UCT UNDERGROUND CONSTRUCTION TECHNOLOGY
The Underground Utilities Event | July 13-15, 2021 | Music City Center | Nashville, TN

What Lies Beneath?

Identifying and Maintaining Buried Wastewater Assets

North Texas Municipal Water District's

Condition Assessment Program

NTMWD.COM
FREESE AND NICHOLS
WHITE ROCK CONSULTANTS
Ace Pipe Cleaning
pure TECHNOLOGIES a xylem brand

Agenda

- Project Background and Drivers
- Condition Assessment Program (CAP)
- Benefits and Lessons Learned

REGIONAL PROVIDER: WATER, WASTEWATER, SOLID WASTE

NORTH TEXAS MUNICIPAL WATER DISTRICT

BY THE NUMBERS

SERVE up to 80 COMMUNITIES

Service area of 2,200 square miles in 10 counties

Serving 1.8 million people in one of the fastest-growing regions in the country

18 MAJOR RAW & TREATED WATER PUMP STATIONS

6 WATER TREATMENT PLANTS
806+ MGD Capacity (million gallons/day)

575+ MILES WATER TRANSMISSION PIPELINES

DID YOU KNOW?

250+ MILES LARGE-DIAMETER WASTEWATER PIPELINES

13 WASTEWATER TREATMENT PLANTS

151+ MGD WASTEWATER TREATMENT CAPACITY
MGD (million gallons/day)

3 TRANSFER STATIONS
up to 3,295 tons of solid waste/day

1 million+ tons/year accepted at landfill

Rev. Feb. 2020

HISTORY OF NTMWD

10 Original Member Cities

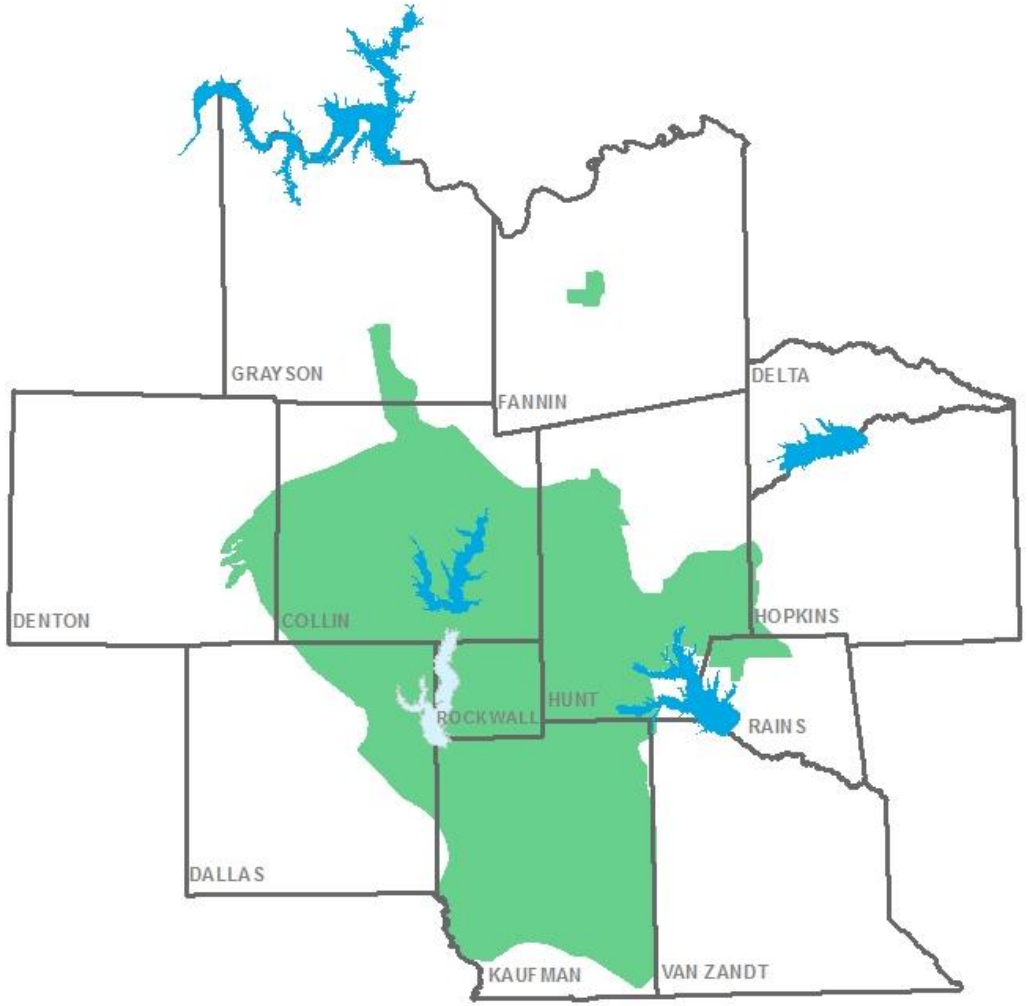
Farmersville, Forney, Garland, McKinney, Mesquite, Plano, Princeton, Rockwall, Royse City, and Wylie

"We decided we were all in this together. We couldn't do it separately."

- **1951 – Created by Texas Legislature to Provide Water Service**
- **1956 – Began Providing Treated WATER to Member Cities**
- **1970s – Expanded to WASTEWATER Service**
- **1973 – Richardson added as Member City**
- **1980s – Expanded to SOLID WASTE Service**
- **1998 – Allen added as Member City**
- **2001 – Frisco added as Member City**

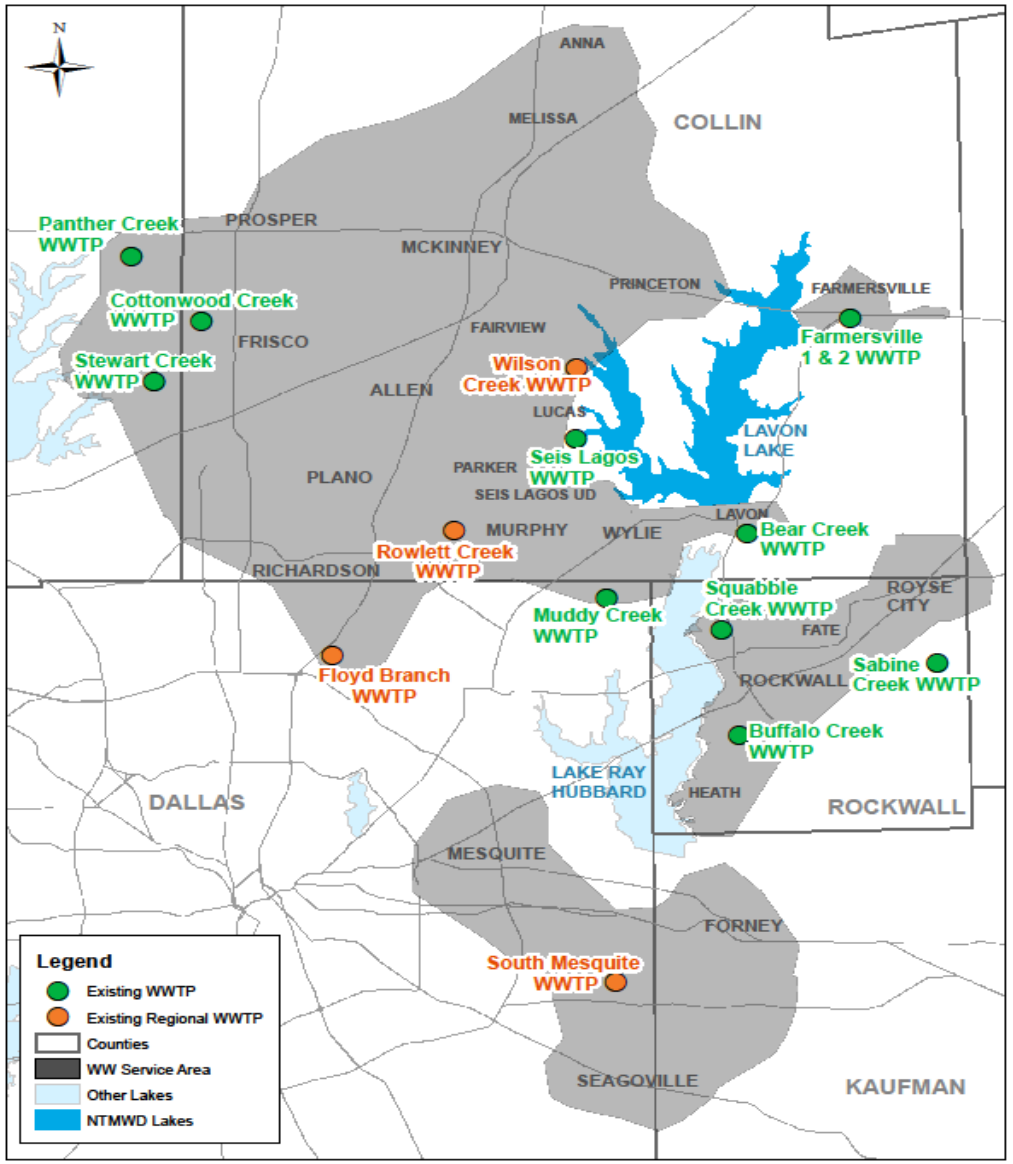
REGIONAL PROVIDER: WATER, WASTEWATER, SOLID WASTE

- *Serve 10-county area nearly twice the size of Rhode Island*
- *Shared systems provide cost-efficiencies for communities served*



