

NCTCOG Public Works Roundup

# Teeing Up Success

Asset Management Hosting for Trophy Club Municipal Utility District

August 22, 2024

# WHO ARE WE?



**ALAN FOURMENTIN**

General Manager,  
Trophy Club Municipal Utility District

- BS, MPA Tarleton State University
- 20 Years at City of Cleburne, City of Celina, and District
- Engineering Tech, Street Superintendent, Operations Manager, Assistant Director of Public Works, Director of Public Works, and Chief Administrative Officer
- Experienced at Software Implementations at three municipalities



**GINI CONNOLLY, AICP, GISP, CFM**

GIS Director, Halff

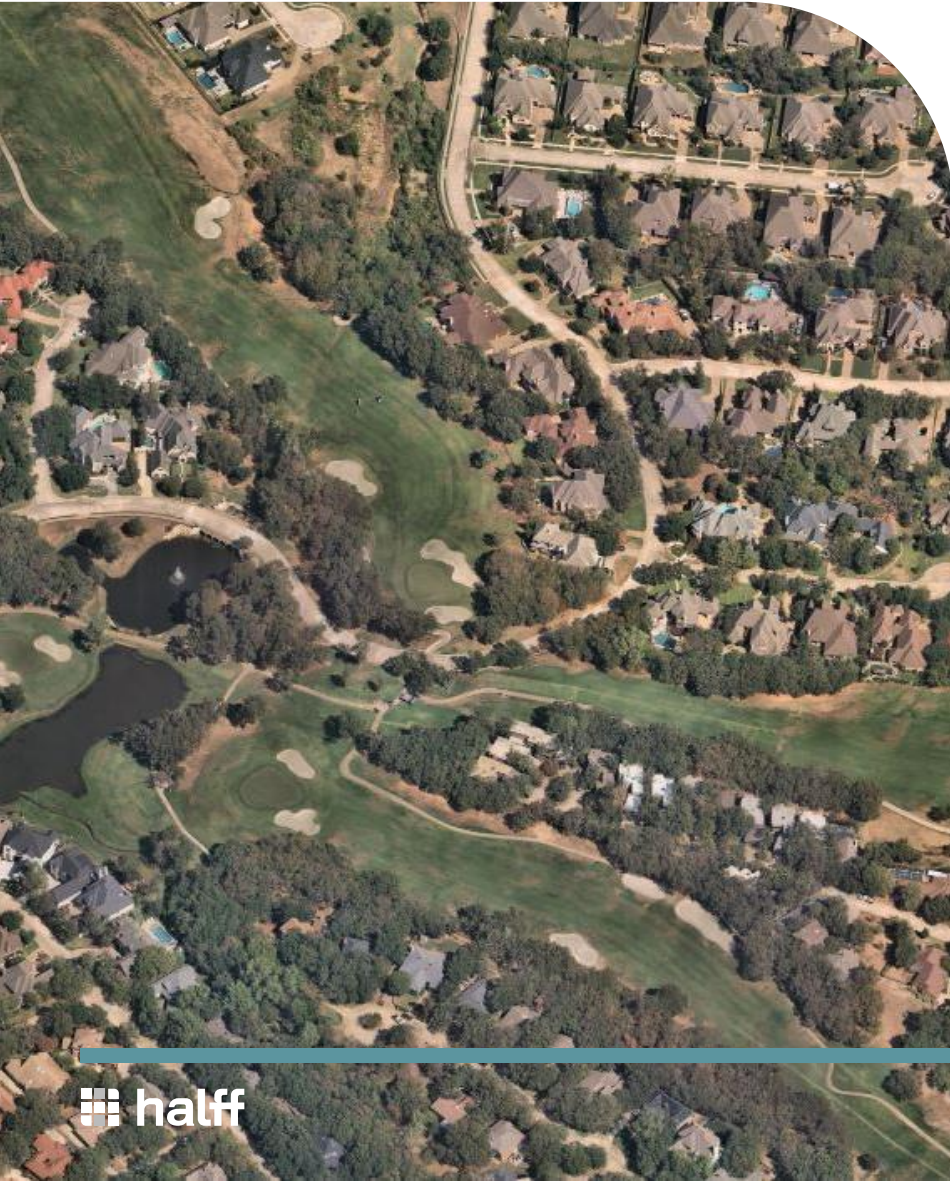
- BA Texas Tech, MCRP University of Texas Arlington
- 20 Years at City of Fort Worth & City of Hurst
- Planner, GIS Manager, Director of Development
- Experienced at Software Implementations



