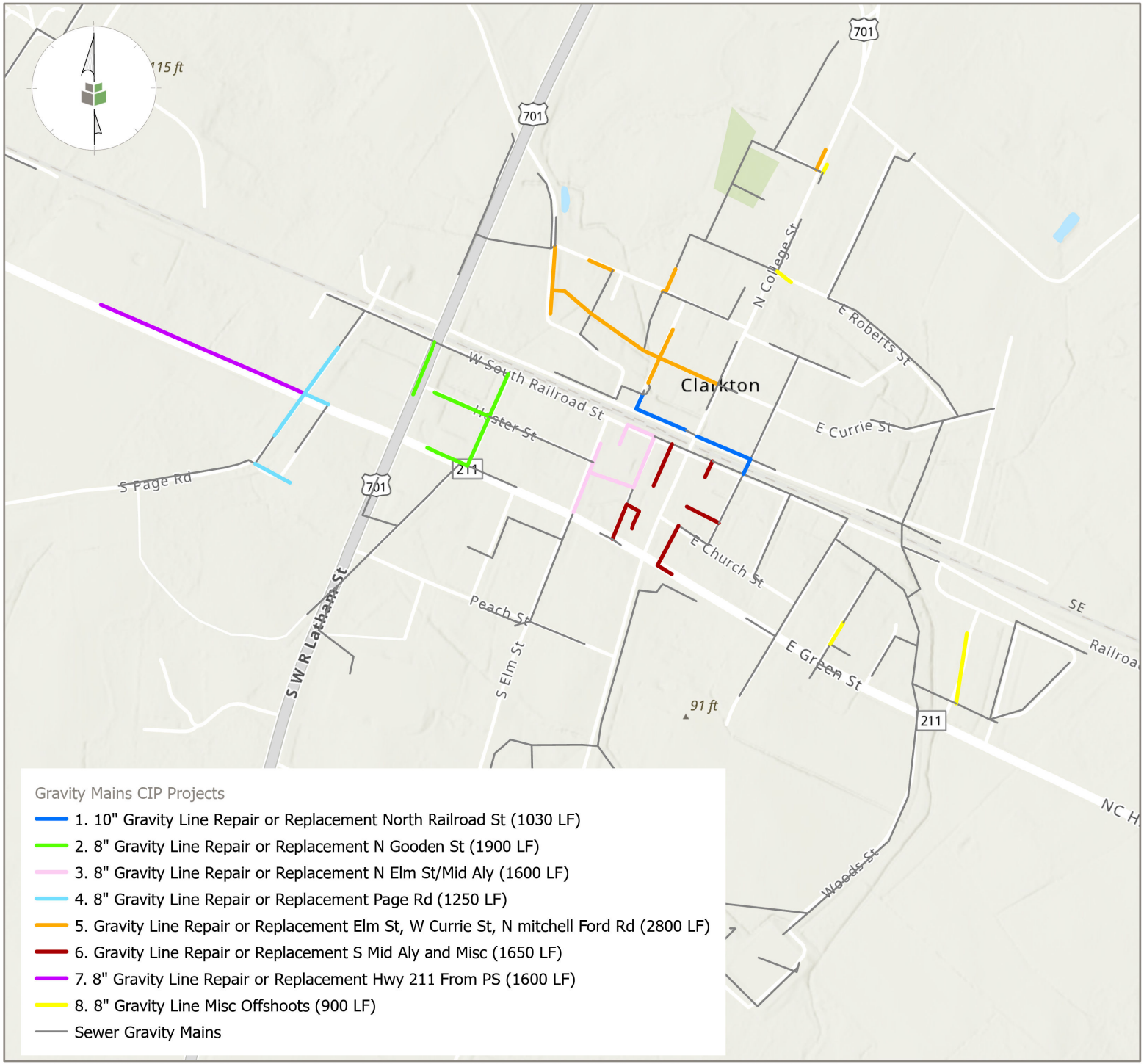
EST. 1983

Sewer System CIP Projects Map

Town of Clarkton, NC



Gravity Mains CIP Projects

- 1. 10" Gravity Line Repair or Replacement North Railroad St (1030 LF)
- 2. 8" Gravity Line Repair or Replacement N Gooden St (1900 LF)
- 3. 8" Gravity Line Repair or Replacement N Elm St/Mid Aly (1600 LF)
- 4. 8" Gravity Line Repair or Replacement Page Rd (1250 LF)
- 5. Gravity Line Repair or Replacement Elm St, W Currie St, N mitchell Ford Rd (2800 LF)
- 6. Gravity Line Repair or Replacement S Mid Aly and Misc (1650 LF)
- 7. 8" Gravity Line Repair or Replacement Hwy 211 From PS (1600 LF)
- 8. 8" Gravity Line Misc Offshoots (900 LF)
- Sewer Gravity Mains

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This map is for informational purposes only. All feature locations displayed are approximate based on available data sources.

Data features are not based on professional field survey unless stated otherwise.

0 500 1,000 Feet

Path: K:\20\20-0410\200415.02-Clarkton Sewer AIA Engineering\Geomatics\GIS\Clarkton AIA_Sewer\Clarkton AIA_Sewer.aprx | 6/24/2025| jwillett

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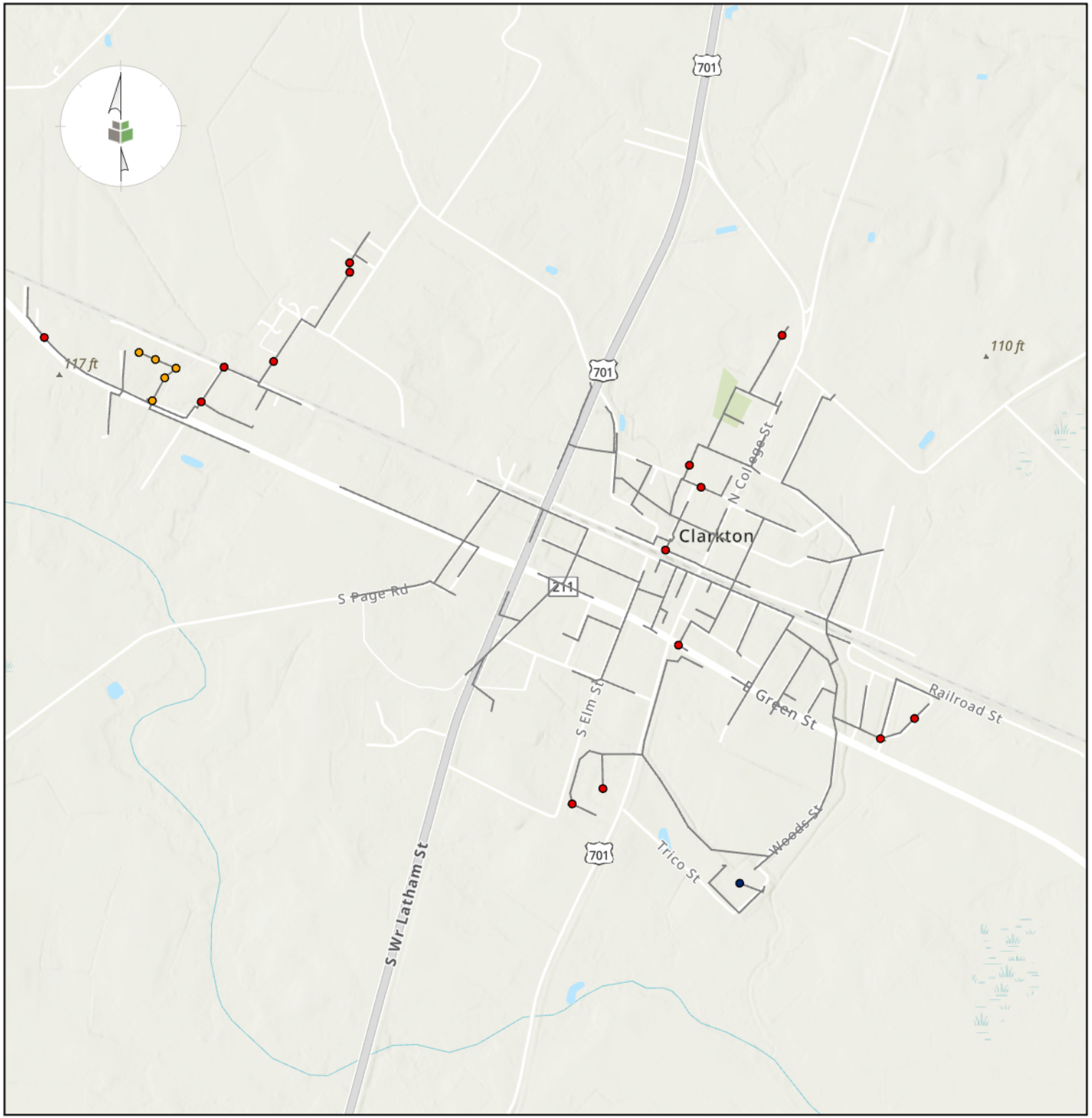

Sewer System CIP Projects Map

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Data features are not based on professional field survey unless stated otherwise.

Legend

CIP Point Projects

- 9. Repair 15 Manholes
- 10. Raise and Replace Covers (Influent to Hwy211 Pump Station)
- 11. Plant Pump Station Pump Replacement

Gravity Mains

APPENDIX II – Condition Assessment Results

Smoke Testing Results (Provided by Town)

ID #	Test Date	Street Location	Smoke Quantity	Defect Type	Corrected
1	4/2/2024 10:52	School	Medium	Unknown	No
2	4/2/2024 10:53	School	Medium	Unknown	No
3	4/2/2024 10:56	School	Low	Inside building	No
4	4/2/2024 11:03	School	Medium	Inside building	No
5	4/2/2024 11:48	North College Street	High	Cleanout - Broken	No
6	4/2/2024 11:51	North College Street	High	Manhole/below surface	No
7	4/2/2024 11:53	North College Street	Medium	Cleanout - Broken	No
8	4/2/2024 11:55	North College Street	Medium	Cleanout - Missing Cap	No
10	4/2/2024 13:29	Highway 211 West	Low	Unknown	No
11	4/2/2024 13:35	Tina's Lane	Low	Cleanout - Missing Cap	Yes
12	4/2/2024 13:36	Tina's Lane	Low	Cleanout - Missing Cap	Yes
13	4/2/2024 13:39	Tina's Lane	Low	Cleanout - Broken	Yes
14	4/2/2024 13:47	Highway 211 West	High	Cleanout - Broken	Yes
15	4/2/2024 13:49	Highway 211 West	High	Cleanout - Broken	Yes
16	4/2/2024 13:51	Highway 211 West	Medium	Cleanout - Broken	Yes
17	4/2/2024 13:52	Highway 211 West	Medium	Cleanout - Broken	Yes
18	4/2/2024 14:03	Ella Bell Rd	High	Cleanout - Missing Cap	No
19	4/2/2024 14:08	Highway 211 West	Medium	Manhole/needs repair	No
20	4/2/2024 14:09	Little John Rd / Hwy 211	High	Cleanout - Broken	No
21	4/2/2024 14:12	Highway 211 West	Medium	Cleanout - Broken	Yes

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Project Summary - CLARKTON SEWER CCTV TV6 04 08 24

Project Name:	CLARKTON SEWER CCTV TV6 04 08 24

US MH	DS MH	Pipe ID	Date	Street	Material	Size	Total	Inspected
1251	1250	1251_1250	04/09/2024	N CLARK ST	Reinforced Concrete Pipe	6		162

Diameter: 6 Total Ln.: 0.0 Inspected Ln.: 162.0

US MH	DS MH	Pipe ID	Date	Street	Material	Size	Total	Inspected
103057	103059	103057_103059	04/08/2024	COLLEGE ST	Reinforced Concrete Pipe	8		49.9
103057A	103057	103057A_103057	04/08/2024	COLLEGE ST	Vitrified Clay Pipe	8		90.5
103057B	103057	103057B_103057	04/08/2024	COLLEGE ST	Reinforced Concrete Pipe	8		98.5
103060	103062	103060_103062	04/08/2024	COLLEGE ST	Reinforced Concrete Pipe	8		406.7
103062	103217	103062_103217	04/09/2024	E ROBERTS ST	Reinforced Concrete Pipe	8		56.6
103062	103217	103062_103217	04/09/2024	E ROBERTS ST	Reinforced Concrete Pipe	8		227.2
103062A	103062	103062A_103062	04/08/2024	E ROBERTS ST	Reinforced Concrete Pipe	8		368.1
103137	1261	103137_1261	04/09/2024	S GROVE ST	Reinforced Concrete Pipe	8		280.4
103138	103137	103138_103137	04/09/2024	S GROVE ST	Reinforced Concrete Pipe	8		211.3
103139	3140	103139_3140	04/09/2024	S GROVE ST	PolyVinyl Chloride	8		56.9
103192	1243	103192_1243	04/09/2024	N CLARK ST	Reinforced Concrete Pipe	8		122.4
103204	1330	103204_1330	04/11/2024	PAGE ST	Reinforced Concrete Pipe	8		243.8
103216	1366	103216_1366	04/11/2024	OFF N COLLEGE ST	Ductile Iron Pipe	8		258.8

Project Summary - CLARKTON SEWER CCTV TV6 04 08 24

103219	103220	103219_103220	04/08/2024	N MITCHELL FORD RD	Reinforced Concrete Pipe	8		172.8
103220	103025	103220_103025	04/08/2024	N MITCHELL FORD RD	Reinforced Concrete Pipe	8		158.3
1238	1344	1238_1344	04/10/2024	N ELMHURST ST	Asbestos Cement	8		286.6
1239	1238	1239_1238	04/10/2024	N ELMHURST ST	Asbestos Cement	8		389.6
1243	1250	1243_1250	04/09/2024	N CLARK ST	Reinforced Concrete Pipe	8		159.5
1250	1252	1250_1252	04/09/2024	N GROVE ST	Reinforced Concrete Pipe	8		181.7
1260	1259	1260_1259	04/09/2024	N GROVE ST	Reinforced Concrete Pipe	8		253.3
1261	1260	1261_1260	04/09/2024	N GROVE ST	Reinforced Concrete Pipe	8		283.2
1347	103137	1347_103137	04/11/2024	E GREENE ST	Reinforced Concrete Pipe	8		244.3
1364	1365	1364_1365	04/10/2024	OFF W GRAHAM ST	Reinforced Concrete Pipe	8		273.2
3140	103138	3140_103138	04/09/2024	S GROVE ST	Reinforced Concrete Pipe	8		213.9

Diameter: 8 Total Ln.: 0.0 Inspected Ln.: 5087.5

US MH	DS MH	Pipe ID	Date	Street	Material	Size	Total	Inspected
103163	1345	103163_1345	04/10/2024	OFF SIXTH ST	Reinforced Concrete Pipe	12		232.4
1345	1344	1345_1344	04/10/2024	OFF SIXTH ST	Reinforced Concrete Pipe	12		404

Diameter: 12 Total Ln.: 0.0 Inspected Ln.: 636.4

Project Total Ln.: 0.0 Project Inspected Ln.: 5885.9

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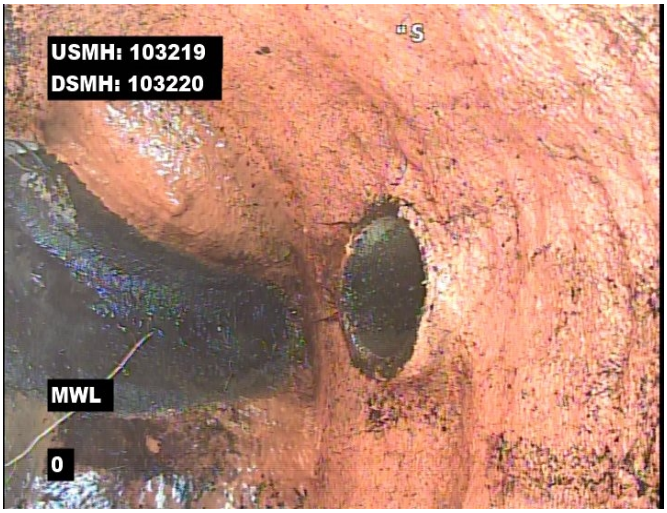
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103220



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 4.0 ft. Grade: 4
Condition: RBL-Roots Ball Lateral
Remarks: N/A

Distance: 4.0 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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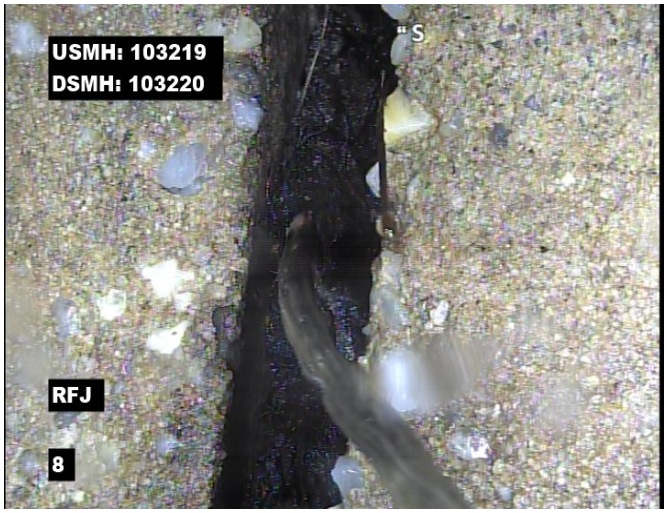
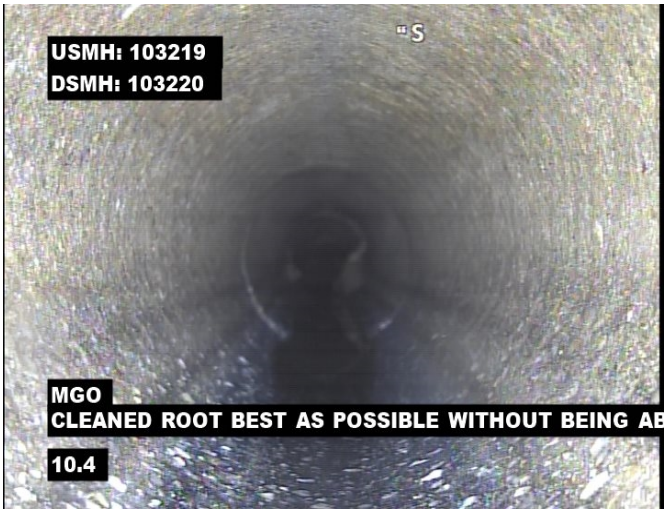
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			



Distance: 8.0 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 10.3 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: CLEANED ROOT BEST AS POSSIBLE WITHOUT BEING ABLE TO CLEAN FROM

Distance: 17.6 ft. Grade: 3
Condition: RMJ-Roots Medium Joint
Remarks: N/A

Distance: 20.6 ft. Grade: 2
Condition: FC-Fracture Circumferential
Remarks: N/A

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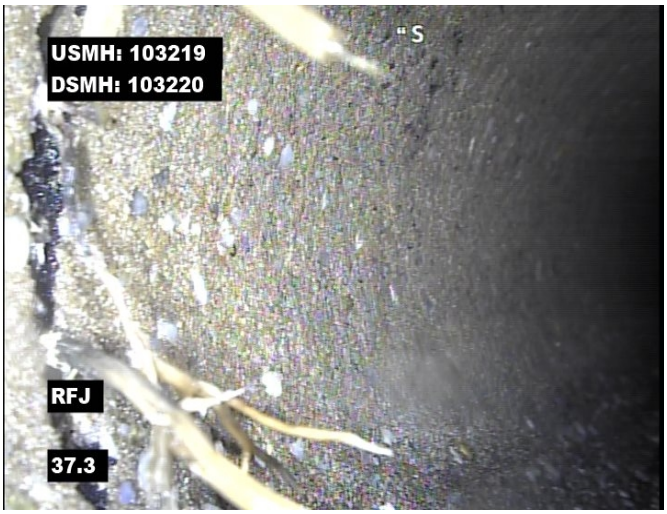
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

Distance: 20.6 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 25.0 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 33.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 37.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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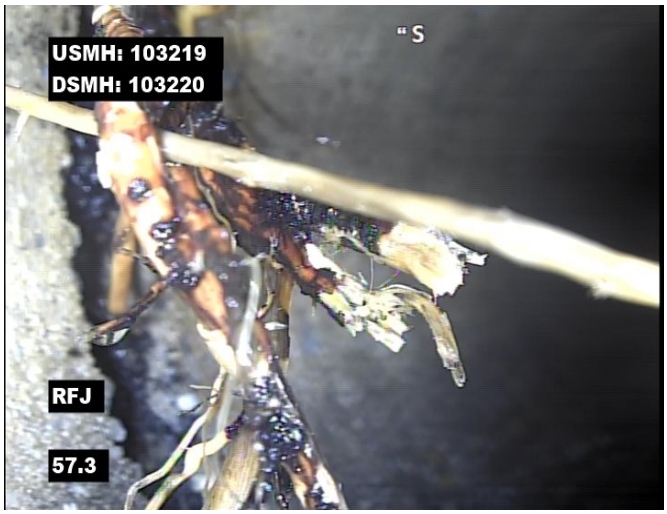
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

Distance: 49.1 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 53.4 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 57.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 57.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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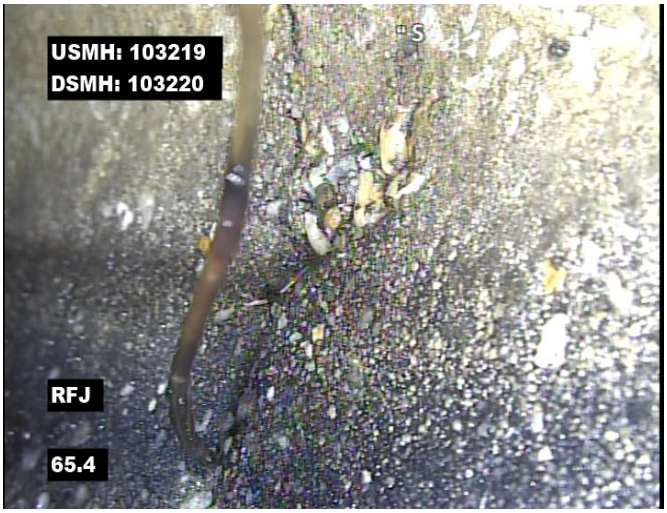
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

Distance: 61.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 65.4 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 73.4 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 77.2 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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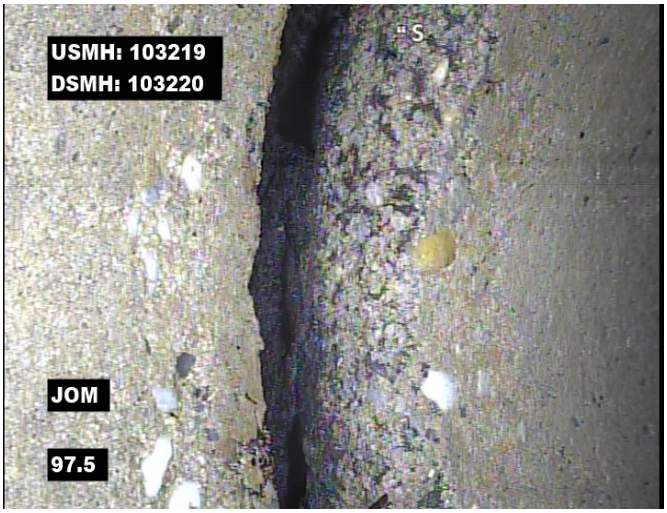
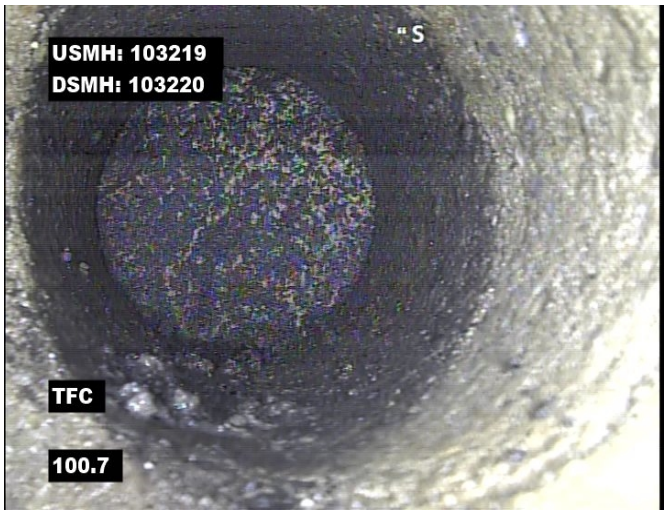
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

Distance: 85.5 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 97.5 ft. Grade: 3
Condition: JOM-Joint Offset Medium
Remarks: N/A



Distance: 100.7 ft. Grade: 0
Condition: TFC-Tap Factory Made Capped
Remarks: N/A

Distance: 149.7 ft. Grade: 3
Condition: JOM-Joint Offset Medium
Remarks: N/A

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4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

Distance: 161.0 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 161.0 ft. Grade: 3
Condition: RML-Roots Medium Lateral
Remarks: N/A

Distance: 165.6 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 169.2 ft. Grade: 0
Condition: TFC-Tap Factory Made Capped
Remarks: N/A

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4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

Distance: 172.8 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 172.8 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103219

Distance: 172.8 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: LAMPHOLE MH

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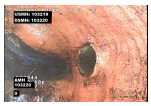
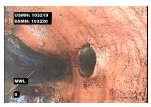
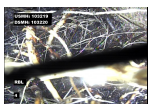
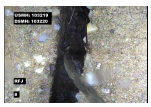
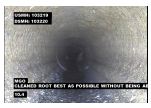
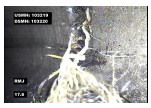
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103219			Circular			
Downstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
103220	172.8		8			

				PO Number	Customer
SPR	8	MPR	25		
SPRI	2.7	MPRI	8.3	Work Order Number	Purpose
QSR	3221	QMR	4132		

OPR	Surveyed By	Direction	Date	Media label	
33	CHRISTIAN CHURCH	Upstream	04/08/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
5.5	P0036843-042022	Heavy Cleaning	12:32	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/08/2024			12:55		

0 ft.	AMH-Access Point Manhole		103220
0 ft.	MWL-Miscellaneous Water Level		
4 ft.	RBL-Roots Ball Lateral		
4 ft.	TF-Tap Factory Made		
8 ft.	RFJ-Roots Fine Joint		
10.3 ft.	MGO-Miscellaneous General Observation		CLEANED ROOT BEST AS POSSIBLE WITHOUT BEING ABLE TO CLEAN FROM CAMERA FROM US
17.6 ft.	RMJ-Roots Medium Joint		

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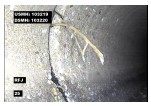
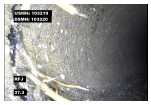
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

20.6 ft.	FC-Fracture Circumferential		2
20.6 ft.	RFJ-Roots Fine Joint		1
25 ft.	RFJ-Roots Fine Joint		1
33.3 ft.	RFJ-Roots Fine Joint		1
37.3 ft.	RFJ-Roots Fine Joint		1
49.1 ft.	RFJ-Roots Fine Joint		1
53.4 ft.	RFJ-Roots Fine Joint		1
57.3 ft.	RFJ-Roots Fine Joint		1
57.3 ft.	RFJ-Roots Fine Joint		1

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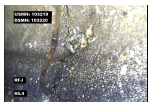
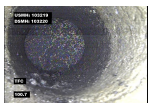
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

61.3 ft.	RFJ-Roots Fine Joint		1
65.4 ft.	RFJ-Roots Fine Joint		1
73.4 ft.	RFJ-Roots Fine Joint		1
77.2 ft.	RFJ-Roots Fine Joint		1
85.5 ft.	RFJ-Roots Fine Joint		1
97.5 ft.	JOM-Joint Offset Medium		3
100.7 ft.	TFC-Tap Factory Made Capped		
149.7 ft.	JOM-Joint Offset Medium		3
161 ft.	TF-Tap Factory Made		

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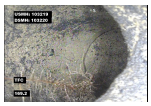
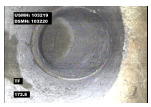
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103219_103220	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103219			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103220	172.8		8			

161 ft.	RML-Roots Medium Lateral		3
165.6 ft.	RFJ-Roots Fine Joint		1
169.2 ft.	TFC-Tap Factory Made Capped		
172.8 ft.	TF-Tap Factory Made		
172.8 ft.	AMH-Access Point Manhole		103219
172.8 ft.	MGO-Miscellaneous General Observation		LAMPHOLE MH

103219

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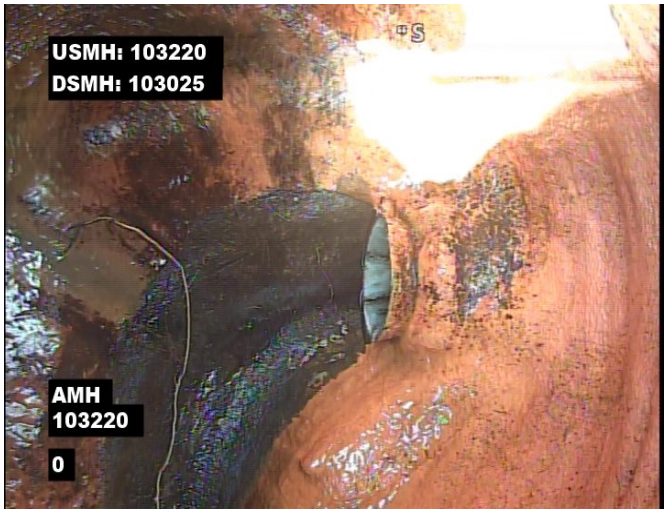
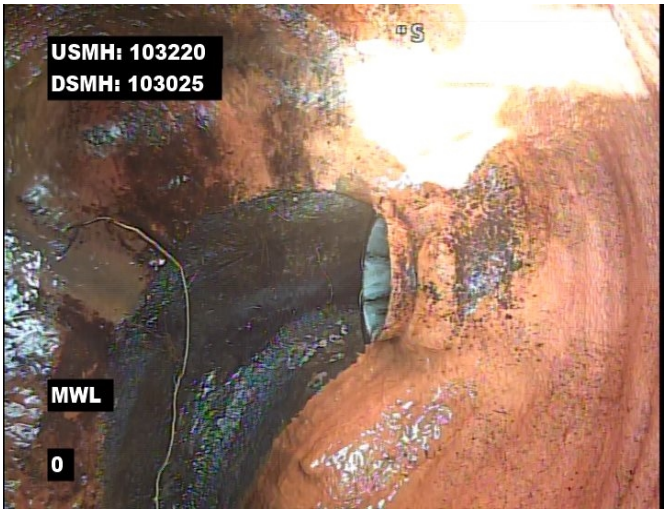
4 Image Report

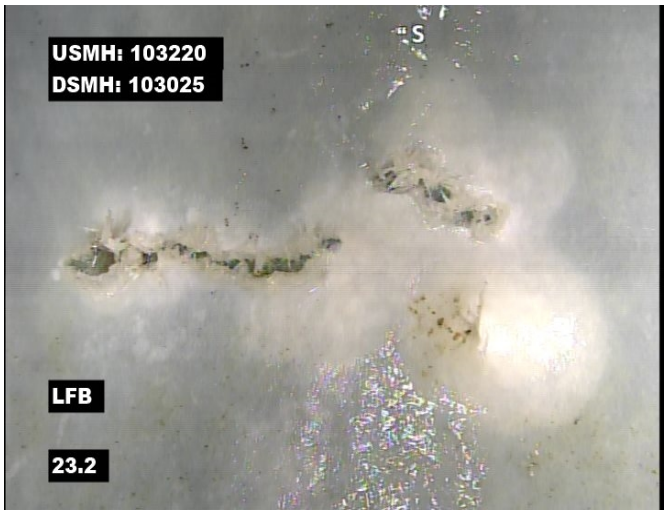
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103220_103025	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103220			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103025	158.3		8			



Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103220



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 23.2 ft. Grade: 3
Condition: LFB-Lining Feature Blistered
Remarks: N/A

Distance: 74.4 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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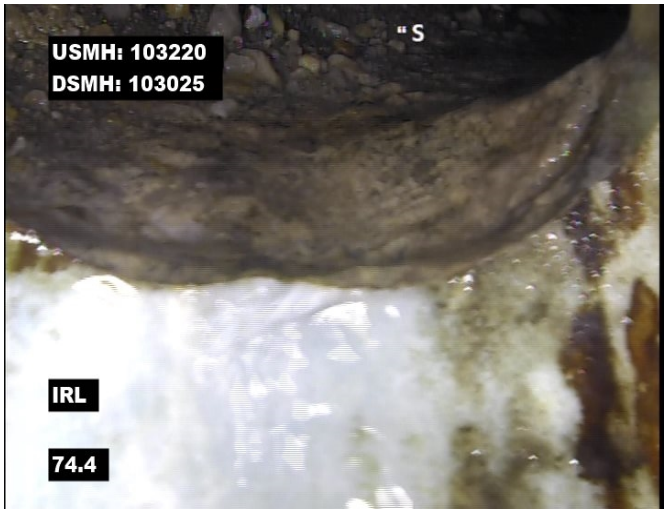
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103220_103025	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103220			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103025	158.3		8			



Distance: 74.4 ft. Grade: 4
Condition: IRL-Infiltration Runner Lateral
Remarks: N/A

Distance: 158.3 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103025

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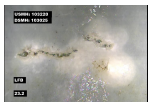
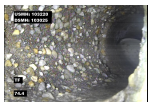
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103220_103025	CLARKTON	N MITCHELL FORD RD	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103220			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
103025	158.3		8			

SPR	3	MPR	4	PO Number	Customer
SPRI	3	MPRI	4		
QSR	3100	QMR	4100	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
7	CHRISTIAN CHURCH	Downstream	04/08/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
3.5	P0036843-042022	Heavy Cleaning	13:06	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/08/2024			13:18		

0 ft.	AMH-Access Point Manhole		103220
0 ft.	MWL-Miscellaneous Water Level		
23.2 ft.	LFB-Lining Feature Blistered		
74.4 ft.	TF-Tap Factory Made		
74.4 ft.	IRL-Infiltration Runner Lateral		
158.3 ft.	AMH-Access Point Manhole		103025

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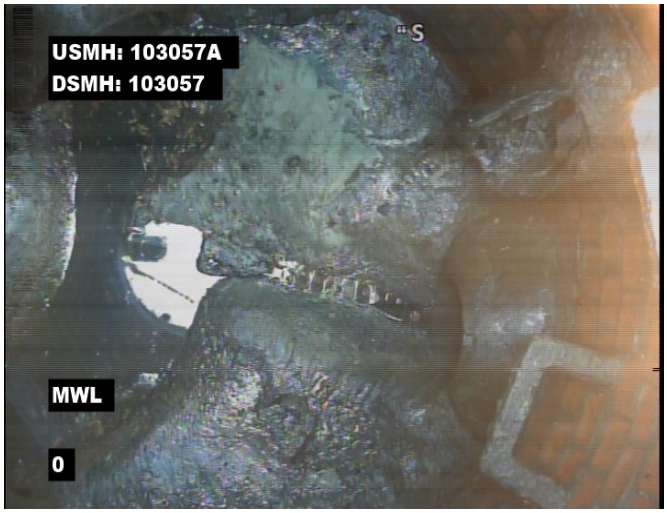
4 Image Report

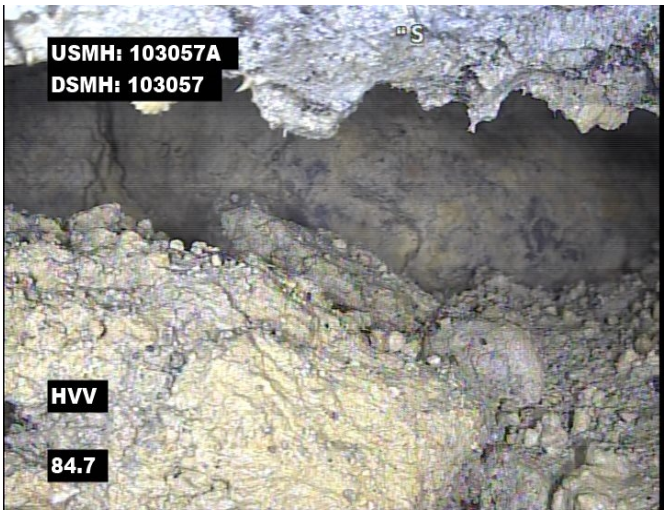
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057A_103057	CLARKTON	COLLEGE ST	Vitrified Clay Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057A			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	90.5		8			



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 15.7 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 64.6 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 84.7 ft. Grade: 5
Condition: HVV-Hole Void Visible
Remarks: N/A

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4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057A_103057	CLARKTON	COLLEGE ST	Vitrified Clay Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057A			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	90.5		8			

Distance: 89.3 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 90.5 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103057A

Distance: 90.5 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: LAMPHOLE MH

Distance: 90.5 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057A_103057	CLARKTON	COLLEGE ST	Vitrified Clay Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057A			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	90.5		8			

Distance: 90.5 ft. Grade: 0
Condition: MSC-Miscellaneous Shape/Size Change
Remarks: N/A

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Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057A_103057	CLARKTON	COLLEGE ST	Vitrified Clay Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057A			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	90.5		8			

				PO Number	Customer
SPR	5	MPR	0		
SPRI	5	MPRI	0	Work Order Number	Purpose
QSR	5100	QMR	0000		

OPR	Surveyed By	Direction	Date	Media label	
5	CHRISTIAN CHURCH	Upstream	04/08/2024		
OPRI	Certificate Number	Pre-Cleaning	Time	Weather	
5	P0036843-042022	Heavy Cleaning	15:21	Dry	
Date Cleaned			End Time	Additional Info	
04/08/2024			15:33		

0 ft.	AMH-Access Point Manhole		103057
0 ft.	MWL-Miscellaneous Water Level		
15.7 ft.	TF-Tap Factory Made		
64.6 ft.	TF-Tap Factory Made		
84.7 ft.	HVV-Hole Void Visible		
89.3 ft.	TF-Tap Factory Made		
90.5 ft.	AMH-Access Point Manhole		103057A

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Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057A_103057	CLARKTON	COLLEGE ST	Vitrified Clay Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057A			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	90.5		8			

90.5 ft. MGO-Miscellaneous General Observation

90.5 ft. TF-Tap Factory Made

90.5 ft. MSC-Miscellaneous Shape/Size Change

LAMPHOLE MH

103057A

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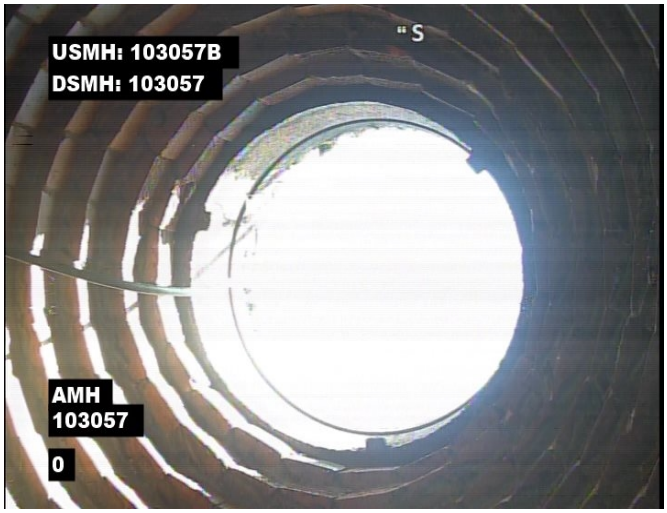
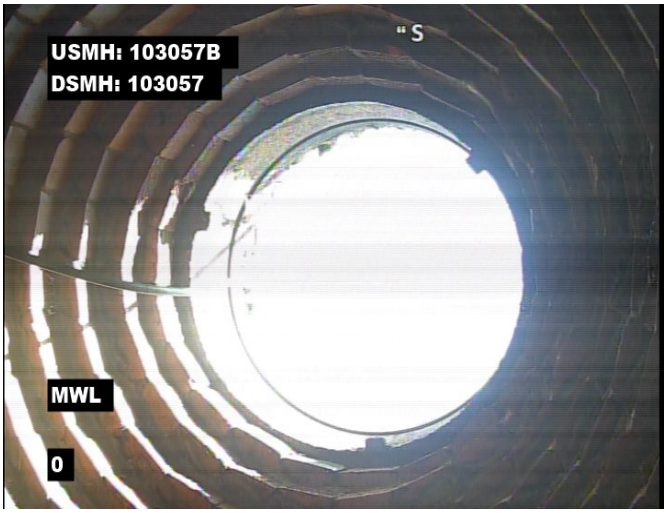
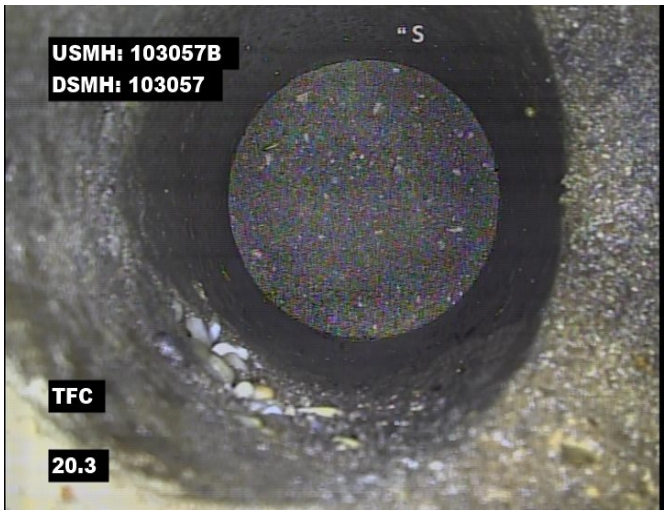
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057B_103057	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057B			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	98.5		8			



Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103057



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 20.3 ft. Grade: 0
Condition: TFC-Tap Factory Made Capped
Remarks: N/A

Distance: 35.9 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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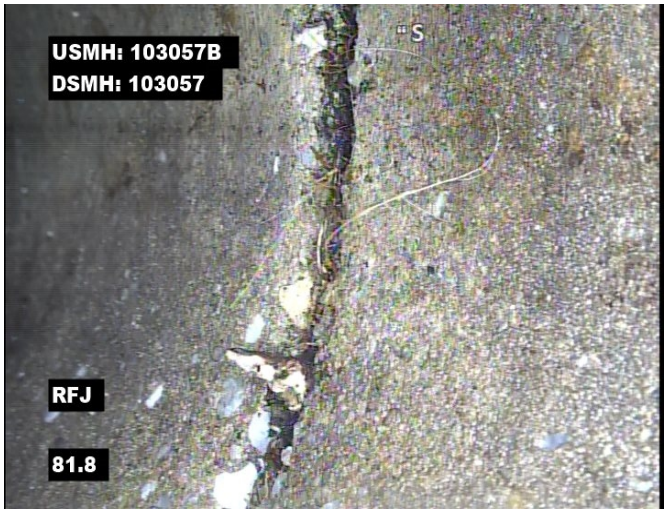
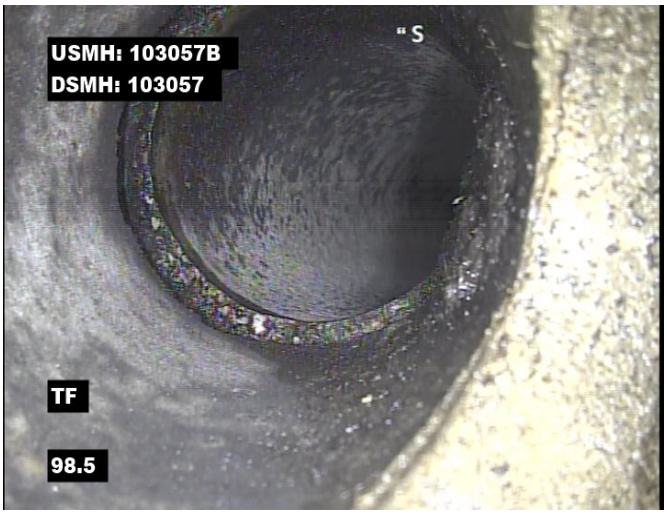
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057B_103057	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057B			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	98.5		8			