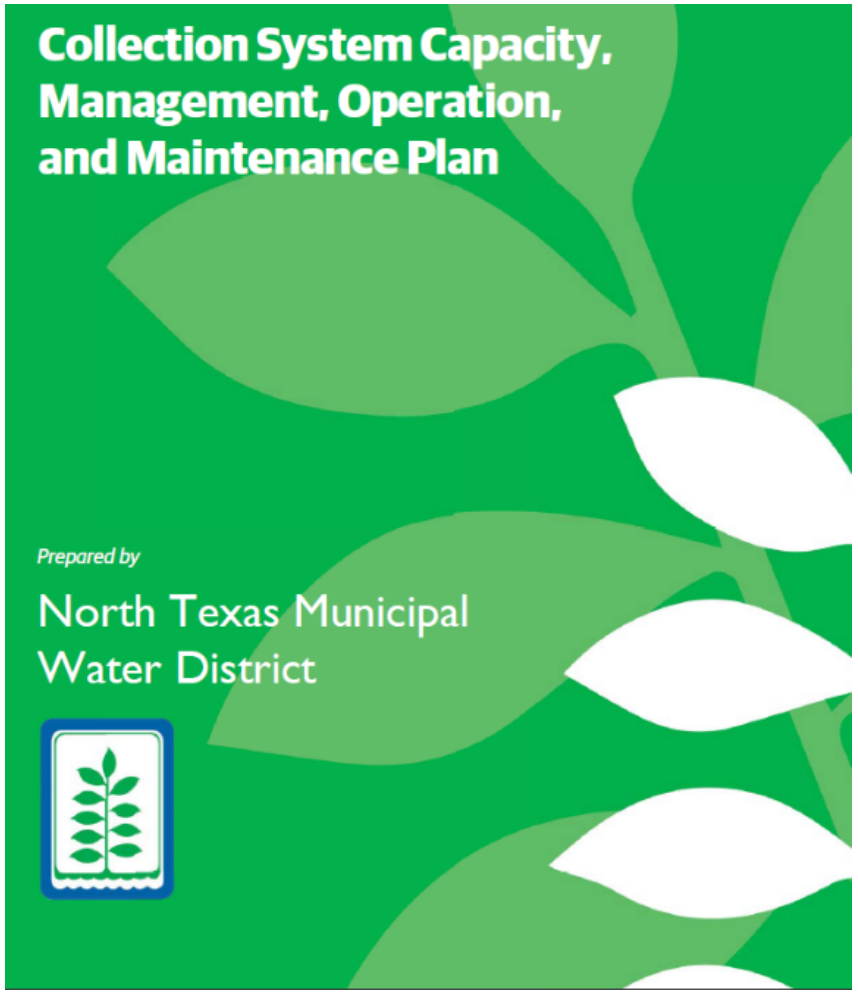
WASTEWATER TREATMENT

- **Entities Served**
  - 24 communities
  - Approximately 1.3 million North Texas Residents
- **Regional Wastewater System**
  - Wilson Creek WWTP 64.00 MGD
  - South Mesquite WWTP 33.00 MGD
  - Rowlett Creek WWTP 24.00 MGD
  - Floyd Branch WWTP 4.75 MGD
  - TOTAL 125.75 MGD
- **Sewer System Plants**
  - Number of Sewer System Plants in Operation: 9
  - Total Sewer System Capacity: 34 MGD
  - Each plant is separate independent system and contracts
- **Total Wastewater Treatment Capacity: 159.45 MGD**



Drivers and Objectives for Condition Assessment Program

- EPA CMOM and Texas SSOI Commitment
- 10-year Program to inspect the gravity Collection System
- Asset Management Approach to Identify Baseline Condition Assessment
- Single Data Repository for Inspections that integrate with GIS
- Better Data for Decisions Regarding Capital Investments
- Maximize Value of Rehabilitation Budgets for Aging Infrastructure



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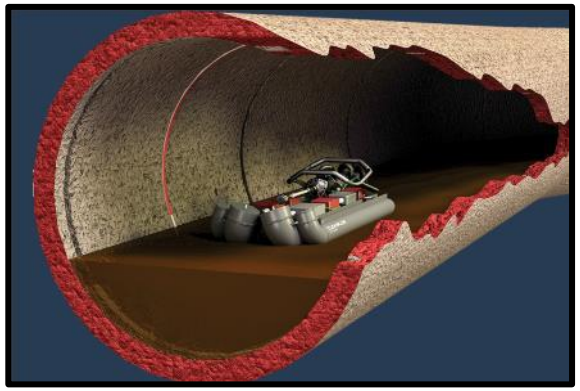
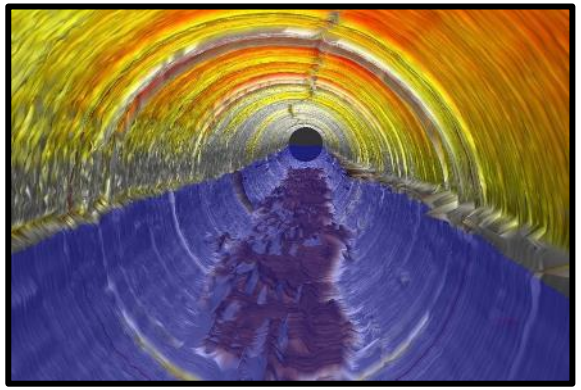
Gravity and Manhole Inspection Technologies

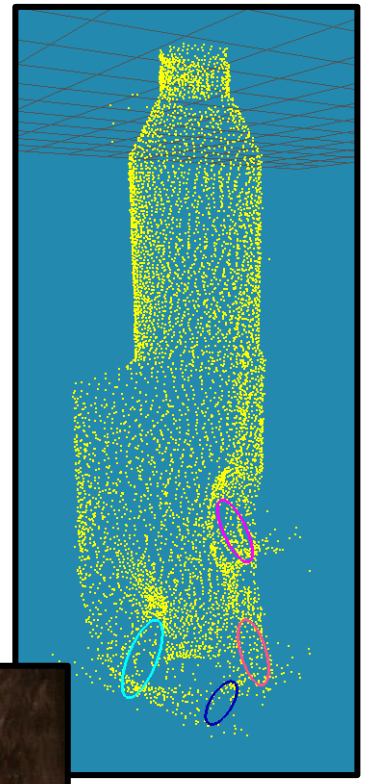


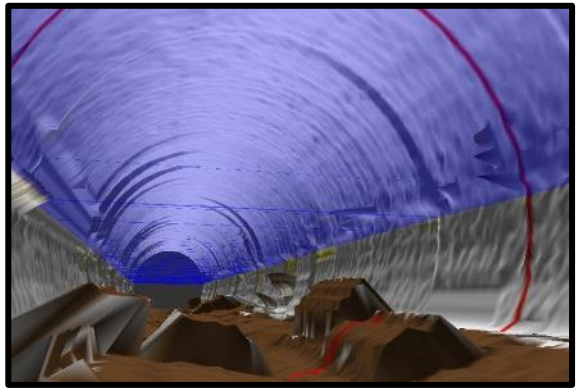
Multi Sensor Inspection (MSI)



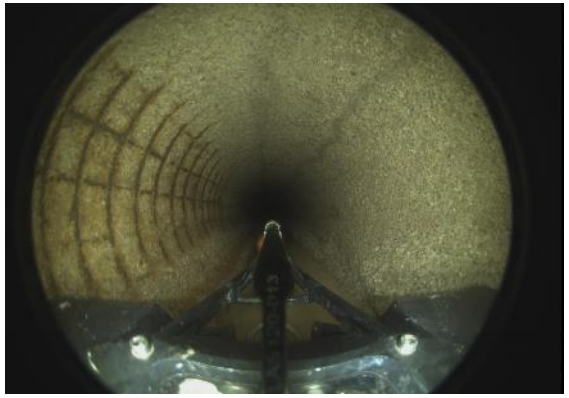
3D Laser Inspection

RapidView IBAK North America





Sonar Inspection

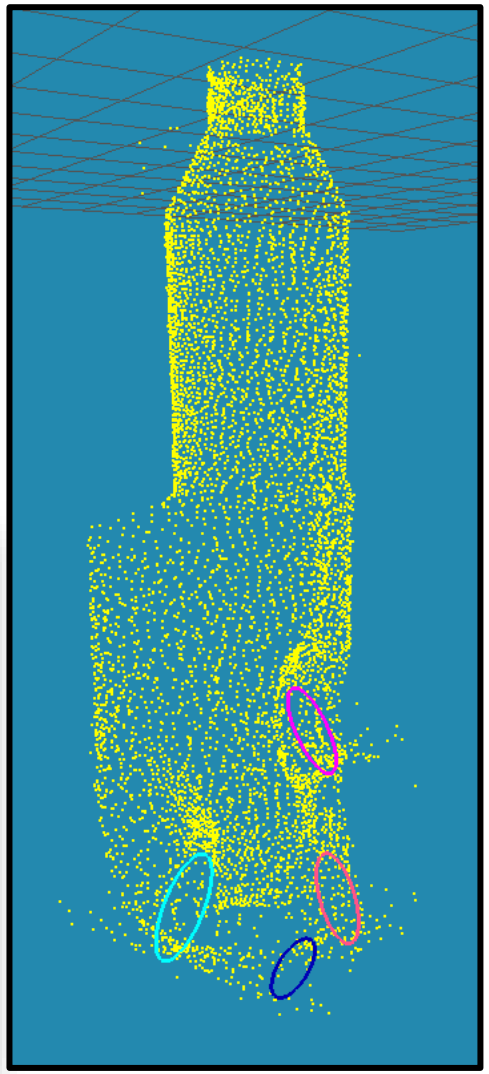


HD Video

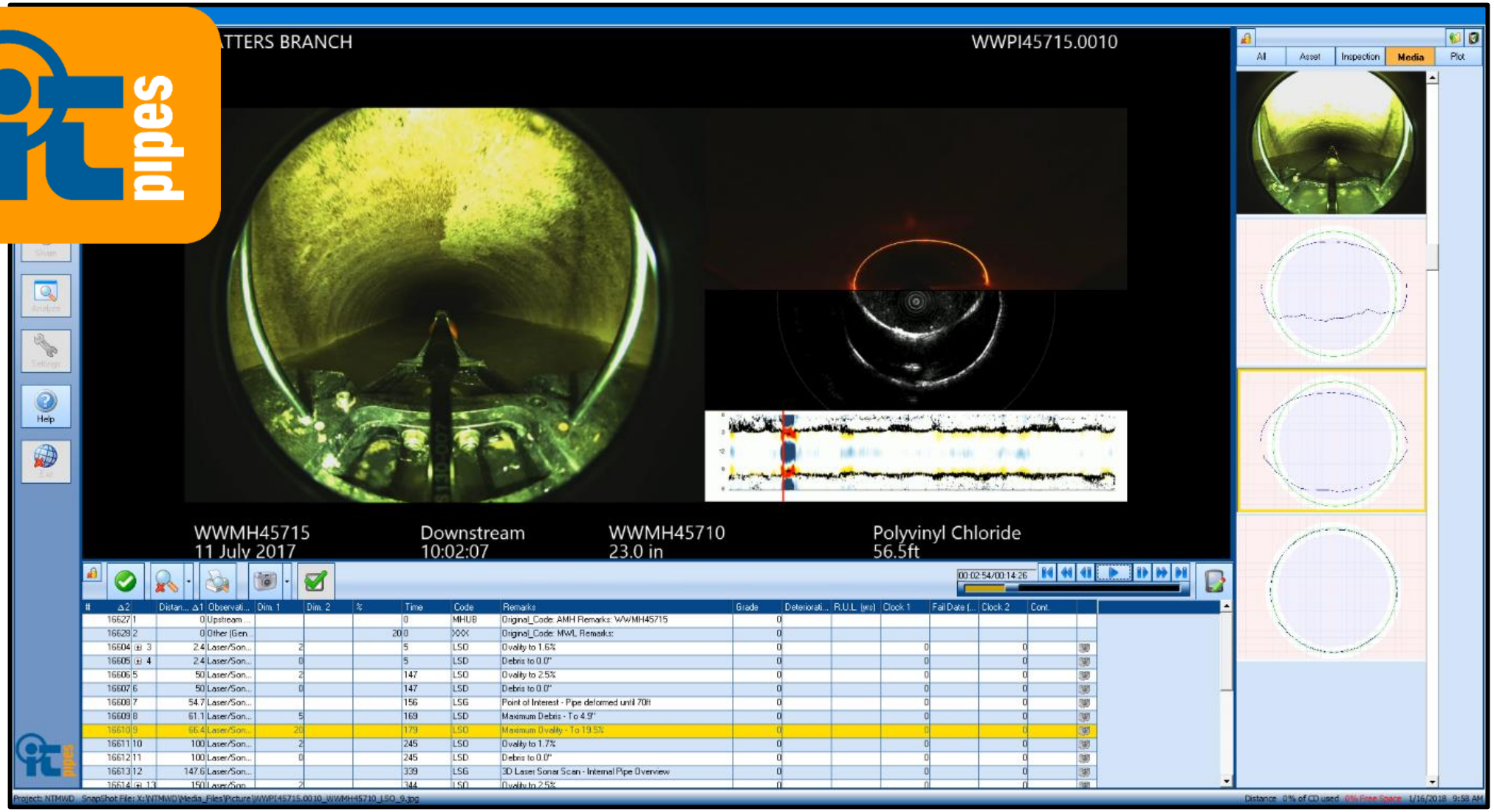
Digital Manhole Inspections

Digital Manhole Inspections

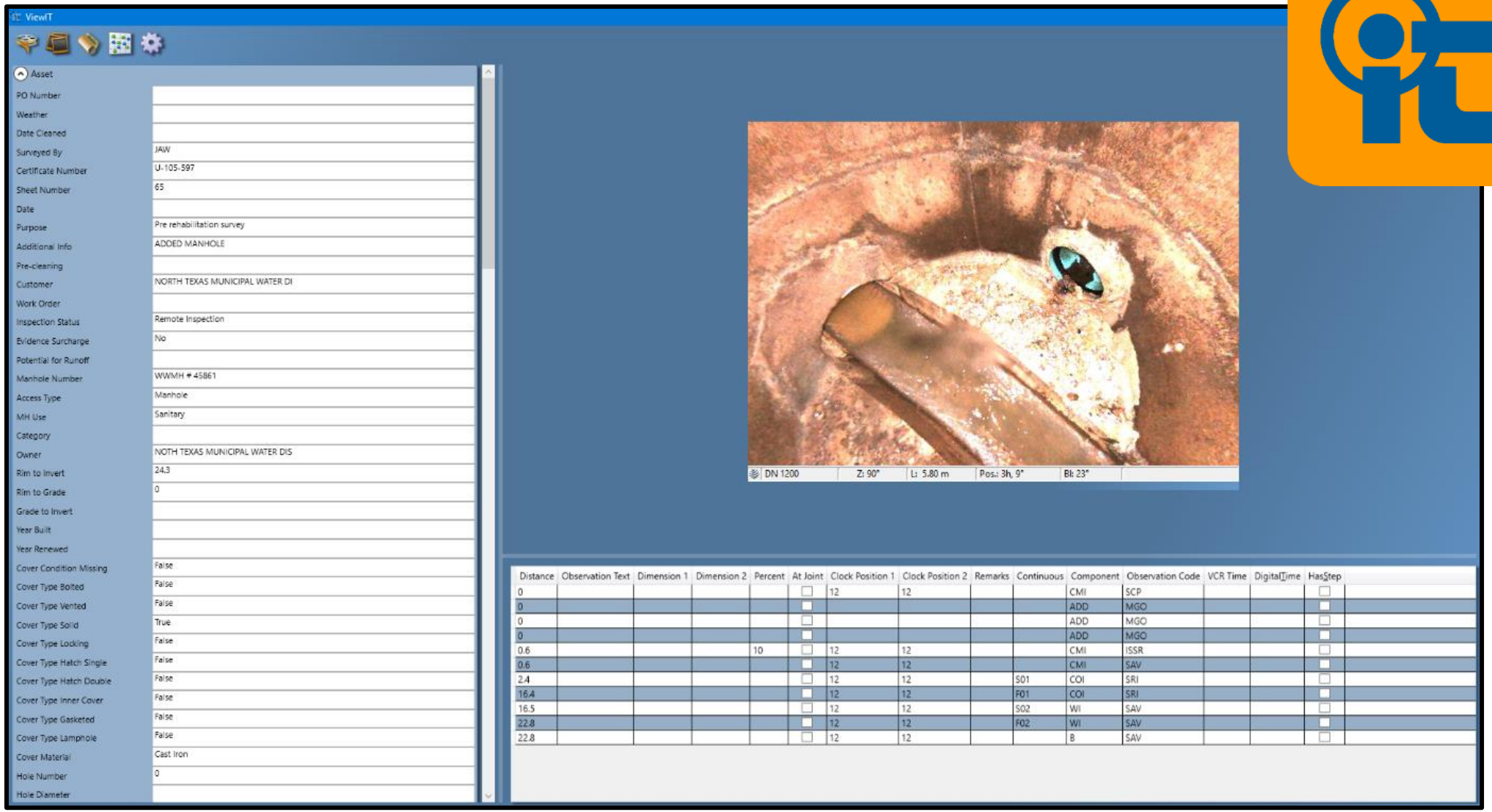
- Accurate point cloud measurements
- Identify defects, pipeline locations and inverts, manholes, and lining materials
- No manned entry required
- Integration into CCTV management software



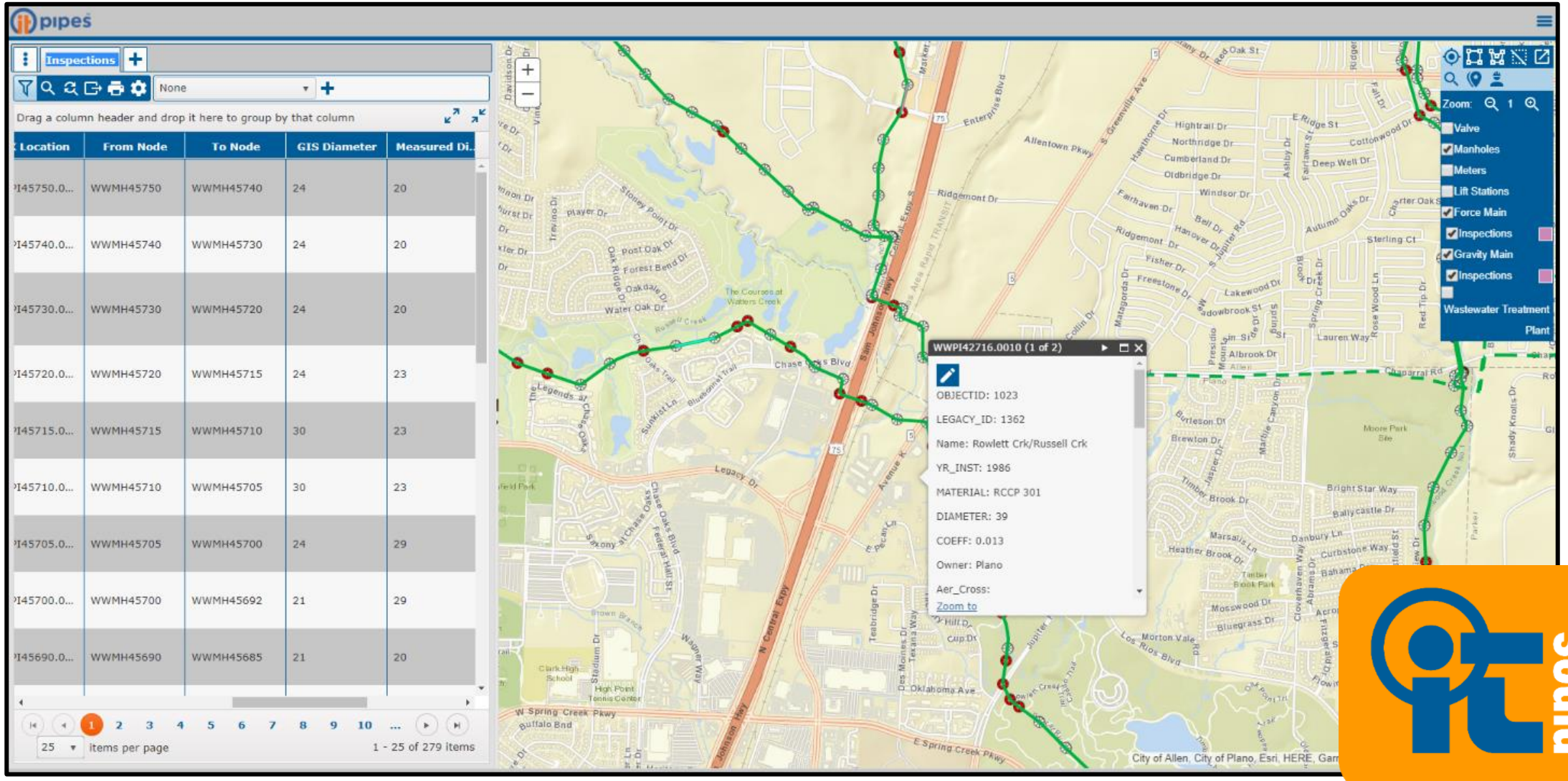
Multi-Sensor Inspections



Digital Manhole Inspections



GIS Integration into ITPipes



Condition Assessment Program Goals and Progress

	Total	FY17	FY18	FY19	FY20	FY21*
Cumulative Gravity Pipeline (LF)						
Goal	710,000	71,000	142,000	213,000	*284,000*	*355,000*
Actual		*101,605*	*168,536*	*254,770*	*339,736*	*371,183*
Cumulative Manholes						
Goal	1,800	180	360	540	720	900
Actual		*263*	*993*	*1,257*	*1,290*	*1,352*
Cumulative Force Main Inspection						
Actual					*5 miles*	*10 miles*