Distance: 81.8 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 94.7 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 95.4 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 98.5 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057B_103057	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057B			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	98.5		8			

Distance: 98.5 ft. Grade: 5
Condition: RBB-Roots Ball Barrell
Remarks: RB AT END OF LINE

Distance: 98.5 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 98.5 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103057B

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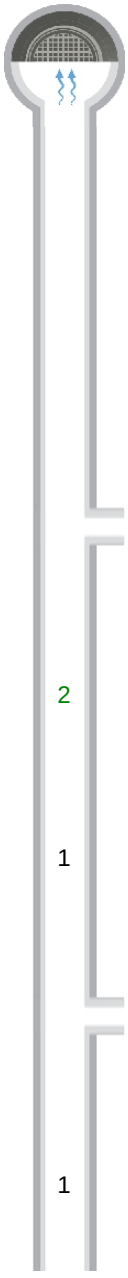
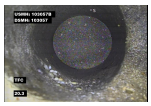
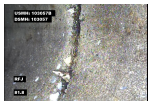
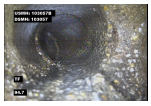
Pipe Segment Reference	City	Street	Material	Location Code	Pipe Use
103057B_103057	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe		Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**	**Location Details**	
103057B			Circular		
Downstream MH	**Length surveyed**	**Year Renewed**	**Height / Width**	**Pipe Joint Length**	
103057	98.5		8		

SPR	26	MPR	7	PO Number	Customer
SPRI	2	MPRI	7		
QSR	2A00	QMR	5100	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
33	CHRISTIAN CHURCH	Upstream	04/08/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
2.4	P0036843-042022	Heavy Cleaning	15:39	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/08/2024			16:28		



0 ft.	AMH-Access Point Manhole		103057
0 ft.	MWL-Miscellaneous Water Level		
20.3 ft.	TFC-Tap Factory Made Capped		
35.9 ft.	SAV-Surface Damage Aggregate Visible - S01		
81.8 ft.	RFJ-Roots Fine Joint		
94.7 ft.	TF-Tap Factory Made		
95.4 ft.	RFJ-Roots Fine Joint		

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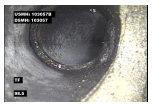
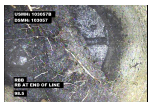
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057B_103057	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057B			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103057	98.5		8			

98.5 ft. TF-Tap Factory Made

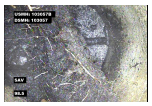


98.5 ft. RBB-Roots Ball Barrell



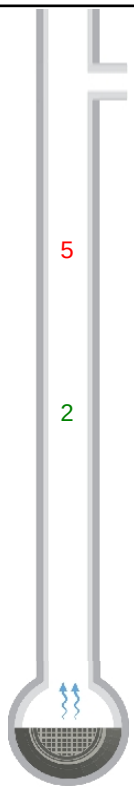
RB AT END OF LINE

98.5 ft. SAV-Surface Damage
Aggregate Visible - F01



98.5 ft. AMH-Access Point Manhole

103057B



103057B

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4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057_103059	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103057			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103059	49.9		8			

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 49.9 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103059

Infrastructure Technologies
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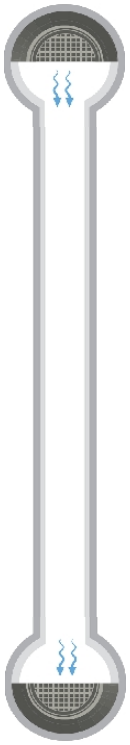
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103057_103059	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103057			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
103059	49.9		8			

SPR	0	MPR	0	PO Number	Customer
SPRI	0	MPRI	0		
QSR	0000	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
0	CHRISTIAN CHURCH	Downstream	04/08/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
0	P0036843-042022	Light Cleaning	17:01	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/08/2024			12:03		



0 ft.	AMH-Access Point Manhole		103057
0 ft.	MWL-Miscellaneous Water Level		
49.9 ft.	AMH-Access Point Manhole		103059

Infrastructure Technologies
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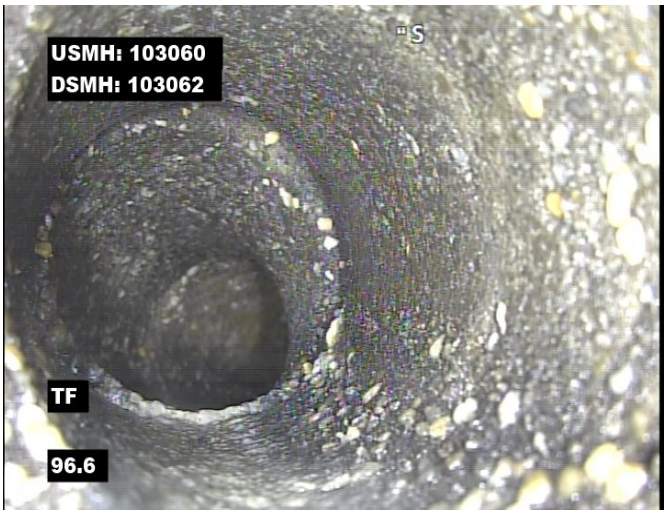
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			

Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103062

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 8.0 ft. Grade: 3
Condition: JOM-Joint Offset Medium
Remarks: N/A



Distance: 96.6 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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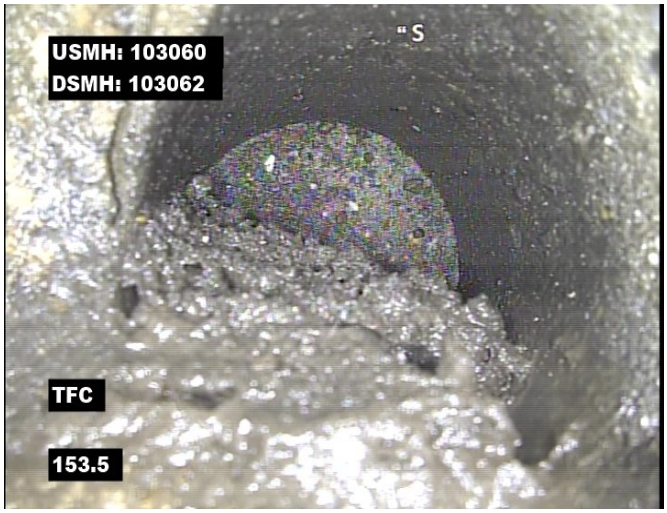
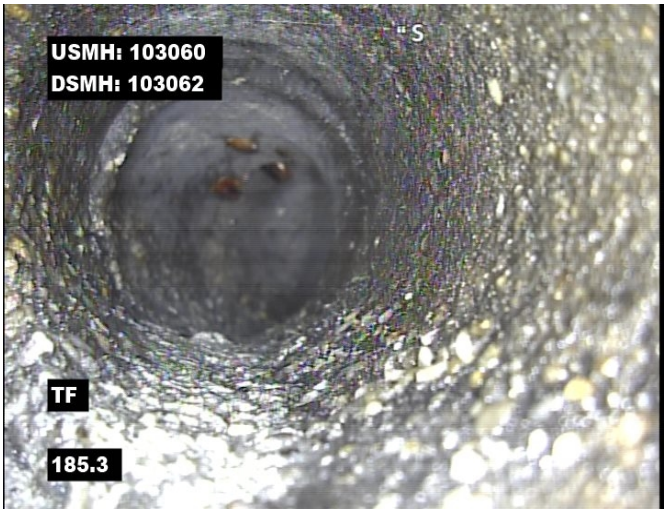
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			



Distance: 153.5 ft. Grade: 0
Condition: TFC-Tap Factory Made Capped
Remarks: N/A



Distance: 185.3 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 194.9 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 211.4 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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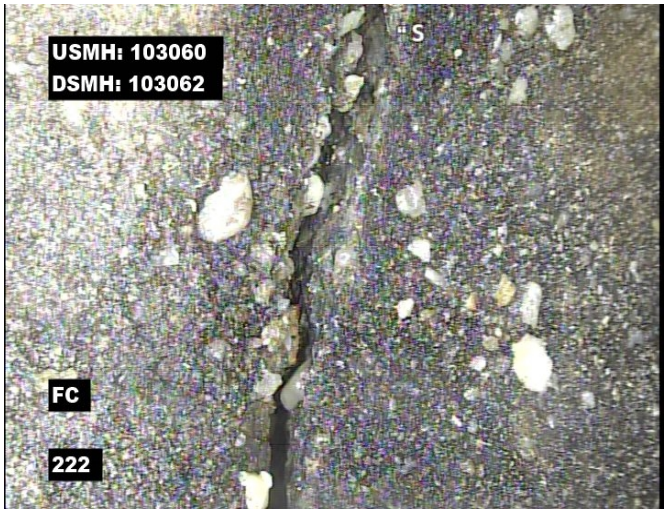
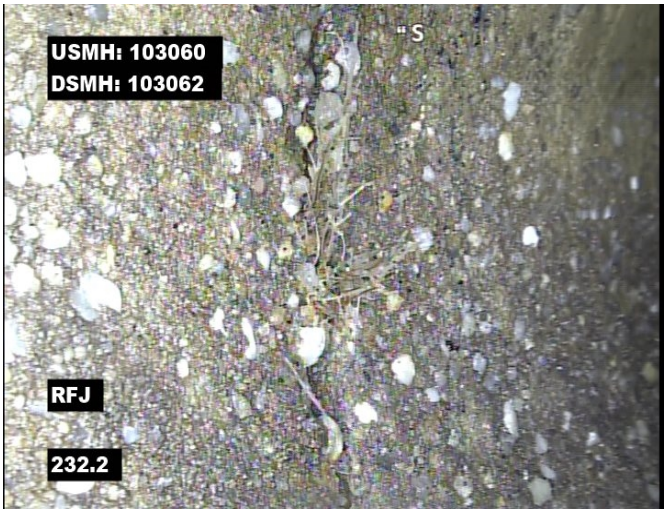
4 Image Report

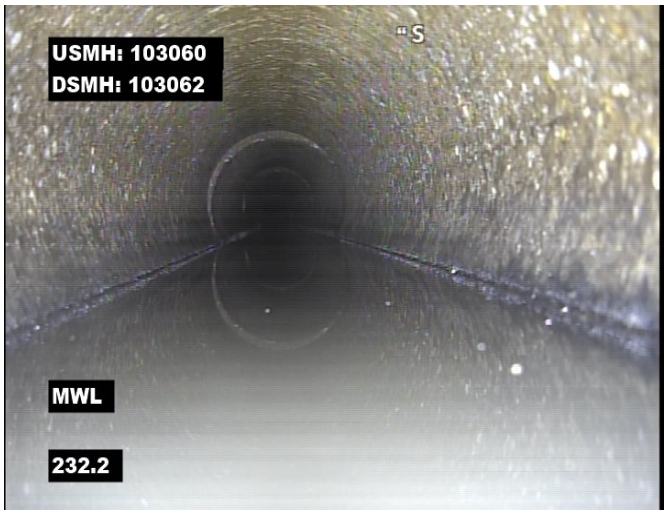
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			



Distance: 222.0 ft. Grade: 2
Condition: FC-Fracture Circumferential
Remarks: N/A



Distance: 232.2 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 232.2 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 240.0 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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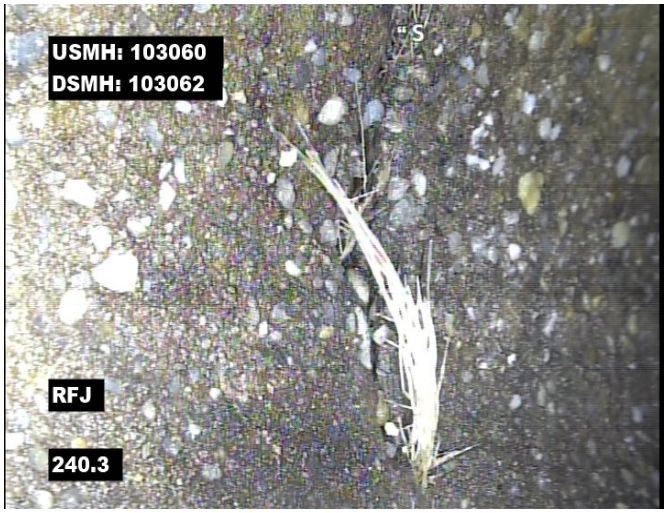
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			



Distance: 240.2 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 247.5 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 247.5 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 252.1 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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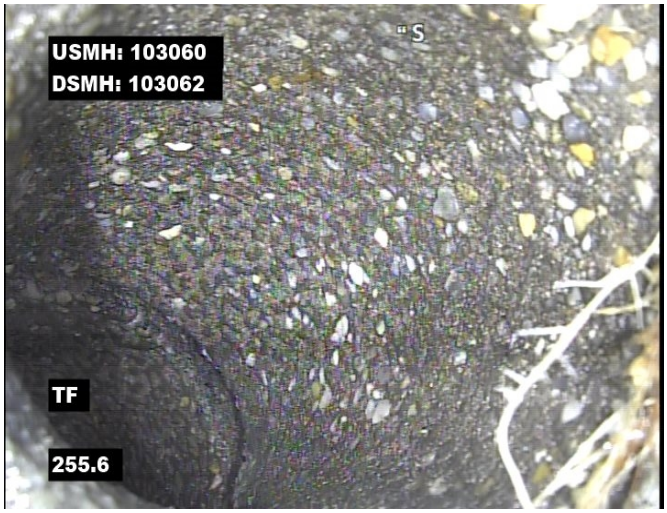
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			



Distance: 255.6 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 255.6 ft. Grade: 1
Condition: RFL-Roots Fine Lateral
Remarks: N/A

Distance: 259.8 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: BURIED MH

Distance: 288.4 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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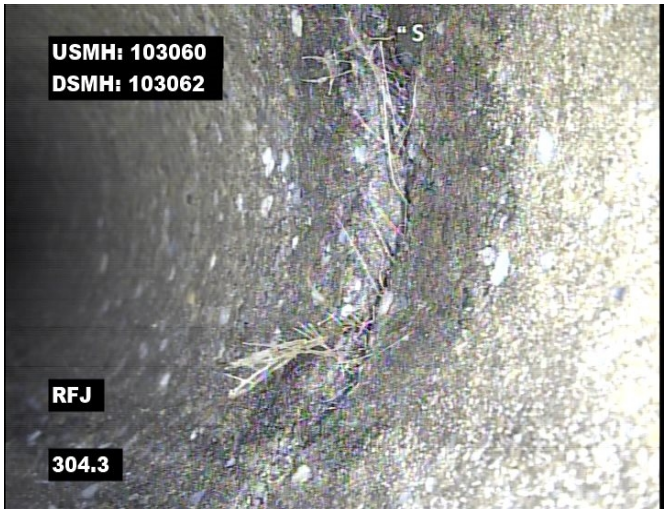
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			



Distance: 304.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 308.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 308.3 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 312.2 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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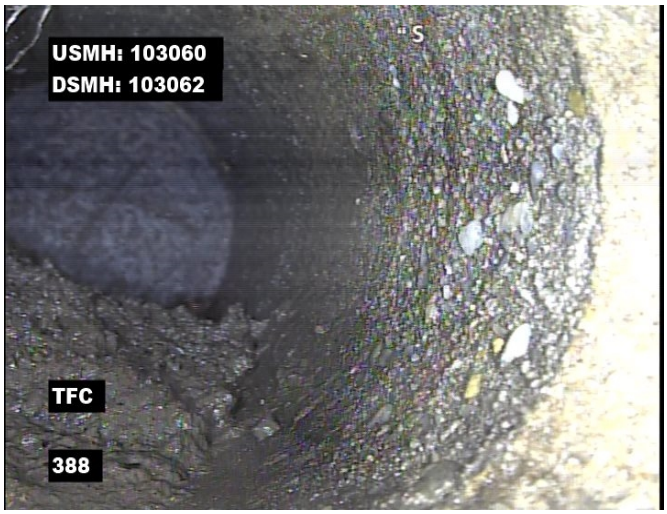
4 Image Report

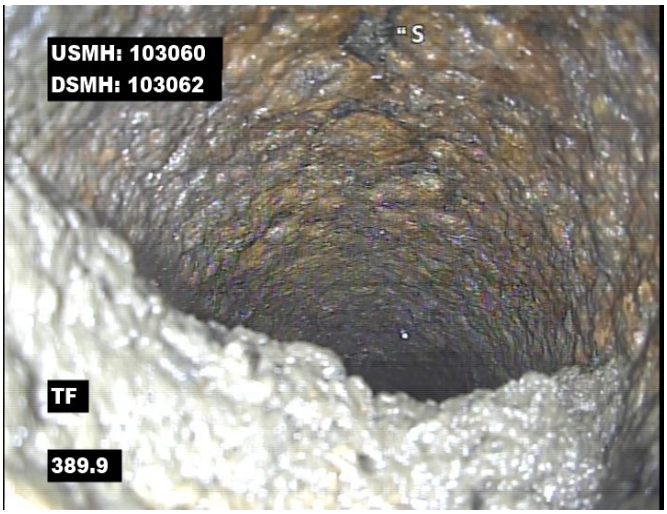
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			

Distance: 317.7 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 325.8 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 388.0 ft. Grade: 0
Condition: TFC-Tap Factory Made Capped
Remarks: N/A



Distance: 389.9 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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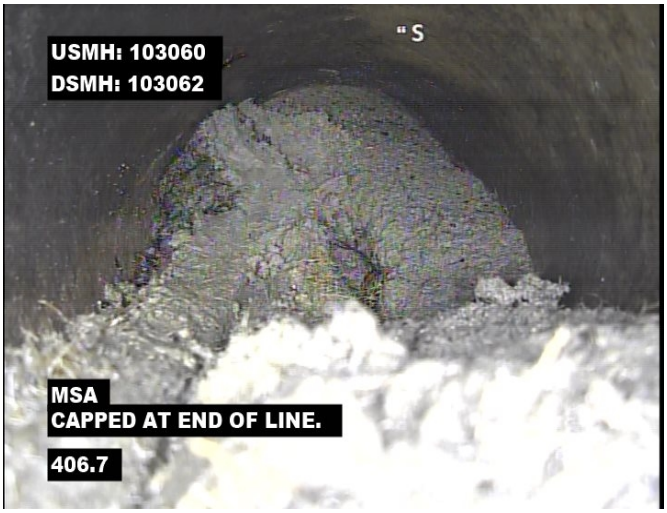
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			

Distance: 404.5 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 406.7 ft. Grade: 0
Condition: MSA-Miscellaneous Survey Abandoned
Remarks: CAPPED AT END OF LINE.

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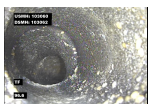
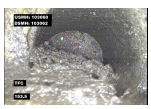
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			

				PO Number	Customer
SPR	51	MPR	14		
SPRI	2	MPRI	0	Work Order Number	Purpose
QSR	312C	QMR	0000		

OPR	Surveyed By	Direction	Date	Media label	
65	CHRISTIAN CHURCH	Upstream	04/08/2024		
OPRI	Certificate Number	Pre-Cleaning	Time	Weather	
2.6	P0036843-042022	Light Cleaning	17:50	Dry	
Date Cleaned			End Time	Additional Info	
04/08/2024			18:13		

0 ft.	AMH-Access Point Manhole		103062
0 ft.	MWL-Miscellaneous Water Level		
8 ft.	JOM-Joint Offset Medium		
96.6 ft.	TF-Tap Factory Made		
153.5 ft.	TFC-Tap Factory Made Capped		
185.3 ft.	TF-Tap Factory Made		
194.9 ft.	SAV-Surface Damage Aggregate Visible - S01		

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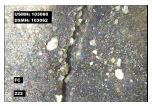
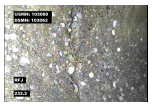
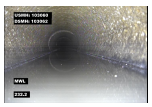
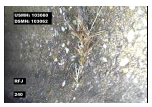
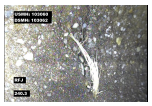
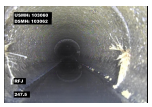
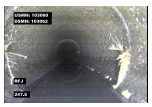
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103060			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	406.7		8			

211.4 ft.	RFJ-Roots Fine Joint		1
222 ft.	FC-Fracture Circumferential		2
232.2 ft.	RFJ-Roots Fine Joint		1
232.2 ft.	MWL-Miscellaneous Water Level		
240 ft.	RFJ-Roots Fine Joint		1
240.2 ft.	RFJ-Roots Fine Joint		1
247.5 ft.	RFJ-Roots Fine Joint		1
247.5 ft.	RFJ-Roots Fine Joint		1
252.1 ft.	RFJ-Roots Fine Joint		1

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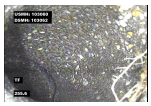
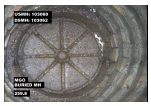
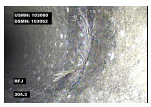
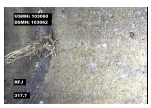
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103060			Circular			
Downstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
103062	406.7		8			

255.6 ft.	TF-Tap Factory Made			
255.6 ft.	RFL-Roots Fine Lateral		1	
259.8 ft.	MGO-Miscellaneous General Observation			BURIED MH
288.4 ft.	RFJ-Roots Fine Joint		1	
304.3 ft.	RFJ-Roots Fine Joint		1	
308.3 ft.	RFJ-Roots Fine Joint		1	
308.3 ft.	SAV-Surface Damage Aggregate Visible - F01		2	
312.2 ft.	RFJ-Roots Fine Joint		1	
317.7 ft.	RFJ-Roots Fine Joint		1	

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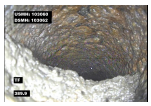
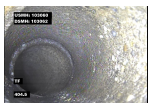
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103060_103062	CLARKTON	COLLEGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103060			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
103062	406.7		8			

1

325.8 ft.	RFJ-Roots Fine Joint		
388 ft.	TFC-Tap Factory Made Capped		
389.9 ft.	TF-Tap Factory Made		
404.5 ft.	TF-Tap Factory Made		
406.7 ft.	MSA-Miscellaneous Survey Abandoned		CAPPED AT END OF LINE.

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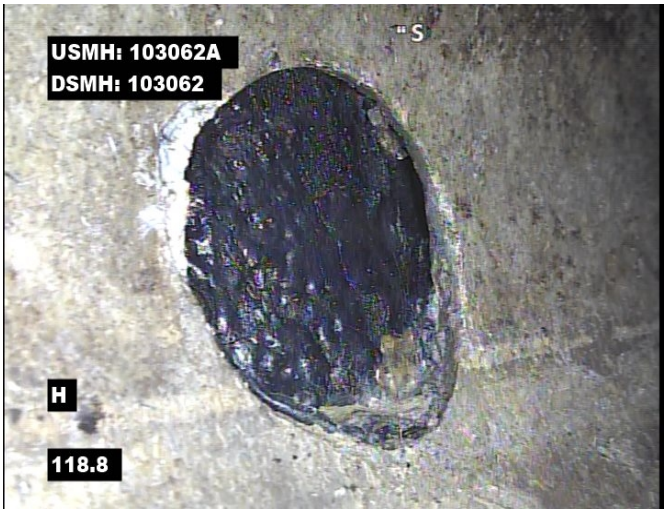
4 Image Report

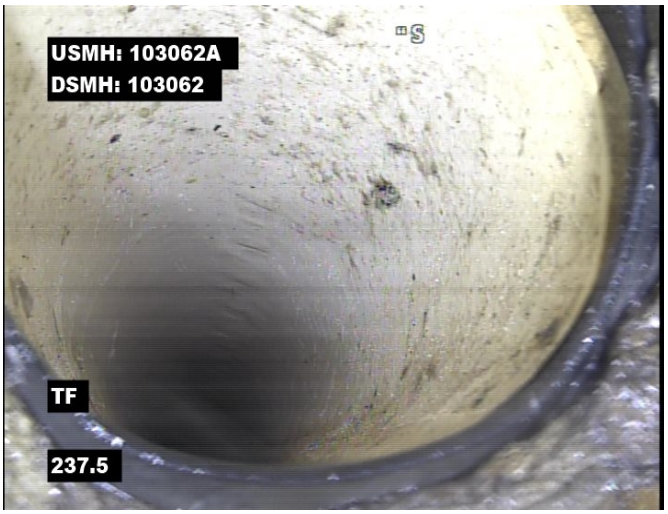
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062A_103062	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062A			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	368.1		8			

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 118.8 ft. Grade: 4
Condition: H-Hole
Remarks: N/A

Distance: 118.8 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A



Distance: 237.5 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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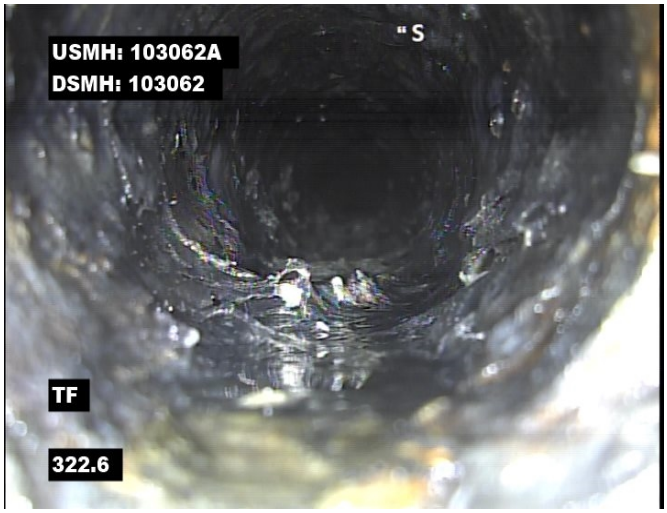
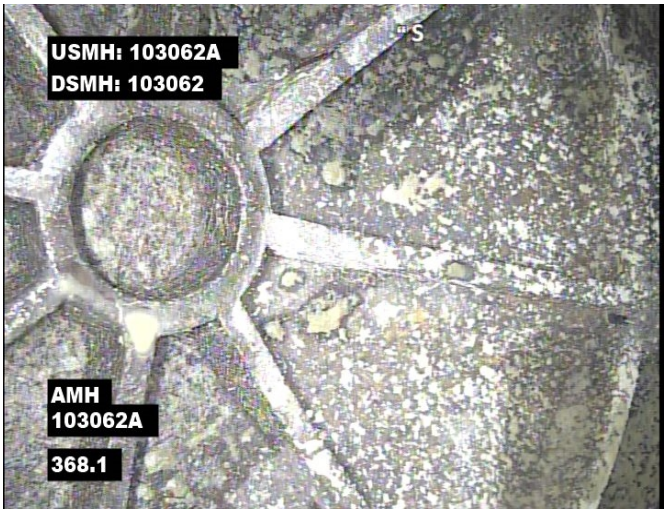
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062A_103062	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062A			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	368.1		8			



Distance: 322.6 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 368.1 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103062A

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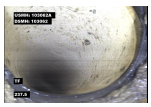
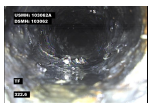
Defect Listing Plot

Pipe Segment Reference	City	Street	Material	Location Code	Pipe Use
103062A_103062	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe		Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**	**Location Details**	
103062A			Circular		
Downstream MH	**Length surveyed**	**Year Renewed**	**Height / Width**	**Pipe Joint Length**	
103062	368.1		8		

SPR	9	MPR	0	PO Number	Customer
SPRI	4.5	MPRI	0		
QSR	5141	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
9	CHRISTIAN CHURCH	Upstream	04/08/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
4.5	P0036843-042022	Light Cleaning	18:28	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/08/2024			18:42		

0 ft.	AMH-Access Point Manhole		103062
0 ft.	MWL-Miscellaneous Water Level		
118.8 ft.	H-Hole		
118.8 ft.	HSV-Hole Soil Visible		
237.5 ft.	TF-Tap Factory Made		
322.6 ft.	TF-Tap Factory Made		

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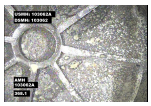
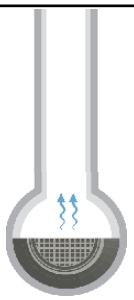
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062A_103062	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062A			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103062	368.1		8			

368.1 ft. AMH-Access Point Manhole





103062A

103062A

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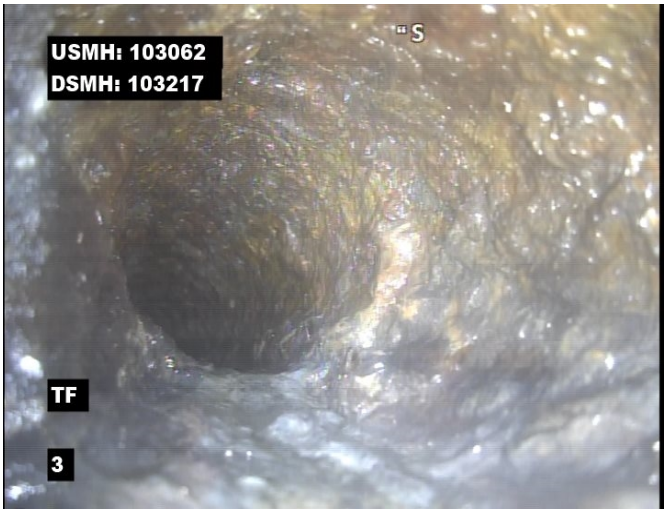
4 Image Report

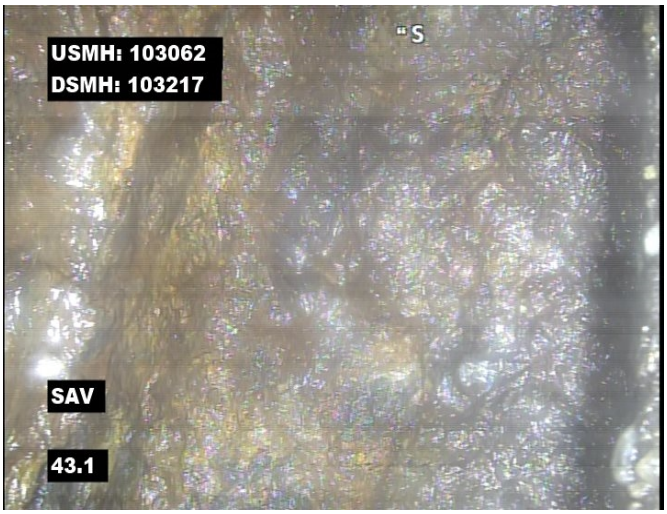
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	56.6		8			

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 3.0 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 16.2 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A



Distance: 43.1 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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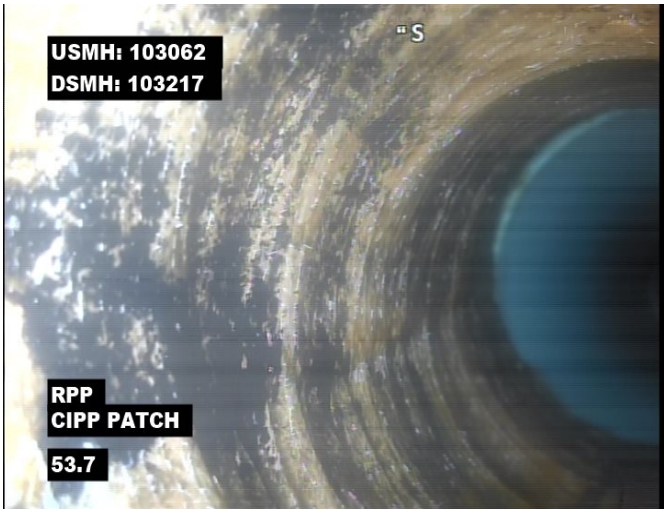
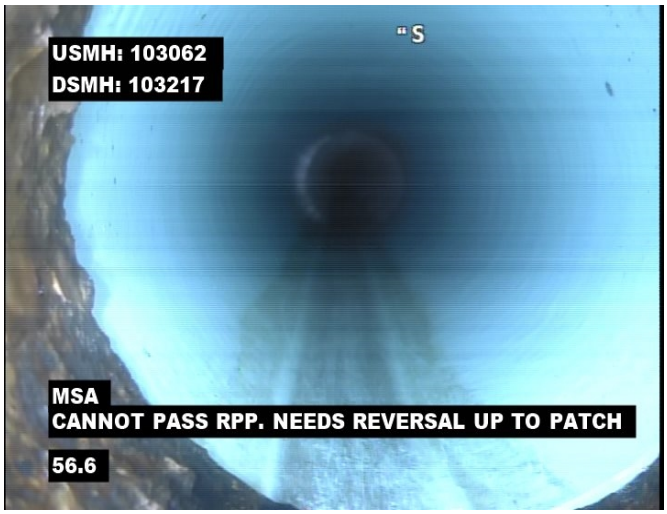
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	56.6		8			

Distance: 43.1 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: DIP



Distance: 53.7 ft. Grade: 0
Condition: RPP-Point Repair Patch
Remarks: CIPP PATCH



Distance: 56.6 ft. Grade: 0
Condition: MSA-Miscellaneous Survey Abandoned
Remarks: CANNOT PASS RPP. NEEDS REVERSAL UP TO PATCH

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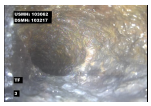
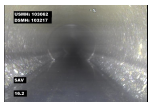
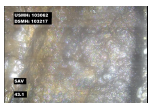
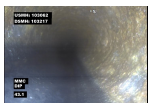
Defect Listing Plot

Pipe Segment Reference	City	Street	Material	Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe		Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**	**Location Details**	
103062			Circular		
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height / Width**	**Pipe Joint Length**	
103217	56.6		8		

SPR	10	MPR	0	PO Number	Customer
SPRI	2	MPRI	0		
QSR	2500	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
10	CHRISTIAN CHURCH	Downstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
2	P0036843-042022	Heavy Cleaning	09:00	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			09:07		

0 ft.	AMH-Access Point Manhole		103062
0 ft.	MWL-Miscellaneous Water Level		
3 ft.	TF-Tap Factory Made		
16.2 ft.	SAV-Surface Damage Aggregate Visible - S01		
43.1 ft.	SAV-Surface Damage Aggregate Visible - F01		
43.1 ft.	MMC-Miscellaneous Material Change		DIP
53.7 ft.	RPP-Point Repair Patch		CIPP PATCH

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Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	56.6		8			

56.6 ft. MSA-Miscellaneous Survey Abandoned

CANNOT PASS RPP. NEEDS REVERSAL UP TO PATCH

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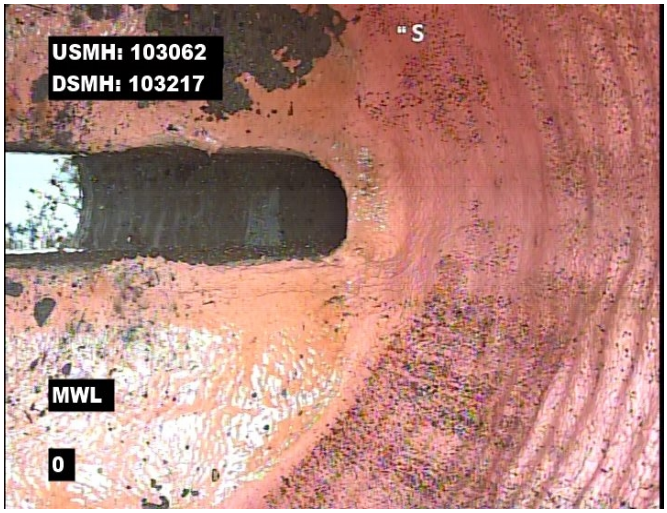
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	227.2		8			



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 0.0 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 0.0 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 9.0 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	227.2		8			

Distance: 13.5 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 16.2 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 21.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 25.1 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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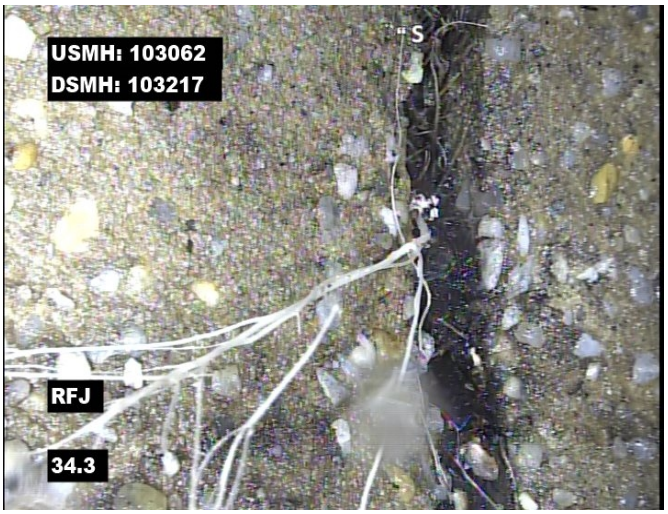
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	227.2		8			

Distance: 25.1 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 30.9 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 30.9 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 34.3 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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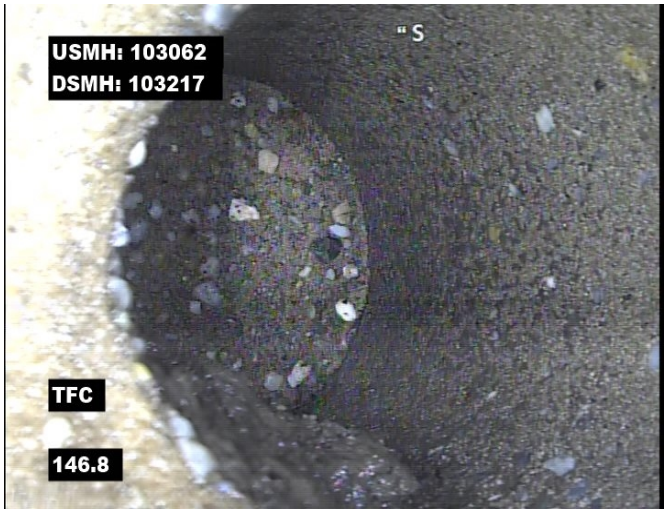
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	227.2		8			



Distance: 146.8 ft. Grade: 0
Condition: TFC-Tap Factory Made Capped
Remarks: N/A

Distance: 221.9 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC

Distance: 222.1 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 227.2 ft. Grade: 0
Condition: MSA-Miscellaneous Survey Abandoned
Remarks: MADE TO PREVIOUS RPP

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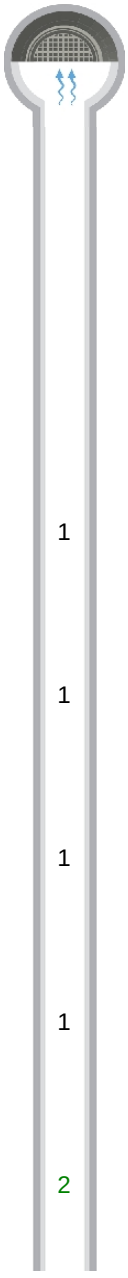
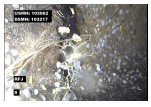
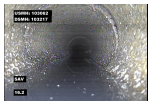
Defect Listing Plot

Pipe Segment Reference	City	Street	Material	Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe		Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**	**Location Details**	
103062			Circular		
Downstream MH	**Length surveyed**	**Year Renewed**	**Height / Width**	**Pipe Joint Length**	
103217	227.2		8		

SPR	82	MPR	10	PO Number	Customer
SPRI	2	MPRI	0		
QSR	2G00	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
92	CHRISTIAN CHURCH	Upstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
2.2	P0036843-042022	Heavy Cleaning	09:30		
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			09:43		



0 ft.	AMH-Access Point Manhole		103217
0 ft.	MWL-Miscellaneous Water Level		
0 ft.	RFJ-Roots Fine Joint		
0 ft.	RFJ-Roots Fine Joint		
9 ft.	RFJ-Roots Fine Joint		
13.5 ft.	RFJ-Roots Fine Joint		
16.2 ft.	SAV-Surface Damage Aggregate Visible - S01		

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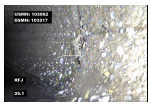
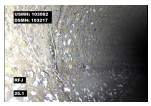
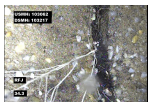
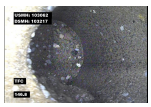
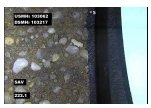
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	227.2		8			

21.3 ft.	RFJ-Roots Fine Joint		1	
25.1 ft.	RFJ-Roots Fine Joint		1	
25.1 ft.	RFJ-Roots Fine Joint		1	
30.9 ft.	RFJ-Roots Fine Joint		1	
30.9 ft.	RFJ-Roots Fine Joint		1	
34.3 ft.	RFJ-Roots Fine Joint		1	
146.8 ft.	TFC-Tap Factory Made Capped			
221.9 ft.	MMC-Miscellaneous Material Change			PVC
222.1 ft.	SAV-Surface Damage Aggregate Visible - F01		2	

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Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103062_103217	CLARKTON	E ROBERTS ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103062			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103217	227.2		8			

227.2 ft. MSA-Miscellaneous Survey Abandoned

MADE TO PREVIOUS RPP

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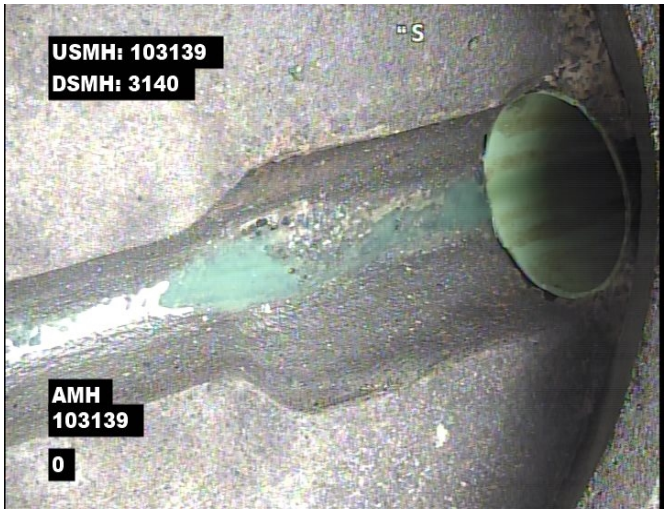
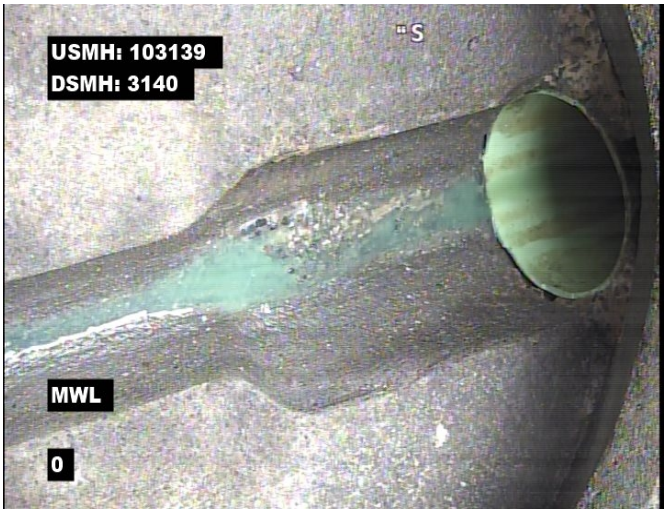
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103139_3140	CLARKTON	S GROVE ST	PolyVinyl Chloride			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103139			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
3140	56.9		8			

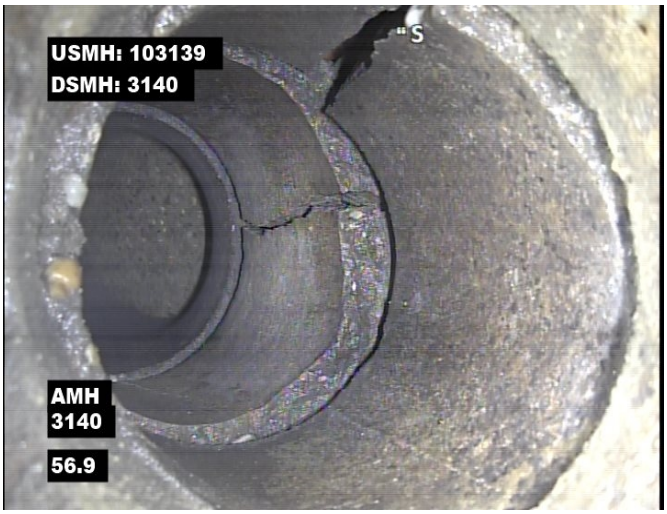


Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103139



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 1.0 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: RCP



Distance: 56.9 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 3140

Infrastructure Technologies
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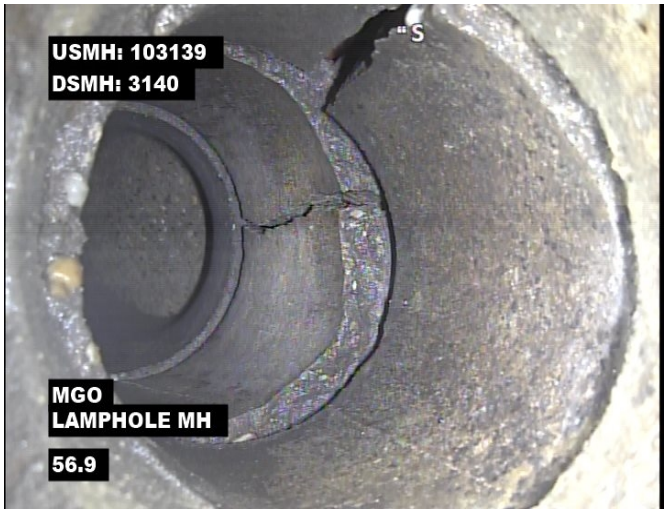
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103139_3140	CLARKTON	S GROVE ST	PolyVinyl Chloride			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103139			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
3140	56.9		8			



Distance: 56.9 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: LAMPHOLE MH

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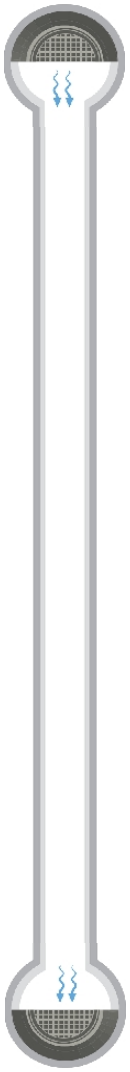
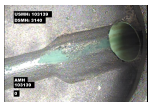
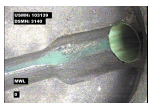
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103139_3140	CLARKTON	S GROVE ST	PolyVinyl Chloride			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103139			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
3140	56.9		8			

SPR	0	MPR	0	PO Number	Customer
SPRI	0	MPRI	0		
QSR	0000	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
0	CHRISTIAN CHURCH	Downstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
0	P0036843-042022	Light Cleaning	10:27	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			10:32		



0 ft.	AMH-Access Point Manhole		103139
0 ft.	MWL-Miscellaneous Water Level		
1 ft.	MMC-Miscellaneous Material Change		RCP
56.9 ft.	AMH-Access Point Manhole		3140
56.9 ft.	MGO-Miscellaneous General Observation		LAMPHOLE MH

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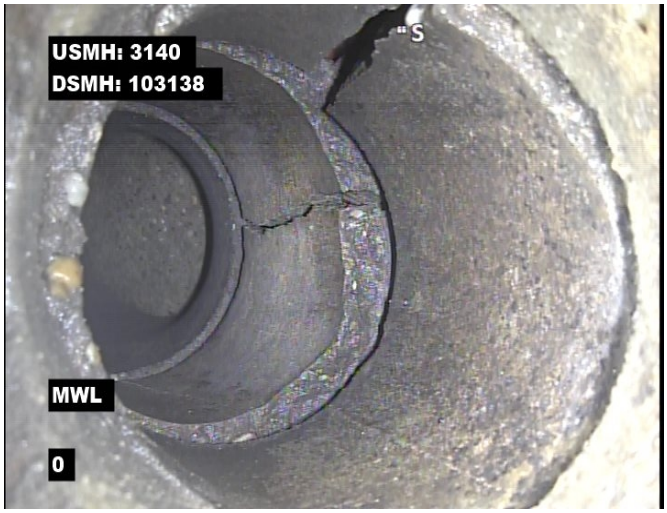
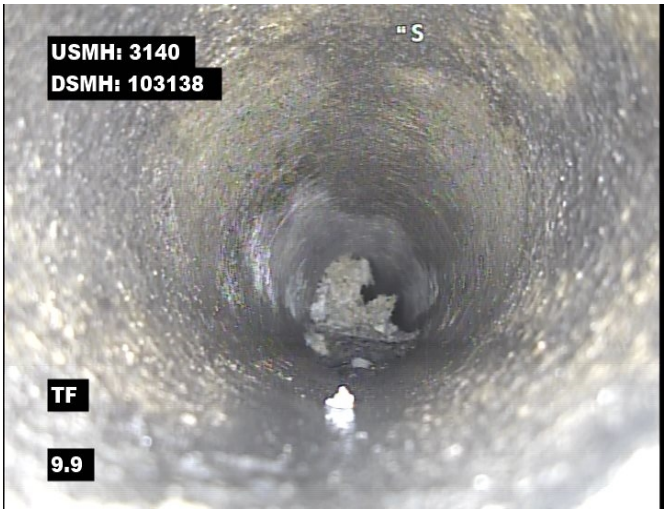
4 Image Report

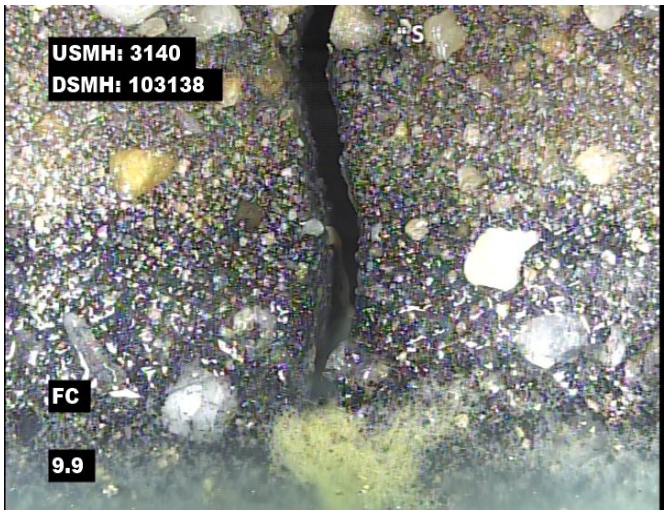
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
3140_103138	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
3140			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103138	213.9		8			



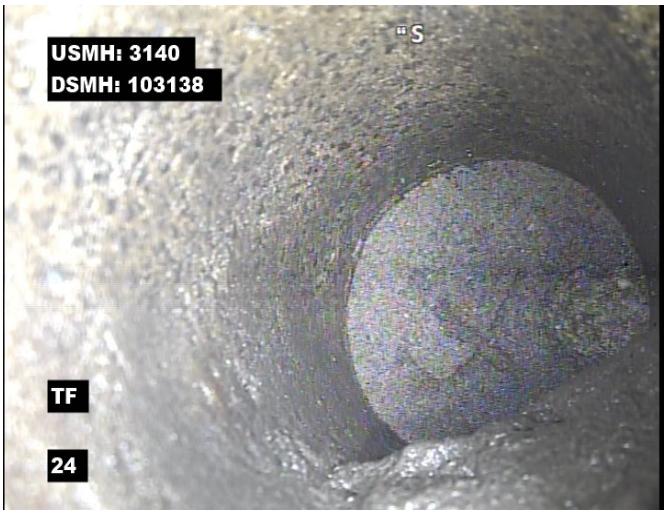
Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 9.9 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 9.9 ft. Grade: 2
Condition: FC-Fracture Circumferential
Remarks: N/A



Distance: 24.0 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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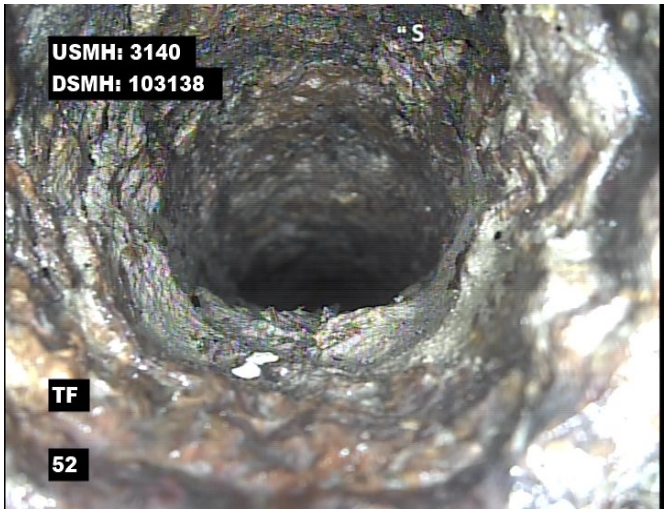
4 Image Report

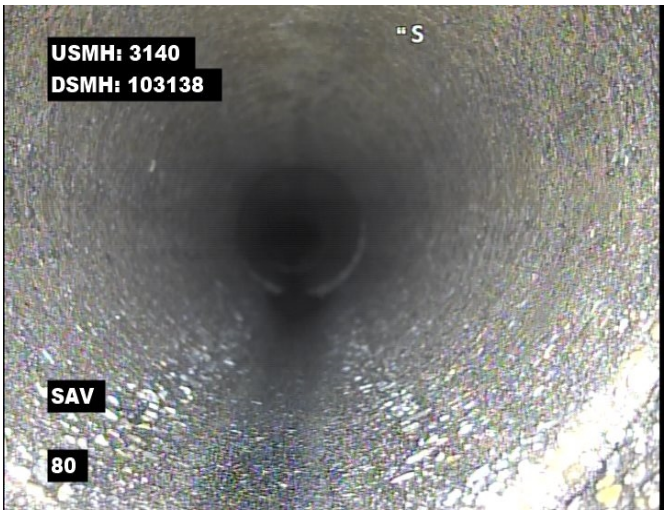
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
3140_103138	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
3140			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103138	213.9		8			



Distance: 52.0 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 71.2 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC

Distance: 75.9 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: RCP



Distance: 80.0 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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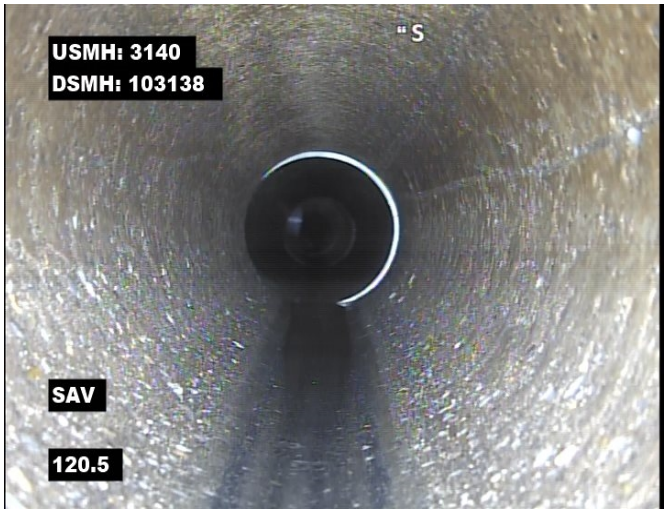
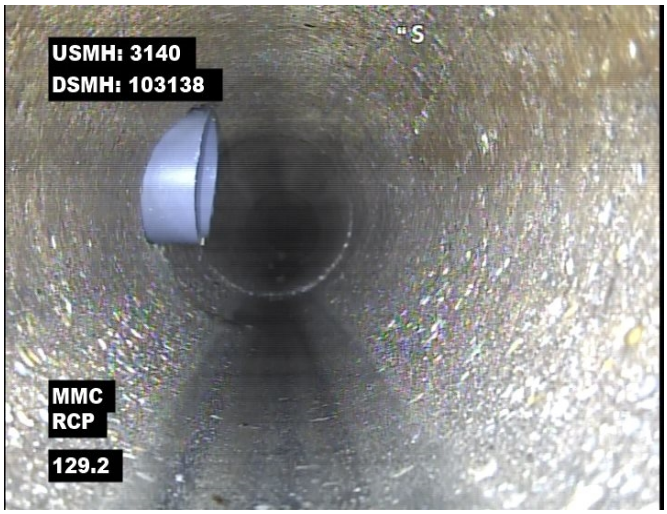
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
3140_103138	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
3140			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103138	213.9		8			

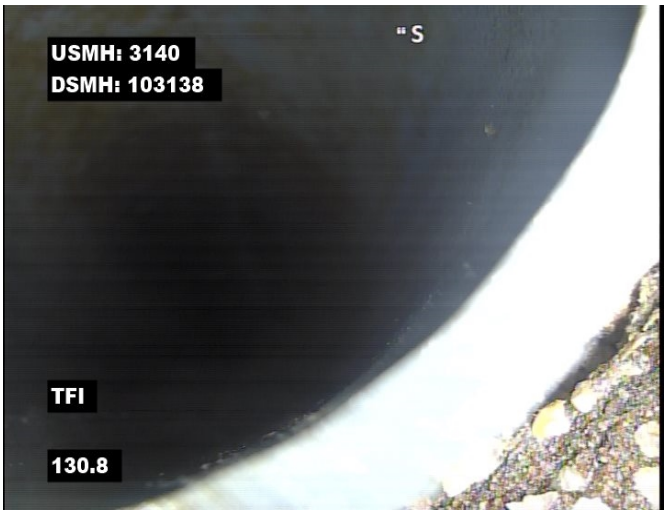


Distance: 120.5 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 123.2 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC



Distance: 129.2 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: RCP



Distance: 130.8 ft. Grade: 5
Condition: TFI-Tap Factory Made Intruding
Remarks: N/A

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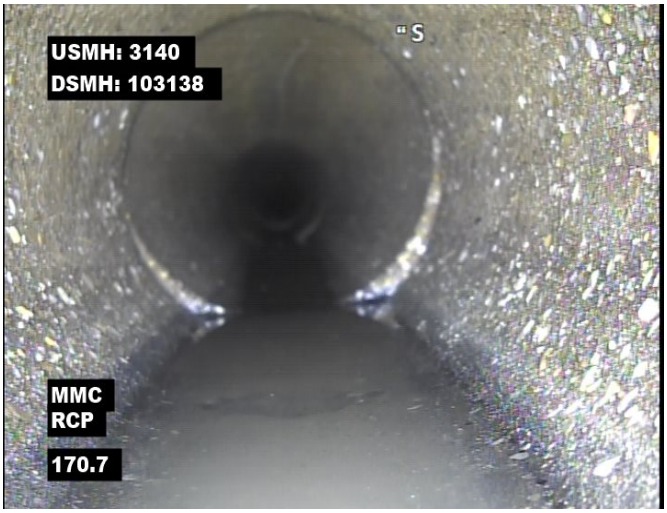
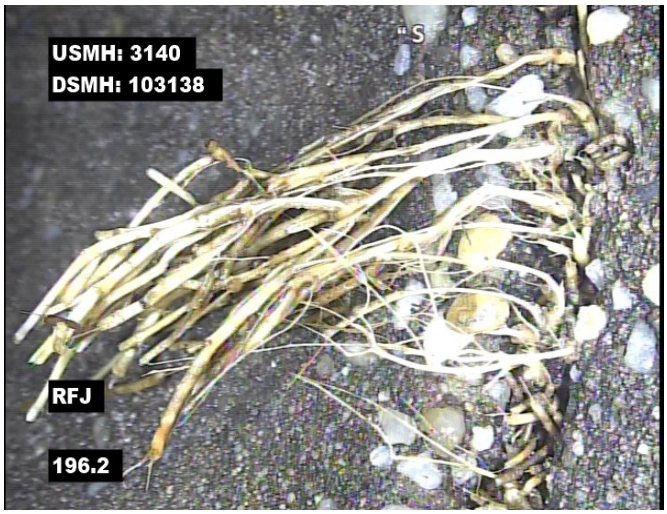
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
3140_103138	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
3140			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103138	213.9		8			

Distance: 166.2 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC



Distance: 170.7 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: RCP



Distance: 196.2 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 196.2 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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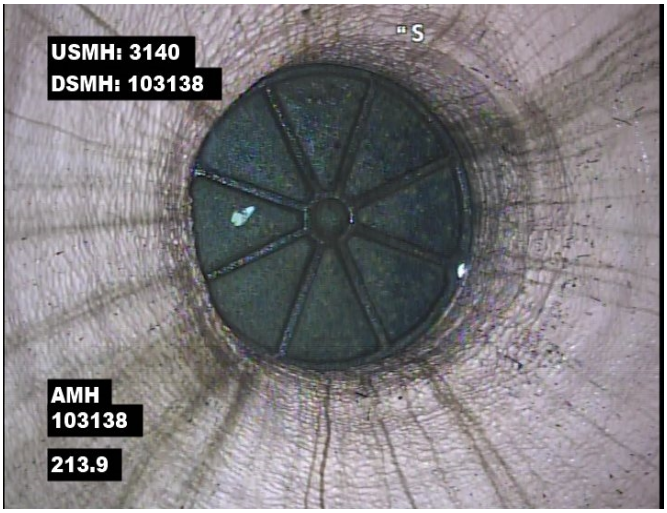
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
3140_103138	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
3140			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103138	213.9		8			

Distance: 209.9 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 213.9 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103138

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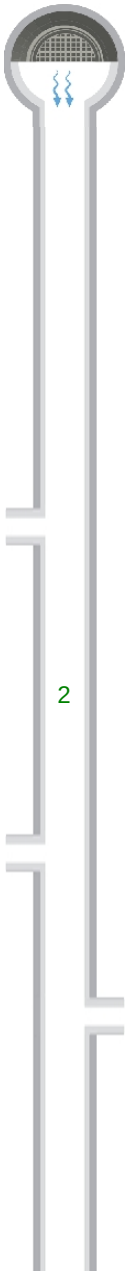
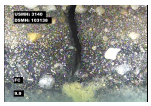
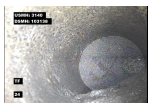
Defect Listing Plot

Pipe Segment Reference	City	Street	Material	Location Code	Pipe Use
3140_103138	CLARKTON	S GROVE ST	Reinforced Concrete Pipe		Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**	**Location Details**	
3140			Circular		
Downstream MH	**Length surveyed**	**Year Renewed**	**Height / Width**	**Pipe Joint Length**	
103138	213.9		8		

SPR	18	MPR	7	PO Number	Customer
SPRI	2	MPRI	7		
QSR	2900	QMR	5100	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
25	CHRISTIAN CHURCH	Downstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
2.5	P0036843-042022	Light Cleaning	10:33	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			10:49		



0 ft.	AMH-Access Point Manhole		3140
0 ft.	MWL-Miscellaneous Water Level		
9.9 ft.	TF-Tap Factory Made		
9.9 ft.	FC-Fracture Circumferential		
24 ft.	TF-Tap Factory Made		
52 ft.	TF-Tap Factory Made		
71.2 ft.	MMC-Miscellaneous Material Change		PVC

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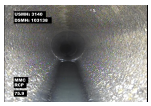
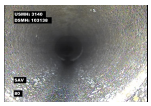
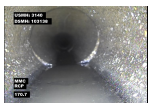
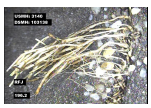
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
3140_103138	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
3140			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103138	213.9		8			

75.9 ft.	MMC-Miscellaneous Material Change			RCP
80 ft.	SAV-Surface Damage Aggregate Visible - S01		2	
120.5 ft.	SAV-Surface Damage Aggregate Visible - F01		2	
123.2 ft.	MMC-Miscellaneous Material Change			PVC
129.2 ft.	MMC-Miscellaneous Material Change			RCP
130.8 ft.	TFI-Tap Factory Made Intruding		5	
166.2 ft.	MMC-Miscellaneous Material Change			PVC
170.7 ft.	MMC-Miscellaneous Material Change			RCP
196.2 ft.	RFJ-Roots Fine Joint		1	

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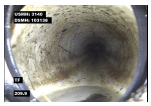
Defect Listing Plot

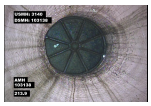
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
3140_103138	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
3140			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103138	213.9		8			

196.2 ft. RFJ-Roots Fine Joint

209.9 ft. TF-Tap Factory Made



213.9 ft. AMH-Access Point Manhole



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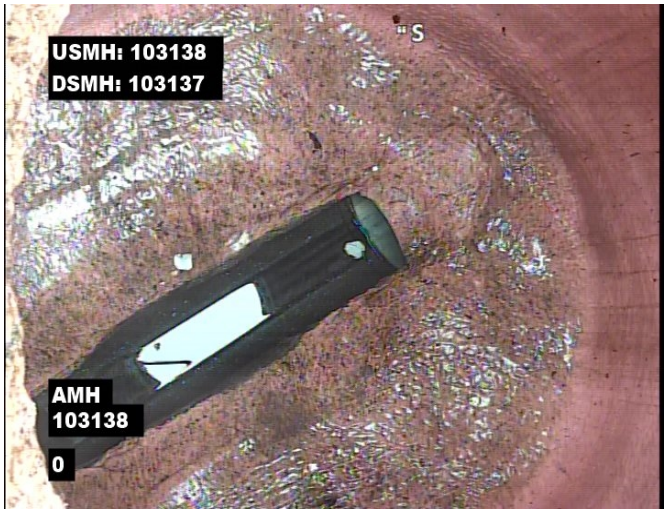
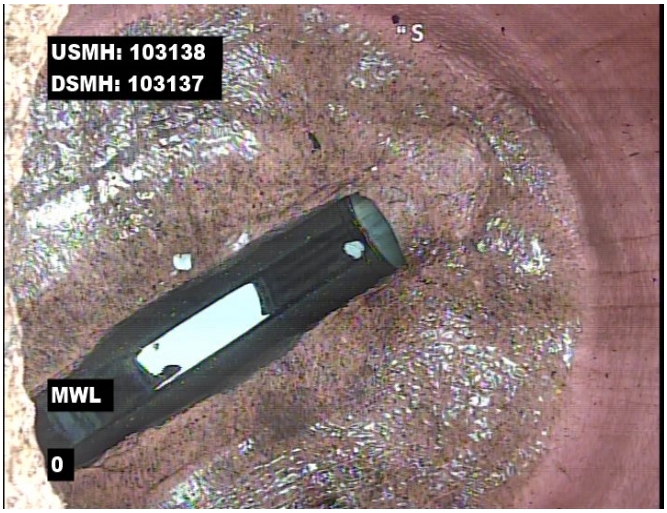
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103138_103137	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103138			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103137	211.3		8			



Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103138



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 11.4 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 62.8 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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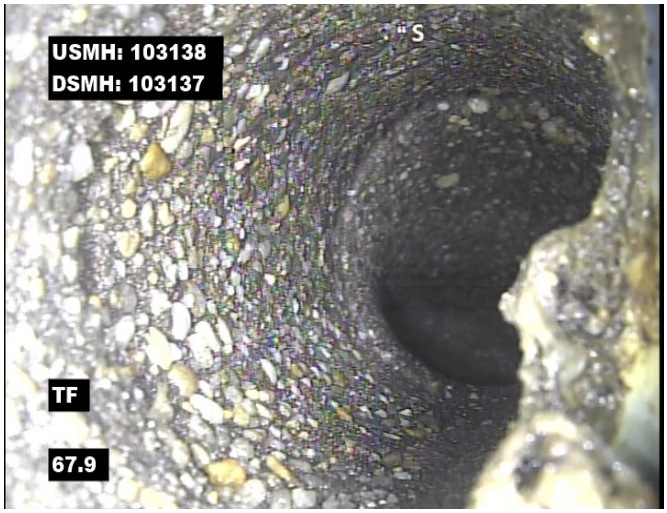
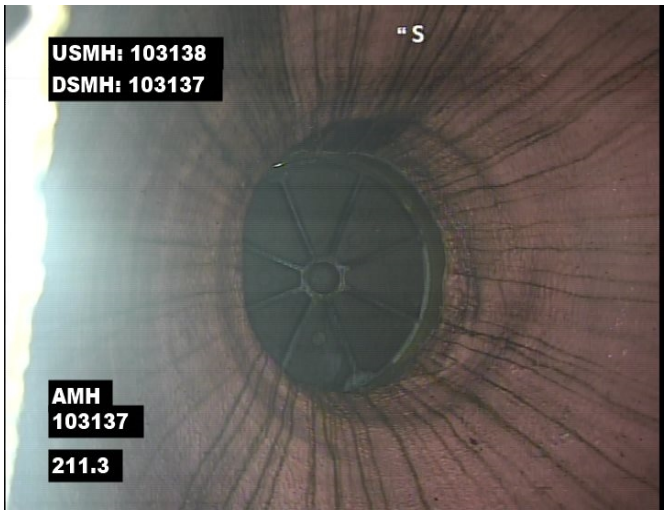
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103138_103137	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103138			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103137	211.3		8			



Distance: 67.9 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 101.1 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 211.3 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103137

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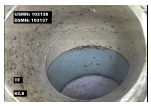
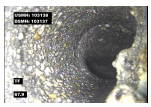
Pipe Segment Reference	City	Street	Material	Location Code	Pipe Use
103138_103137	CLARKTON	S GROVE ST	Reinforced Concrete Pipe		Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**	**Location Details**	
103138			Circular		
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height / Width**	**Pipe Joint Length**	
103137	211.3		8		

SPR	0	MPR	0	PO Number	Customer
SPRI	0	MPRI	0		
QSR	0000	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
0	CHRISTIAN CHURCH	Downstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
0	P0036843-042022	Light Cleaning	11:26	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			12:13		

0 ft.	AMH-Access Point Manhole		103138
0 ft.	MWL-Miscellaneous Water Level		
11.4 ft.	TF-Tap Factory Made		
62.8 ft.	TF-Tap Factory Made		
67.9 ft.	TF-Tap Factory Made		
101.1 ft.	TF-Tap Factory Made		

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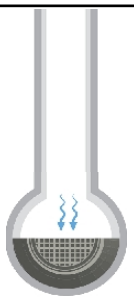
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103138_103137	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103138			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103137	211.3		8			

211.3 ft. AMH-Access Point Manhole  103137



103137

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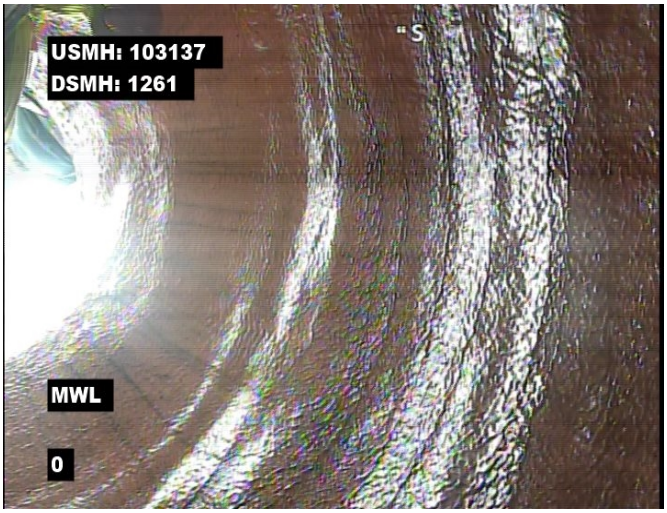
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103137_1261	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103137			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1261	280.4		8			

Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103137



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 74.2 ft. Grade: 3
Condition: LFW-Lining Feature Wrinkled
Remarks: N/A

Distance: 100.4 ft. Grade: 3
Condition: LFW-Lining Feature Wrinkled
Remarks: N/A

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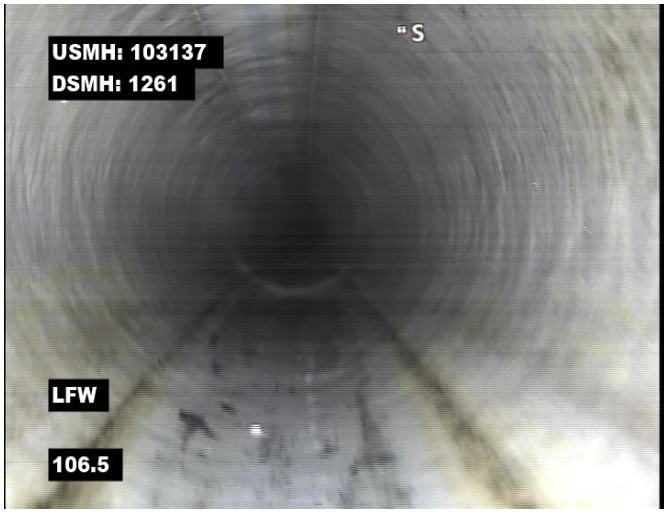
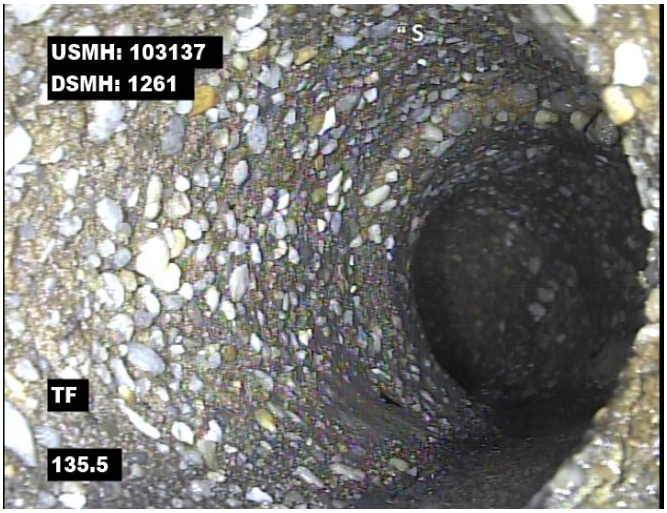
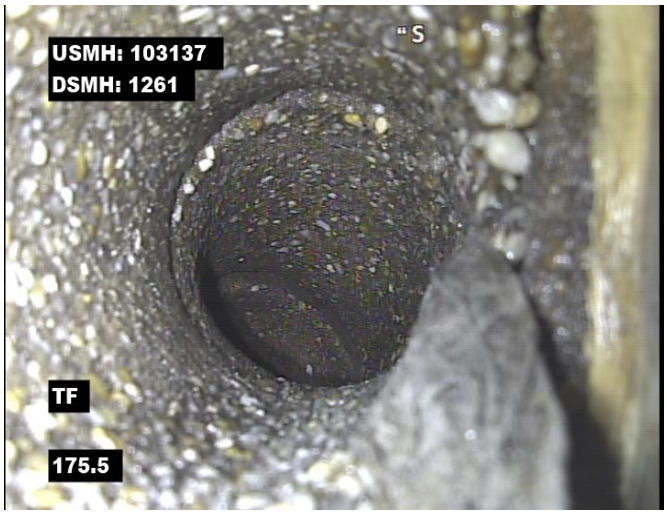
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103137_1261	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103137			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1261	280.4		8			



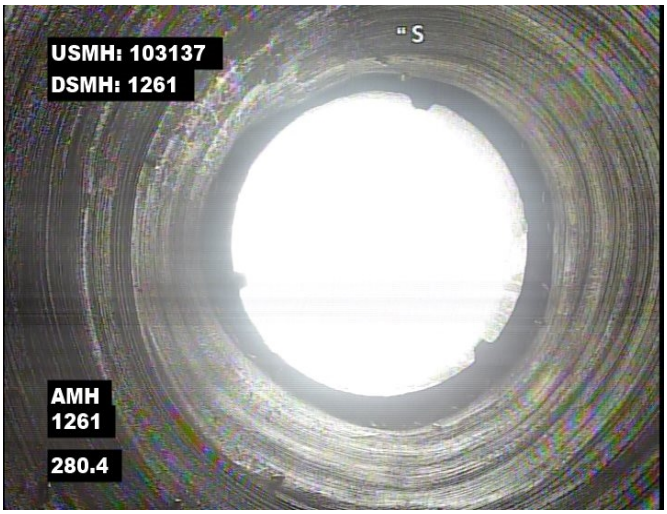
Distance: 106.1 ft. Grade: 3
Condition: LFW-Lining Feature Wrinkled
Remarks: N/A



Distance: 135.5 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 175.5 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 280.4 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1261

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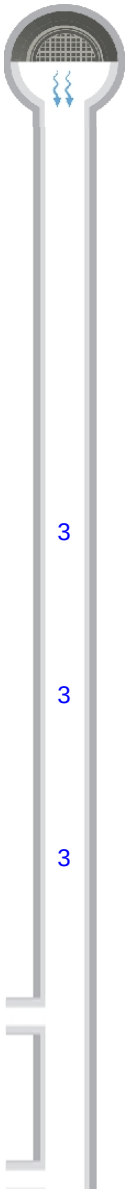
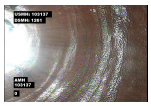
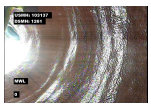
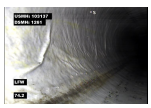
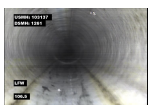
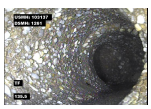
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103137_1261	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103137			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1261	280.4		8			

SPR	6	MPR	0	PO Number	Customer
SPRI	3	MPRI	0		
QSR	3200	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
6	CHRISTIAN CHURCH	Downstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
3	P0036843-042022	Light Cleaning	12:18	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			12:58		



0 ft.	AMH-Access Point Manhole		103137
0 ft.	MWL-Miscellaneous Water Level		
74.2 ft.	LFW-Lining Feature Wrinkled		
100.4 ft.	LFW-Lining Feature Wrinkled - S01		
106.1 ft.	LFW-Lining Feature Wrinkled - F01		
135.5 ft.	TF-Tap Factory Made		
175.5 ft.	TF-Tap Factory Made		

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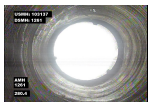
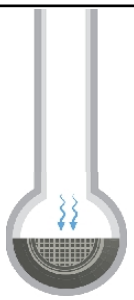
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103137_1261	CLARKTON	S GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103137			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1261	280.4		8			

280.4 ft. AMH-Access Point Manhole  1261



1261

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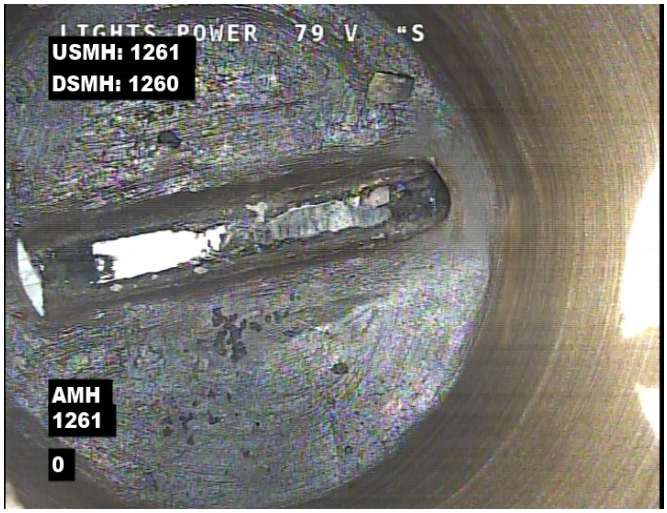
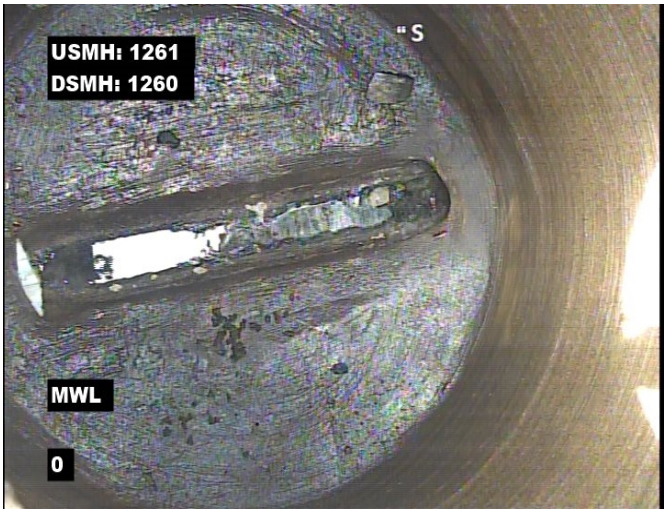
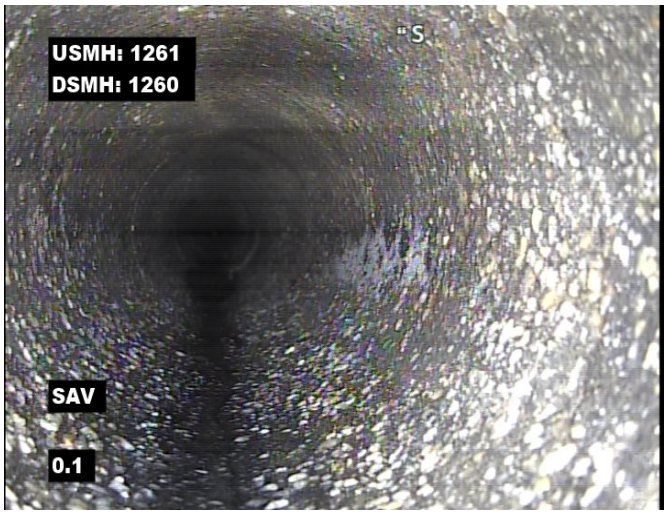
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			



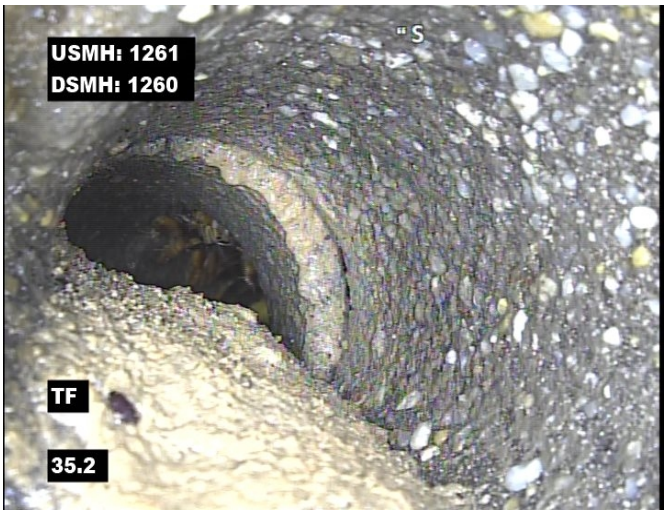
Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1261



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 0.1 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A



Distance: 35.2 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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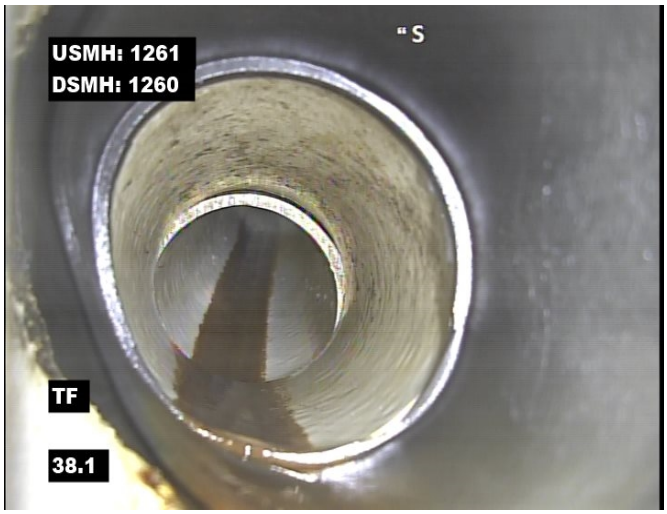
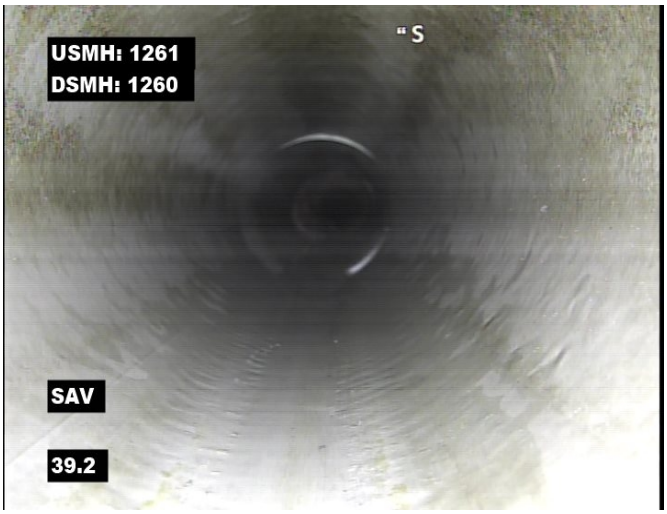
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			

Distance: 35.6 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC

Distance: 35.6 ft. Grade: 3
Condition: JOM-Joint Offset Medium
Remarks: N/A



Distance: 38.1 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 39.2 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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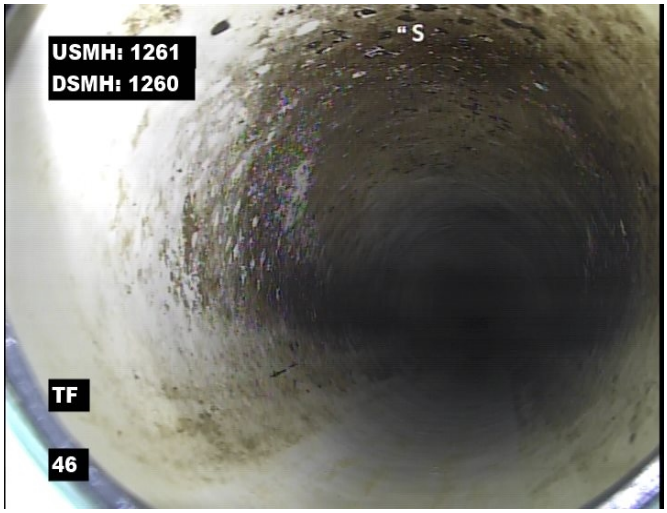
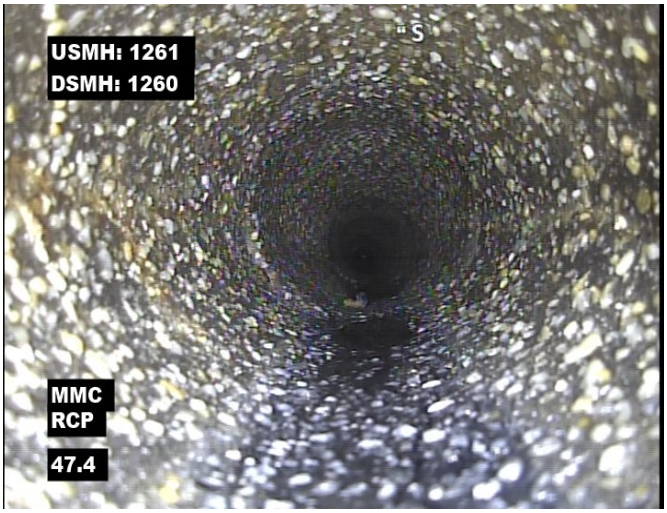
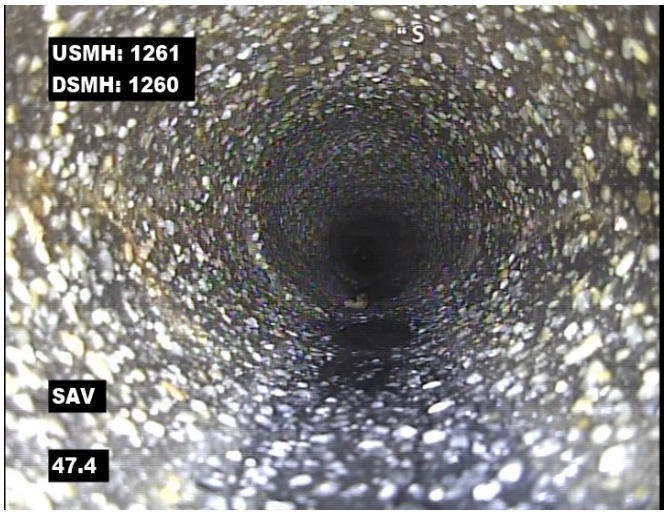
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			