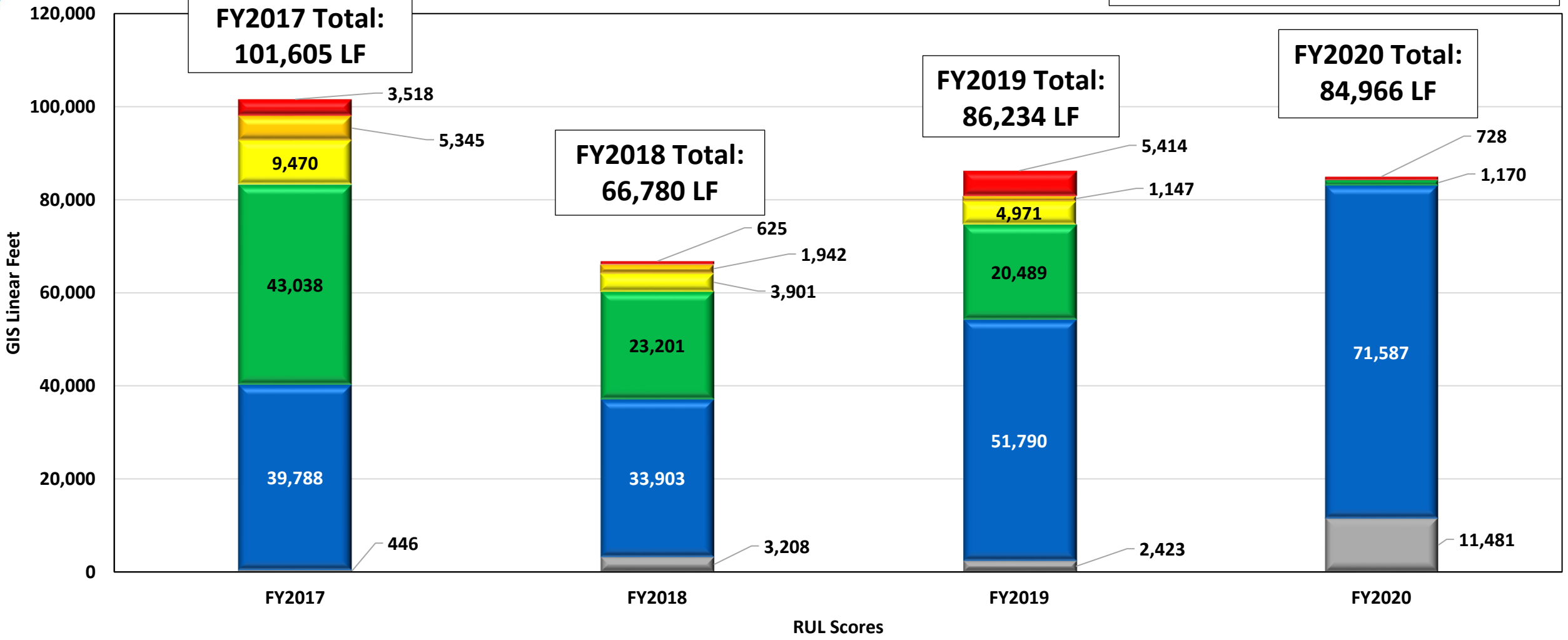
*In progress, final quantities pending

Remaining Useful Life (RUL) Scores

Score	1	2	3	4	5
RUL	36 - 50 years	21 - 35 years	11 - 20 years	3 - 10 years	0 - 2 years