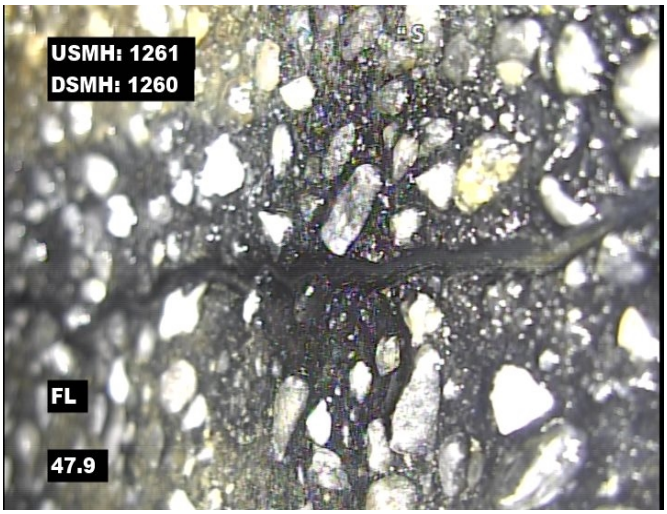
Distance: 46.0 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 47.4 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: RCP



Distance: 47.4 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A



Distance: 47.9 ft. Grade: 3
Condition: FL-Fracture Longitudinal
Remarks: N/A

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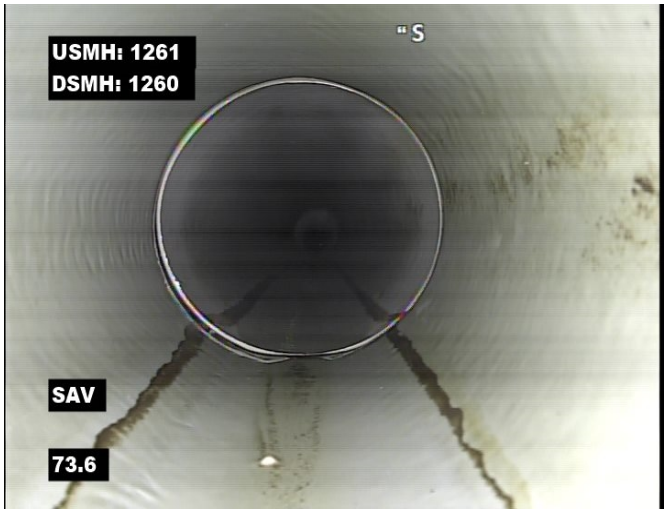
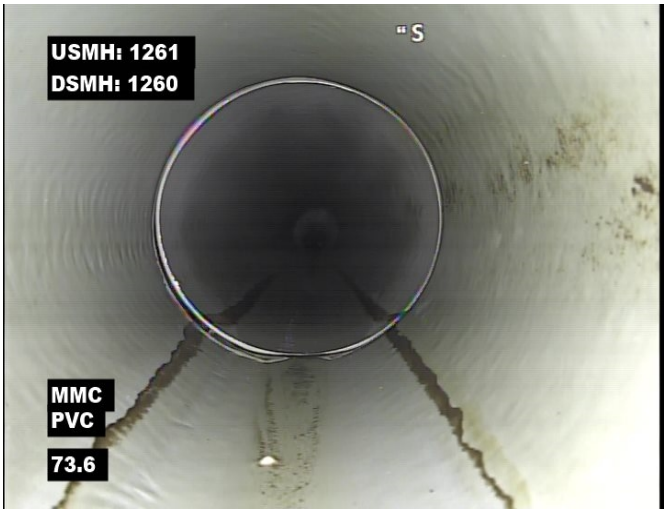
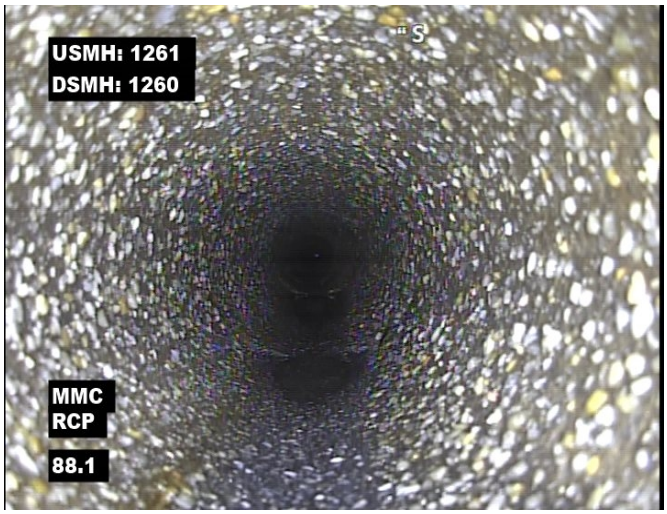
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			



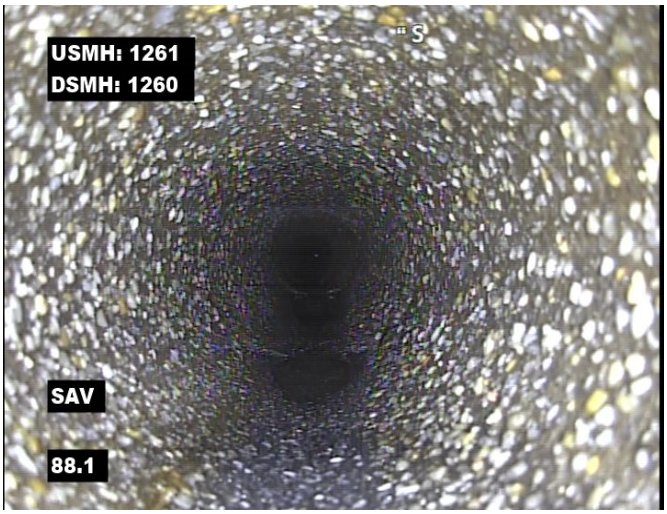
Distance: 73.6 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A



Distance: 73.6 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC



Distance: 88.1 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: RCP



Distance: 88.1 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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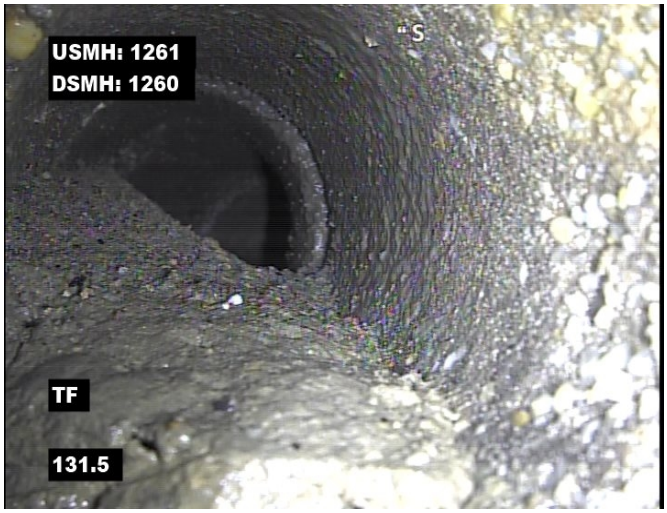
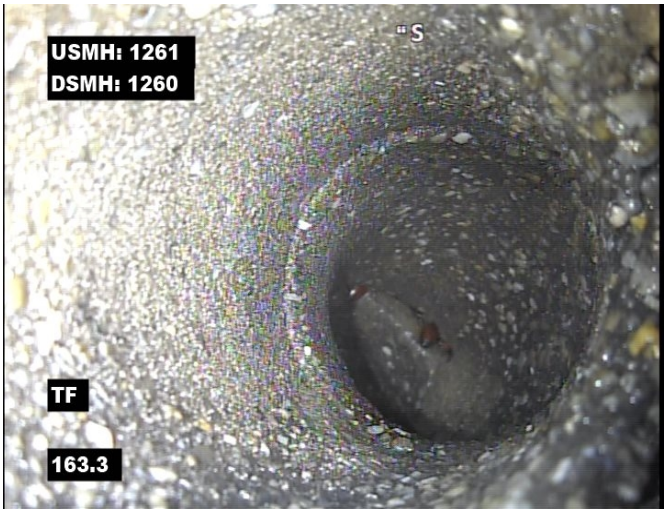
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			

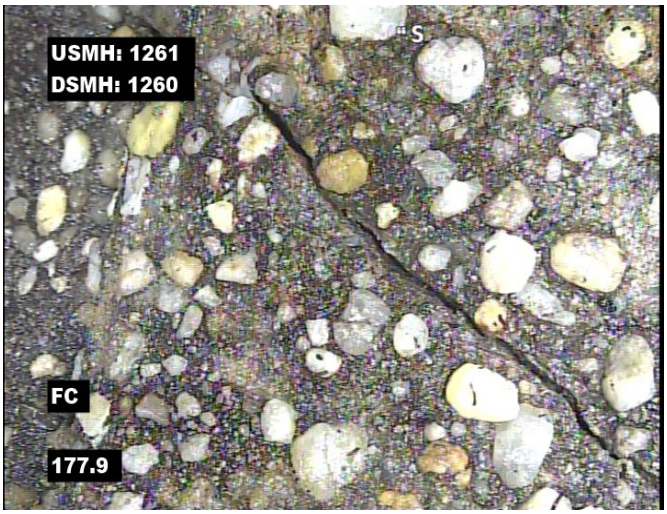


Distance: 131.5 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 163.3 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 175.4 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 177.9 ft. Grade: 2
Condition: FC-Fracture Circumferential
Remarks: N/A

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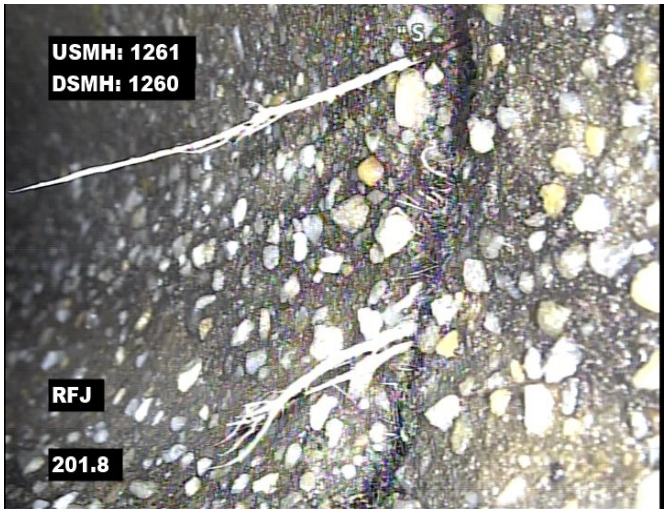
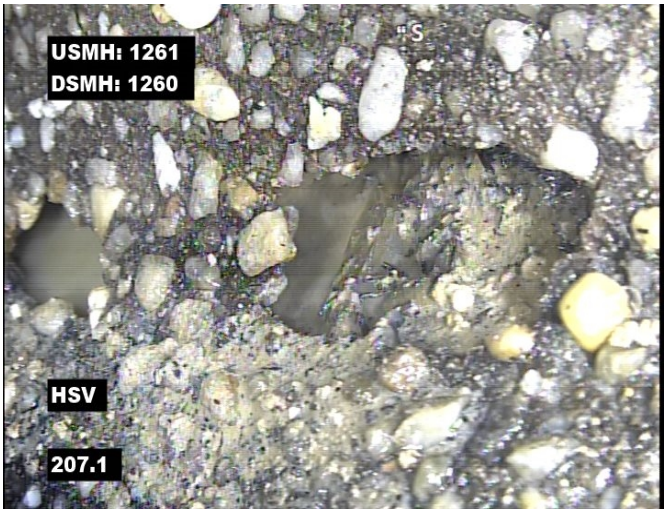
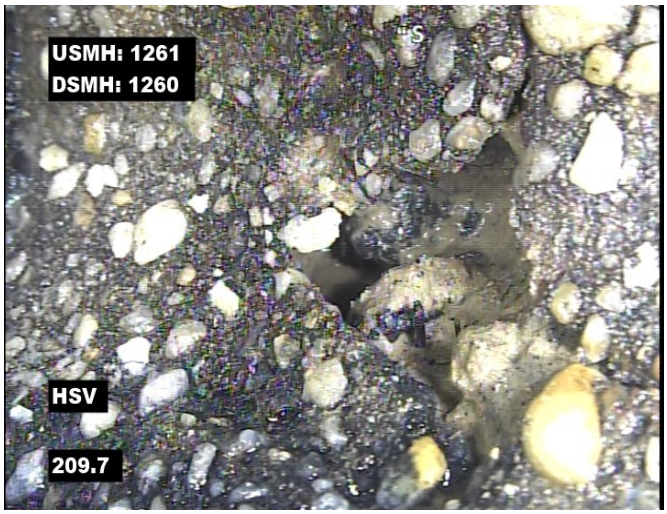
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			



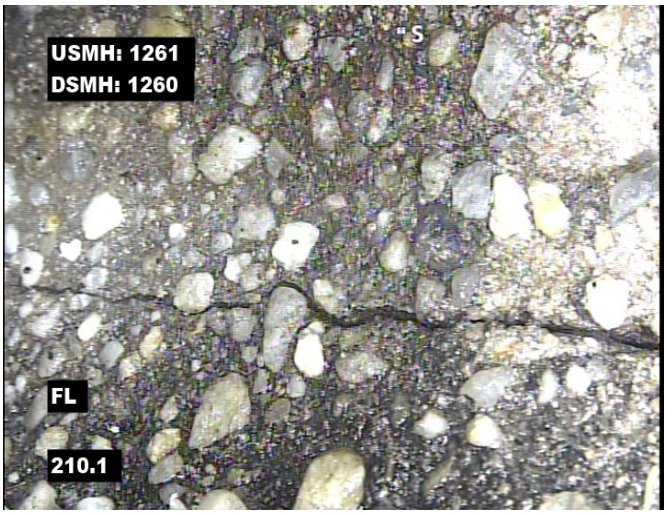
Distance: 201.8 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 207.1 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A



Distance: 209.7 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A



Distance: 210.1 ft. Grade: 3
Condition: FL-Fracture Longitudinal
Remarks: N/A

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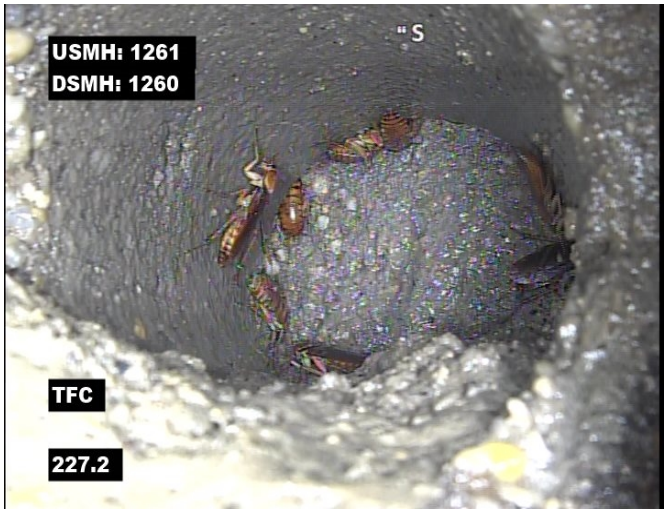
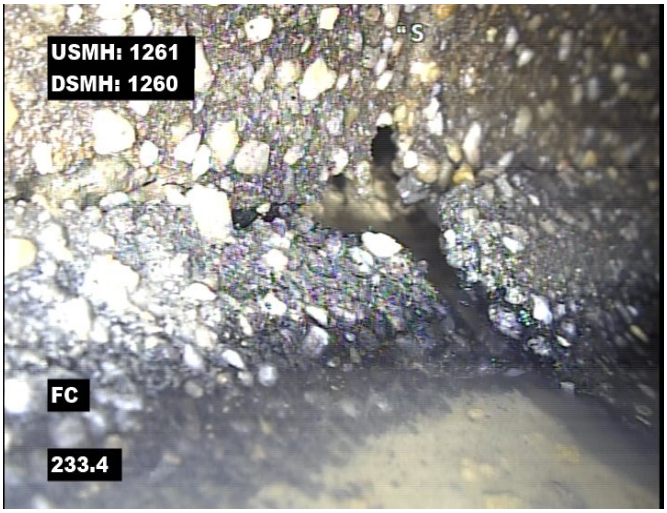
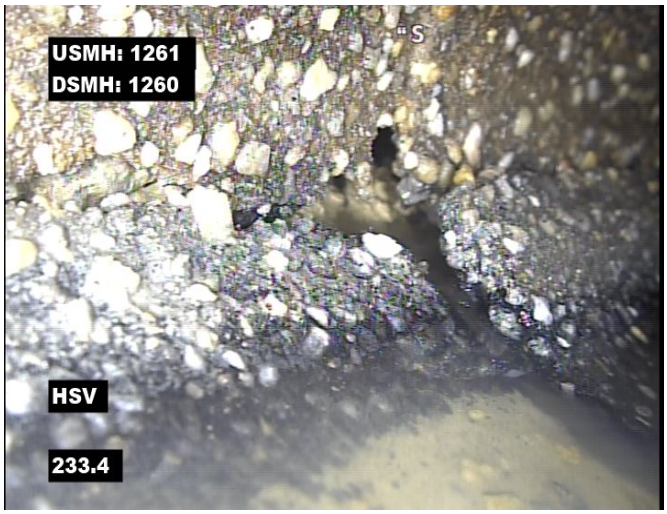
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			



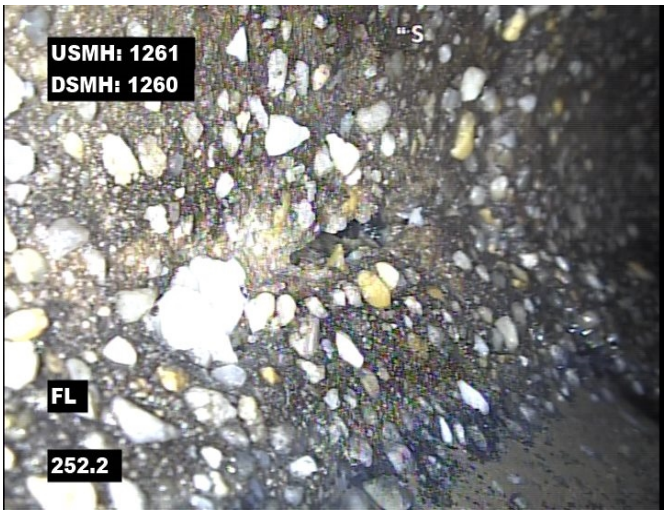
Distance: 227.2 ft. Grade: 0
Condition: TFC-Tap Factory Made Capped
Remarks: N/A



Distance: 233.4 ft. Grade: 2
Condition: FC-Fracture Circumferential
Remarks: N/A



Distance: 233.4 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A



Distance: 252.2 ft. Grade: 3
Condition: FL-Fracture Longitudinal
Remarks: N/A

Infrastructure Technologies
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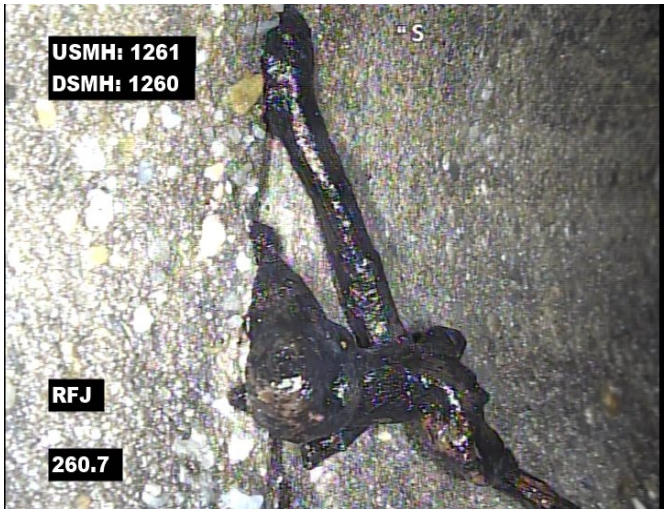
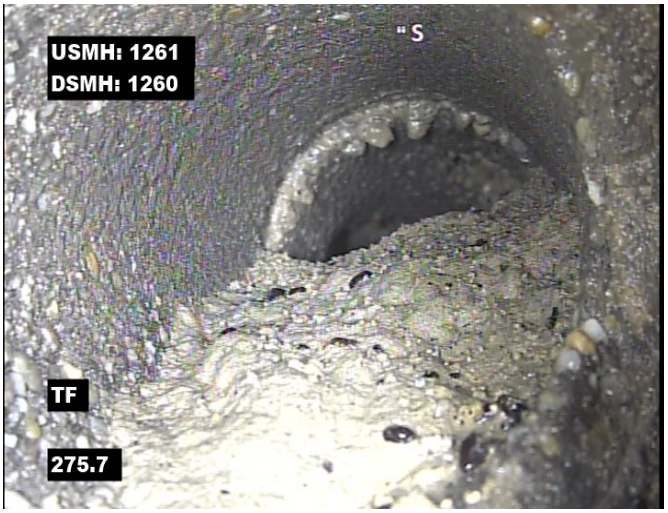
4 Image Report

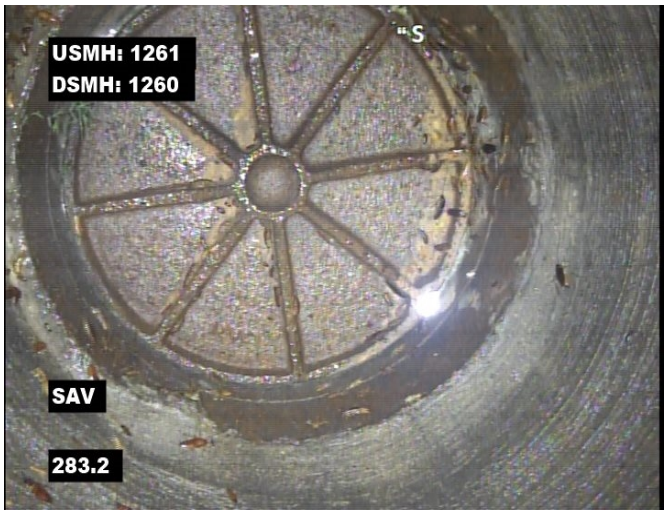
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			



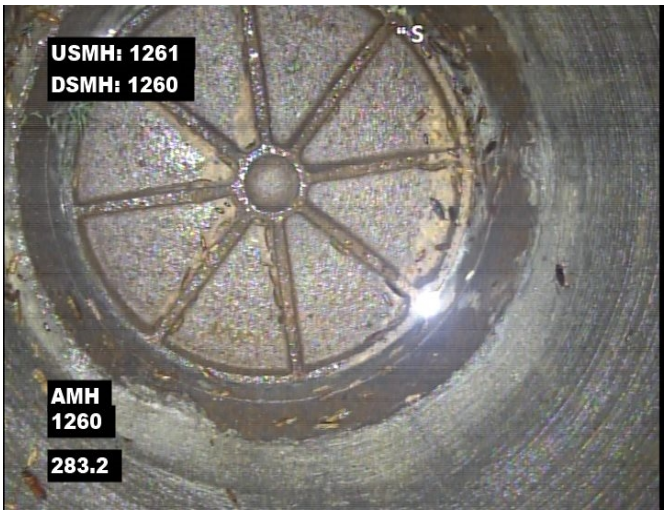
Distance: 260.7 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 275.7 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 283.2 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A



Distance: 283.2 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1260

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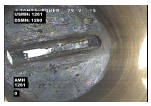
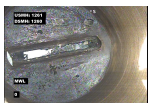
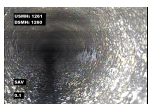
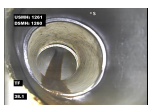
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1261			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1260	283.2		8			

SPR	135	MPR	2	PO Number	Customer
SPRI	2.2	MPRI	0		
QSR	5334	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
137	CHRISTIAN CHURCH	Downstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
2.2	P0036843-042022	Heavy Cleaning	15:08	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			15:25		

0 ft.	AMH-Access Point Manhole		1261
0 ft.	MWL-Miscellaneous Water Level		
0.1 ft.	SAV-Surface Damage Aggregate Visible - S01		
35.2 ft.	TF-Tap Factory Made		
35.6 ft.	MMC-Miscellaneous Material Change		PVC
35.6 ft.	JOM-Joint Offset Medium		
38.1 ft.	TF-Tap Factory Made		

Infrastructure Technologies
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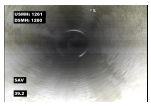
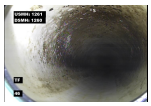
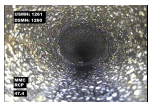
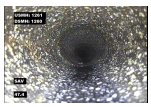
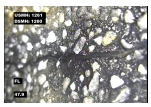
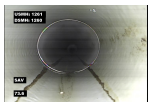
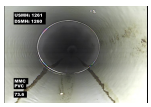
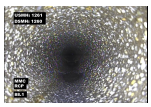
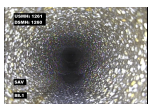
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1261			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1260	283.2		8			

39.2 ft.	SAV-Surface Damage Aggregate Visible - F01		2	
46 ft.	TF-Tap Factory Made			
47.4 ft.	MMC-Miscellaneous Material Change			RCP
47.4 ft.	SAV-Surface Damage Aggregate Visible - S02		2	
47.9 ft.	FL-Fracture Longitudinal		3	
73.6 ft.	SAV-Surface Damage Aggregate Visible - F02		2	
73.6 ft.	MMC-Miscellaneous Material Change			PVC
88.1 ft.	MMC-Miscellaneous Material Change			RCP
88.1 ft.	SAV-Surface Damage Aggregate Visible - S03		2	

Infrastructure Technologies
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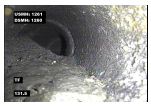
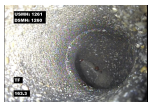
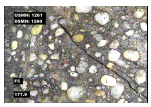
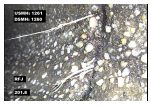
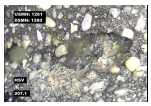
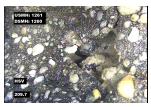
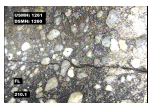
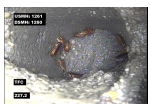
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1261			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1260	283.2		8			

131.5 ft.	TF-Tap Factory Made		
163.3 ft.	TF-Tap Factory Made		
175.4 ft.	TF-Tap Factory Made		
177.9 ft.	FC-Fracture Circumferential		2
201.8 ft.	RFJ-Roots Fine Joint		1
207.1 ft.	HSV-Hole Soil Visible		5
209.7 ft.	HSV-Hole Soil Visible		5
210.1 ft.	FL-Fracture Longitudinal		3
227.2 ft.	TFC-Tap Factory Made Capped		

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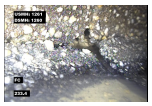
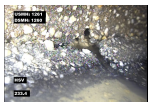
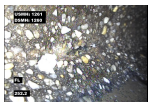
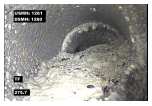
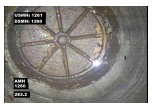
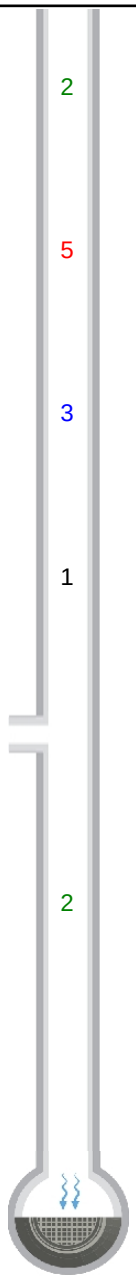
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1261_1260	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1261			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1260	283.2		8			

233.4 ft.	FC-Fracture Circumferential		2
233.4 ft.	HSV-Hole Soil Visible		5
252.2 ft.	FL-Fracture Longitudinal		3
260.7 ft.	RFJ-Roots Fine Joint		1
275.7 ft.	TF-Tap Factory Made		
283.2 ft.	SAV-Surface Damage Aggregate Visible - F03		2
283.2 ft.	AMH-Access Point Manhole		1260



1260

Infrastructure Technologies
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Albuquerque, NM
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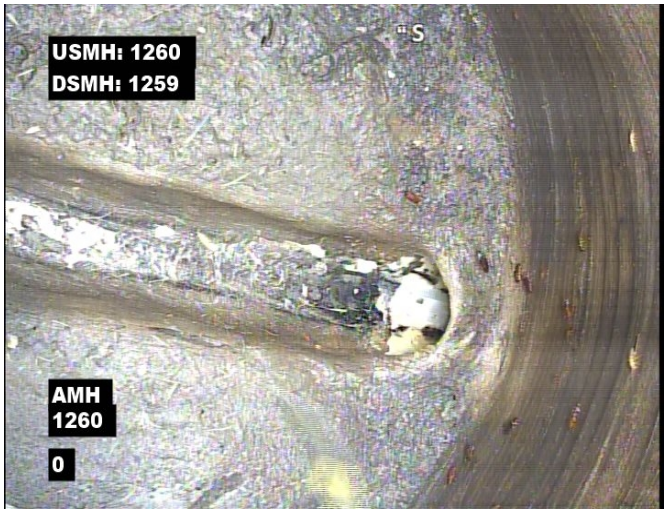
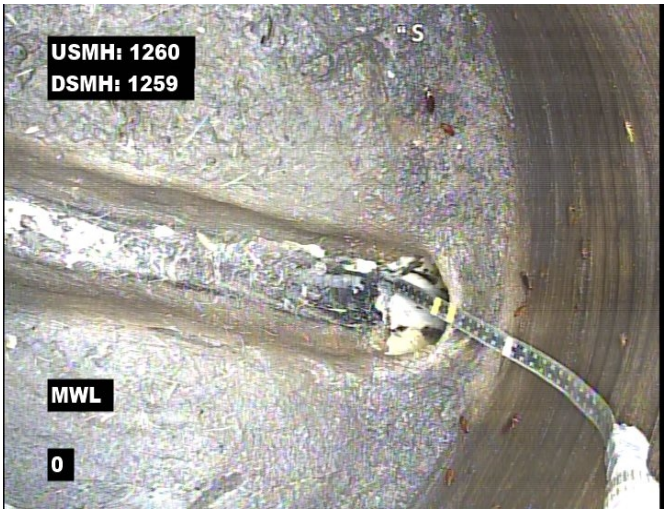
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1260_1259	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1260			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1259	253.3		8			

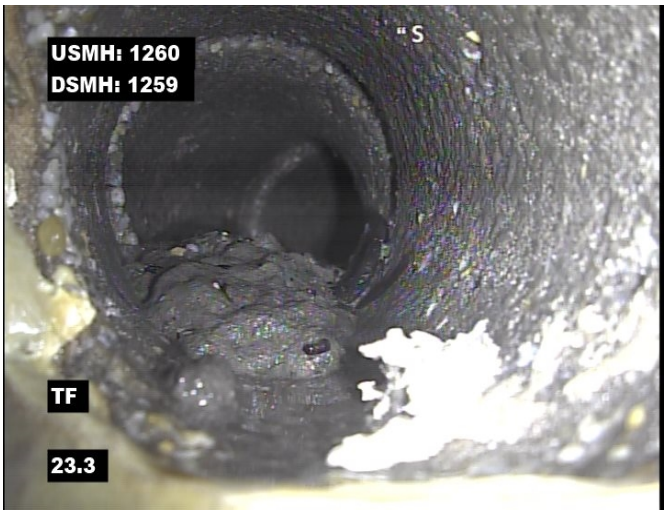


Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1260



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 19.8 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 23.3 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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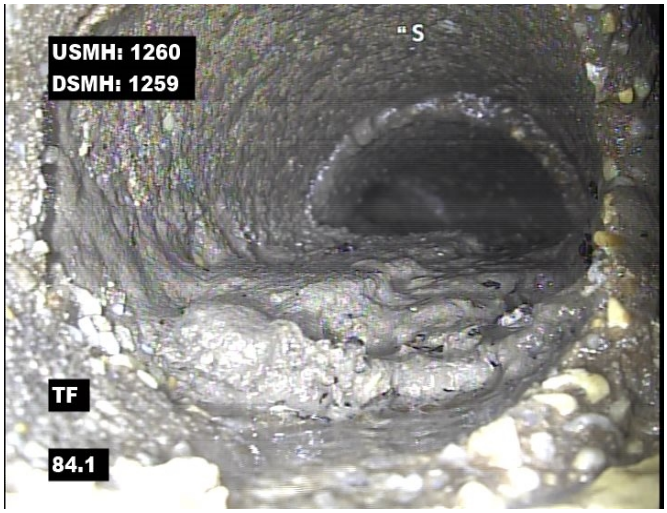
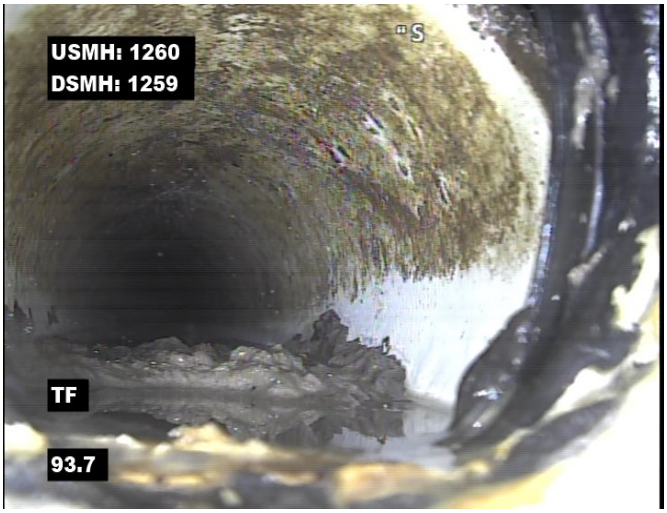
4 Image Report

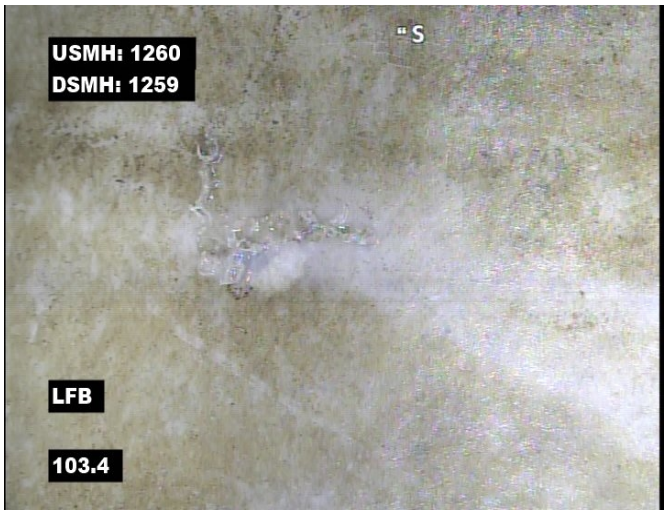
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1260_1259	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1260			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1259	253.3		8			



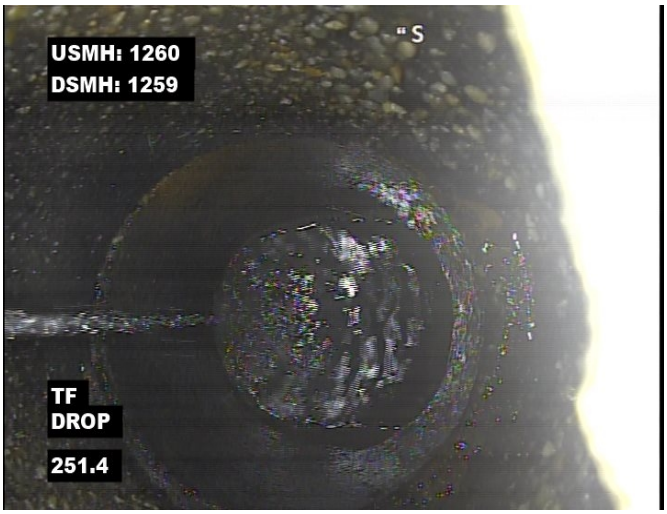
Distance: 84.1 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 93.7 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 103.4 ft. Grade: 3
Condition: LFB-Lining Feature Blistered
Remarks: N/A



Distance: 251.4 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: DROP

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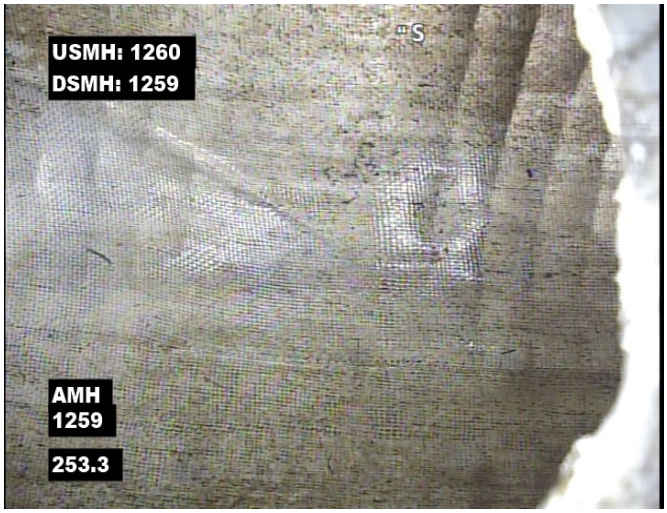
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1260_1259	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1260			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1259	253.3		8			



Distance: 253.3 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1259

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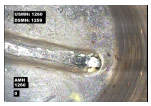
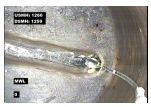
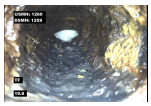
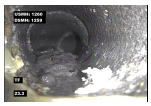
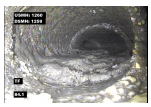
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1260_1259	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1260			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1259	253.3		8			

SPR	3	MPR	0	PO Number	Customer
SPRI	3	MPRI	0		
QSR	3100	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
3	CHRISTIAN CHURCH	Downstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
3	P0036843-042022	Light Cleaning	15:44	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			15:57		

0 ft.	AMH-Access Point Manhole		1260
0 ft.	MWL-Miscellaneous Water Level		
19.8 ft.	TF-Tap Factory Made		
23.3 ft.	TF-Tap Factory Made		
84.1 ft.	TF-Tap Factory Made		
93.7 ft.	TF-Tap Factory Made		
103.4 ft.	LFB-Lining Feature Blistered		

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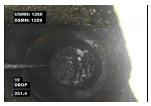
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1260_1259	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1260			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1259	253.3		8			

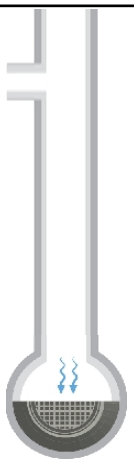
251.4 ft. TF-Tap Factory Made



DROP

253.3 ft. AMH-Access Point Manhole

1259



1259

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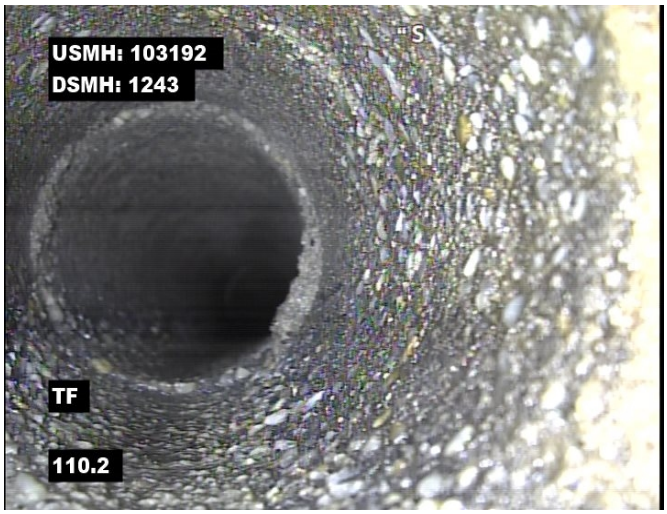
4 Image Report

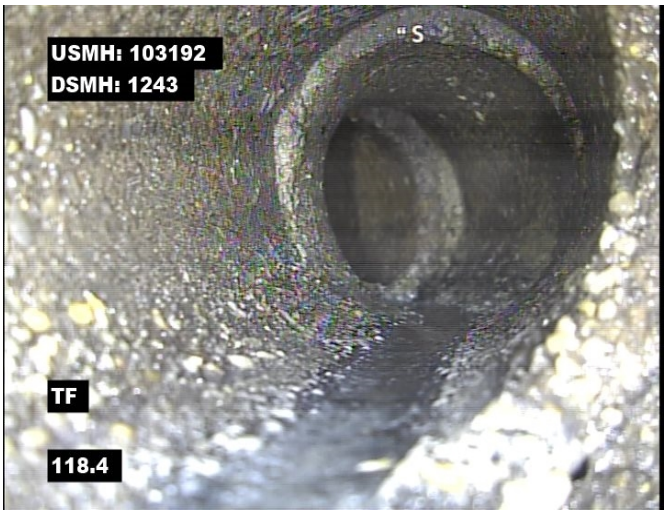
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103192_1243	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103192			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1243	122.4		8			

Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1243

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 110.2 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 118.4 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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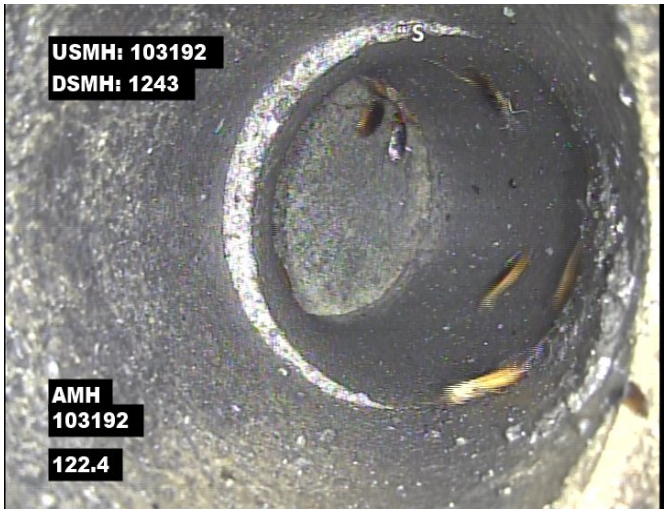
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103192_1243	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103192			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1243	122.4		8			



Distance: 122.4 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103192

Distance: 122.4 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: LAMPHOLE MH. COULD NOT LOCATE

Distance: 122.4 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: COULD NOT LOCATE

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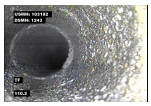
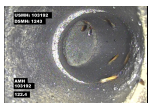
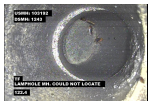
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103192_1243	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103192			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1243	122.4		8			

SPR	0	MPR	0	PO Number	Customer
SPRI	0	MPRI	0		
QSR	0000	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
0	CHRISTIAN CHURCH	Upstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
0	P0036843-042022	Heavy Cleaning	16:38	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			16:44		

0 ft.	AMH-Access Point Manhole		1243
0 ft.	MWL-Miscellaneous Water Level		
110.2 ft.	TF-Tap Factory Made		
118.4 ft.	TF-Tap Factory Made		
122.4 ft.	AMH-Access Point Manhole		103192
122.4 ft.	TF-Tap Factory Made		LAMPHOLE MH. COULD NOT LOCATE

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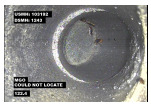
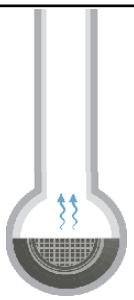
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103192_1243	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103192			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1243	122.4		8			

122.4 ft. MGO-Miscellaneous General Observation



COULD NOT LOCATE



103192

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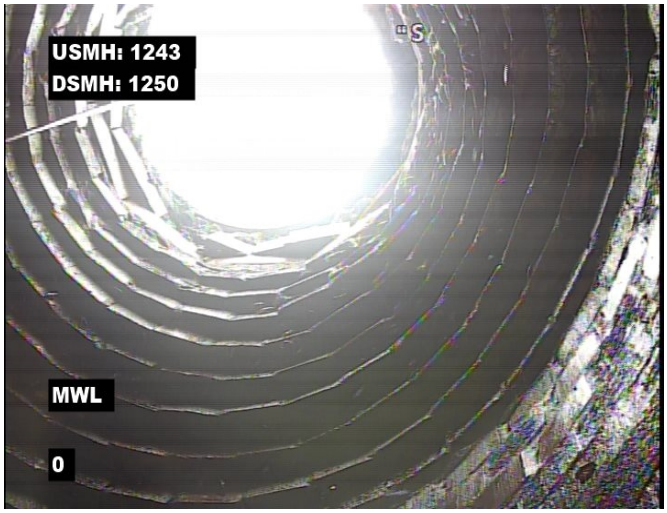
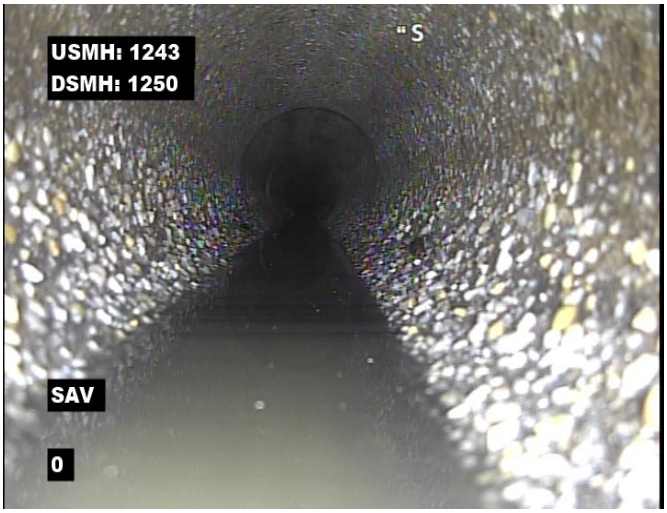
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1243_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1243			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1250	159.5		8			



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 0.0 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 62.0 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 62.0 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC

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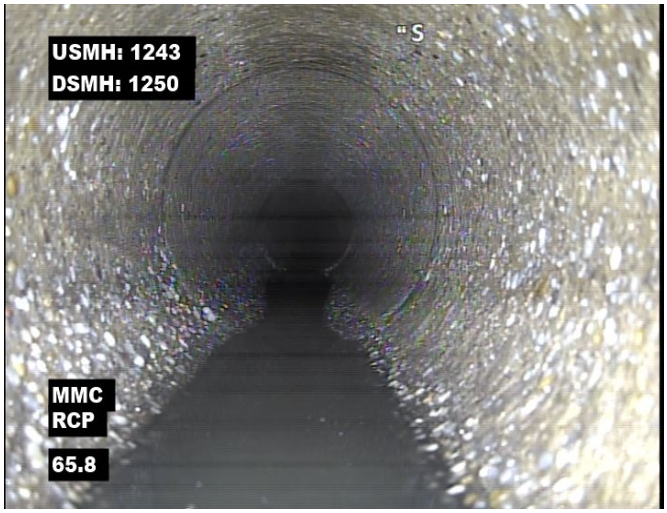
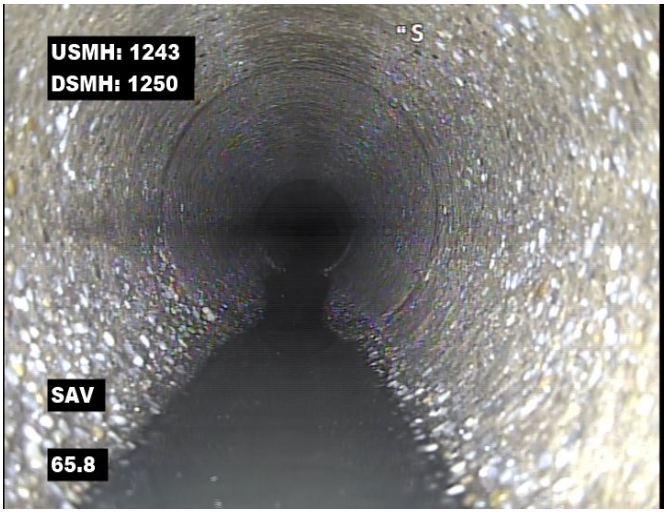
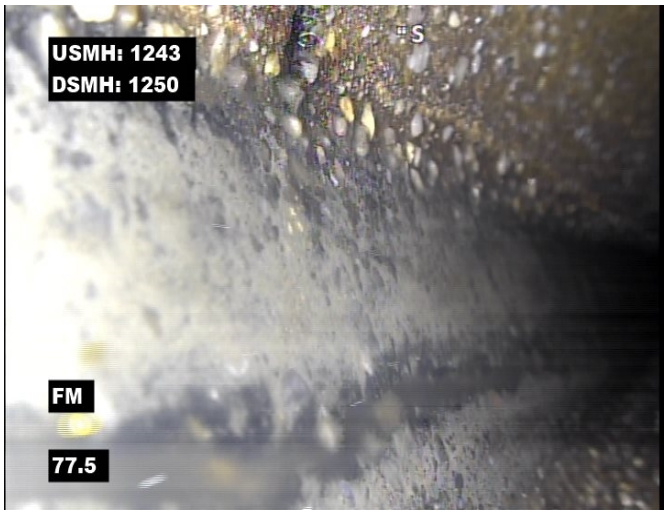
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1243_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1243			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1250	159.5		8			



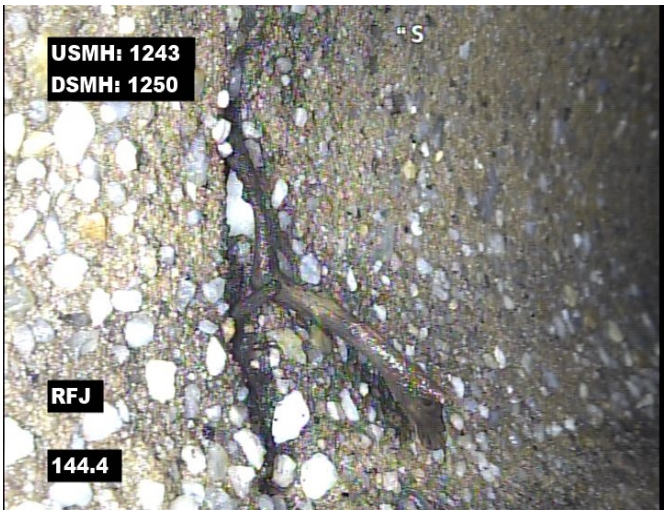
Distance: 65.8 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: RCP



Distance: 65.8 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A



Distance: 77.5 ft. Grade: 4
Condition: FM-Fracture Multiple
Remarks: N/A



Distance: 144.4 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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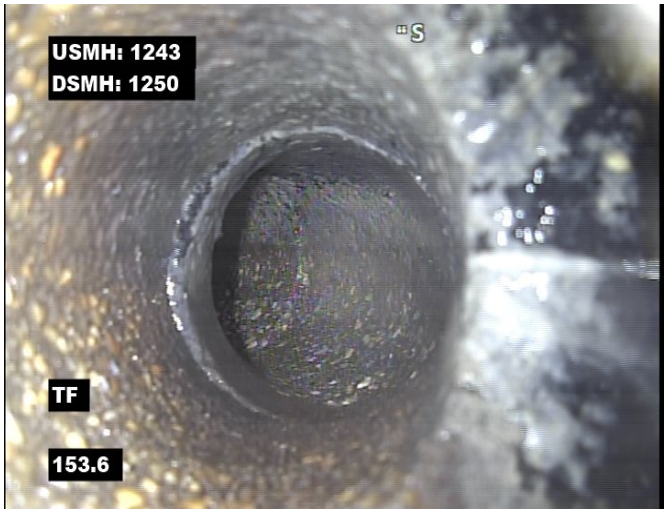
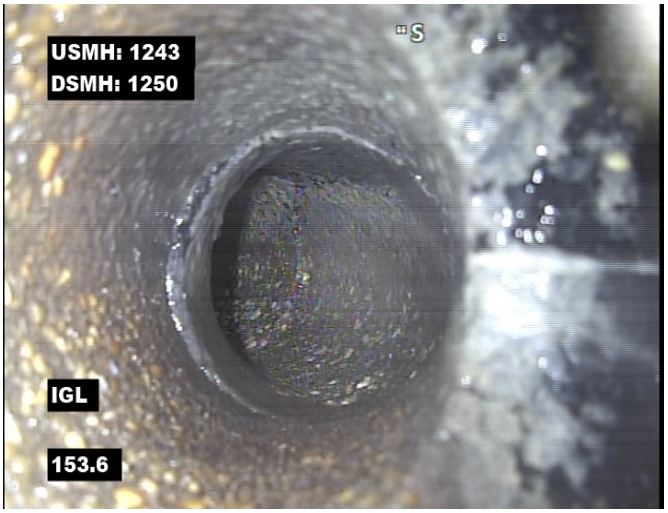
4 Image Report

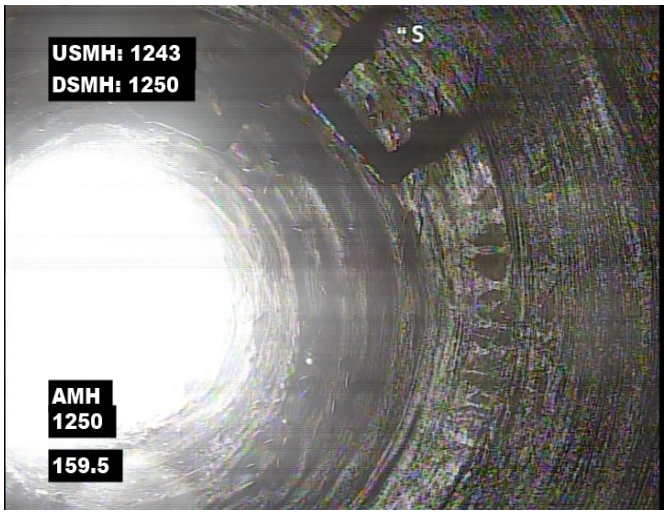
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1243_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1243			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1250	159.5		8			



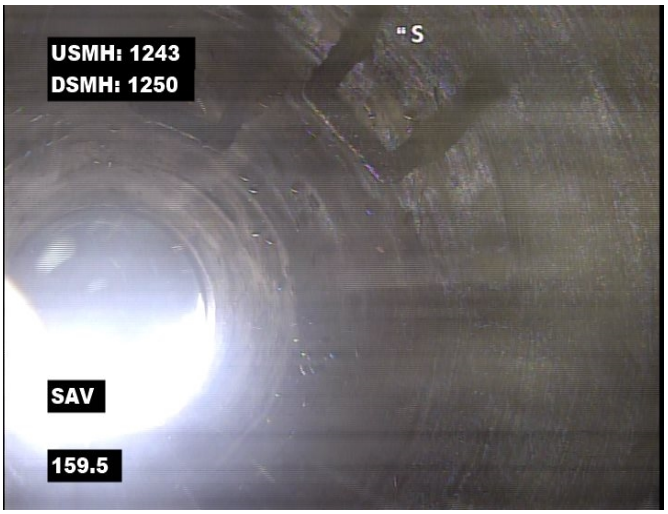
Distance: 153.6 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 153.6 ft. Grade: 5
Condition: IGL-Infiltration Gusher Lateral
Remarks: N/A



Distance: 159.5 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1250



Distance: 159.5 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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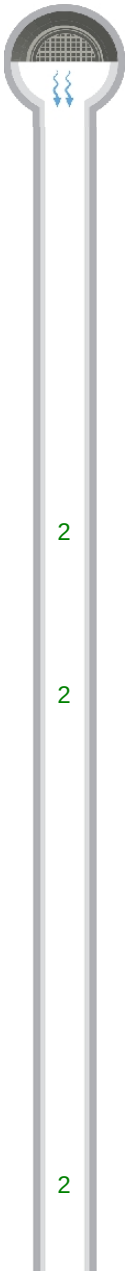
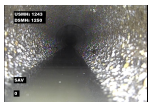
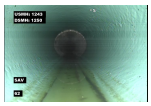
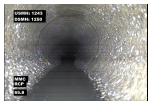
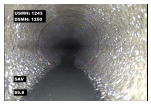
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1243_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1243			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1250	159.5		8			

				PO Number	Customer
SPR	66	MPR	6		
SPRI	2.1	MPRI	6	Work Order Number	Purpose
QSR	412E	QMR	5100		

OPR	Surveyed By	Direction	Date	Media label	
72	CHRISTIAN CHURCH	Downstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
2.2	P0036843-042022	Light Cleaning	16:48	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			16:59		



0 ft.	AMH-Access Point Manhole		1243
0 ft.	MWL-Miscellaneous Water Level		
0 ft.	SAV-Surface Damage Aggregate Visible - S01		
62 ft.	SAV-Surface Damage Aggregate Visible - F01		
62 ft.	MMC-Miscellaneous Material Change		PVC
65.8 ft.	MMC-Miscellaneous Material Change		RCP
65.8 ft.	SAV-Surface Damage Aggregate Visible - S02		

Infrastructure Technologies
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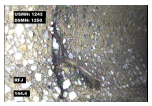
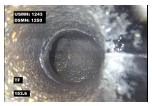
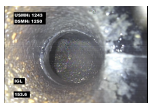
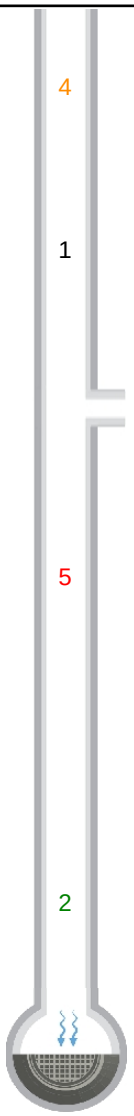
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1243_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1243			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1250	159.5		8			

77.5 ft.	FM-Fracture Multiple		4
144.4 ft.	RFJ-Roots Fine Joint		1
153.6 ft.	TF-Tap Factory Made		
153.6 ft.	IGL-Infiltration Gusher Lateral		5
159.5 ft.	AMH-Access Point Manhole		1250
159.5 ft.	SAV-Surface Damage Aggregate Visible - F02		2



1250

Infrastructure Technologies
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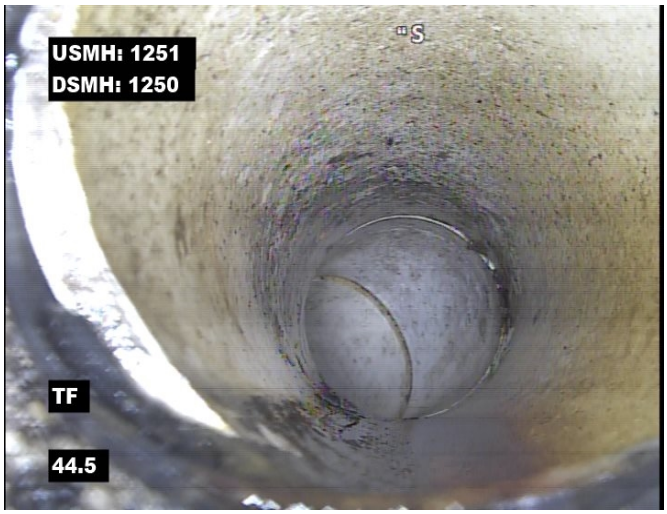
4 Image Report

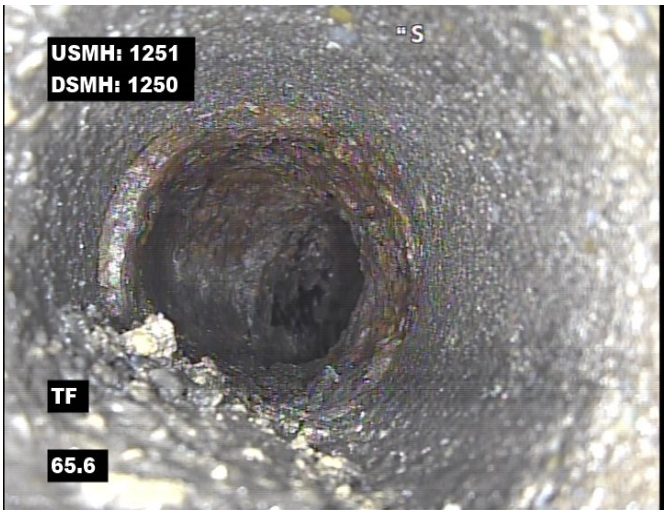
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1251_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1251			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1250	162		6			

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 0.0 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: COULD NOT ACCESS US MH. CUT ROOTS BEST AS POSSIBLE WITH



Distance: 44.5 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 65.6 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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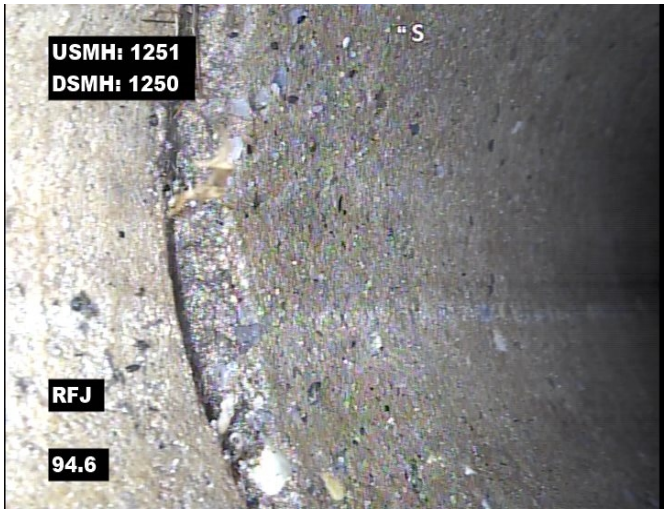
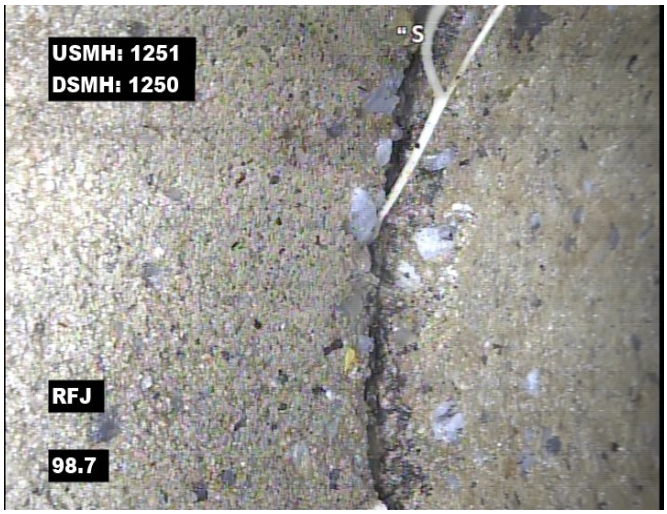
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1251_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1251			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1250	162		6			

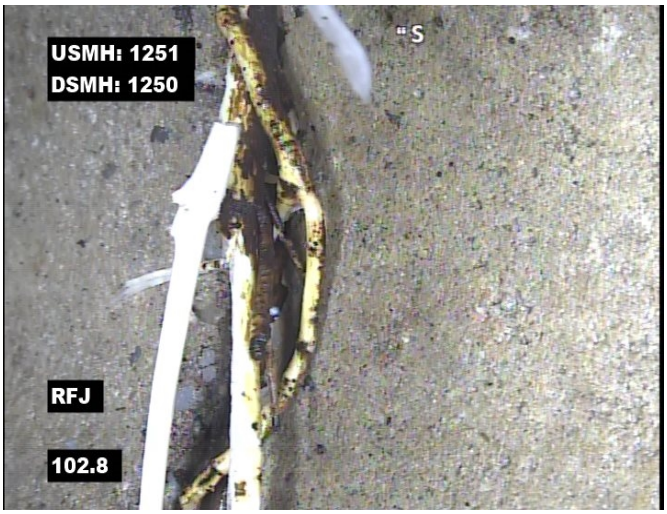


Distance: 94.6 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 97.9 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 98.7 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 102.8 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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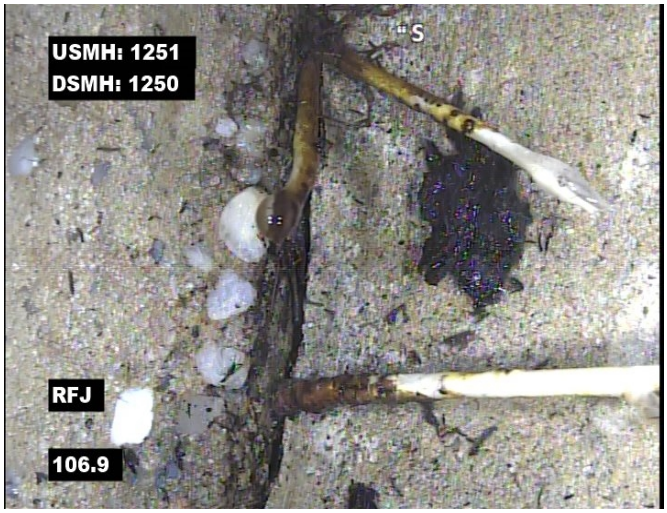
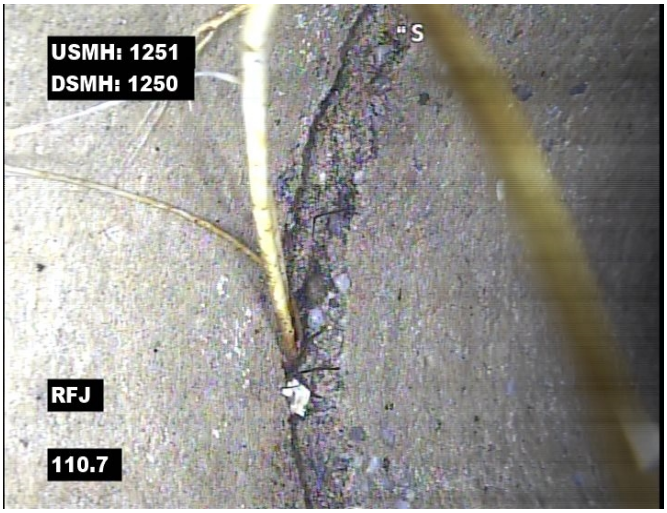
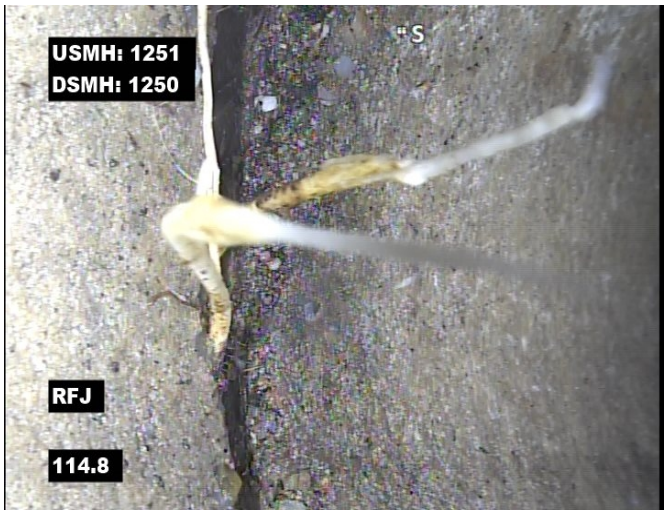
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1251_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1251			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1250	162		6			



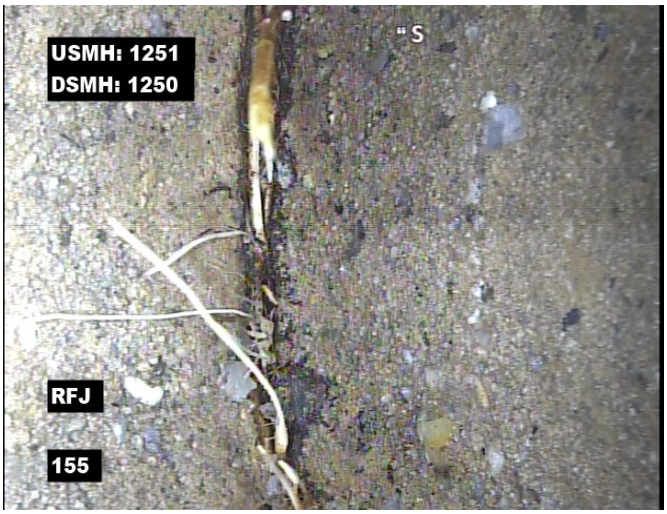
Distance: 106.9 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 110.7 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 114.8 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 155.0 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

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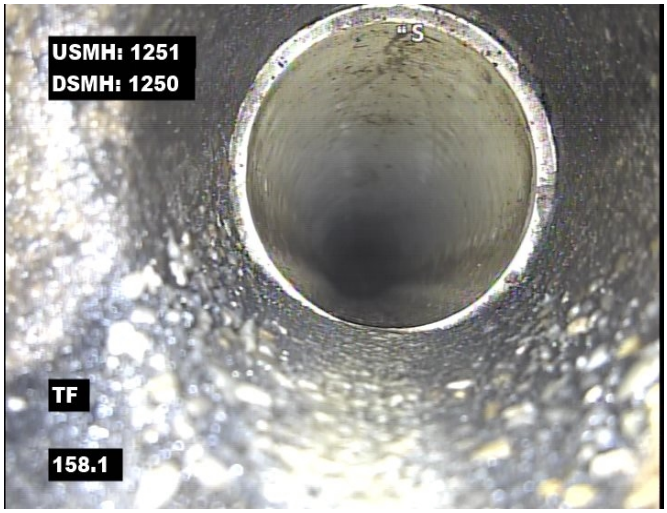
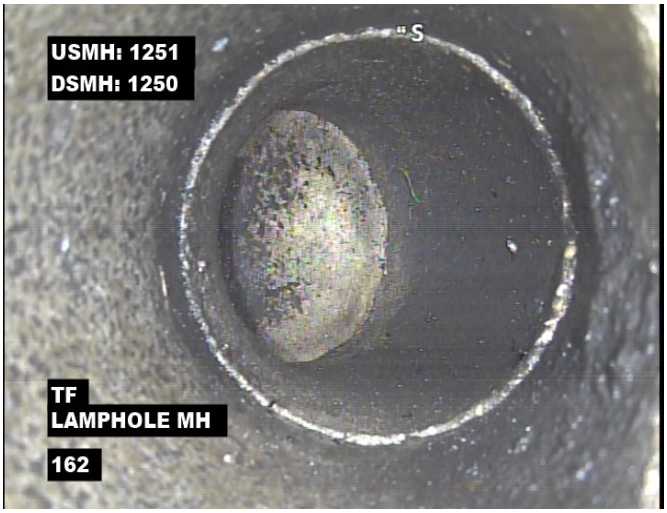
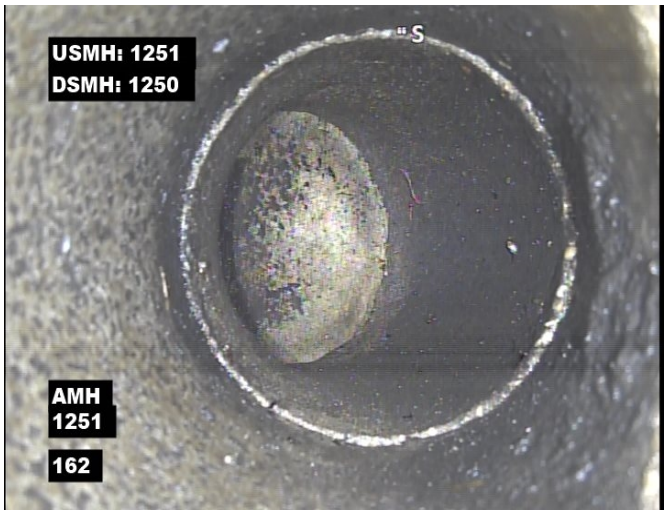
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1251_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1251			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1250	162		6			



Distance: 158.1 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 162.0 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: LAMPHOLE MH



Distance: 162.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1251

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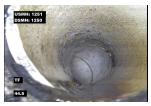
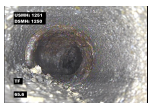
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1251_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1251			Circular			
Downstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1250	162		6			

				PO Number	Customer
SPR	0	MPR	7		
SPRI	0	MPRI	0	Work Order Number	Purpose
QSR	0000	QMR	0000		

OPR	Surveyed By	Direction	Date	Media label	
7	CHRISTIAN CHURCH	Upstream	04/09/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
0	P0036843-042022	Heavy Cleaning	17:43	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/09/2024			17:58		

0 ft.	AMH-Access Point Manhole		1250
0 ft.	MWL-Miscellaneous Water Level		
0 ft.	MGO-Miscellaneous General Observation		COULD NOT ACCESS US MH. CUT ROOTS BEST AS POSSIBLE WITH SPINNER NOZZLE.
44.5 ft.	TF-Tap Factory Made		
65.6 ft.	TF-Tap Factory Made		
94.6 ft.	RFJ-Roots Fine Joint		
97.9 ft.	TF-Tap Factory Made		

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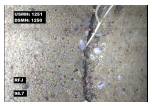
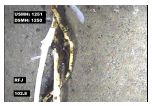
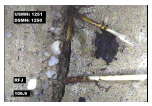
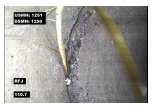
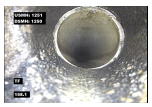
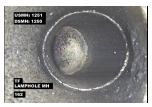
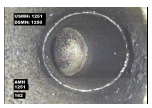
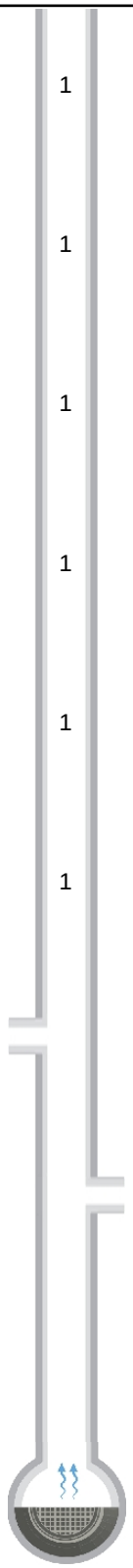
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1251_1250	CLARKTON	N CLARK ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1251			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1250	162		6			

98.7 ft.	RFJ-Roots Fine Joint		1	
102.8 ft.	RFJ-Roots Fine Joint		1	
106.9 ft.	RFJ-Roots Fine Joint		1	
110.7 ft.	RFJ-Roots Fine Joint		1	
114.8 ft.	RFJ-Roots Fine Joint		1	
155 ft.	RFJ-Roots Fine Joint		1	
158.1 ft.	TF-Tap Factory Made			
162 ft.	TF-Tap Factory Made			LAMPHOLE MH
162 ft.	AMH-Access Point Manhole			1251



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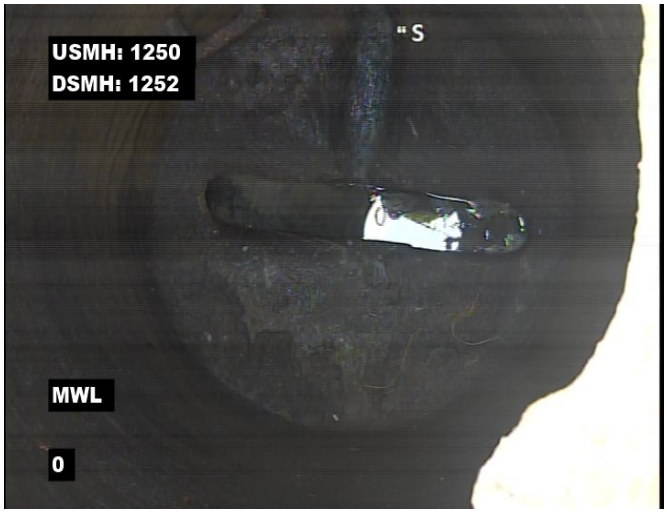
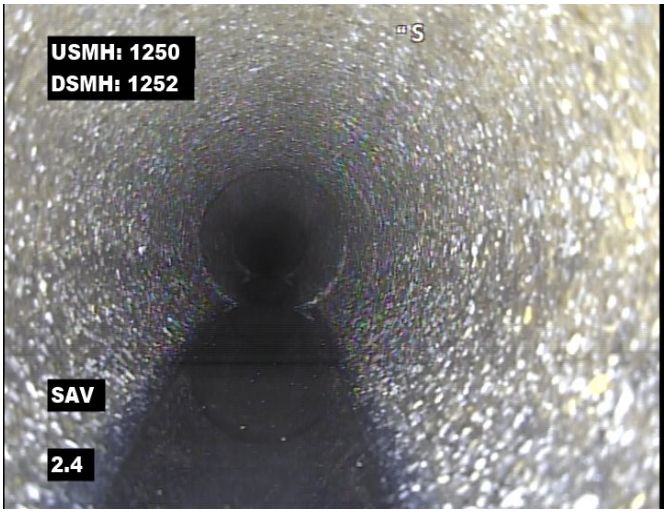
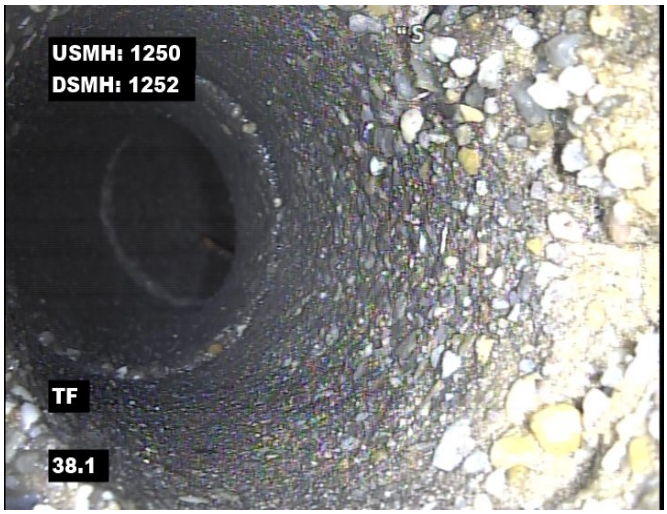
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1250			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1252	181.7		8			



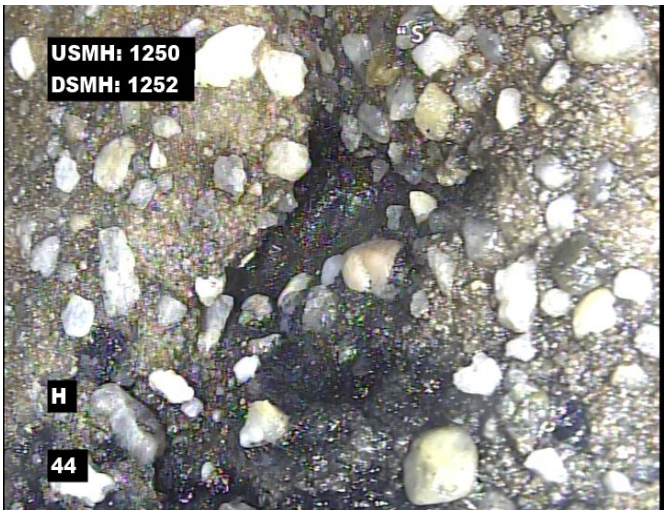
Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 2.4 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A



Distance: 38.1 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 44.0 ft. Grade: 4
Condition: H-Hole
Remarks: N/A

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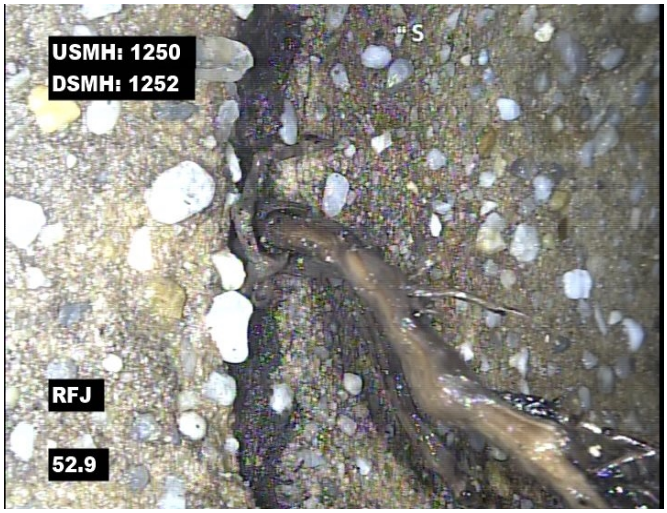
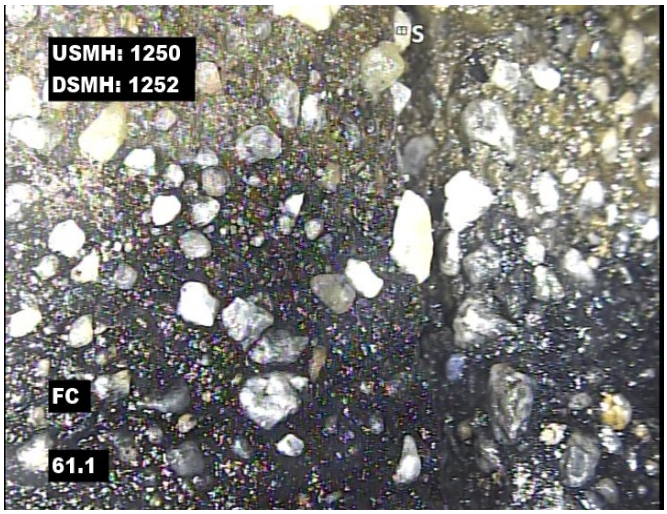
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1250			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1252	181.7		8			

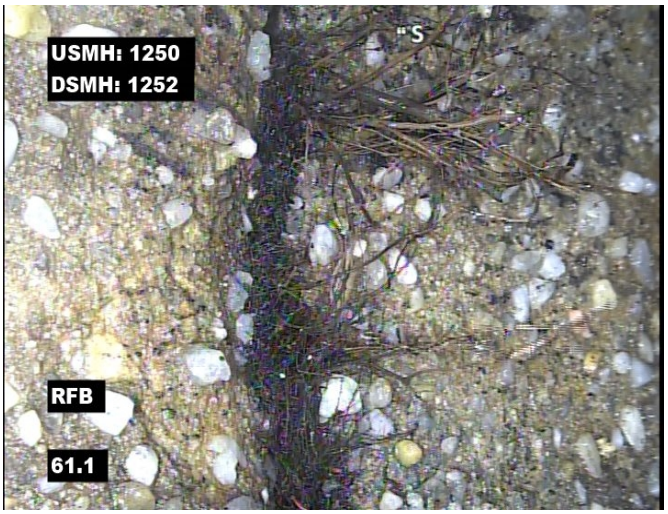


Distance: 52.9 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A

Distance: 56.8 ft. Grade: 1
Condition: RFJ-Roots Fine Joint
Remarks: N/A



Distance: 61.1 ft. Grade: 2
Condition: FC-Fracture Circumferential
Remarks: N/A



Distance: 61.1 ft. Grade: 2
Condition: RFB-Roots Fine Barrel
Remarks: N/A

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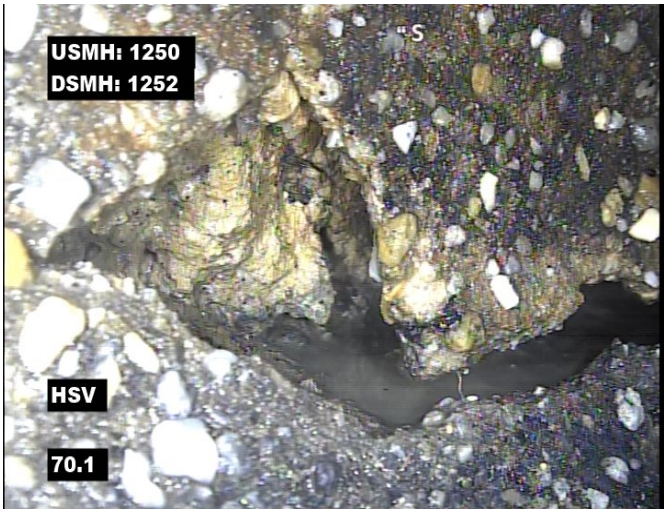
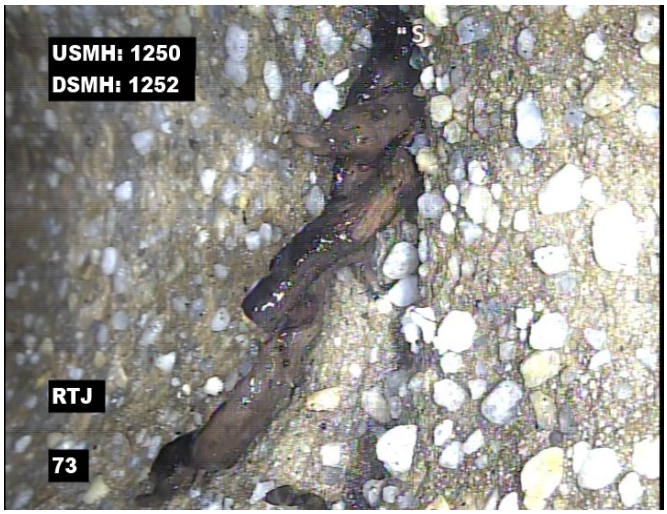
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1250			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1252	181.7		8			

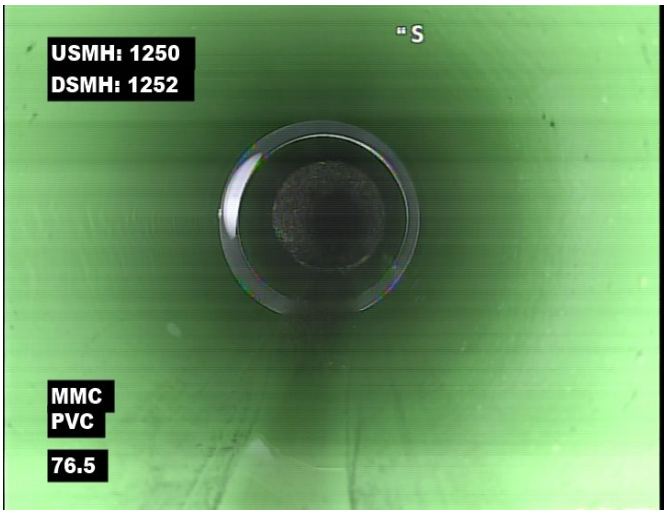
Distance: 65.1 ft. Grade: 2
Condition: RTJ-Roots Tap Joint
Remarks: CANNOT CHAIN CUT DUE TO PR FURTHER DOWN LINE