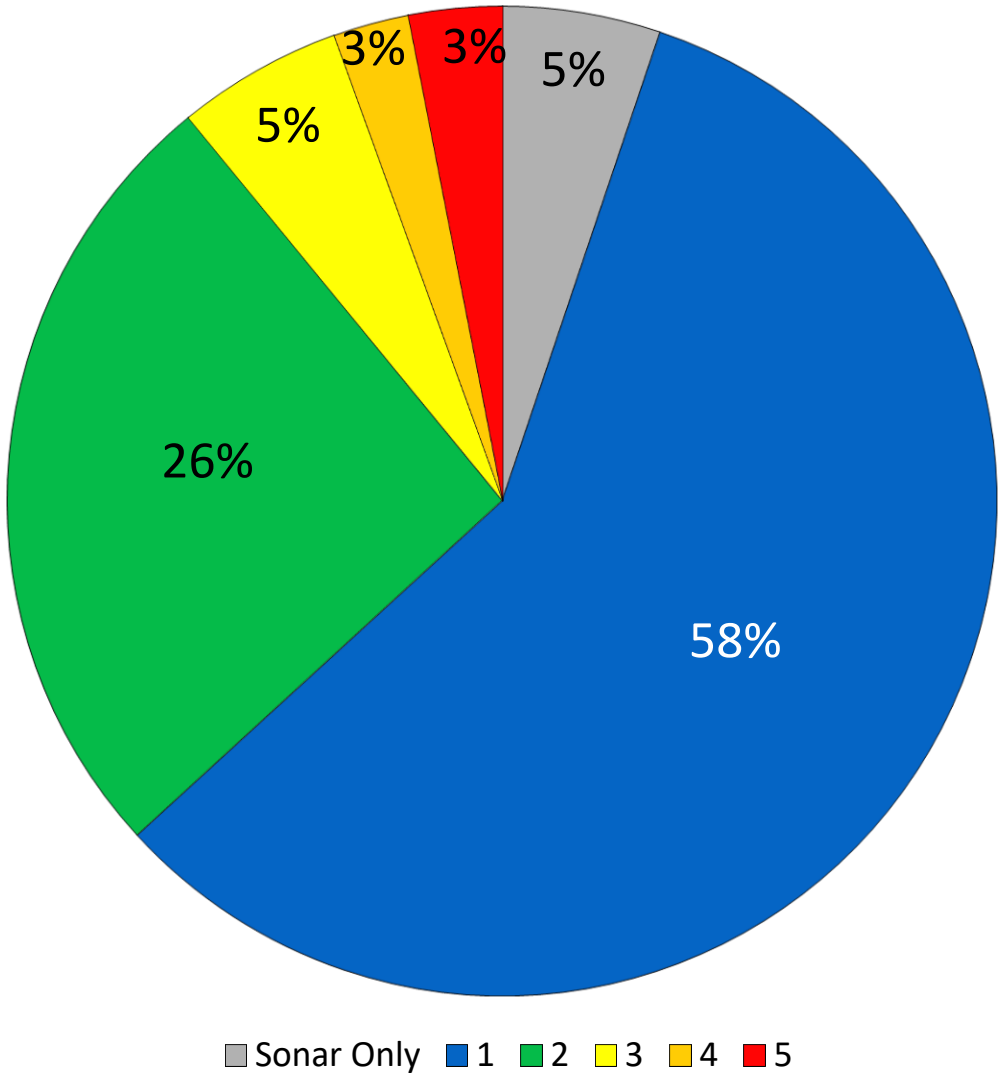
Pipeline Inspection Results

339,585 LF Inspected of 710,000 LF Total
48% Complete



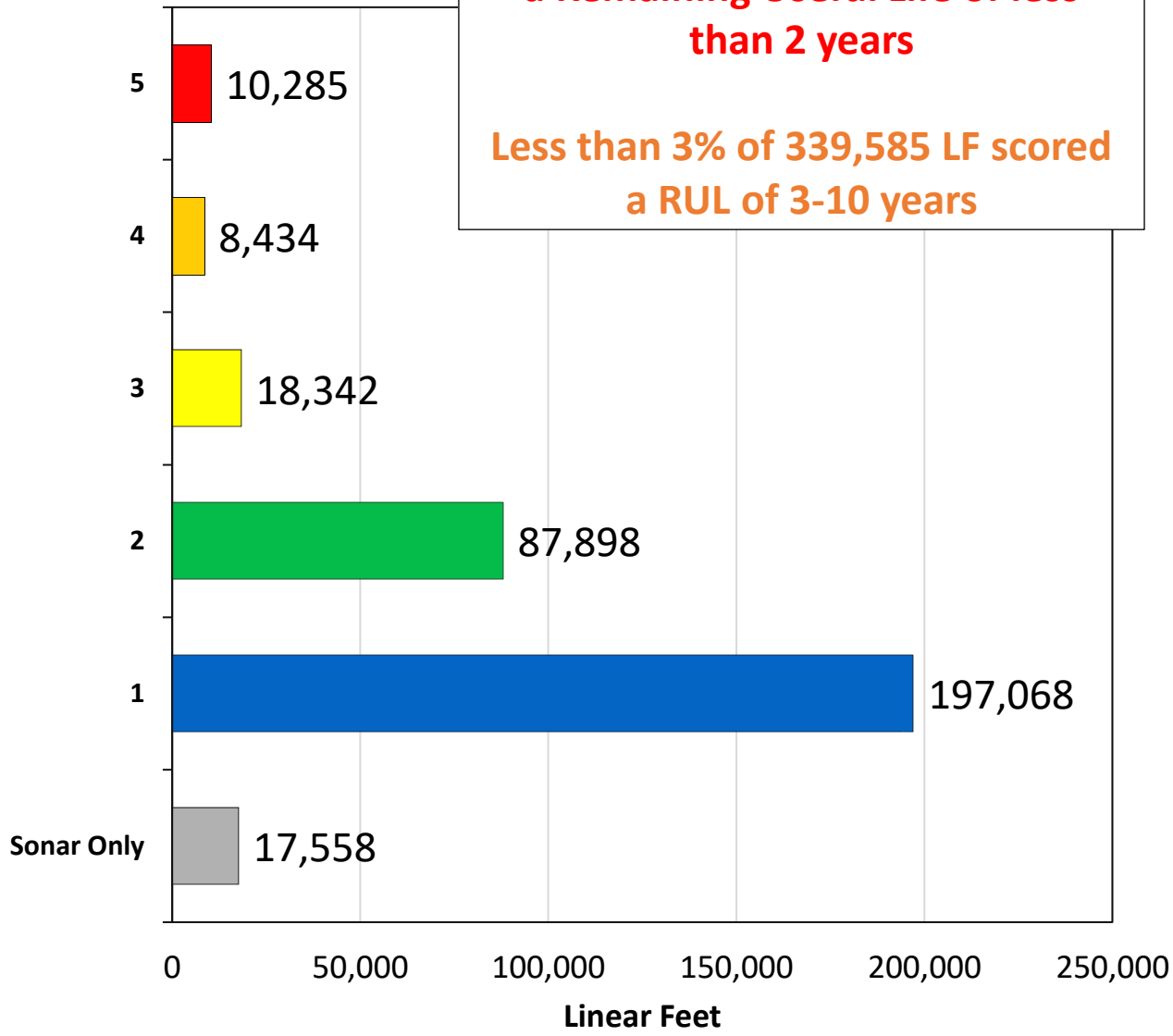
*GIS Footage at Time of Inspection

Pipeline Inspection Results

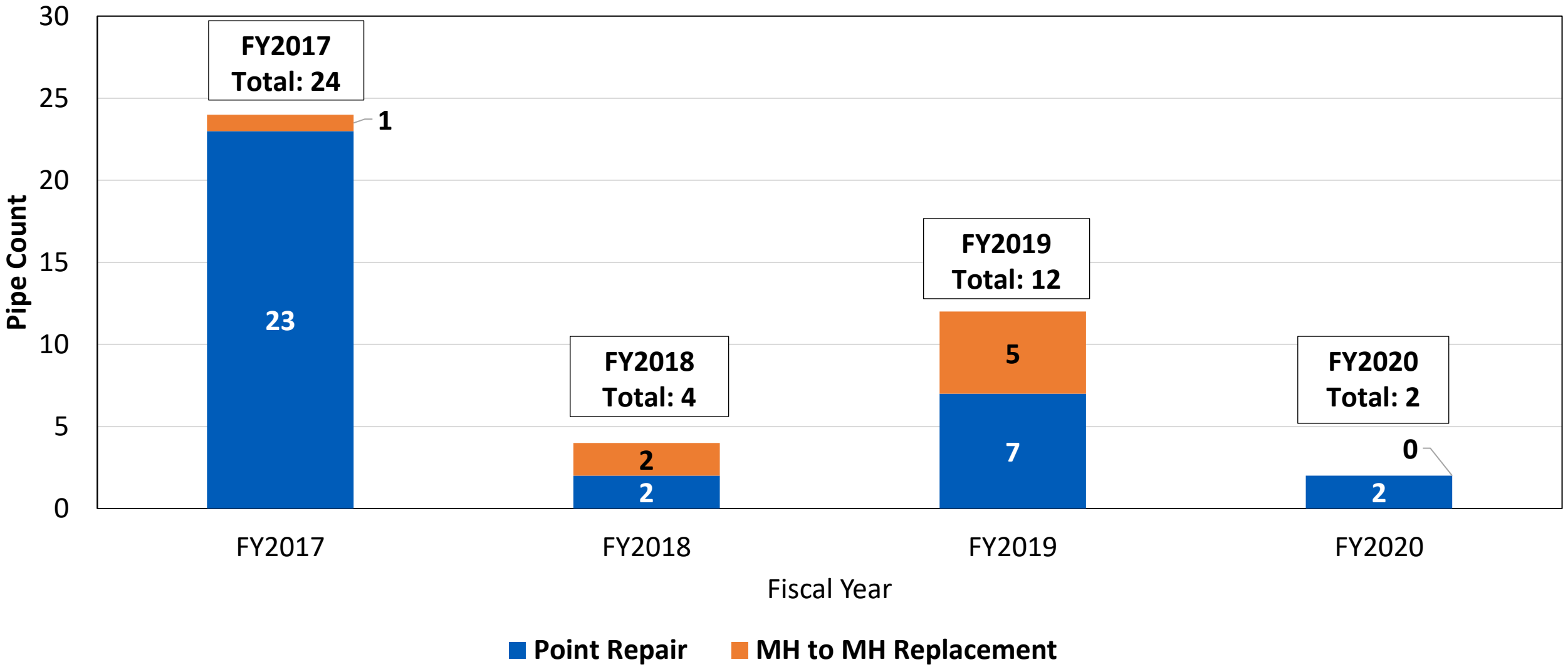


Less than 3% of 339,585 LF scored a Remaining Useful Life of less than 2 years

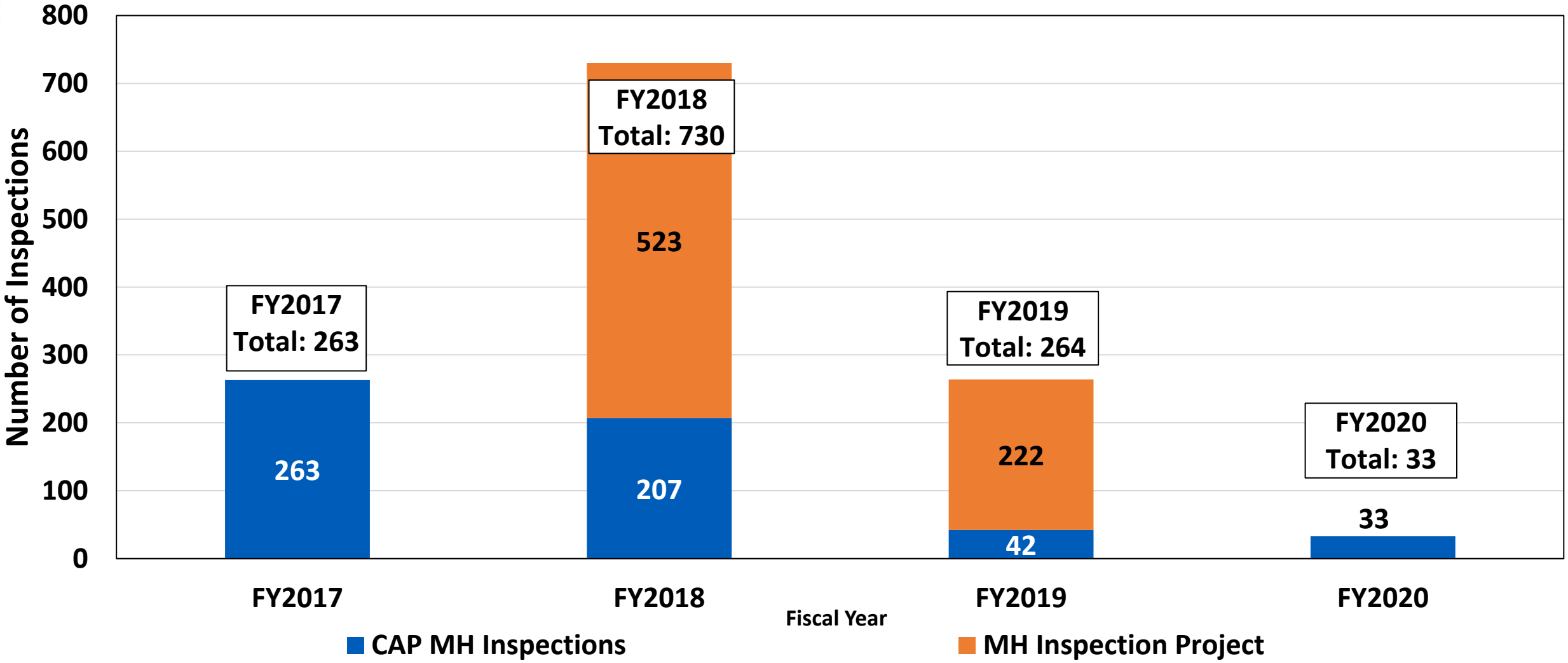
Less than 3% of 339,585 LF scored a RUL of 3-10 years