Distance: 70.1 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A



Distance: 73.0 ft. Grade: 2
Condition: RTJ-Roots Tap Joint
Remarks: N/A



Distance: 76.5 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC

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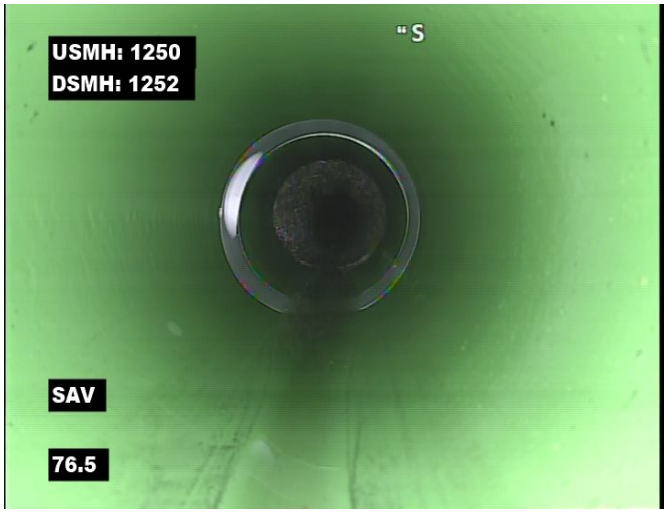
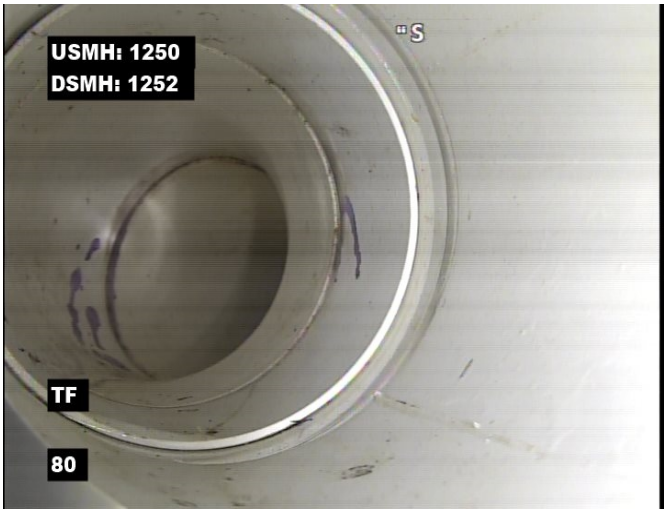
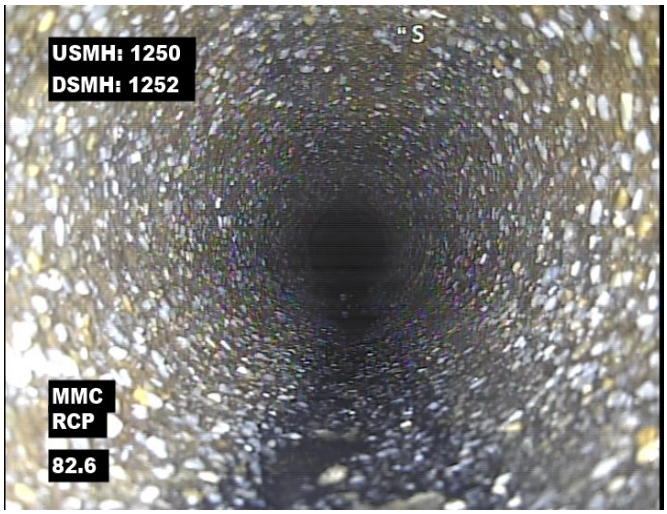
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1250			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1252	181.7		8			



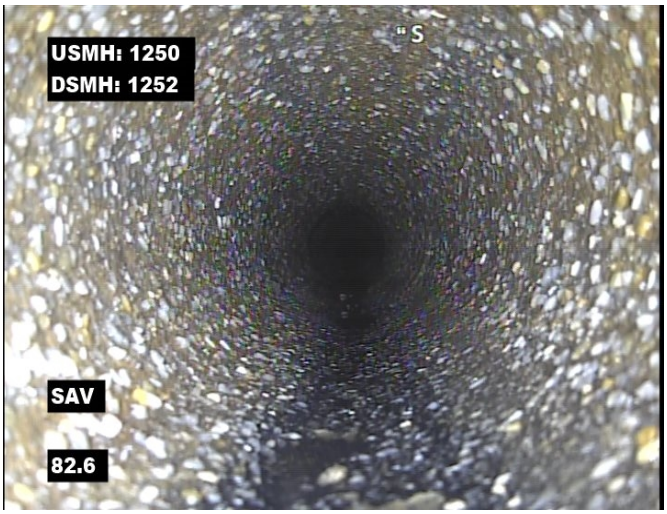
Distance: 76.5 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A



Distance: 80.0 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 82.6 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: RCP



Distance: 82.6 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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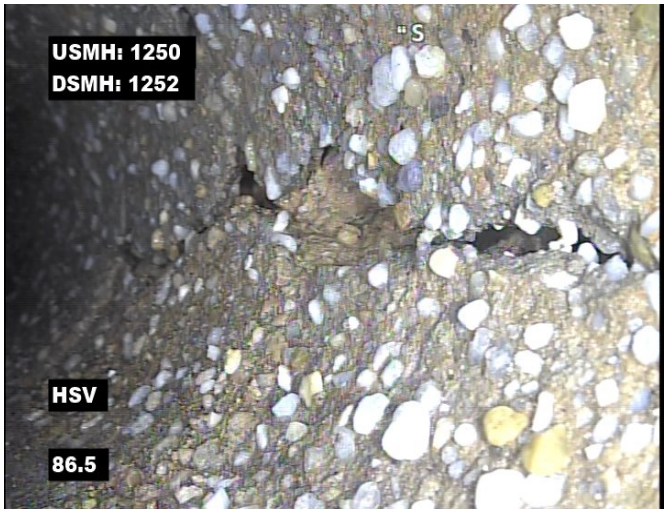
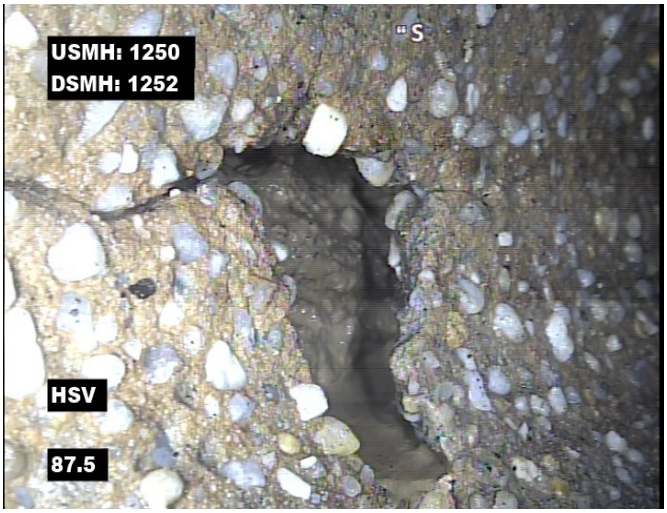
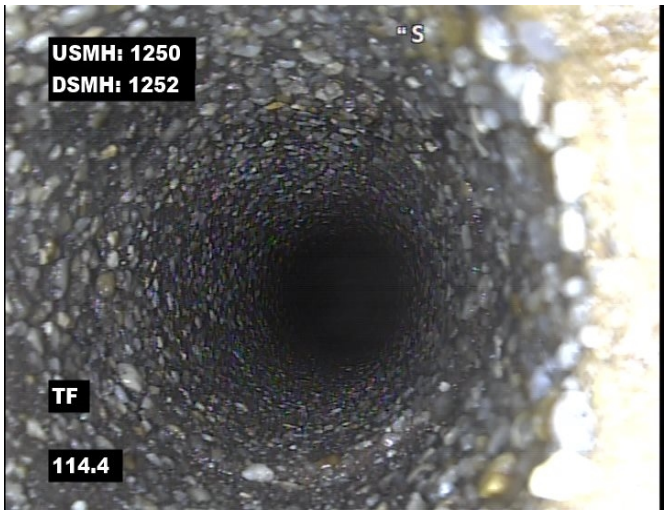
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1250			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1252	181.7		8			



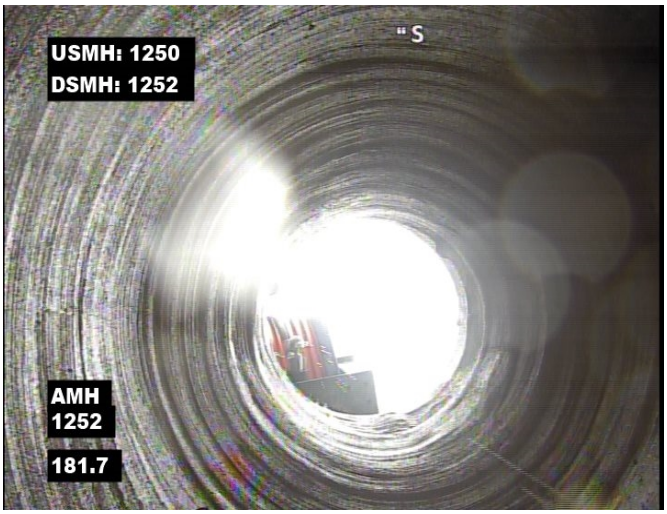
Distance: 86.5 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A



Distance: 87.5 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A



Distance: 114.4 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 181.7 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1252

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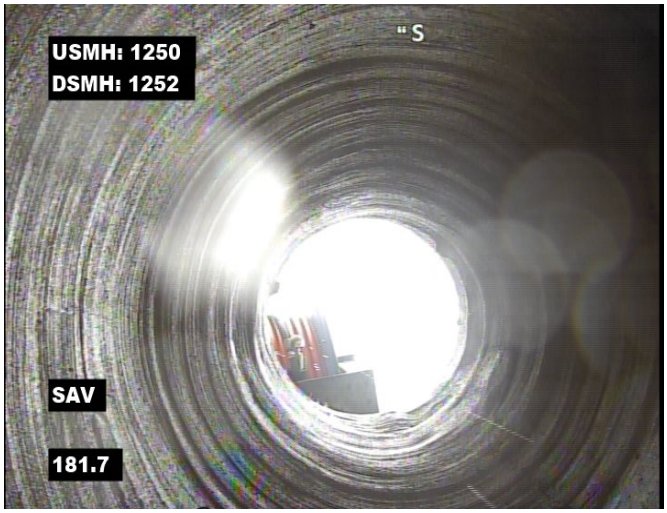
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1250			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1252	181.7		8			



Distance: 181.7 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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Defect Listing Plot

Pipe Segment Reference	City	Street	Material	Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe		Sanitary Sewage Pipe

Upstream MH	Total Length	Year Constructed	Shape	Location Details
1250			Circular	

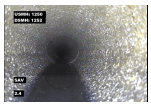
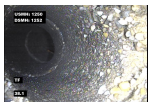
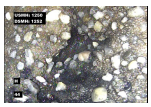
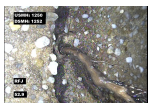
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1252	181.7		8			

SPR	91	MPR	8	PO Number	Customer
SPRI	2.3	MPRI	2.7		
QSR	5341	QMR	2300	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label
99	CHRISTIAN CHURCH	Downstream	04/09/2024	

OPRI	Certificate Number	Pre-Cleaning	Time	Weather	
2.3	P0036843-042022	Light Cleaning	18:11	Dry	

Date Cleaned	End Time	Additional Info
04/09/2024	18:52	

0 ft.	AMH-Access Point Manhole		1250
0 ft.	MWL-Miscellaneous Water Level		
2.4 ft.	SAV-Surface Damage Aggregate Visible - S01		
38.1 ft.	TF-Tap Factory Made		
44 ft.	H-Hole		
52.9 ft.	RFJ-Roots Fine Joint		
56.8 ft.	RFJ-Roots Fine Joint		

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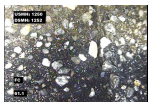
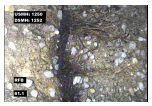
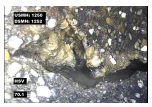
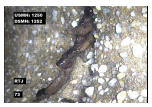
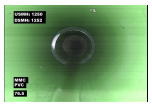
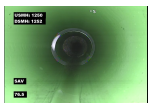
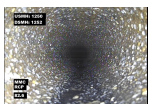
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	**Shape**		Location Details	
1250			Circular			
Downsstream MH	Length surveyed	Year Renewed	**Height**	**Width**	Pipe Joint Length	
1252	181.7		8			

61.1 ft.	FC-Fracture Circumferential		2	
61.1 ft.	RFB-Roots Fine Barrel		2	
65.1 ft.	RTJ-Roots Tap Joint		2	CANNOT CHAIN CUT DUE TO PR FURTHER DOWN LINE
70.1 ft.	HSV-Hole Soil Visible		5	
73 ft.	RTJ-Roots Tap Joint		2	
76.5 ft.	MMC-Miscellaneous Material Change			PVC
76.5 ft.	SAV-Surface Damage Aggregate Visible - F01		2	
80 ft.	TF-Tap Factory Made			
82.6 ft.	MMC-Miscellaneous Material Change			RCP

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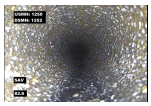
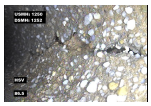
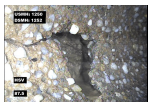
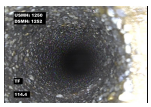
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1250_1252	CLARKTON	N GROVE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1250			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1252	181.7		8			

82.6 ft.	SAV-Surface Damage Aggregate Visible - S02		2
86.5 ft.	HSV-Hole Soil Visible		5
87.5 ft.	HSV-Hole Soil Visible		5
114.4 ft.	TF-Tap Factory Made		
181.7 ft.	AMH-Access Point Manhole		1252
181.7 ft.	SAV-Surface Damage Aggregate Visible - F02		2

1252

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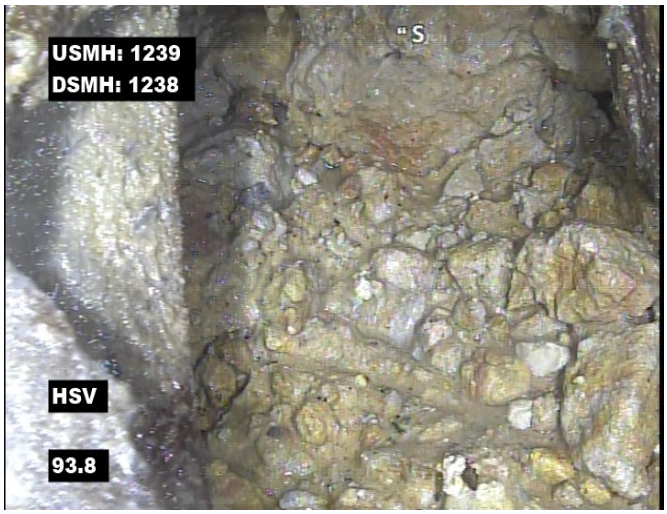
4 Image Report

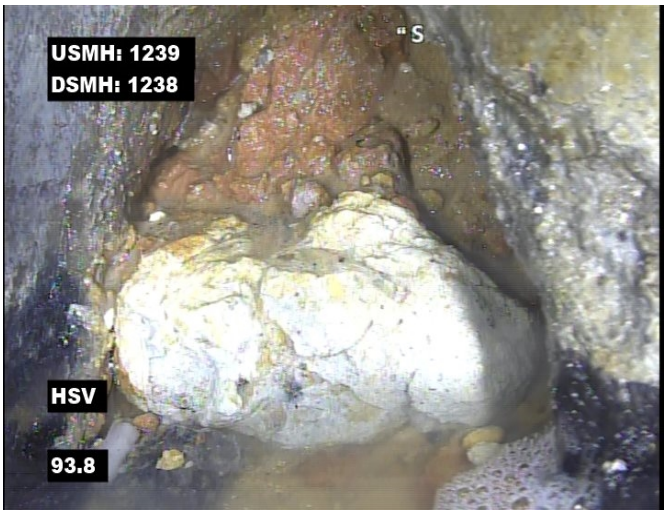
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1239_1238	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1239			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1238	389.6		8			

Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1238

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 93.8 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A



Distance: 93.8 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A

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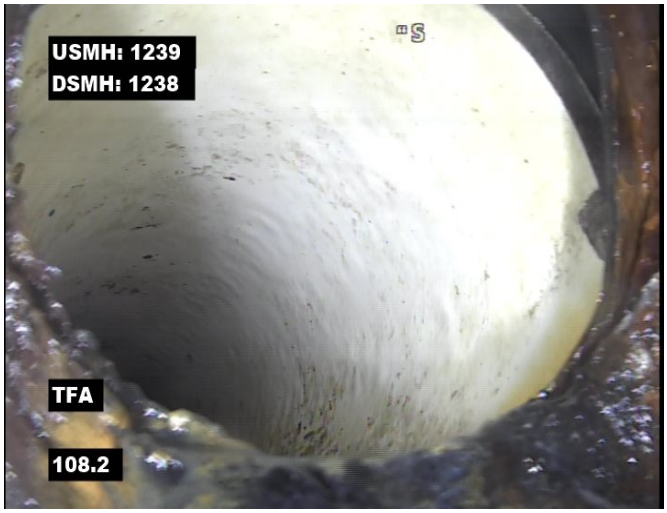
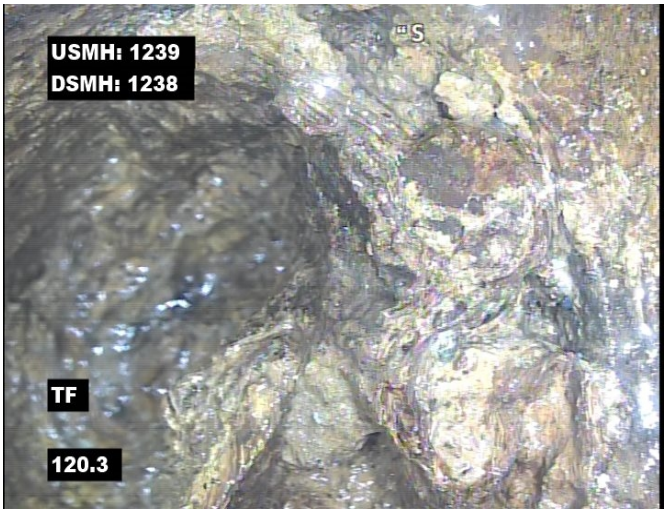
4 Image Report

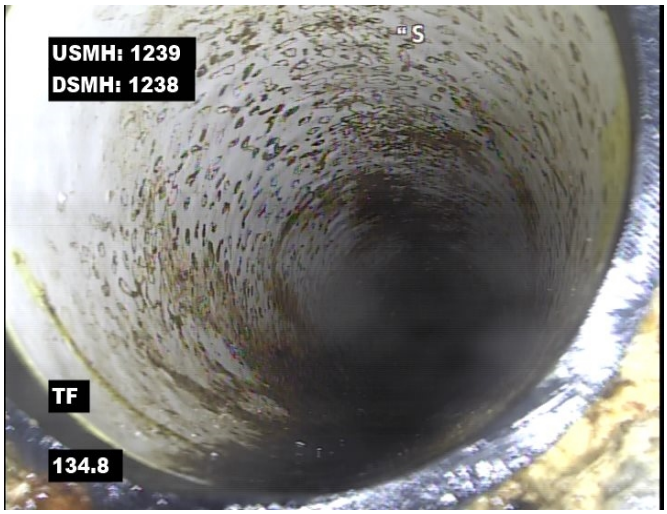
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1239_1238	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1239			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1238	389.6		8			



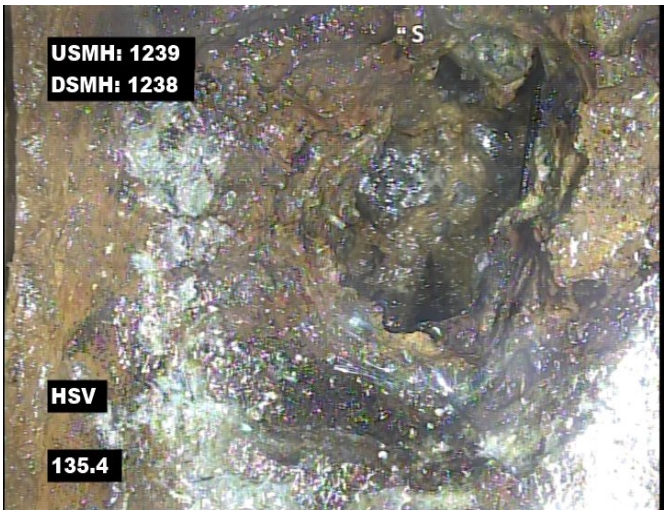
Distance: 108.2 ft. Grade: 0
Condition: TFA-Tap Factory Activity
Remarks: N/A



Distance: 120.3 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 134.8 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 135.4 ft. Grade: 5
Condition: HSV-Hole Soil Visible
Remarks: N/A

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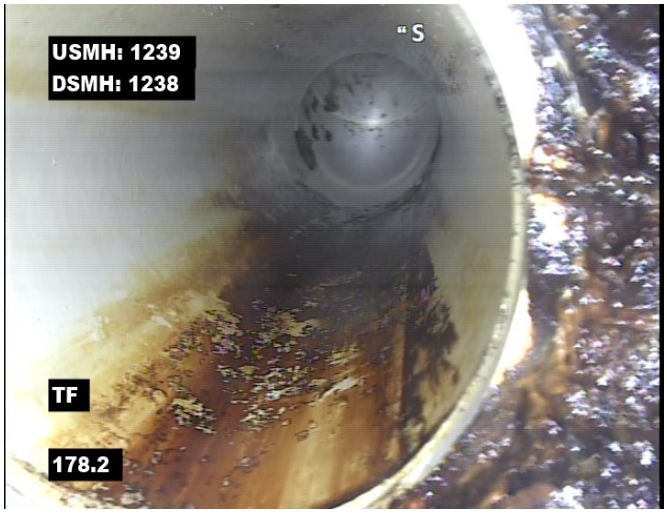
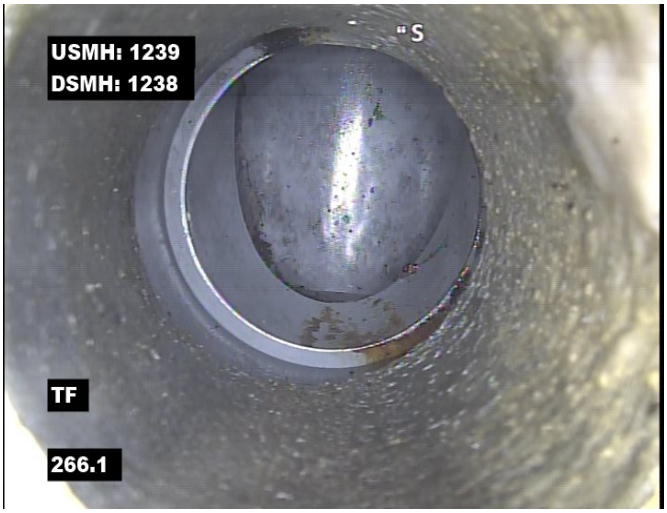
4 Image Report

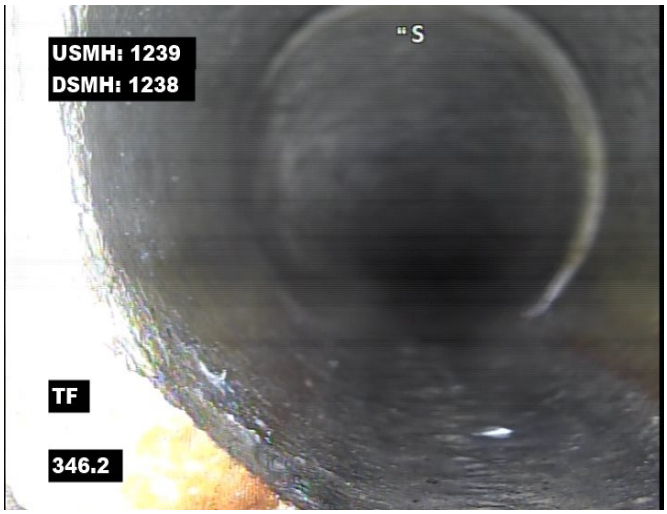
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1239_1238	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1239			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1238	389.6		8			



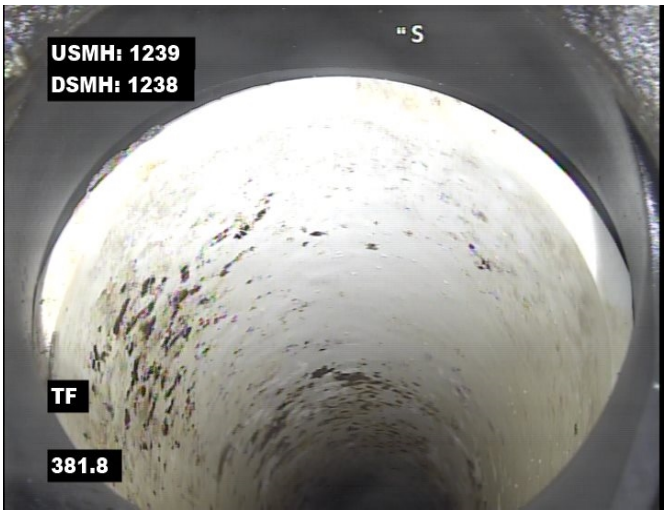
Distance: 178.2 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 266.1 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 346.2 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 381.8 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1239_1238	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1239			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1238	389.6		8			

Distance: 385.1 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: PVC

Distance: 388.7 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: ASBESTES

Distance: 389.6 ft. Grade: 0
Condition: MSA-Miscellaneous Survey Abandoned
Remarks: CAMERA WILL NOT PULL ANY FURTHER. NO USMH ACCESS TO DO VIDEO FROM.

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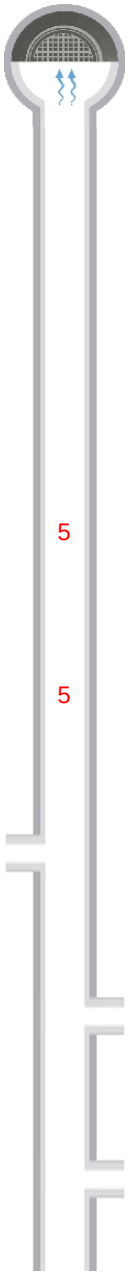
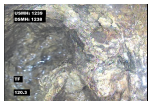
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1239_1238	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1239			Circular			
Downstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1238	389.6		8			

				PO Number	Customer
SPR	15	MPR	0		
SPRI	5	MPRI	0	Work Order Number	Purpose
QSR	5300	QMR	0000		

OPR	Surveyed By	Direction	Date	Media label	
15	CHRISTIAN CHURCH	Upstream	04/10/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
5	P0036843-042022	Heavy Cleaning	11:02	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/10/2024			11:48		



0 ft.	AMH-Access Point Manhole	
0 ft.	MWL-Miscellaneous Water Level	
93.8 ft.	HSV-Hole Soil Visible	
93.8 ft.	HSV-Hole Soil Visible	
108.2 ft.	TFA-Tap Factory Activity	
120.3 ft.	TF-Tap Factory Made	
134.8 ft.	TF-Tap Factory Made	

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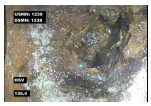
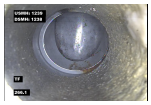
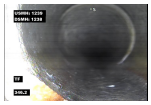
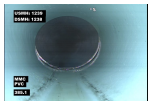
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1239_1238	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1239			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1238	389.6		8			

135.4 ft.	HSV-Hole Soil Visible		
178.2 ft.	TF-Tap Factory Made		
266.1 ft.	TF-Tap Factory Made		
346.2 ft.	TF-Tap Factory Made		
381.8 ft.	TF-Tap Factory Made		
385.1 ft.	MMC-Miscellaneous Material Change		PVC
388.7 ft.	MMC-Miscellaneous Material Change		ASBESTES
389.6 ft.	MSA-Miscellaneous Survey Abandoned		CAMERA WILL NOT PULL ANY FURTHER. NO USMH ACCESS TO DO VIDEO FROM.

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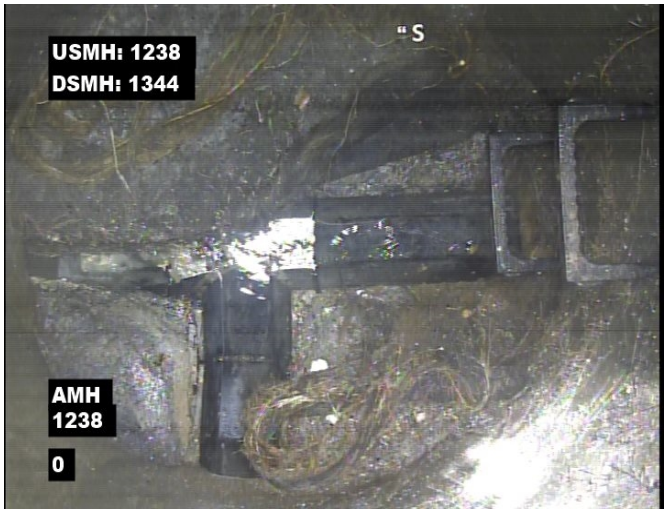
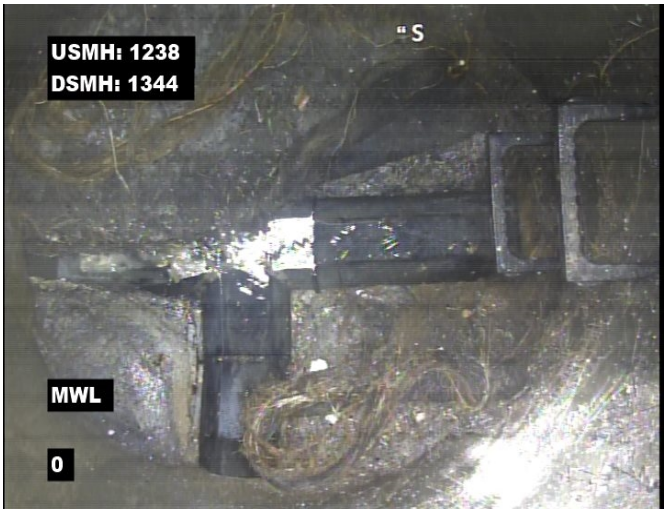
4 Image Report

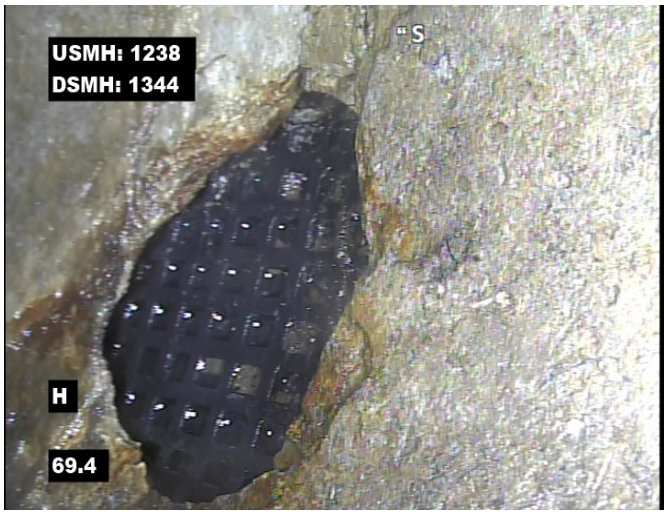
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1238_1344	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1238			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1344	286.6		8			



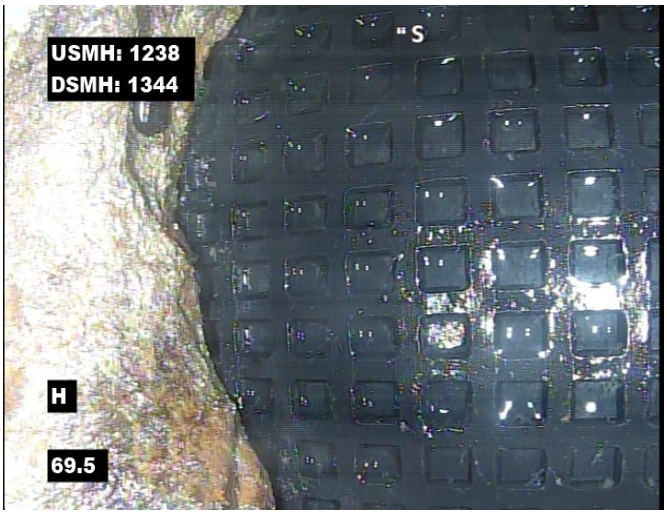
Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1238



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 69.4 ft. Grade: 4
Condition: H-Hole
Remarks: N/A



Distance: 69.5 ft. Grade: 4
Condition: H-Hole
Remarks: N/A

Infrastructure Technologies
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Albuquerque, NM
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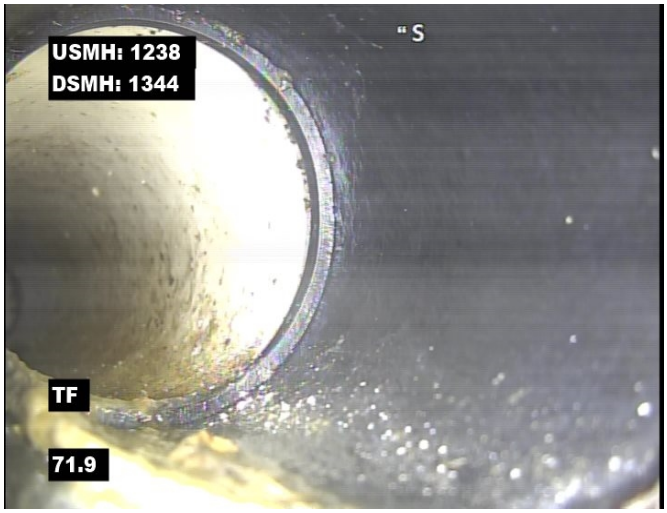
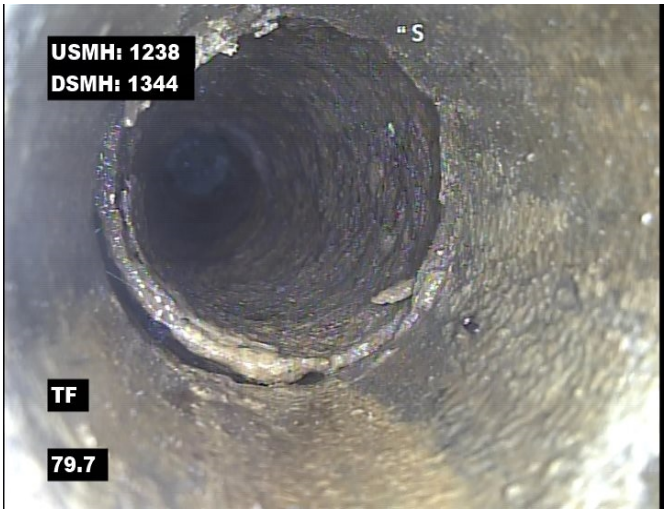
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1238_1344	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1238			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1344	286.6		8			

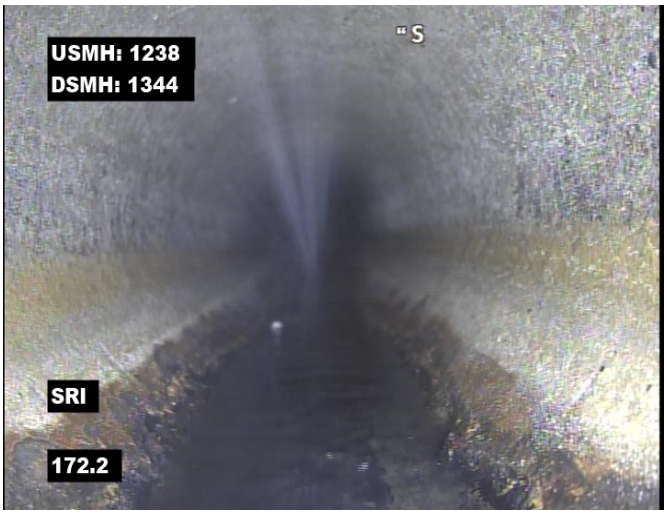


Distance: 71.9 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 79.7 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 161.1 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: DIP



Distance: 172.2 ft. Grade: 1
Condition: SRI-Surface Damage Roughness Increased
Remarks: N/A

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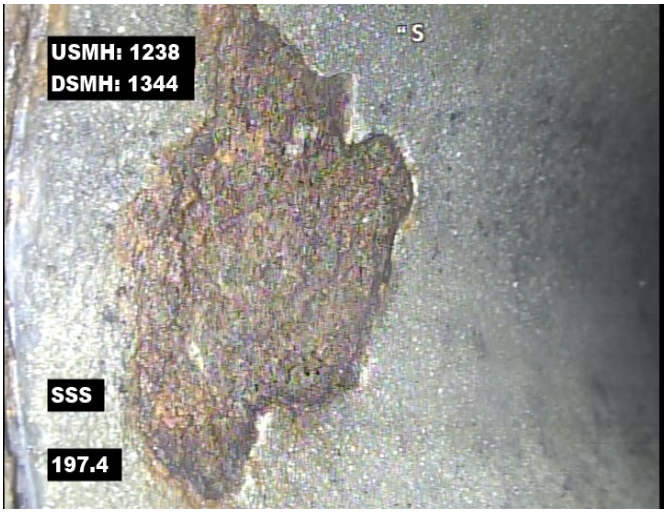
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1238_1344	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1238			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1344	286.6		8			

Distance: 178.2 ft. Grade: 2
Condition: SSS-Surface Damage Surface Spalling
Remarks: N/A



Distance: 197.4 ft. Grade: 2
Condition: SSS-Surface Damage Surface Spalling
Remarks: N/A

Distance: 214.3 ft. Grade: 0
Condition: MMC-Miscellaneous Material Change
Remarks: ASBESTES

Distance: 216.5 ft. Grade: 1
Condition: SRI-Surface Damage Roughness Increased
Remarks: N/A

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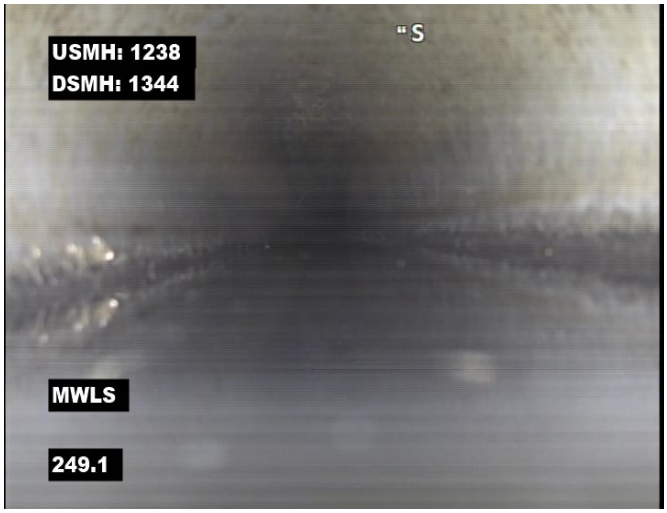
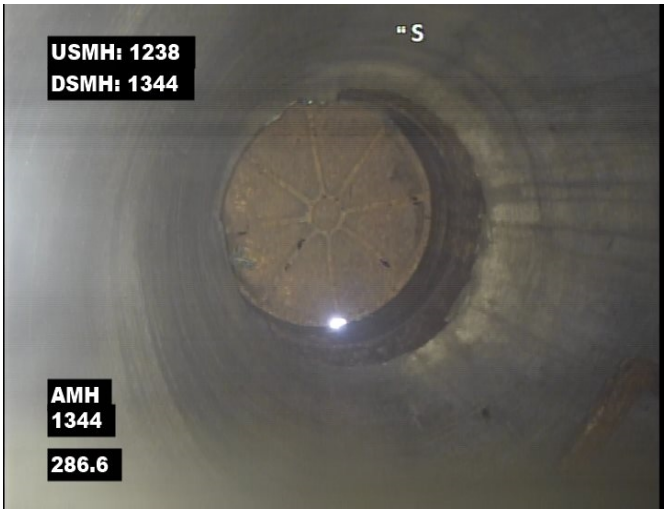
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1238_1344	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1238			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1344	286.6		8			



Distance: 249.1 ft. Grade: 3
Condition: MWLS-Miscellaneous Water Level Sag
Remarks: N/A



Distance: 286.6 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1344

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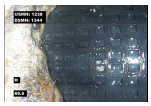
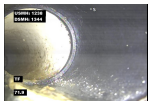
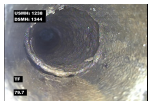
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1238_1344	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1238			Circular			
Downstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1344	286.6		8			

SPR	21	MPR	3	PO Number	Customer
SPRI	5.2	MPRI	3		
QSR	4222	QMR	3100	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
24	CHRISTIAN CHURCH	Downstream	04/10/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
4.8	P0036843-042022	Heavy Cleaning	13:14	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/10/2024			13:29		

0 ft.	AMH-Access Point Manhole		1238
0 ft.	MWL-Miscellaneous Water Level		
69.4 ft.	H-Hole		
69.5 ft.	H-Hole		
71.9 ft.	TF-Tap Factory Made		
79.7 ft.	TF-Tap Factory Made		
161.1 ft.	MMC-Miscellaneous Material Change		DIP

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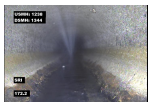
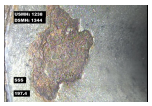
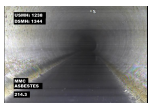
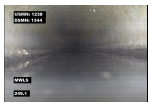
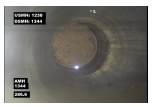
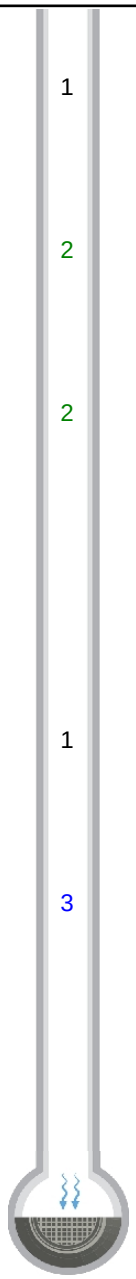
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1238_1344	CLARKTON	N ELMHURST ST	Asbestos Cement			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1238			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1344	286.6		8			

172.2 ft.	SRI-Surface Damage Roughness Increased - S01		1	
178.2 ft.	SSS-Surface Damage Surface Spalling		2	
197.4 ft.	SSS-Surface Damage Surface Spalling		2	
214.3 ft.	MMC-Miscellaneous Material Change			ASBESTES
216.5 ft.	SRI-Surface Damage Roughness Increased - F01		1	
249.1 ft.	MWLS-Miscellaneous Water Level Sag		3	
286.6 ft.	AMH-Access Point Manhole			1344



1344

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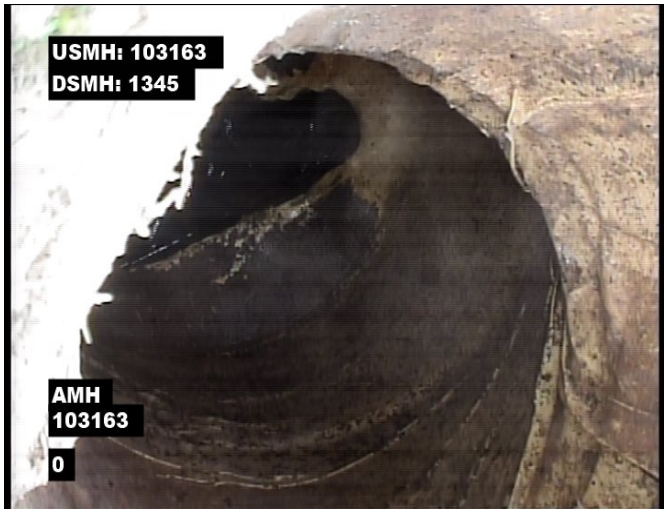
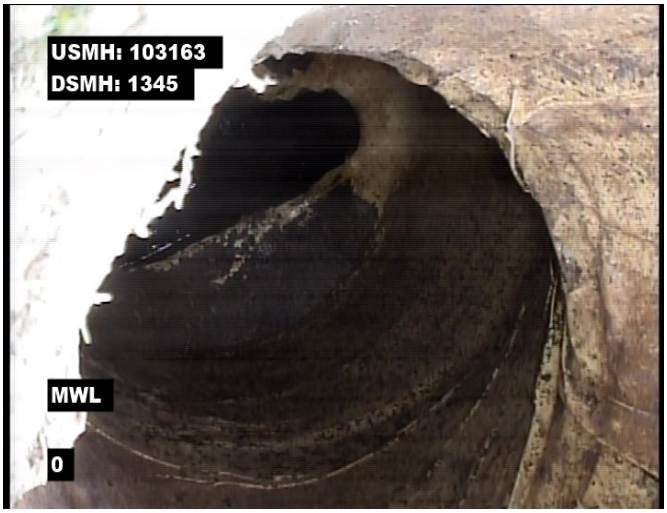
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103163_1345	CLARKTON	OFF SIXTH ST	Reinforced Concrete Pipe			Combined Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103163			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1345	232.4		12			



Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103163



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 232.4 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1345

Distance: 232.4 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: CANNOT LOCATE MH.

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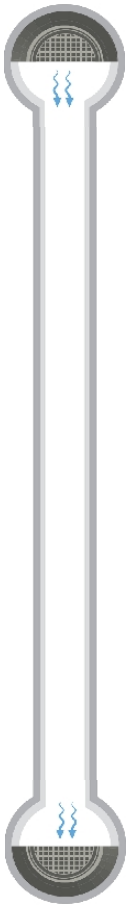
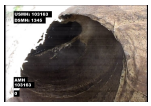
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103163_1345	CLARKTON	OFF SIXTH ST	Reinforced Concrete Pipe			Combined Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103163			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1345	232.4		12			

				PO Number	Customer
SPR	0	MPR	0		
SPRI	0	MPRI	0	Work Order Number	Purpose
QSR	0000	QMR	0000		

OPR	Surveyed By	Direction	Date	Media label	
0	CHRISTIAN CHURCH	Downstream	04/10/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
0	P0036843-042022	Heavy Cleaning	14:28	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/10/2024			14:54		



0 ft.	AMH-Access Point Manhole		103163
0 ft.	MWL-Miscellaneous Water Level		
232.4 ft.	AMH-Access Point Manhole		1345
232.4 ft.	MGO-Miscellaneous General Observation		CANNOT LOCATE MH.

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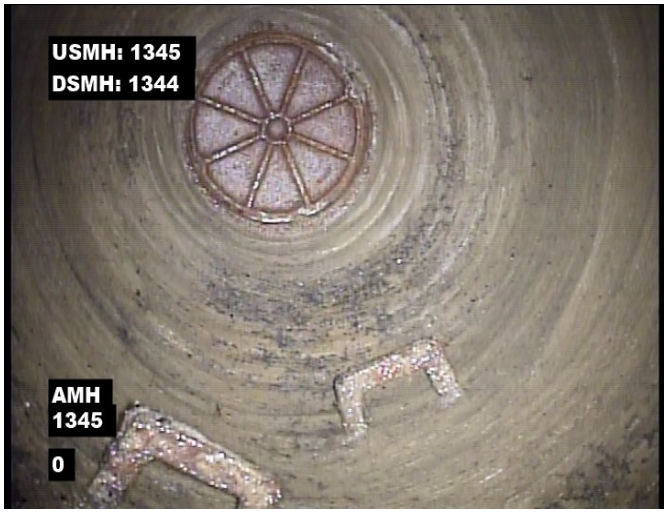
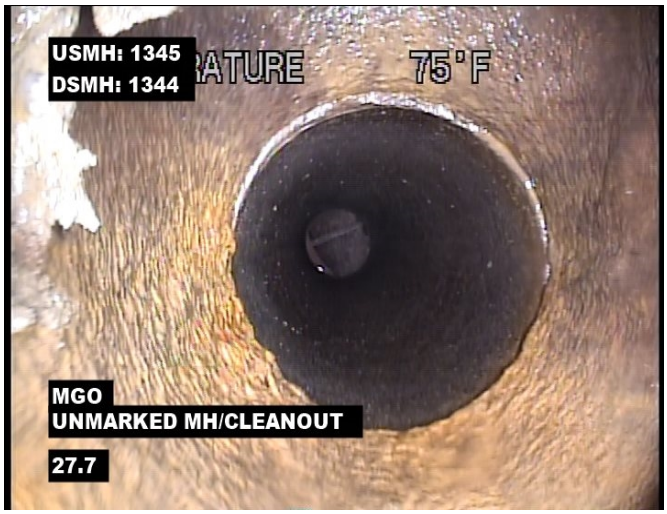
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1345_1344	CLARKTON	OFF SIXTH ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1345			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1344	404		12			

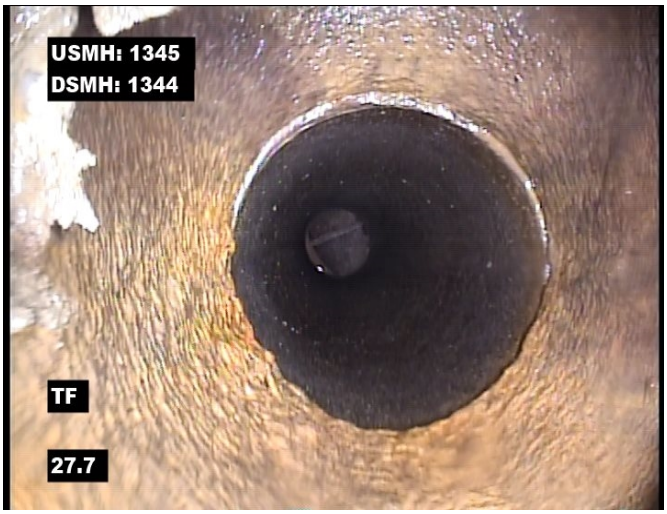


Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1345

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 27.7 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: UNMARKED MH/CLEANOUT



Distance: 27.7 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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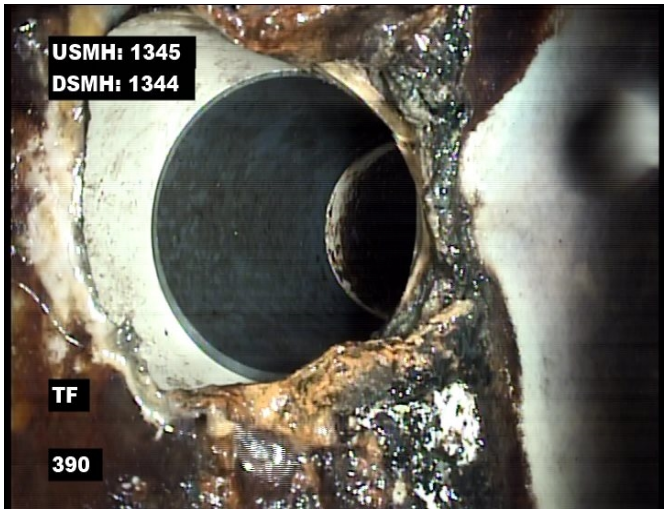
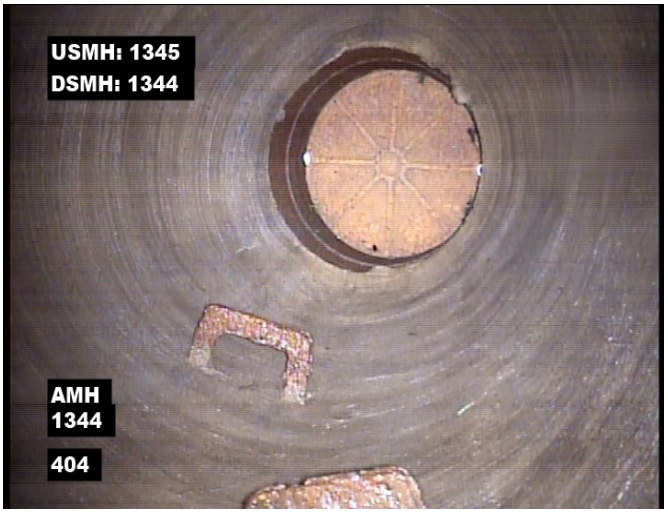
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1345_1344	CLARKTON	OFF SIXTH ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1345			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1344	404		12			



Distance: 389.9 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 404.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1344

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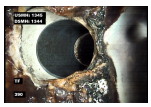
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1345_1344	CLARKTON	OFF SIXTH ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1345			Circular			
Downstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1344	404		12			

SPR	0	MPR	0	PO Number	Customer
SPRI	0	MPRI	0		
QSR	0000	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
0	CHRISTIAN CHURCH	Downstream	04/10/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
0	P0036843-042022	Heavy Cleaning	14:55	Dry	
Date Cleaned			**End Time**	**Additional Info**	
04/10/2024			15:22		

0 ft.	AMH-Access Point Manhole		1345
0 ft.	MWL-Miscellaneous Water Level		
27.7 ft.	MGO-Miscellaneous General Observation		UNMARKED MH/CLEANOUT
27.7 ft.	TF-Tap Factory Made		
389.9 ft.	TF-Tap Factory Made		
404 ft.	AMH-Access Point Manhole		1344

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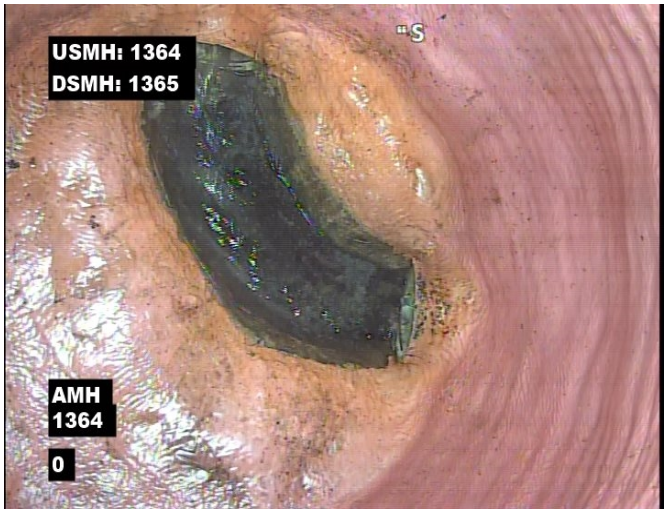
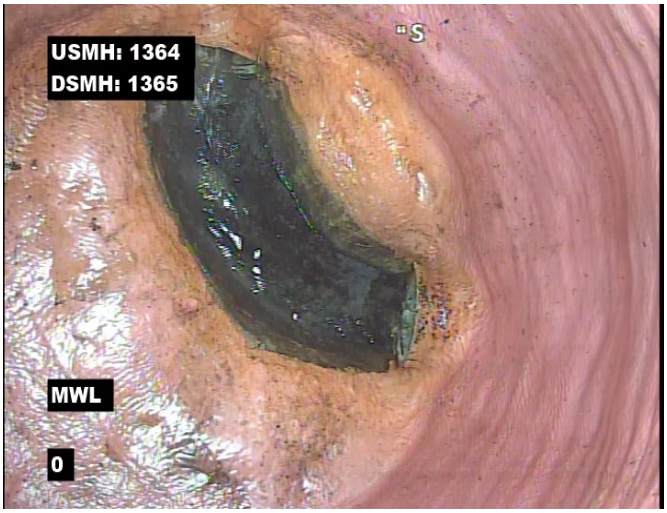
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1364_1365	CLARKTON	OFF W GRAHAM ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1364			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1365	273.2		8			



Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1364



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 273.2 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1365

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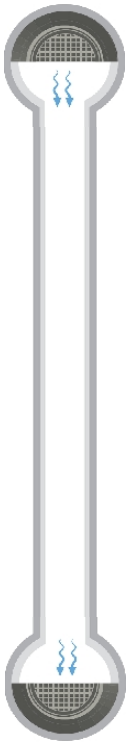
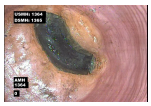
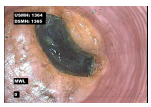
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1364_1365	CLARKTON	OFF W GRAHAM ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
1364			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1365	273.2		8			

SPR	0	MPR	0	PO Number	Customer
SPRI	0	MPRI	0		
QSR	0000	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
0	CHRISTIAN CHURCH	Downstream	04/10/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
0	P0036843-042022	Light Cleaning	16:43		
Date Cleaned			**End Time**	**Additional Info**	
04/10/2024			18:26		



0 ft.	AMH-Access Point Manhole		1364
0 ft.	MWL-Miscellaneous Water Level		
273.2 ft.	AMH-Access Point Manhole		1365

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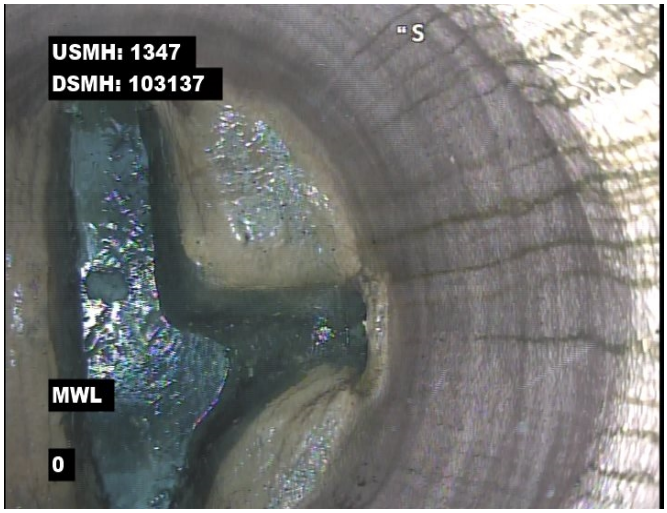
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1347_103137	CLARKTON	E GREENE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1347			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103137	244.3		8			



Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 22.9 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

Distance: 242.2 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

Distance: 244.0 ft. Grade: 2
Condition: SAV-Surface Damage Aggregate Visible
Remarks: N/A

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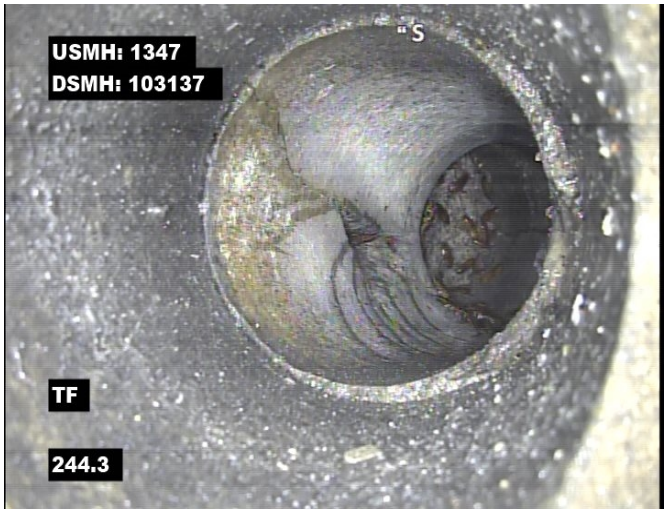
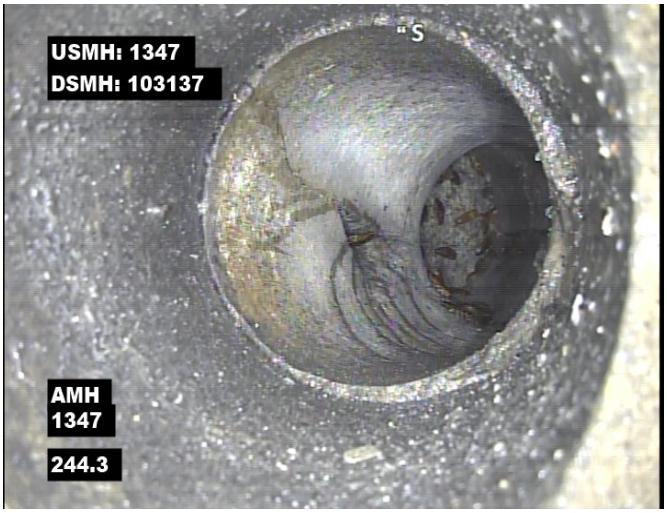
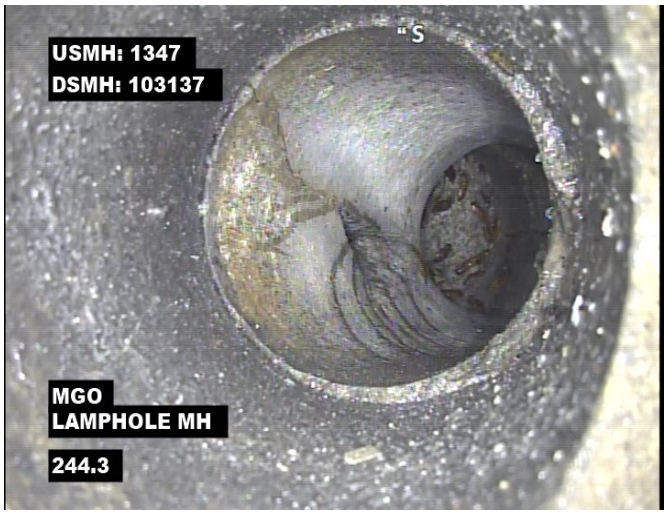
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1347_103137	CLARKTON	E GREENE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1347			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103137	244.3		8			



Distance: 244.3 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 244.3 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1347



Distance: 244.3 ft. Grade: 0
Condition: MGO-Miscellaneous General Observation
Remarks: LAMPHOLE MH

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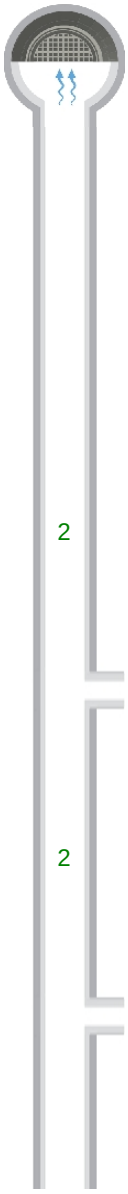
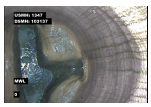
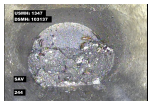
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1347_103137	CLARKTON	E GREENE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1347			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103137	244.3		8			

SPR	88	MPR	0	PO Number	Customer
SPRI	2	MPRI	0		
QSR	2G00	QMR	0000	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
88	CHRISTIAN CHURCH	Upstream	04/11/2024		
OPRI	Certificate Number	Pre-Cleaning	Time	Weather	
2	P0036843-042022	Heavy Cleaning	08:45	Light Rain	
Date Cleaned			End Time	Additional Info	
04/11/2024			08:57		



0 ft.	AMH-Access Point Manhole		103137
0 ft.	MWL-Miscellaneous Water Level		
22.9 ft.	SAV-Surface Damage Aggregate Visible - S01		
242.2 ft.	TF-Tap Factory Made		
244 ft.	SAV-Surface Damage Aggregate Visible - F01		
244.3 ft.	TF-Tap Factory Made		
244.3 ft.	AMH-Access Point Manhole		1347

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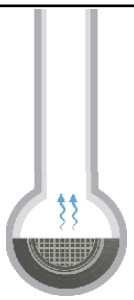
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
1347_103137	CLARKTON	E GREENE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
1347			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
103137	244.3		8			

244.3 ft. MGO-Miscellaneous General Observation



LAMPHOLE MH

1347

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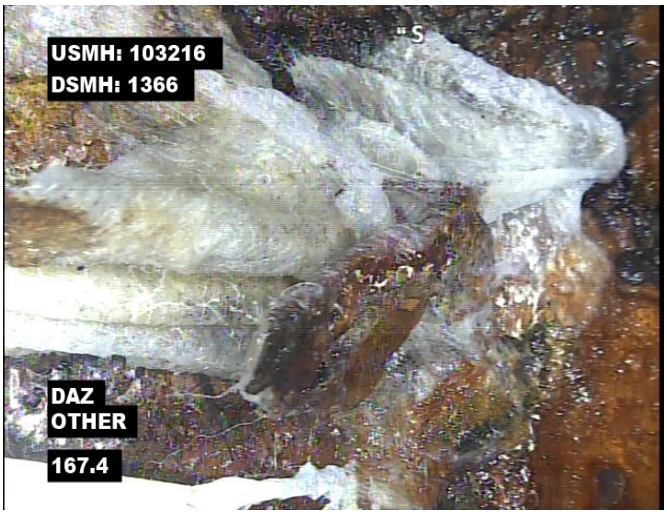
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103216_1366	CLARKTON	OFF N COLLEGE ST	Ductile Iron Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103216			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1366	258.8		8			

Distance: 0.0 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 103216

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A

Distance: 10.0 ft. Grade: 1
Condition: SRI-Surface Damage Roughness Increased
Remarks: N/A



Distance: 167.4 ft. Grade: 2
Condition: DAZ-Deposits Attached Other
Remarks: OTHER

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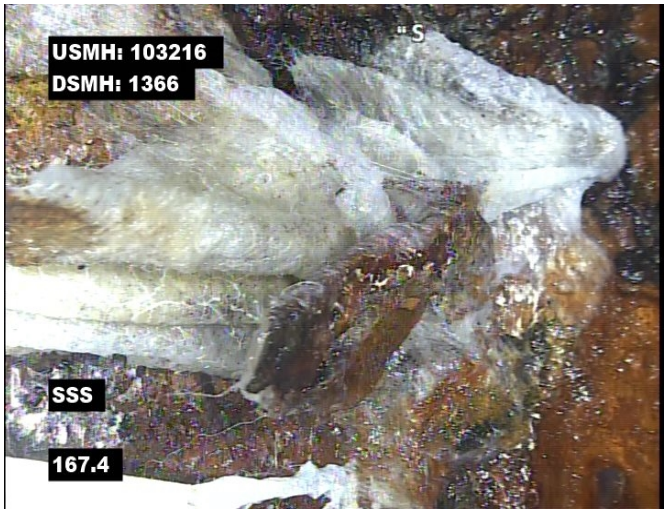
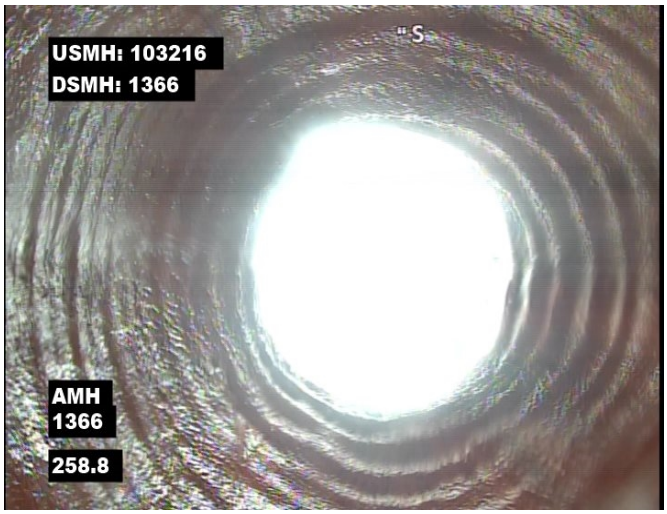
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103216_1366	CLARKTON	OFF N COLLEGE ST	Ductile Iron Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103216			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1366	258.8		8			

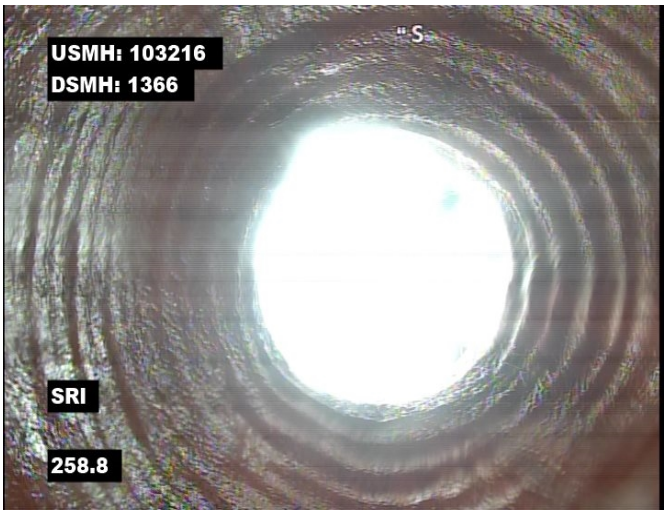


Distance: 167.4 ft. Grade: 2
Condition: SSS-Surface Damage Surface Spalling
Remarks: N/A

Distance: 243.3 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 258.8 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1366



Distance: 258.8 ft. Grade: 1
Condition: SRI-Surface Damage Roughness Increased
Remarks: N/A

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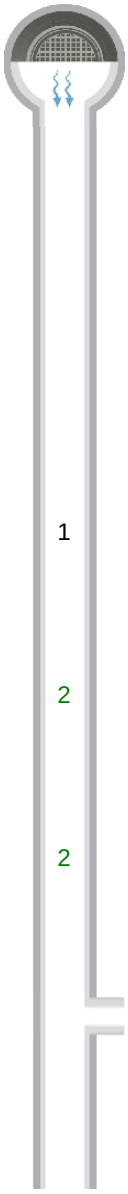
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103216_1366	CLARKTON	OFF N COLLEGE ST	Ductile Iron Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103216			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1366	258.8		8			

SPR	52	MPR	2	PO Number	Customer
SPRI	52	MPRI	2		
QSR	2100	QMR	2100	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label
54	CHRISTIAN CHURCH	Downstream	04/11/2024	
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**
27	P0036843-042022	Heavy Cleaning	10:22	Light Rain
Date Cleaned			**End Time**	**Additional Info**
04/11/2024			10:37	



0 ft.	AMH-Access Point Manhole		103216
0 ft.	MWL-Miscellaneous Water Level		
10 ft.	SRI-Surface Damage Roughness Increased - S01		
167.4 ft.	DAZ-Deposits Attached Other		OTHER
167.4 ft.	SSS-Surface Damage Surface Spalling		
243.3 ft.	TF-Tap Factory Made		
258.8 ft.	AMH-Access Point Manhole		1366

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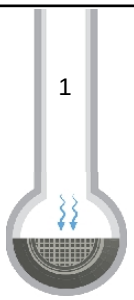
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103216_1366	CLARKTON	OFF N COLLEGE ST	Ductile Iron Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103216			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1366	258.8		8			

258.8 ft. SRI-Surface Damage
Roughness Increased - F01



1366

Infrastructure Technologies
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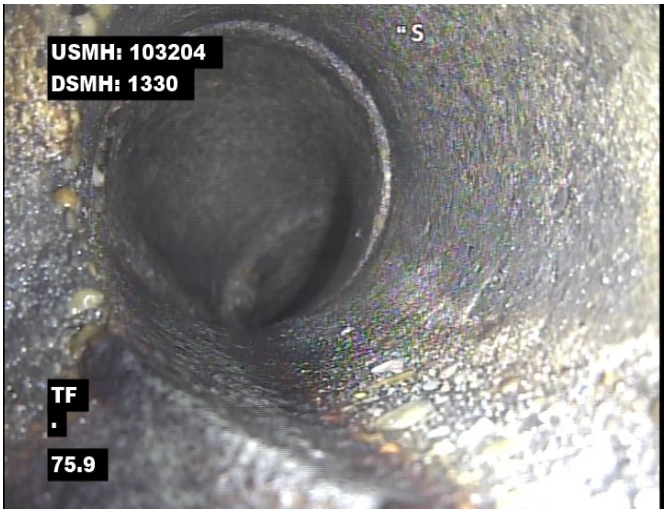
4 Image Report

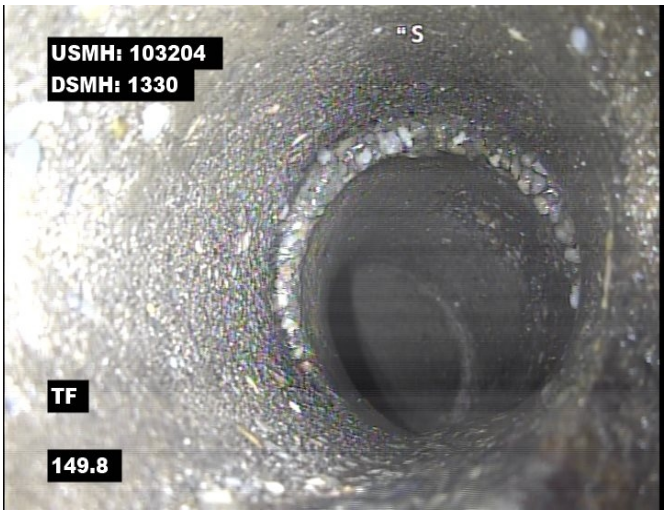
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103204_1330	CLARKTON	PAGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103204			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1330	243.8		8			

Distance: 0.0 ft. Grade: 0
Condition: MWL-Miscellaneous Water Level
Remarks: N/A



Distance: 75.9 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: .

Distance: 75.9 ft. Grade: 4
Condition: IRL-Infiltration Runner Lateral
Remarks: N/A



Distance: 149.8 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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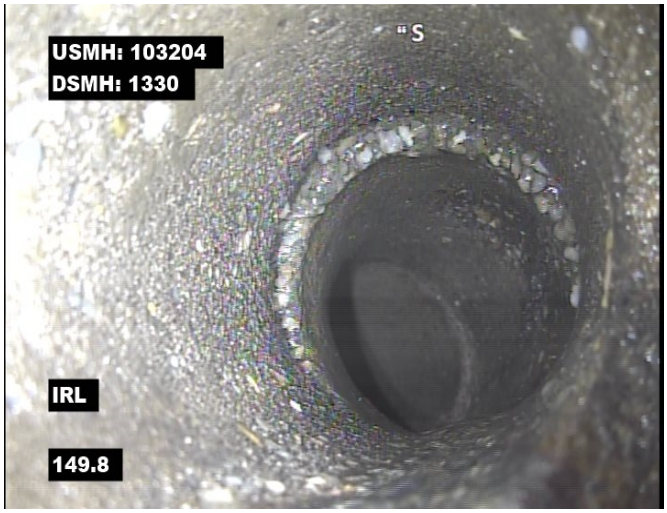
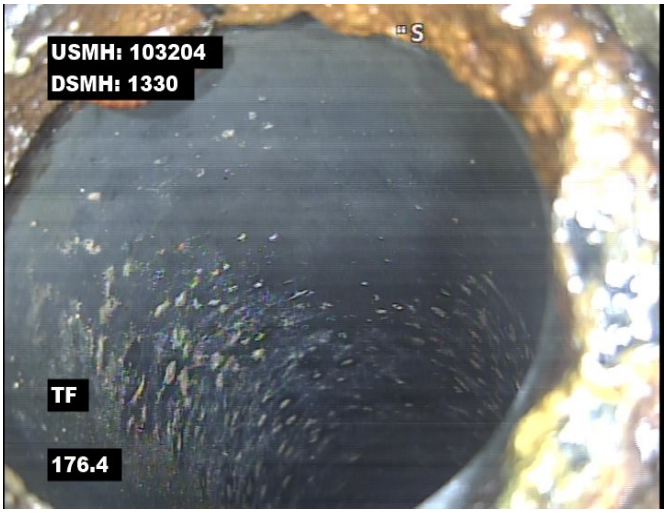
4 Image Report

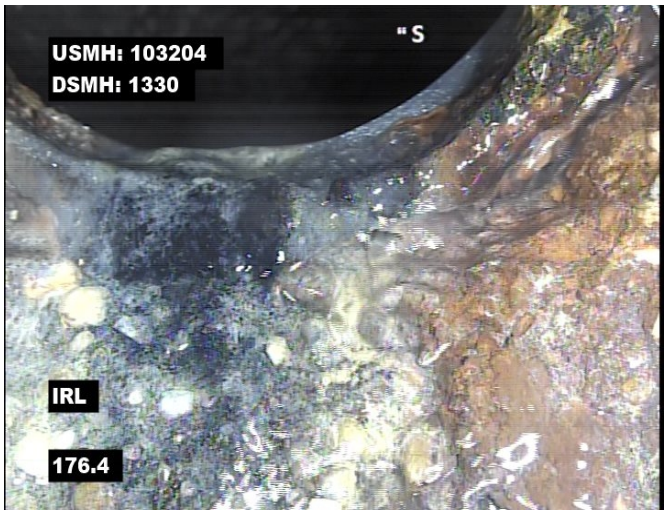
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103204_1330	CLARKTON	PAGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103204			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1330	243.8		8			



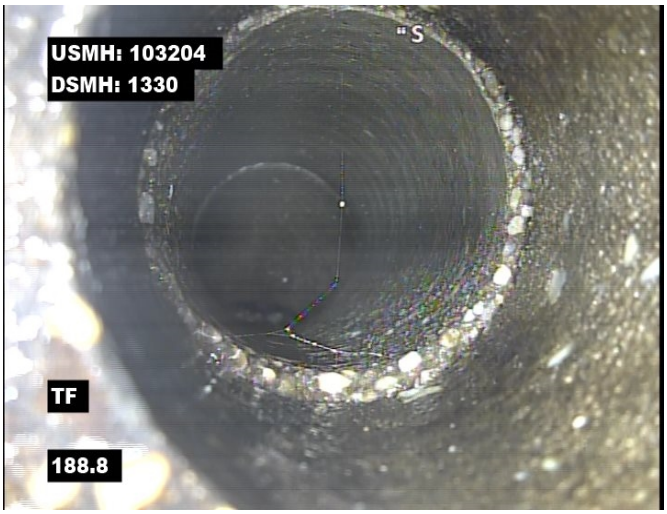
Distance: 149.8 ft. Grade: 4
Condition: IRL-Infiltration Runner Lateral
Remarks: N/A



Distance: 176.4 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A



Distance: 176.4 ft. Grade: 4
Condition: IRL-Infiltration Runner Lateral
Remarks: N/A



Distance: 188.8 ft. Grade: 0
Condition: TF-Tap Factory Made
Remarks: N/A

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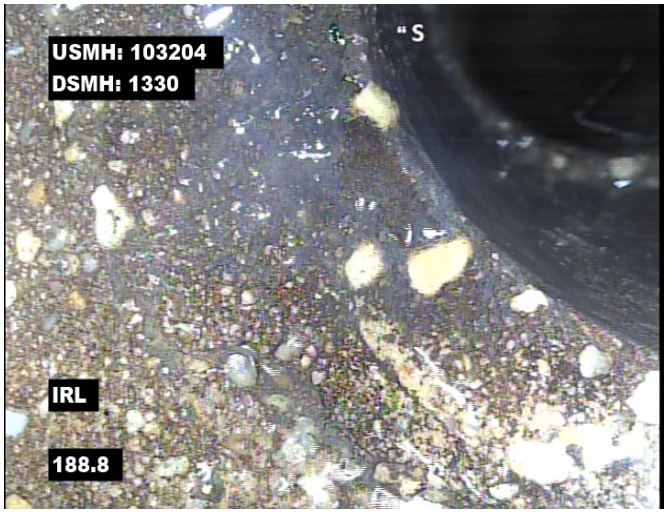
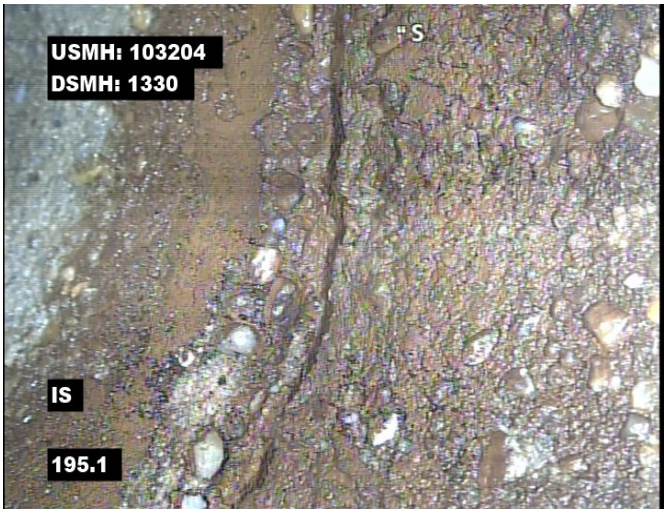
4 Image Report

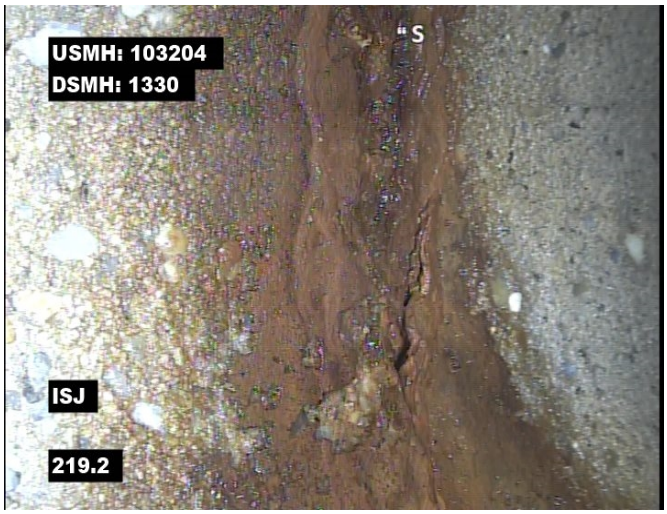
Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103204_1330	CLARKTON	PAGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	Total Length	Year Constructed	Shape		Location Details	
103204			Circular			
Downsstream MH	Length surveyed	Year Renewed	Height	Width	Pipe Joint Length	
1330	243.8		8			



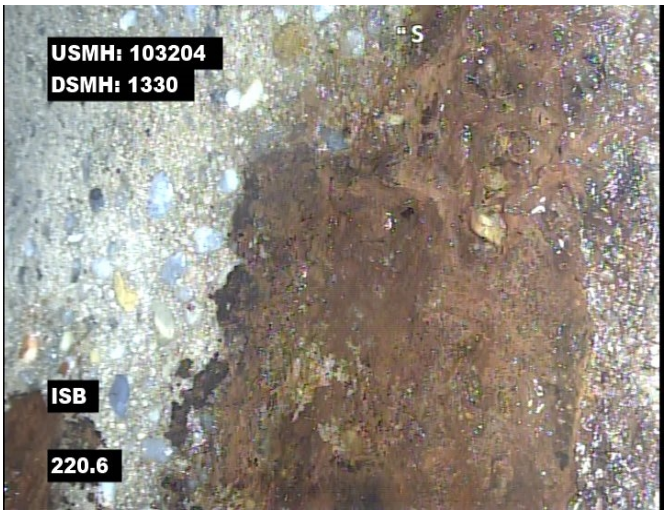
Distance: 188.8 ft. Grade: 4
Condition: IRL-Infiltration Runner Lateral
Remarks: N/A



Distance: 195.1 ft. Grade: 1
Condition: IS-Infiltration Stain
Remarks: N/A



Distance: 219.2 ft. Grade: 1
Condition: ISJ-Infiltration Stain Joint
Remarks: N/A



Distance: 220.6 ft. Grade: 1
Condition: ISB-Infiltration Stain Barrel
Remarks: N/A

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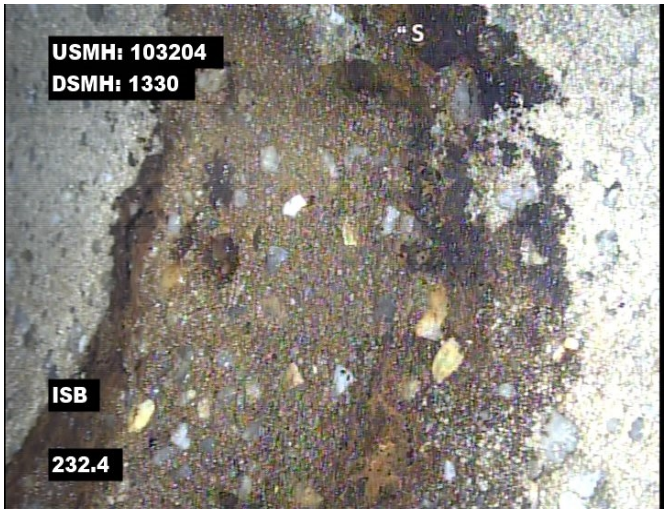
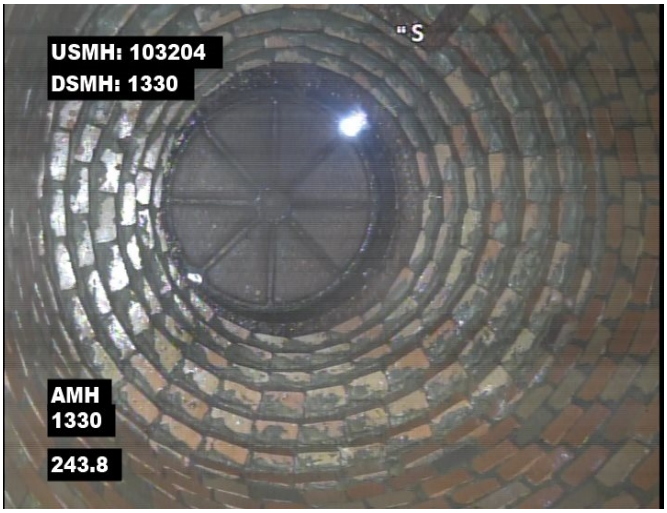
4 Image Report

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103204_1330	CLARKTON	PAGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103204			Circular			
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1330	243.8		8			



Distance: 232.4 ft. Grade: 1
Condition: ISB-Infiltration Stain Barrel
Remarks: N/A



Distance: 243.8 ft. Grade: 0
Condition: AMH-Access Point Manhole
Remarks: 1330

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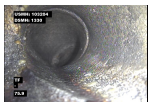
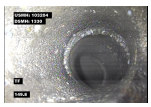
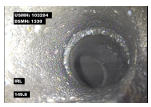
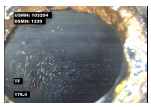
Defect Listing Plot

Pipe Segment Reference	City	Street	Material	Location Code	Pipe Use
103204_1330	CLARKTON	PAGE ST	Reinforced Concrete Pipe		Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**	**Location Details**	
103204			Circular		
Downsstream MH	**Length surveyed**	**Year Renewed**	**Height / Width**	**Pipe Joint Length**	
1330	243.8		8		

SPR	0	MPR	20	PO Number	Customer
SPRI	0	MPRI	5		
QSR	0000	QMR	4400	Work Order Number	Purpose

OPR	Surveyed By	Direction	Date	Media label	
20	CHRISTIAN CHURCH	Downstream	04/11/2024		
OPRI	**Certificate Number**	**Pre-Cleaning**	**Time**	**Weather**	
5	P0036843-042022	Light Cleaning	11:17	Light Rain	
Date Cleaned			**End Time**	**Additional Info**	
04/11/2024			11:31		

0 ft.	AMH-Access Point Manhole		103204
0 ft.	MWL-Miscellaneous Water Level		
75.9 ft.	TF-Tap Factory Made		.
75.9 ft.	IRL-Infiltration Runner Lateral		
149.8 ft.	TF-Tap Factory Made		
149.8 ft.	IRL-Infiltration Runner Lateral		
176.4 ft.	TF-Tap Factory Made		

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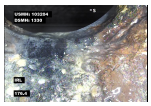
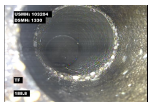
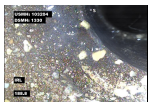
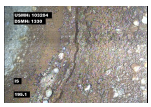
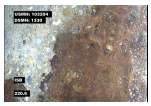
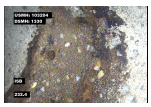
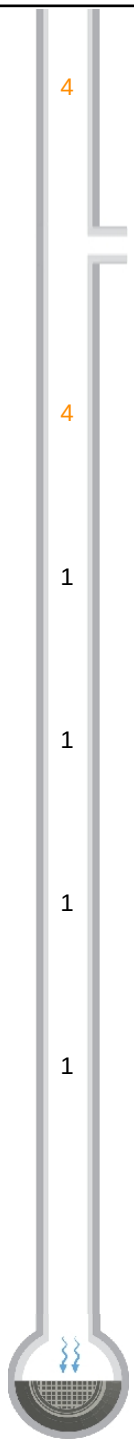
Defect Listing Plot

Pipe Segment Reference	City	Street	Material		Location Code	Pipe Use
103204_1330	CLARKTON	PAGE ST	Reinforced Concrete Pipe			Sanitary Sewage Pipe
Upstream MH	**Total Length**	**Year Constructed**	**Shape**		**Location Details**	
103204			Circular			
Downstream MH	**Length surveyed**	**Year Renewed**	**Height**	**Width**	**Pipe Joint Length**	
1330	243.8		8			

176.4 ft.	IRL-Infiltration Runner Lateral		4
188.8 ft.	TF-Tap Factory Made		
188.8 ft.	IRL-Infiltration Runner Lateral		4
195.1 ft.	IS-Infiltration Stain		1
219.2 ft.	ISJ-Infiltration Stain Joint		1
220.6 ft.	ISB-Infiltration Stain Barrel		1
232.4 ft.	ISB-Infiltration Stain Barrel		1
243.8 ft.	AMH-Access Point Manhole		1330



1330

APPENDIX III – Lifecycle Model Documentation Report

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Model Documentation Report

Summary of process used to structure data for Town of Clarkton, North Carolina

Sewer Lifecycle Models

March 2025

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Asheville | Cary | Charlotte | Greensboro | Pittsboro | Powells Point | Raleigh | Southern Pines | Wilmington

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INTRODUCTION

This document lists the tasks performed to prepare the Town of Clarkton's Sewer Lifecycle Model in Capital Predictor software using the Town's GIS data and WithersRavenel's subject matter experts involved in Clarkton's AIA project. Separate lifecycle models were built for the different components of the Town's sewer system which include sewer gravity mains, force mains, and manholes as their GIS datasets are separate as well as the treatment that's applied to each.