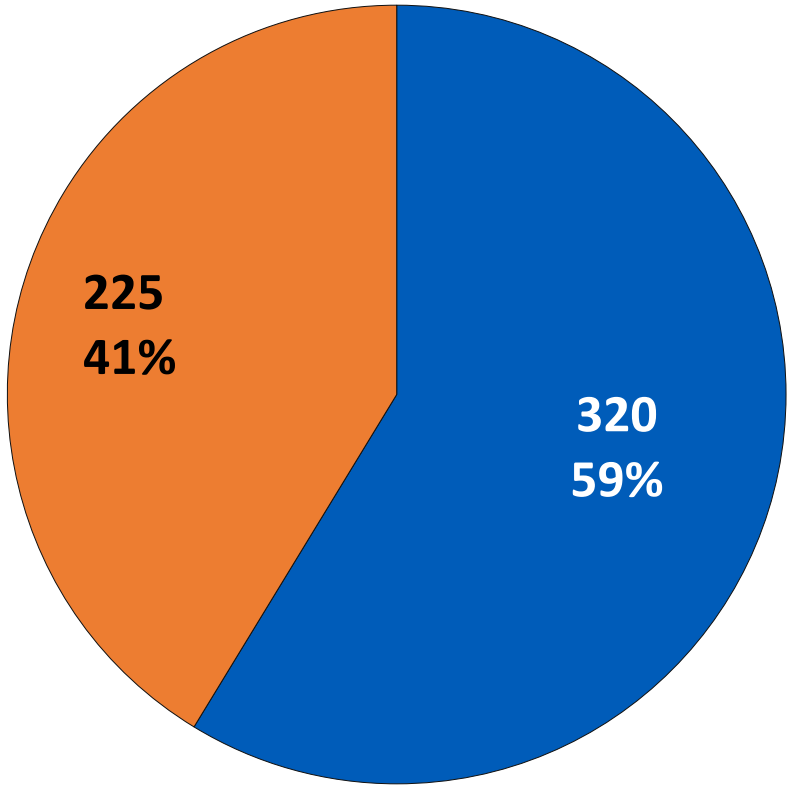
Pipeline Inspection Results

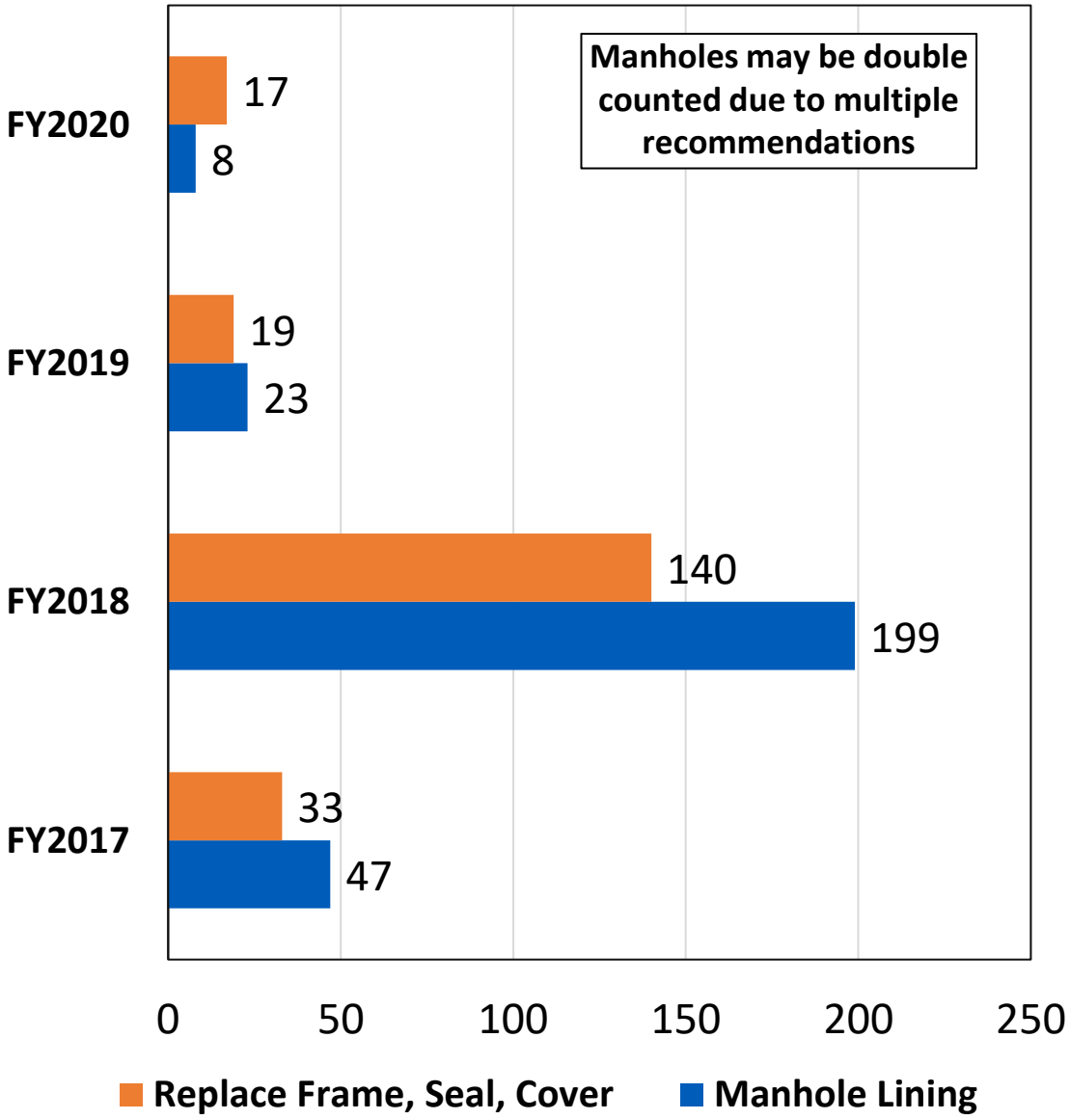


Manhole Inspection

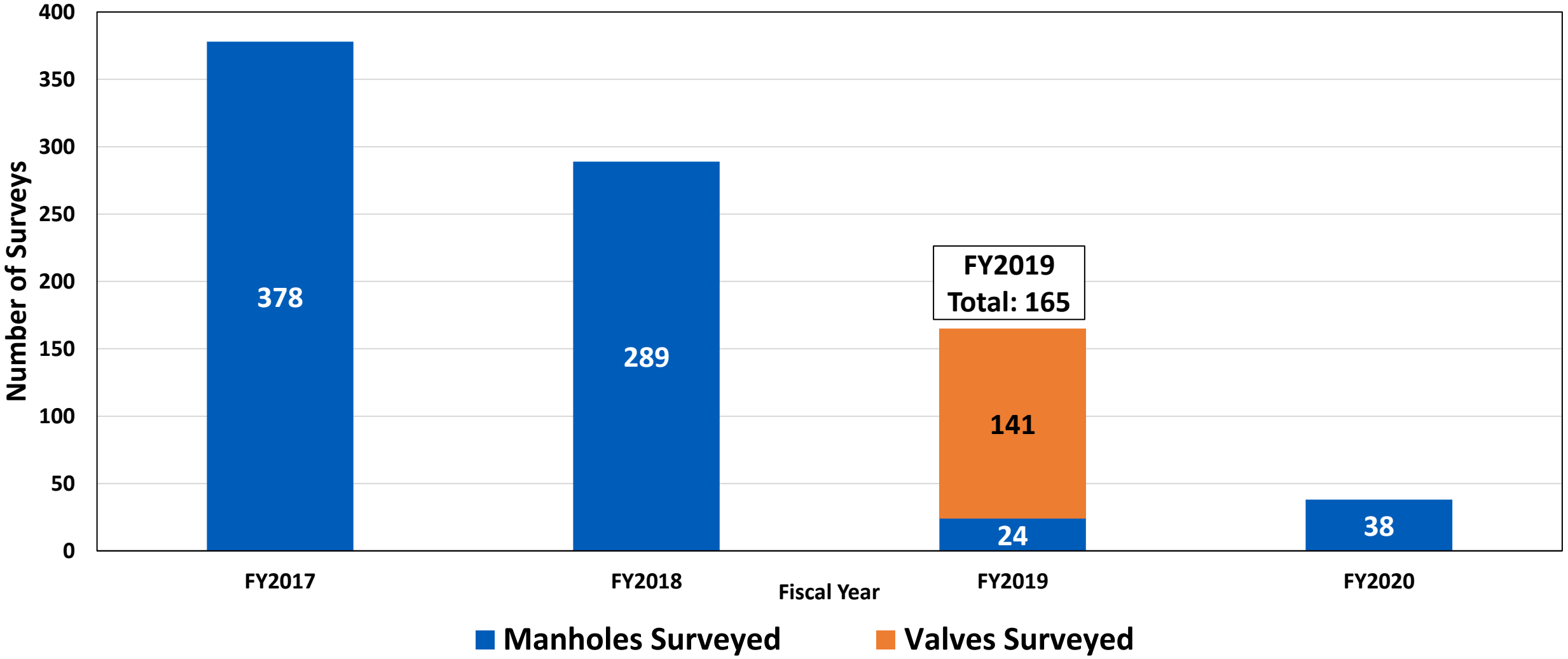


Manhole Inspection Results





Manhole and Valve Surveys



GIS Improvements

GIS Improvements

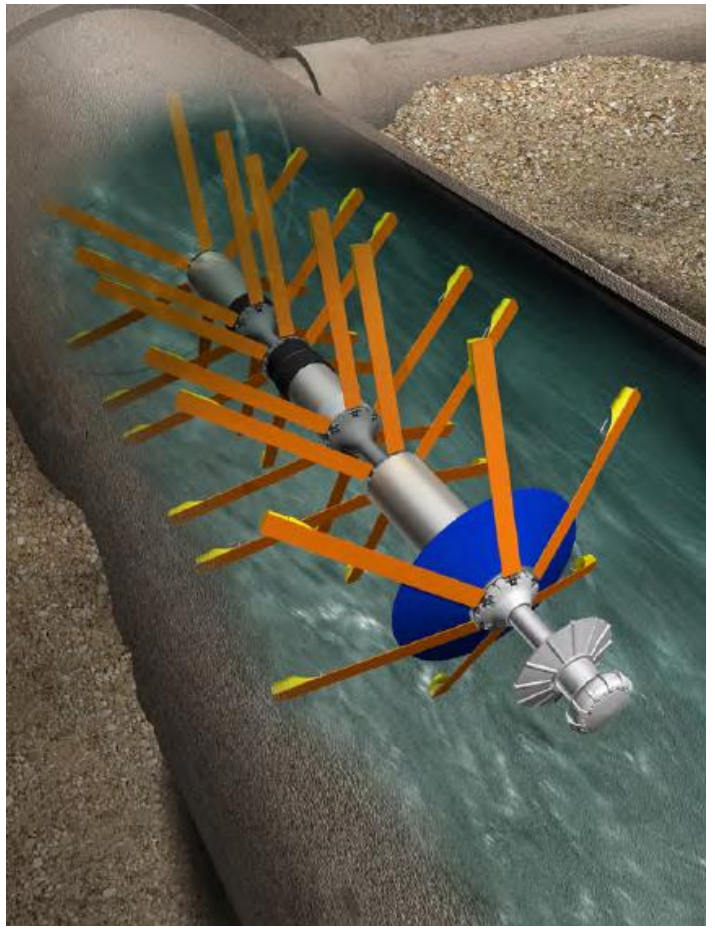
Approximately 50 manholes raised, inspected, and surveyed in FY2019 & FY2020