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PREPARING YOUR DATA

We utilized Clarkton's GIS data to model the assets within the Town's sewer system. WithersRavenel requested that additional data be added to the Town's GIS that was required to develop an accurate model within Capital Predictor. Those new data fields are listed below.

Gravity Mains

- Condition – Represents the condition of each gravity main and the remaining useful life for that stage:
  - Service State 5 equals "Very Poor" with <15% remaining useful life
  - Service State 4 equals "Poor" with 16-30% remaining useful life
  - Service State 3 equals "Fair" with 31-50% remaining useful life
  - Service State 2 equals "Good" with 51-75% remaining useful life
  - Service State 1 equals "Good, New, or Nearly New" with 76-95% remaining useful life
- Rehab - To be updated as lines are rehabbed to ensure they are recommended for replacement after the initial rehab is completed.
- Unit Cost Variation - For this field we used the diameter of the main, included to calculate rehab and replacement costs. One gravity main had the diameter of "Unknown" and was assumed to be 8".

Force Mains

- Life Stage – Represents the present state of each force main based on a 1-5 scale:
  - Life Stage 5 equals "Very Poor" with <5% remaining useful life
  - Life Stage 4 equals "Poor" with 5-15% remaining useful life
  - Life Stage 3 equals "Fair" with 15-50% remaining useful life
  - Life Stage 2 equals "Good" with 50-95% remaining useful life
  - Life Stage 1 equals "Good, New, or Nearly New" with >95% remaining useful life
- Unit Cost Variation – For this field we used the diameter of the force main, included to calculate replacement costs. One force main had the diameter of "Unknown" and was assumed to be 6".

Manholes

- Condition –Represents the condition of each Manhole and the remaining useful life for that stage:
  - Service State 1 is used for a "Good" condition hydrant with 95% remaining life
  - Service State 3 is used for a "Fair" condition hydrant with 50% remaining life
  - Service State 5 is used for a "Poor" condition hydrant with 30% remaining life
- Unit Cost Variation – For this field we used the depth of the manhole, included to calculate rehab costs.

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ESTABLISH THE UNIT OF MEASURE

As part of the calculation of the value of assets, the Unit of Measure is used as a foundational metric. For Clarkton's gravity mains and force mains models, the line's calculated "Shape_Leng", which is the pipe's length, is multiplied by the diameter in inches when applying costs. "Shape_Leng" is used as the unit of measure as these treatment costs are based on length and diameter of the pipe.

A value of 1 is added as the manhole unit of measure as the rehab cost for each manhole is a flat rate of $300 plus $250/per depth foot. To accommodate these fees a unique price was added to Capital Predictor for each depth foot possibility.

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ESTABLISH EXPECTED LIVES

Life Stage and Condition are factors of deterioration rates and thereby a key element in a life cycle model as it influences when assets will be replaced. For Clarkton's model, using Life Stage or Condition was determined by the data available. Manholes and sewer gravity mains use Condition, whereas sewer force mains use Life Stage.

Life expectancies for the gravity mains and force mains were based on pipe material. The following life expectancies were given to the following materials:

Gravity Mains:

Main Material	**Expected Life**
Asbestos Cement	60 years
Cast Iron	60 years
Ductile Iron	100 years
Polyvinyl Chloride	80 years
High Density Polyethylene	80 years
Vitrified Clay	50 years
Reinforced Concrete	100 years
Other	50 years

Force Mains:

Main Material	**Expected Life**
Polyvinyl Chloride	80 years
Unknown	80 years

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TREATMENT

We implemented a “run to failure” model which predicts the end of life for each asset and then calculates the replacement costs of all assets due for replacement each year. Each model was uniquely configured and the treatments for each model are highlighted below.

The Gravity Mains model has two treatments, one for Rehab Line and one for Replace which is based on the Condition of the main. The cost to Rehab Line is estimated to be $21 per inch*foot and the cost to Replace is estimated to be $25 per inch*foot.

The Force Main model has one treatment for Replace Line which is based on the Life Stage of the main. The estimated cost to replace a Force Main is $25 per inch*foot.

The Manhole model has one treatment for Rehab Manhole which is based on the Condition of the manhole. The estimated cost to rehab a manhole is $300 plus $250 per depth foot.

TREATMENT CRITERIA

The established Treatment Criteria is what triggers the asset for treatment in the model. The Treatment Criteria set up for Clarkton's sewer model is based on the asset's Life Stage or Condition.

For the Gravity Mains model, the model will trigger a Rehab when the Condition of the main is a 4 or worse and rehab has not yet been performed on the main. A replacement will occur when the Condition of the main is a 4 or worse and has already been rehabbed.

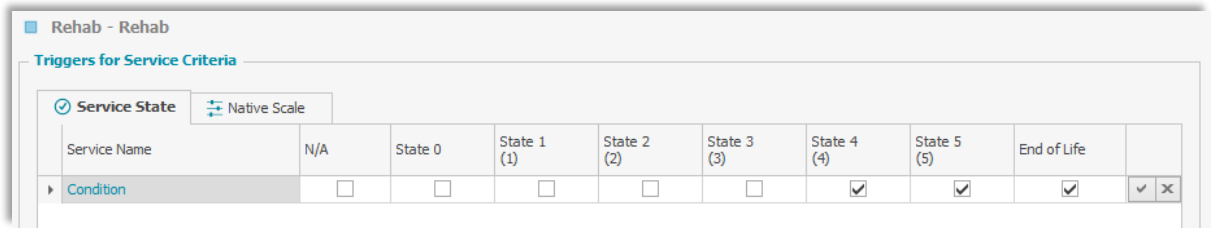

Figure 1 Treatment Criteria for Rehabbing a Gravity Main based on Life Stage

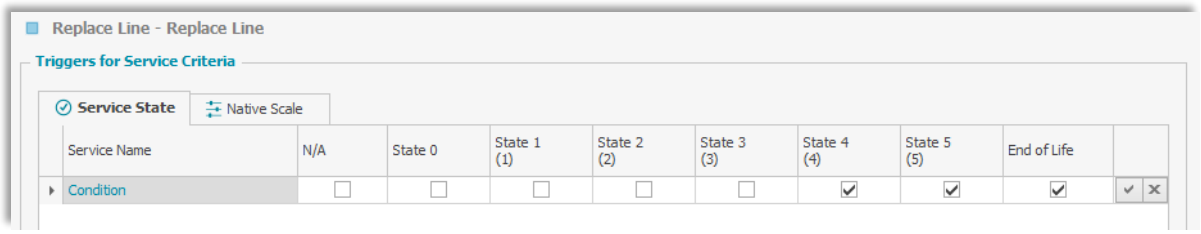

Figure 2 Treatment Criteria for Replacing a Gravity Main based on Life Stage and previous Treatment

For Force Mains, a Replacement is triggered when the Force Main has reached a 4 or worse Life Stage.

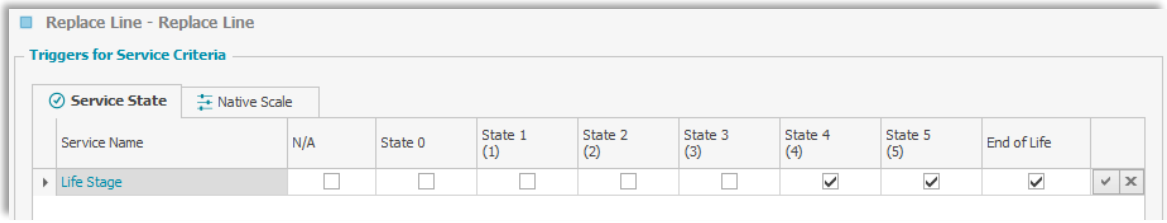

Figure 3 Treatment Criteria for Replacing a Force Main based on Life Stage

The Manhole model is setup to trigger a Rehab when the manhole reaches the Condition of a State 5 (Poor) or worse.

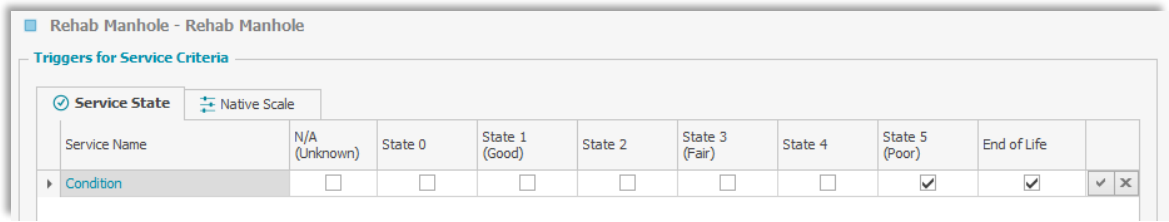

Figure 4 Treatment Criteria for Rehabbing a Manhole based on Condition

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SERVICE STATE BASED ON AGE AND CONDITION

Another key factor in a Life Cycle Model is the Service State of the asset, often expressed in terms of Condition. Capital Predictor utilizes a standardized 0 to 6 Service State to assign where assets are on their lifecycle degradation curve. Two degradation curves were selected, one to represent Condition, and one to represent Life Stage.

A custom degradation profile was created for Clarkton's condition scale. An asset with a Good condition rating will be considered Service State 1 with 95% remaining life, Fair assets are Service State 3 with 50% remaining life, and Poor assets are Service State 5 with 15% remaining life.

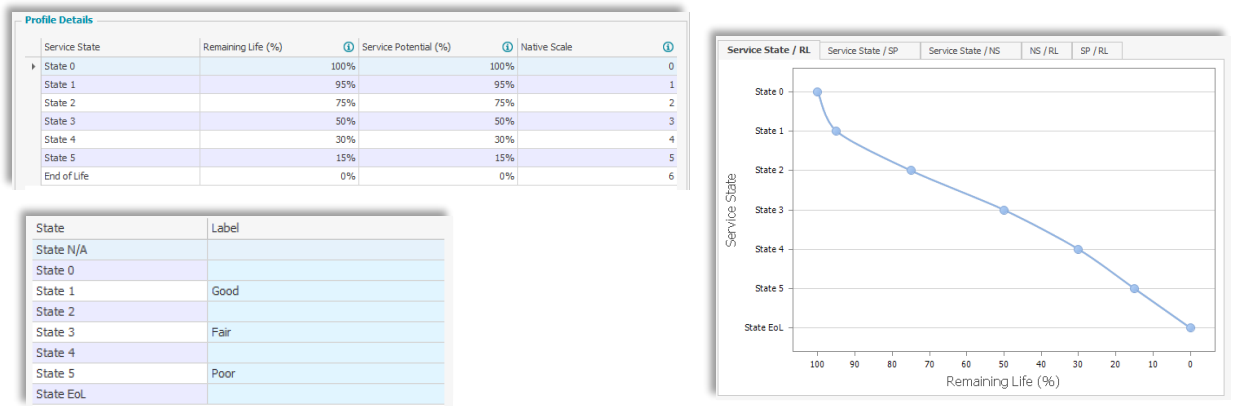
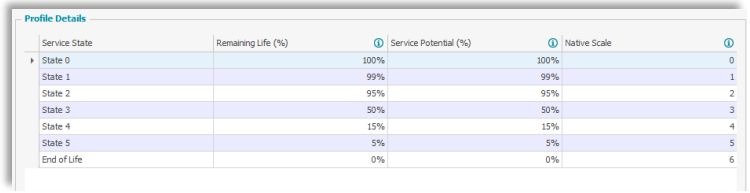


Figure 5 Condition to Service State Assignment Table and Degradation Profile

Another custom degradation profile was created for Clarkton's Life Stage scale. An asset with a Life Stage 1 rating will be considered Service State 1 with 99% remaining life, Life Stage 2 assets are Service State 2 with 95% remaining life, Life Stage 3 assets are Service State 3 with 50% remaining life, Life Stage 4 assets are Service State 4 with 15% remaining life, and Life Stage 5 assets are Service State 5 with 5% remaining life.



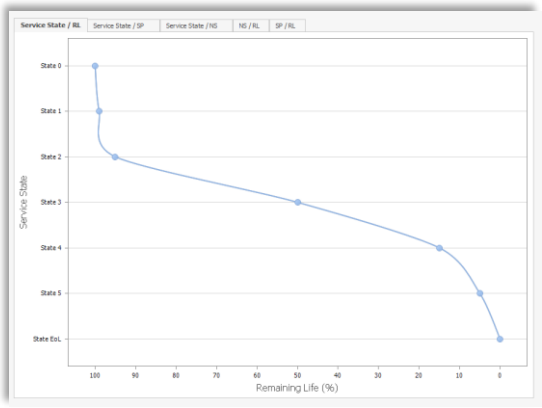


Figure 6 Life Stage to Service State Assignment Table and Degradation Profile

CONCLUSION

The Town of Clarkton's sewer lifecycle model in Capital Predictor provides a structured and data-driven approach to managing sewer system assets. By integrating GIS data, defining treatment criteria, and establishing expected life spans, the model ensures a proactive strategy for asset maintenance and replacement. The implementation of a "run to failure" methodology allows for accurate forecasting of future costs and infrastructure needs. Moving forward, continued data updates will enhance model accuracy, supporting informed decision-making for long-term infrastructure sustainability.

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NEXT STEPS

To further refine the Town of Clarkton's sewer lifecycle model, the next steps include additional refinements to treatment triggers and cost assumptions based on real-world rehabilitation and replacement data. The model should be periodically reviewed and updated with the latest rehabilitation and replacement activities to maintain accuracy, helping to optimize long-term capital planning. Additionally, budget allocations and funding strategies should be reassessed to ensure alignment with long-term infrastructure needs. Finally, continued coordination between GIS specialists, your WithersRavenel Managed Services Team, and decision-makers will enhance data integrity and support proactive sewer system management.

APPENDIX IV – Lifecycle Model Results Narrative

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Model Results Narrative
Town of Clarkton, NC Sewer Lifecycle Model

March 2025

A. Introduction

The Lifecycle Model created for Town of Clarkton's sewer system utilized the Town's GIS data which contains estimated life expectancy and condition data. A technical explanation of how this data was used to develop the model may be found in the accompanying Model Documentation Report.

Separate models were built for each component of the sewer system and the following Model Scenarios (aka Simulations) were created:

Gravity Mains
1. Current Budget - $50k/$90k/$50k
2. Current Budget - $50k/$90k/$90k
3. Current Budget - $50k/$90k/$90k w/ inflation
4. Current Budget - $50k/$90k/$175k
5. Calibration
6. No Budget

Force Mains
1. Calibration
2. No Budget

Manholes
1. $5,000
2. $7,500
3. $10,000
4. $10,000 w/inflation
5. Calibration
6. No Budget

These budget scenarios are preliminary and may be subject to change. All scenarios were analyzed over a 100-year period. Scenarios that include inflation add 3% inflation year-over-year to the costs of rehabilitation and replacement. The *Calibration* budget is used for the purposes of measurement and shows the model results as if there were no caps on available funding. The *No Budget* model shows the model results as if there was no funding for the entirety of the 100-year timeframe.

B. Overview of Results

Gravity Mains

With the proposed budgets of approximately $50k in FY25 and $90k in FY26, four separate current budget scenarios were conducted:

- The first simulation of *$50k/$90k/$50k* (yellow) represents the suggested budgets with a continued budget of $50k in FY27 through the remainder of the 100-year model. The model maintains a service state of "Good" until Year 18, where it begins to decline into the service state of "Fair". In Year 40, the model declines into a service state of "Poor" that continues throughout the remainder of the 100-year model.
- The second current budget simulation of *$50k/$90k/90k* (purple) represents the suggested budgets with a continued budget of $90k in FY27 through the remainder of the 100-year model. This model maintained a service state of "Good" until Year 27 and then a service state of "Fair" until Year 56 that continued throughout the remainder of the 100-year model.
- The third scenario, *$50k/$90k/$90k w/ inflation* (teal), demonstrates the impact of the second proposed budget with a 3% inflation on rehabilitation and replacement costs. Service state is impacted in Year 20 dropping to "Fair", "Poor" by Year 39, and ultimately declining to "Very Poor" by Year 61 through the end of the model.
- The fourth scenario, *$50k/$90k/$175k* (cyan), demonstrates the suggested budget with a continued budget of $175k in FY27 through the remainder of the model. This budget maintained a service state of "Good" until Year 48 and remains in a consistent state of "Fair" through the final 52 years of the model

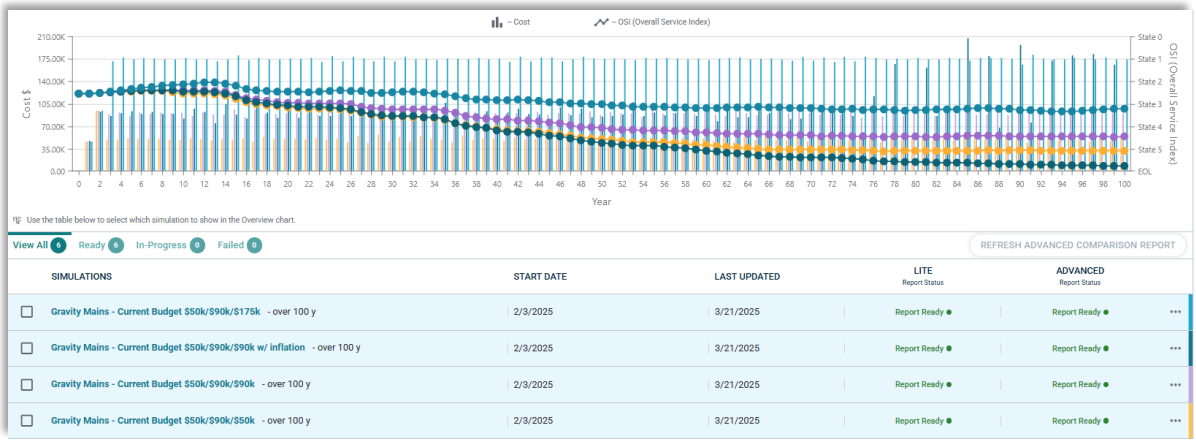

Figure 1 Simulation Comparison comparing the Gravity Mains overall service state over 100 years given each current budget scenario.

For baseline purposes *No Budget* (yellow) and *Calibration* (light blue) models were conducted. The *No Budget* (yellow) model reflects a steady decline in service state from "Good" to "Fair" by Year 15 and continues to decline before reaching EOL at Year 93. Our *Calibration* model (light blue) indicates a Year 1 backlog of approximately $2.16 million as shown in further detail in *Figure 6*, below.

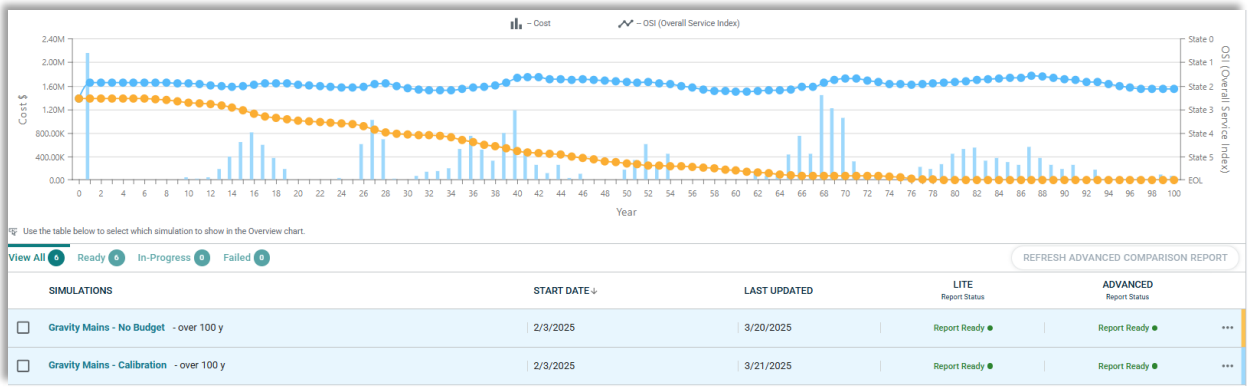

Figure 2 Simulation Comparison comparing the Gravity Mains overall service state over 100 years given each baseline budget scenario.

Force Mains

The data received for Clarkton's two force mains indicates no immediate need for replacement in the first 25 years of our 100-year model. The *Calibration* (light blue) model demonstrates the first replacement of the shorter main in Year 27 for approximately $35k. Replacement for the larger main would take place shortly after in Year 29 for a cost of approximately $373k. Another replacement of the small main occurring in Year 94. The *No Budget* (green) simulation reflects EOL of both mains by Year 41.

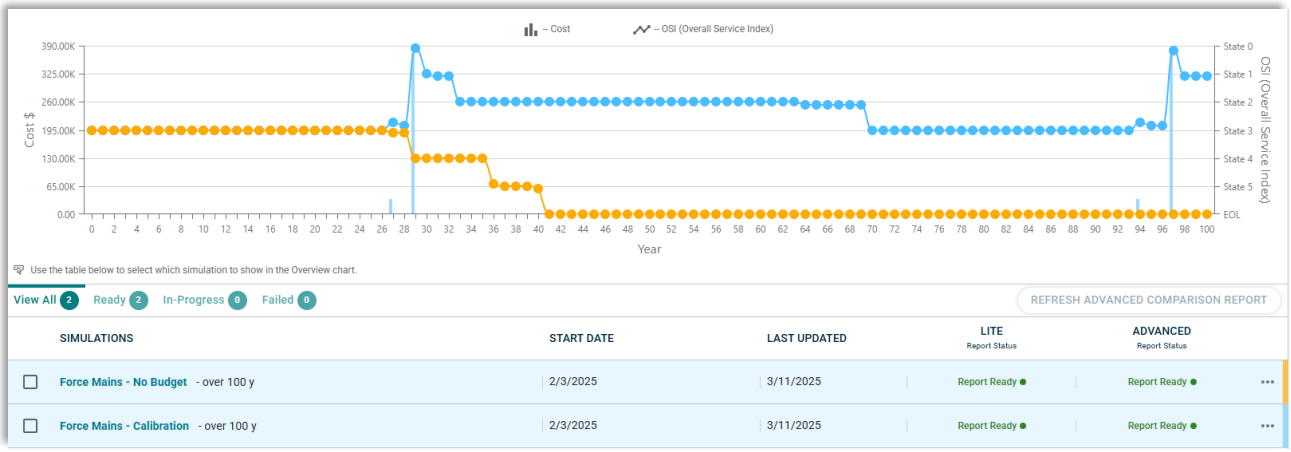

Figure 3 Simulation Comparison comparing the Force Mains overall service state over 100 years given each budget scenario.

Manholes

The simulation of *$10k* (purple) was determined to be an effective model as it maintains a consistent service state over the next 100 years, finishing in a service state of "Good" by Year 100. When considering inflation, the *$10k with inflation* (yellow) model begins a slight decline in service state around Year 18, due to the increases in rehabilitation costs, that continue through Year 100 where it nears EOL. The *$7.5k* (teal) model also maintains a similar service state to the $10k model through the first 40 years, then a consistent service state a "Fair" through the final 60 years of the model. The *$5k* (light blue) budget demonstrates a slight decline in asset condition compared to the other models beginning in Year 18, when an increase in forecasted rehabilitations are expected, and ends the 100-year model in "Poor" condition.

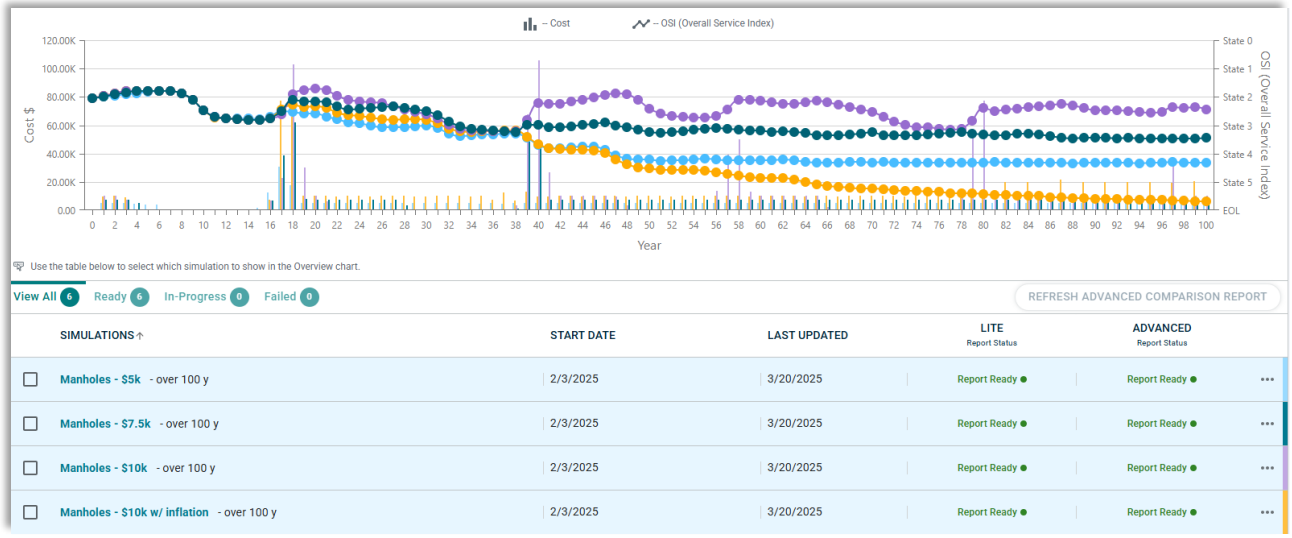

Figure 4 Simulation Comparison comparing the Manholes overall service state over 100 years given each budget scenario.

In the *No Budget* (light blue) simulation, assets degrade from "Good" to "EOL" by Year 49. The *Calibration* (yellow) model demonstrates a Year 1 backlog of approximately $27.5k as reflected below in *Figure 8*.

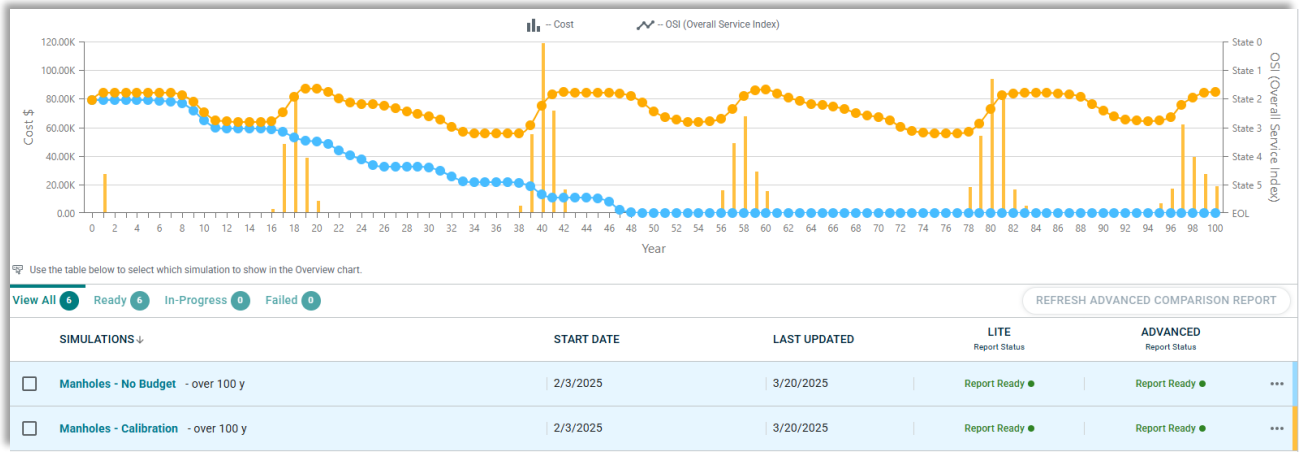

Figure 5 Simulation Comparison comparing the Manholes overall service state over 100 years given each baseline scenario.

C. Calibration

Calibration of the model was conducted to validate that the model triggers the expected treatments without any budget caps in place. All models were validated with the "*Calibration*" model and then additional budget scenarios were run.

D. Treatment Costs

Predictor utilizes an optimization engine that selects the treatment of each asset based on the estimated life expectancy and/or treatment counter data provided. The charts below show the recommended treatment costs required over the 40-year period for each model with no budget restraints in place.

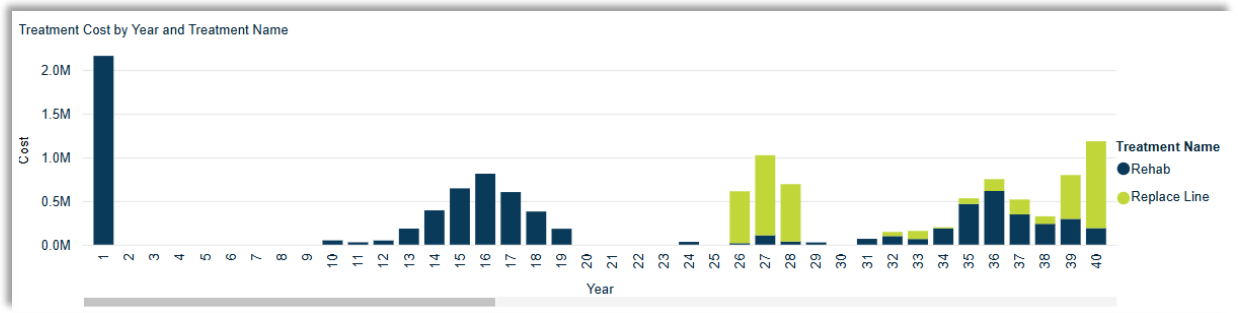

Figure 6 The treatment costs for the Gravity Mains model selected over a 40-year period

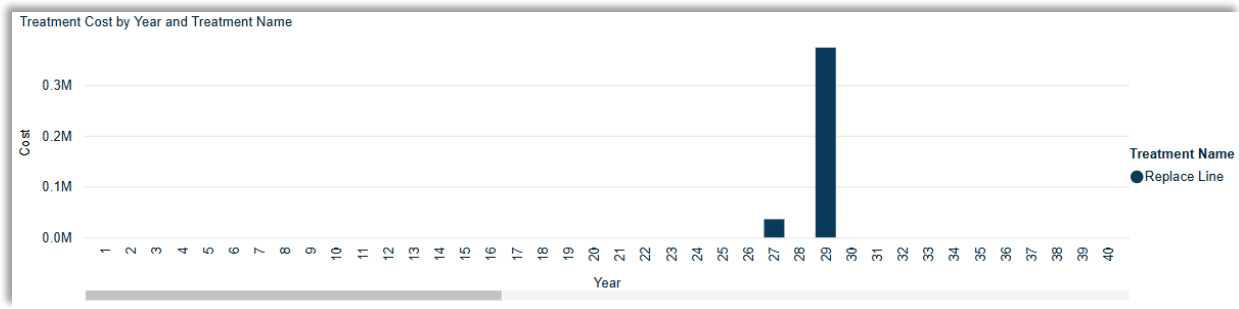

Figure 7 The treatment costs for the Force Mains model selected over a 40-year period

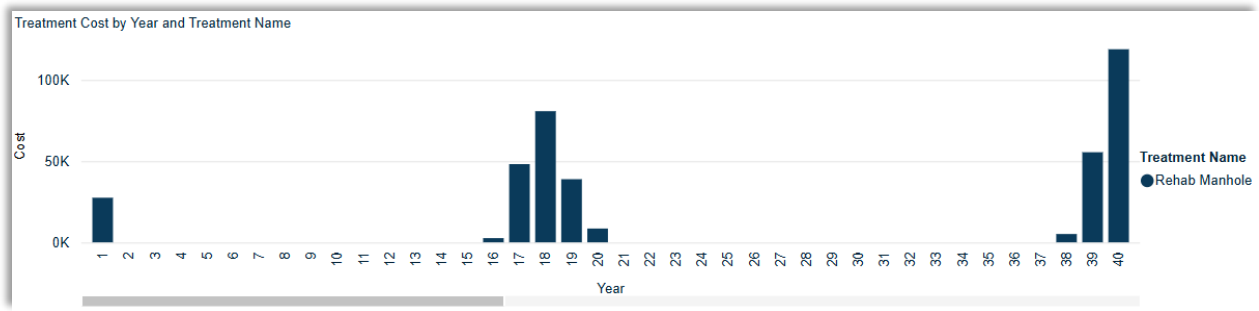

Figure 8 The treatment costs for the Manholes model selected over a 40-year period

E. Further investigations & Next Steps

It is encouraged to continue to evaluate your asset data and to continue to keep it updated in Capital Predictor. We also encourage the Town to explore additional budget scenarios to determine the optimal amount to maintain the water and sewer systems at the desired service state.

We encouraged you to continue to work with the lifecycle model, continue to collect asset data, and to consult with WithersRavenel Consultants to further refine your models, create additional scenarios, enhance reporting and similar activity. The goal is to integrate the lifecycle model into the Town's capital planning process.

APPENDIX V – Rate Study

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TABLES AND CHARTS

Introduction

The following rate study references and builds upon the financial analysis that was completed in the Town's Merger and Regionalization Feasibility study Option A, (Project #MRF-W-ARP-0010). The financial analysis proposed 6% annual rate increases from FY 2027 through FY 2036 to fund capital needs and increasing operating and maintenance costs while establishing a healthy fund balance. The rate study considers the revenue needs and proposes changes, based on best practices, to the rates to accomplish the objectives.

Rate Study Findings
The following characteristics stand out when analyzing the Town's FY 2026 water and sewer rates, as shown in Table 1.

- They are comprised of fixed/minimum and volumetric charges
- Minimum charges include 1500 gallons of monthly usage
- Outside users pay rates that are double inside rates.
- Fund needs annual revenue increases due to inflation and capital needs
- There are 407 water and 303 sewer customers, actively billed
- 86% of water and sewer users are residential
- 69% of water and 89% of sewer users are located inside Town limits
- Average monthly residential usage is 2,800 gallons

TABLE 1
FY 2026 Water and Sewer Rates

WATER - IN TOWN	
Minimum (includes 1,500 gal)	$ 11.75
Volume, per 1,000	$ 5.50
SEWER - IN TOWN	
Minimum (includes 1,500 gal)	$ 14.75
Volume, per 1,000	$ 6.25
WATER - OUT OF TOWN	
Minimum (includes 1,500 gal)	$ 23.50
Volume, per 1,000	$ 11.00
SEWER - OUT OF TOWN	
Minimum (includes 1,500 gal)	$ 29.50
Volume, per 1,000	$ 12.50

To analyze the present water and sewer rates and the impact of any changes, a financial model was created to show the impact of various rate modifications. In proposing changes to rates, the objectives are to maintain positive revenue generation for the fund, while promoting user equity and best practices. Below are the structural changes discussed for the Town's future consideration:

OPTION 1 – Vary minimum charge by meter size max flow rate

- Greatest impact on the non-residential & large users
- Minimum charges increase by factor of maximum meter flow.

METER SIZE	AMOUNT GREATER FLOW VS ¾-IN
1-in meter	1.6x
2-in meter	5.3x

Pros:

- **Reflects system capacity need:** Larger meters can deliver more water, so charges based on size reflect a customer's potential burden on the system.
- **Encourages correct meter sizing:** Customers may opt for smaller meters if they don't need high capacity, which promotes system efficiency.
- **Slightly more stable revenue:** Greater fixed charges help stabilize overall revenue and cover fixed charges if conservation reduces usage.

Cons:

- **Disincentivizes conservation:** High fixed charges may reduce the bill's sensitivity to usage, offering less motivation to reduce consumption.
- **May not reflect actual use:** A large meter doesn't always mean high usage, especially for infrequent users or those with sprinklers.

OPTION 2 – Add second residential rate tier at 5,000 gallons

- This does not affect small residential customers
- Best practice to charge a significantly higher rate, such as $0.30 inside and $0.60 outside

Pros:

- **Promotes conservation:** Higher per-unit prices at higher usage levels send a strong price signal to discourage excessive use.
- **Aligns with cost-of-service at high usage:** Reflects the increasing marginal cost of treatment and supply.
- **Supports equity:** Basic water needs prices are unaffected, which benefits low-use customers.

Cons:

- **Revenue instability:** Income becomes more sensitive to usage fluctuations from weather, economic changes. etc.
- **May penalize large but efficient households:** Households with more members may unintentionally move into higher blocks.

OPTION 3 - REDUCE 1500 GALLON ALLOCATION IN FIXED CHARGE

- **Could be implemented over time, for example, over 3 years (500 gallons per year) or 5 years (300 gallons per year), reducing the price shock all at once**

Pros:

- **Improves pricing transparency:** Customers see a clear separation between fixed infrastructure costs and variable usage costs.
- **Strengthens conservation signal:** All water use is charged volumetrically, eliminating the included usage that can encourage overuse.
- **Aligns with AWWA cost-of-service principles:** Fixed charges reflect customer and demand costs, while usage charges reflect consumption/commodity costs.

Cons:

- **Revenue instability:** Income becomes more sensitive to usage fluctuations (weather, economic changes).
- **Bill increases for low-income or fixed-use households:** Those who previously stayed within the included volume will see higher bills despite modest usage.

Each of these rate structure options is provided to help facilitate discussion between Town staff and Town leaders about ways to provide simple, fair, equitable and defensible methods to recover water and sewer program costs from its customers. The implementation of any one or more options will help generate needed future revenues. New revenue is necessary for the program to address growing operation costs and planned capital costs, as depicted in the next section.

Outcomes

As a result of WithersRavenel's feasibility study, 6% annual water and sewer revenue increases are needed to plan for inflation and capital needs over the next ten years. The water and sewer increases would affect fixed and volume charges but not tap or other miscellaneous charges. These increases, as shown below, utilize structure changes to generate initial revenue needs then across the board increases thereafter.

The increases will help strengthen unrestricted net position, fund large capital needs and operating costs, while considering limited growth in water usage. It is worth mentioning that an increase in water revenue requires a greater increase in rates due to the price elasticity of demand. When rates increase, customers' usage slightly decreases. However, the revenue loss from the lower water and sewer usage is less than the revenue gained from higher rates. Consequently, rate increases generate more revenue for the program but the percentage increases in rates must exceed the percentage increases in required revenues. The proposed differential is 1% more than the revenue increases. Tentative rates for the next five years are shown in the following tables for each option.

TABLE 2
Tentative Future Water and Sewer Rates

	CURRENT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
WATER - IN TOWN	2026	2027	2028	2029	2030	2031
Minimum (includes 1,500 gal)	$ 11.75					
3/4 IN METER		$ 12.60	$ 13.50	$ 14.45	$ 15.50	$ 16.60
1 IN METER		$ 21.05	$ 22.55	$ 24.15	$ 25.85	$ 27.70
2 IN METER		$ 67.20	$ 71.95	$ 77.00	$ 82.40	$ 88.20
1,501 -5,000	$ 5.50	$ 5.50	$ 5.90	$ 6.35	$ 6.80	$ 7.30
5,001 +		$ 5.80	$ 6.25	$ 6.70	$ 7.20	$ 7.75
SEWER - IN TOWN						
Minimum (includes 1,500 gal)	$ 14.75					
3/4 IN METER		$ 15.80	$ 16.95	$ 18.15	$ 19.45	$ 20.85
1 IN METER		$ 26.40	$ 28.25	$ 30.25	$ 32.40	$ 34.70
2 IN METER		$ 84.21	$ 90.15	$ 96.50	$ 103.30	$ 110.55
1,501 -5,000	$ 6.25	$ 6.25	$ 6.70	$ 7.20	$ 7.75	$ 8.30
5,001 +		$ 6.55	$ 7.05	$ 7.55	$ 8.10	$ 8.70
WATER - OUT OF TOWN						
Minimum (includes 1,500 gal)	$ 23.50					
3/4 IN METER		$ 25.20	$ 27.00	$ 28.90	$ 31.00	$ 33.20
1 IN METER		$ 42.10	$ 45.10	$ 48.30	$ 51.70	$ 55.40
2 IN METER		$ 134.40	$ 143.90	$ 154.00	$ 164.80	$ 176.40
1,501 -5,000	$ 11.00	$ 11.00	$ 11.80	$ 12.70	$ 13.60	$ 14.60
5,001 +		$ 11.60	$ 12.50	$ 13.40	$ 14.40	$ 15.50
SEWER - OUT OF TOWN						
Minimum (includes 1,500 gal)	$ 29.50					
3/4 IN METER		$ 31.60	$ 33.90	$ 36.30	$ 38.90	$ 41.70
1 IN METER		$ 52.80	$ 56.50	$ 60.50	$ 64.80	$ 69.40
2 IN METER		$ 168.43	$ 180.30	$ 193.00	$ 206.60	$ 221.10
1,501 -5,000	$ 12.50	$ 12.50	$ 13.40	$ 14.40	$ 15.50	$ 16.60
5,001 +		$ 13.10	$ 14.10	$ 15.10	$ 16.20	$ 17.40

TABLE 3
Tentative Sample Monthly Residential Charges

	CURRENT 2026	YEAR 1 2027	YEAR 2 2028	YEAR 3 2029	YEAR 4 2030	YEAR 5 2031
SAMPLE CHARGES						
INSIDE 0.75-IN 2000 GALLONS	$ 32.38	$ 34.28	$ 36.75	$ 39.38	$ 42.23	$ 45.25
INSIDE 0.75-IN 10,000 GALLONS	$ 126.38	$ 131.28	$ 141.05	$ 151.28	$ 162.38	$ 174.30
INSIDE 2-IN 20,000 GALLONS	$ 243.88	$ 377.79	$ 405.70	$ 434.68	$ 466.13	$ 500.10
INSIDE 2-IN 50,000 GALLONS	$ 596.38	$ 748.29	$ 804.70	$ 862.18	$ 925.13	$ 993.60

Conclusions

Based upon the analysis, the water and sewer fund recovers its system costs through current revenues and has strong unrestricted net position and cash levels. However, due to inflation and capital needs, the current water and sewer rates will not be enough to support future increases in operating costs and planned capital projects. The estimated annual revenue increases will prepare for the phase-in of additional debt service payments, operating, and capital costs associated with the CIP. The Town should consider the issuance of debt for the long-term financing of capital improvements. This would allow debt service payments to be spread over a longer period to avoid rate shock for current customers. Additionally, it allows future customers, who will benefit from the improvements, to pay a fair share of the costs. Furthermore, it should consider the implementation of structural changes to rates to ensure they continue to be fair, equitable, and easy to understand and implement.

The increases are estimated from the current fiscal year's data and projections of future events. If net income declines due to several risks, rates may need to increase further to replace the lost revenue. The risks include, but are not limited to, the following:

- Water usage and sewer flow decline due to higher fees or reduced commercial business.
- Operating costs increasing at unsustainable levels, exceeding those projected.
- Higher than projected CIP cost estimates.
- Rising interest rates or unobtainable funding.

Due to the multiple risks facing the Town, it is recommended that the Town continues to review the assumptions and calculations regularly using updated information to determine if adjustments are required at that time to meet established financial objectives.

APPENDIX VI – References

1. NCDEQ Asset Assessment Guidance Document September 2020
2. NCDEQ DWR Clarkton Local Water Supply Planning Document 2024