Force Main Inspection

pure TECHNOLOGIES
a xylem brand

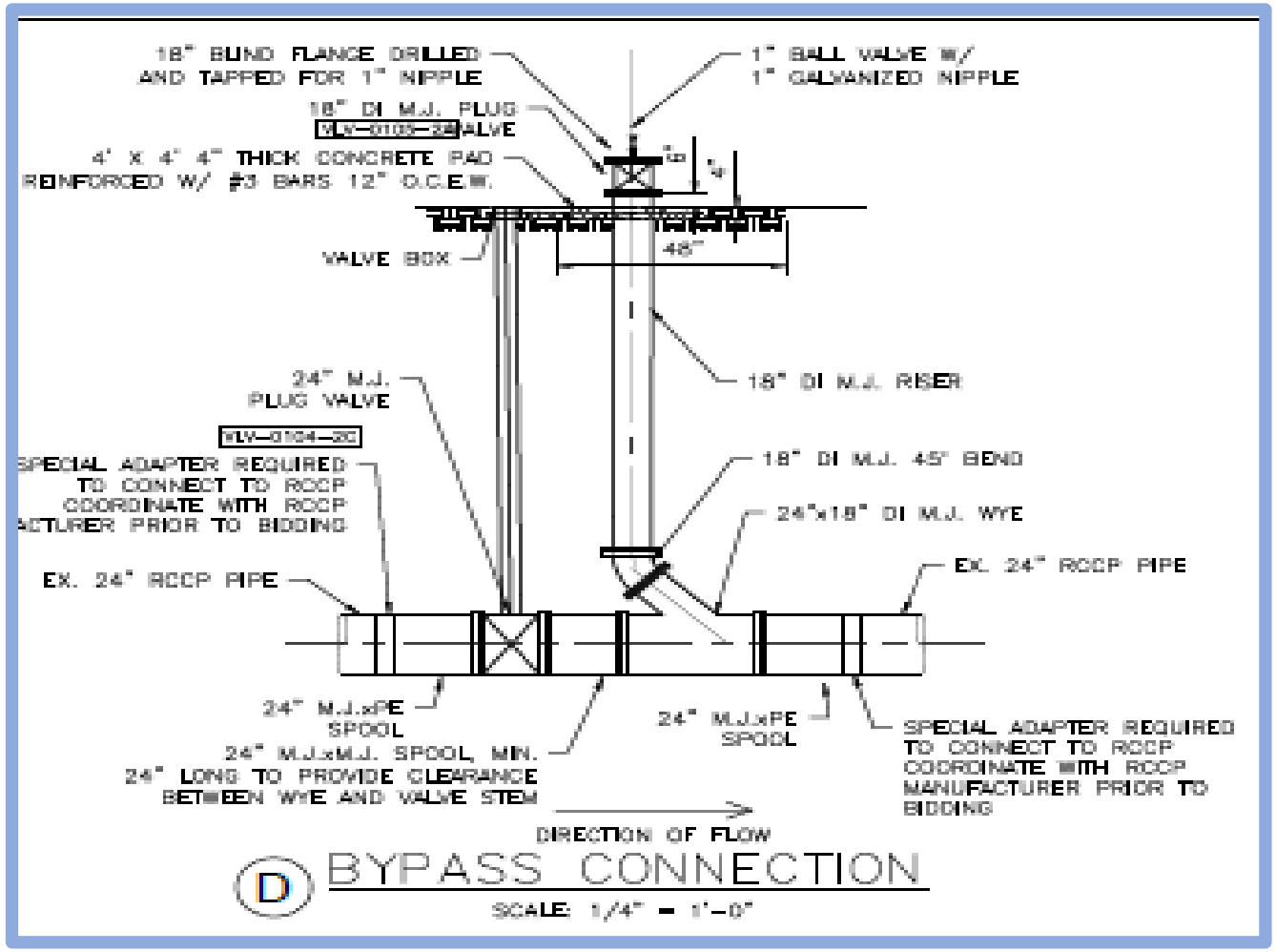
Inspection Tools/Process

SmartBall® acoustic leak and gas pocket tool



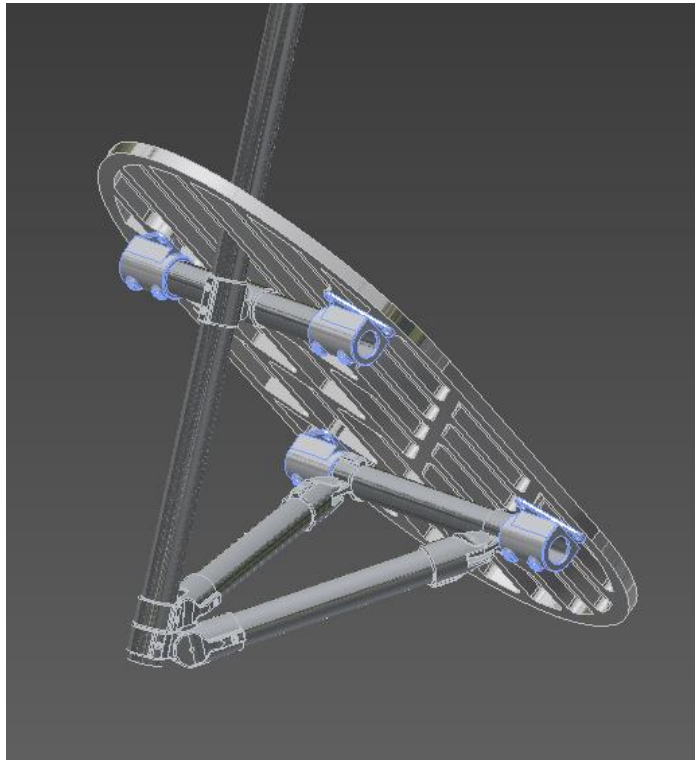
PipeDiver® electromagnetic tool

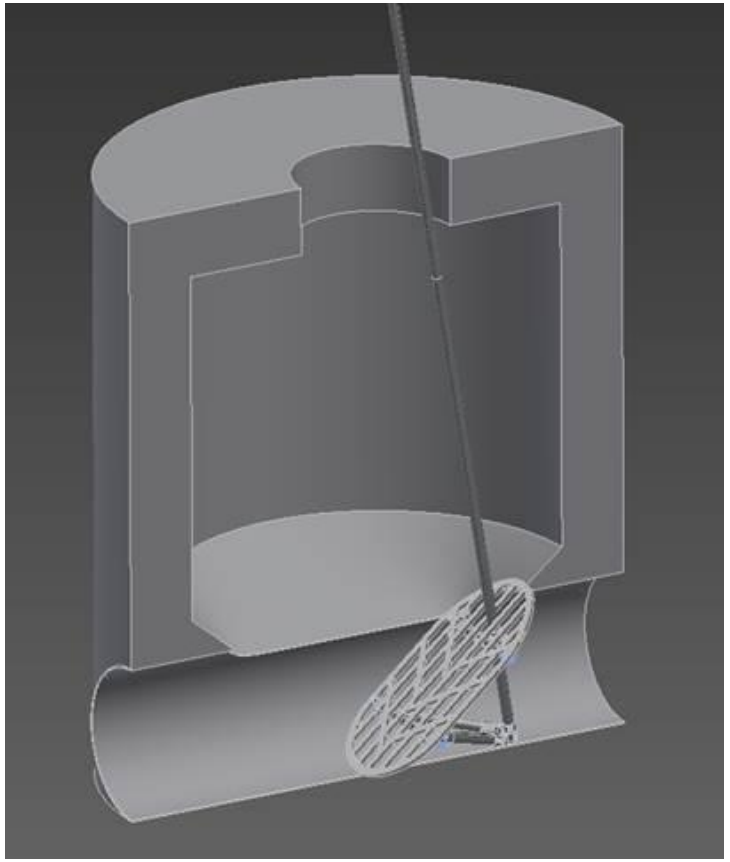
Pre-Inspection Construction



Added insertion point for PipeDiver access

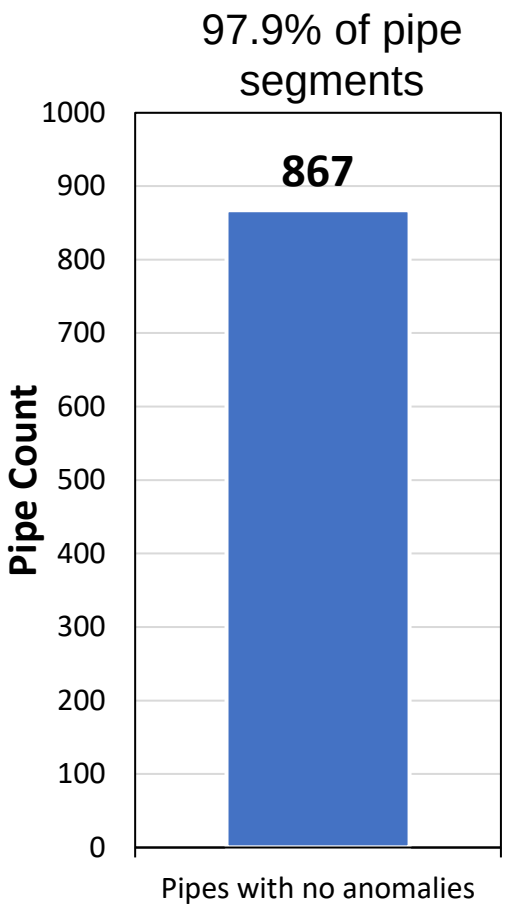
Custom Grate

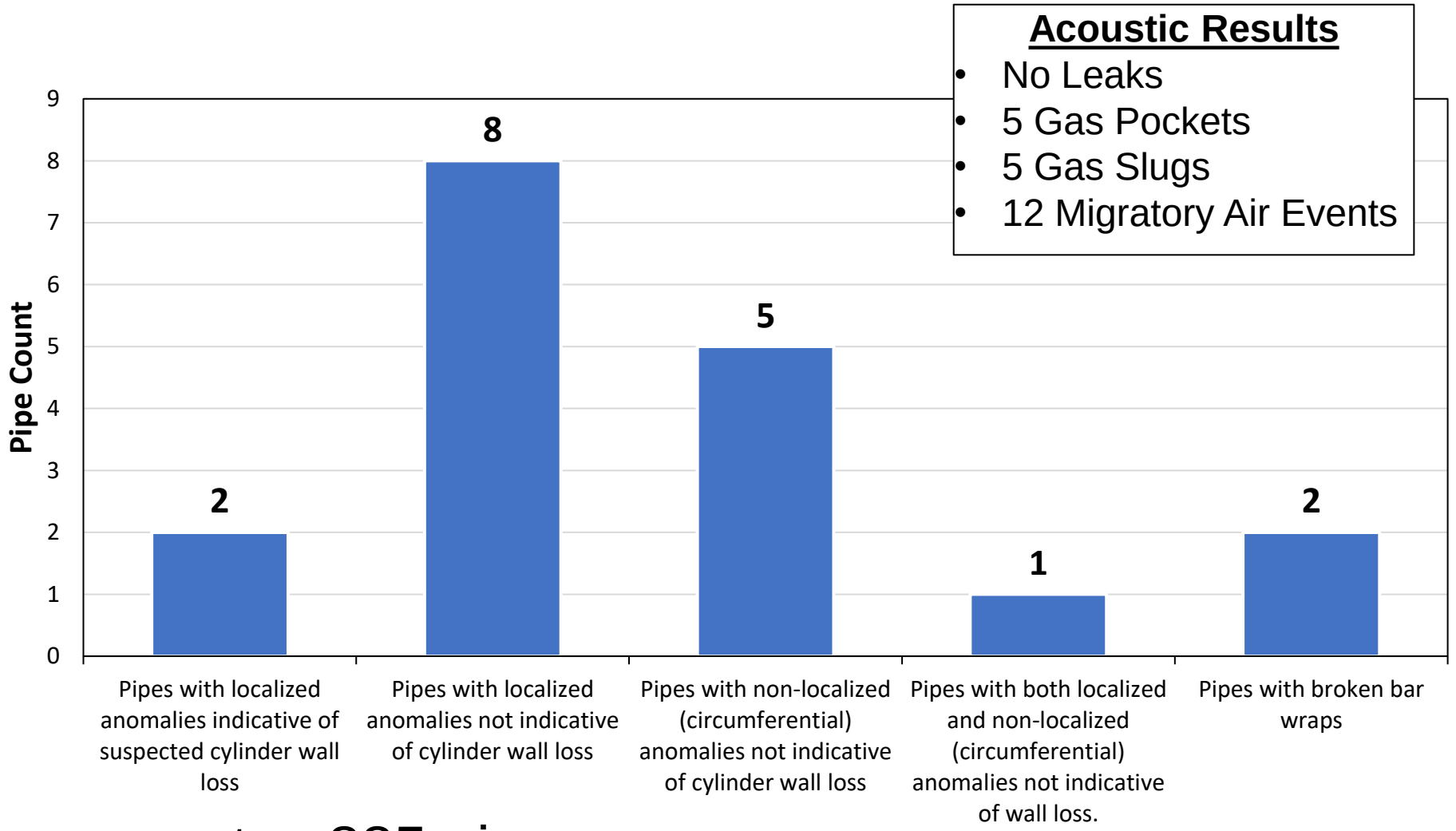




Custom fit to the discharge manhole to capture the inspection tools

Force Main Inspection Results

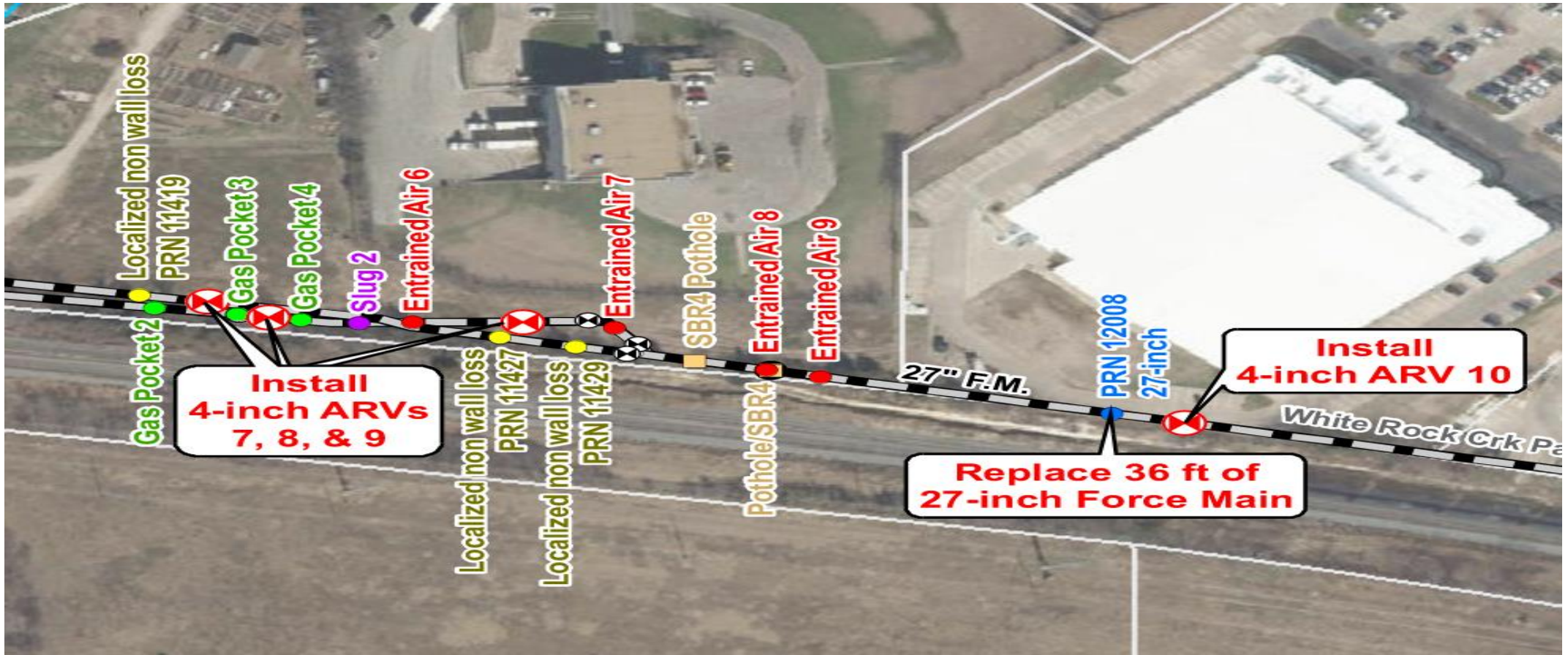




Total number of pipe segments: 885 pipes

Force Main Recommendations

1. Identified ARV and rehab locations
2. NTMWD budgeting and planning rehab projects



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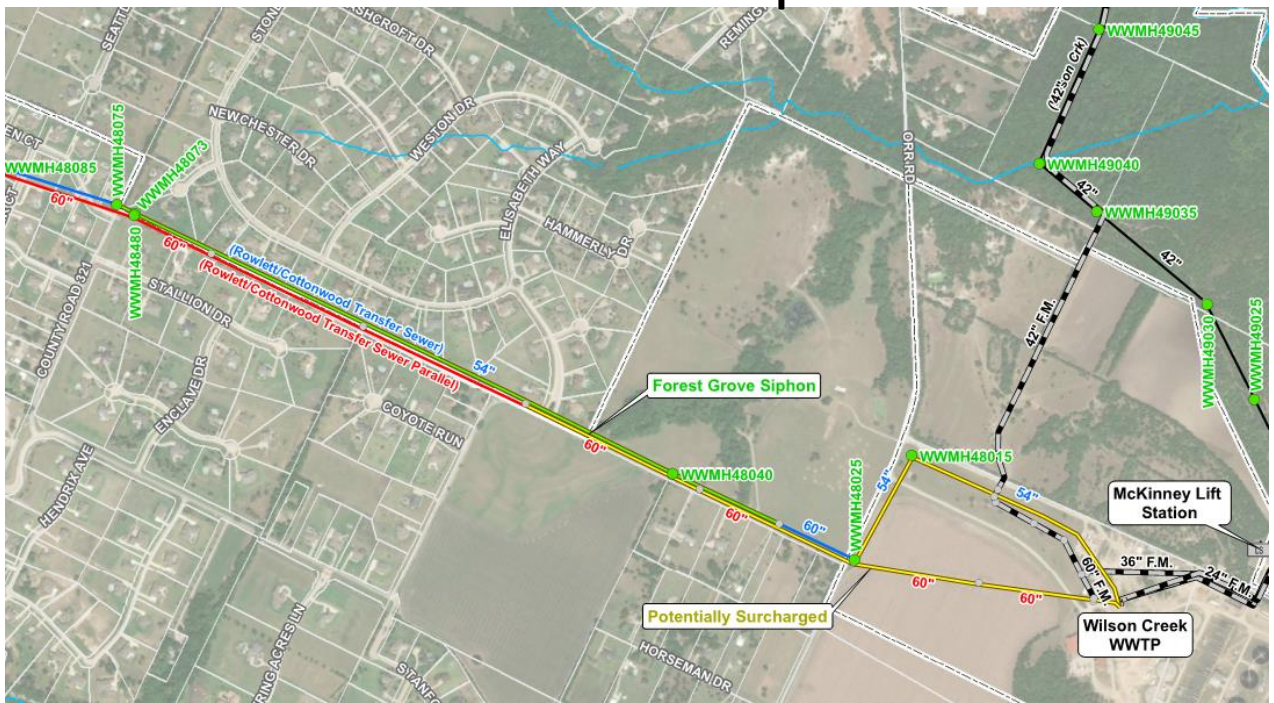
Benefits of Condition Assessment Program To Date

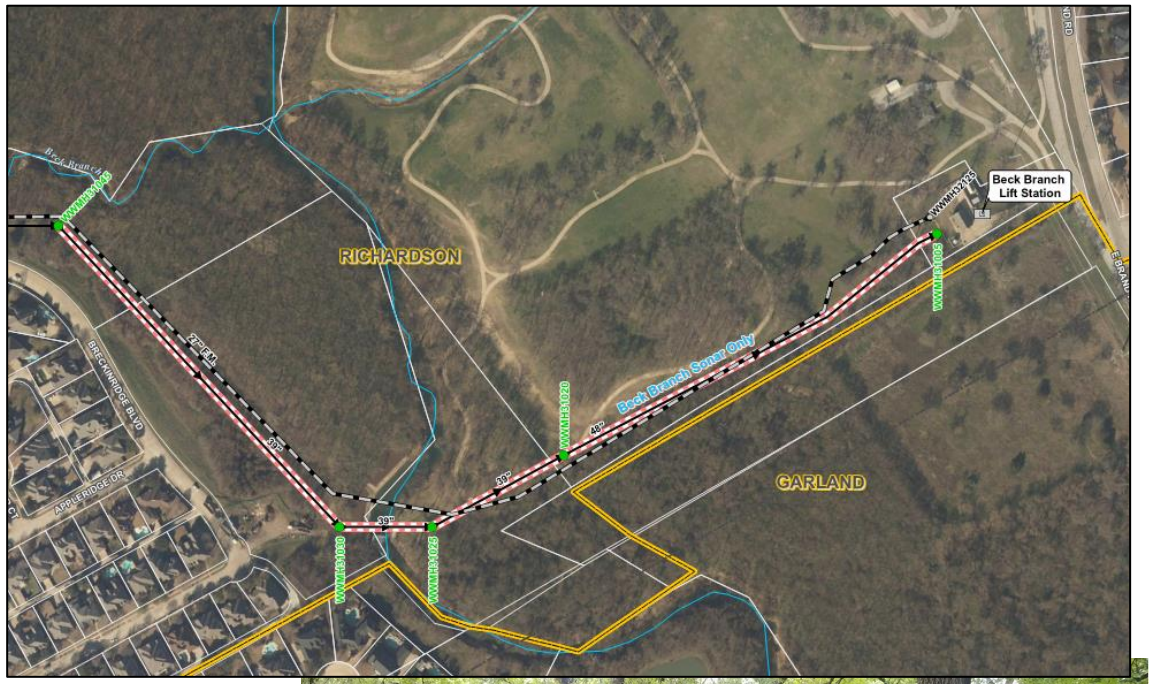
- Enhanced understanding and knowledge of asset condition
- Restoring capacity through detailed cleaning and debris removal where needed
- Increased proactive maintenance
- Increased GIS accuracy from manhole surveying
- Data integration with IBM Maximo, GIS, ITPipes, and hydraulic model

Benefits of Condition Assessment Program To Date

Proactive Cleaning

- Beck Branch Interceptor
- Forest Grove Siphon
- West Rowlett Creek Siphon





Acknowledgements

NTMWD

Freese and Nichols, Inc.

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QUESTIONS?

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