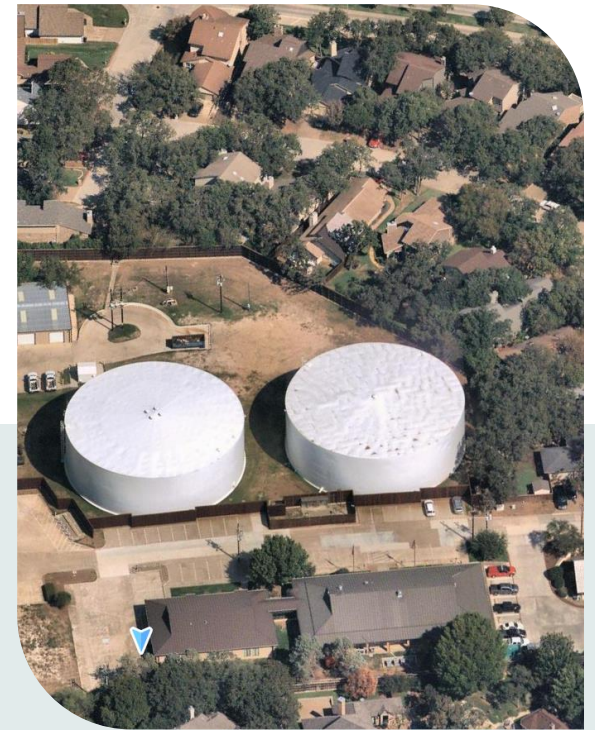
# ASSET MANAGEMENT JOURNEY

- About Trophy Club Municipal Utility District
- Building the Foundation: The Inventory
- Implementing the Asset Management Software
- How It's Going Now
- Lesson Learned

# ABOUT TROPHY CLUB MUNICIPAL UTILITY DISTRICT



The District provides water and wastewater services to over 13,700 people in Denton County, north of 114, west of Grapevine Lake.



Trophy Club developed as elite suburban golf community



TCEQ Outstanding Public Water System 2022



District boundaries includes Solana development in Westlake



4,895 Utility Connections  
2 GSTs, 2 ESTs  
4 Wells  
5 Vertical Turbine Pumps  
1 Wastewater Treatment Plant  
10 Lift Stations



# Building the Foundation: The Inventory

# FOUNDATION NECESSARY

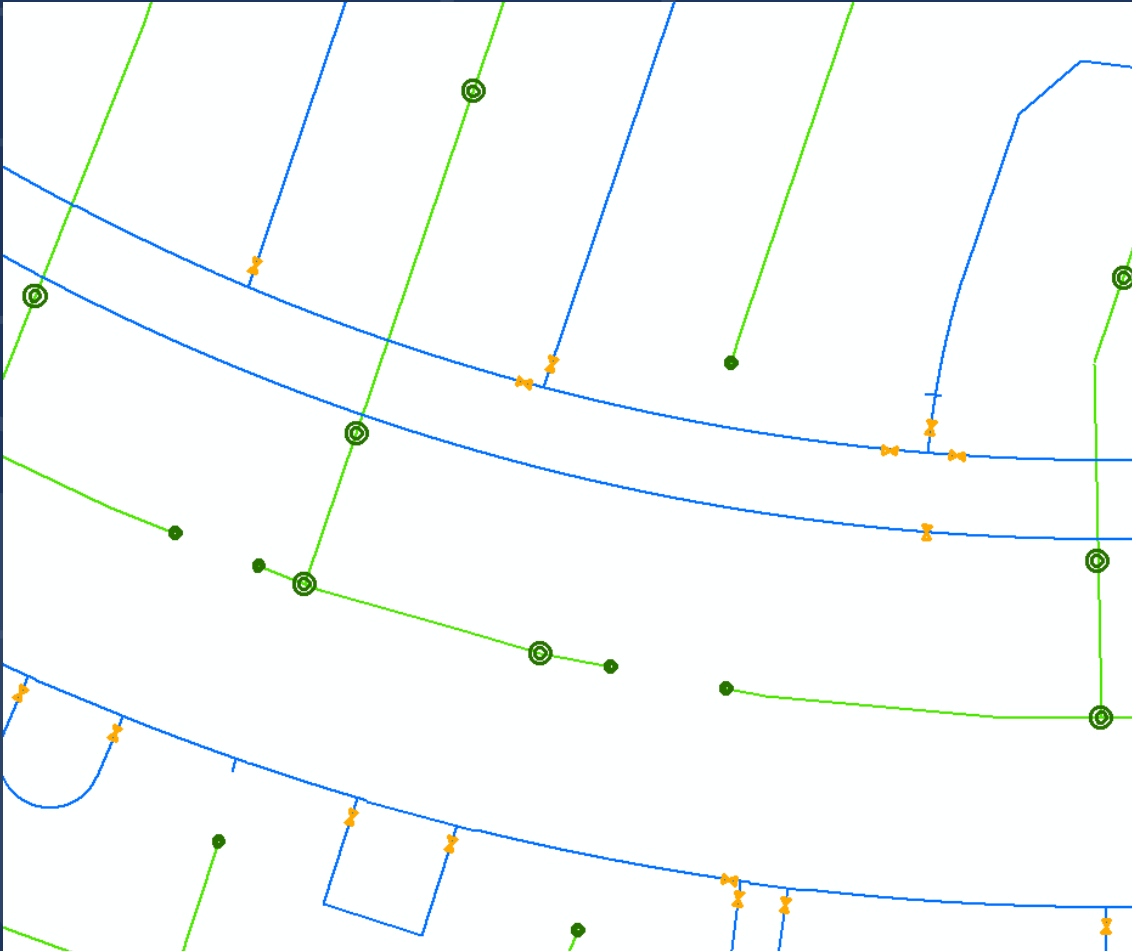


At that time, maintenance work, line locates and sampling was all being conducted by hand with paper.

In 2019, the District had a need to both 1) perform hydraulic modeling on its systems and 2) understand it's full asset inventory to implement asset management software.

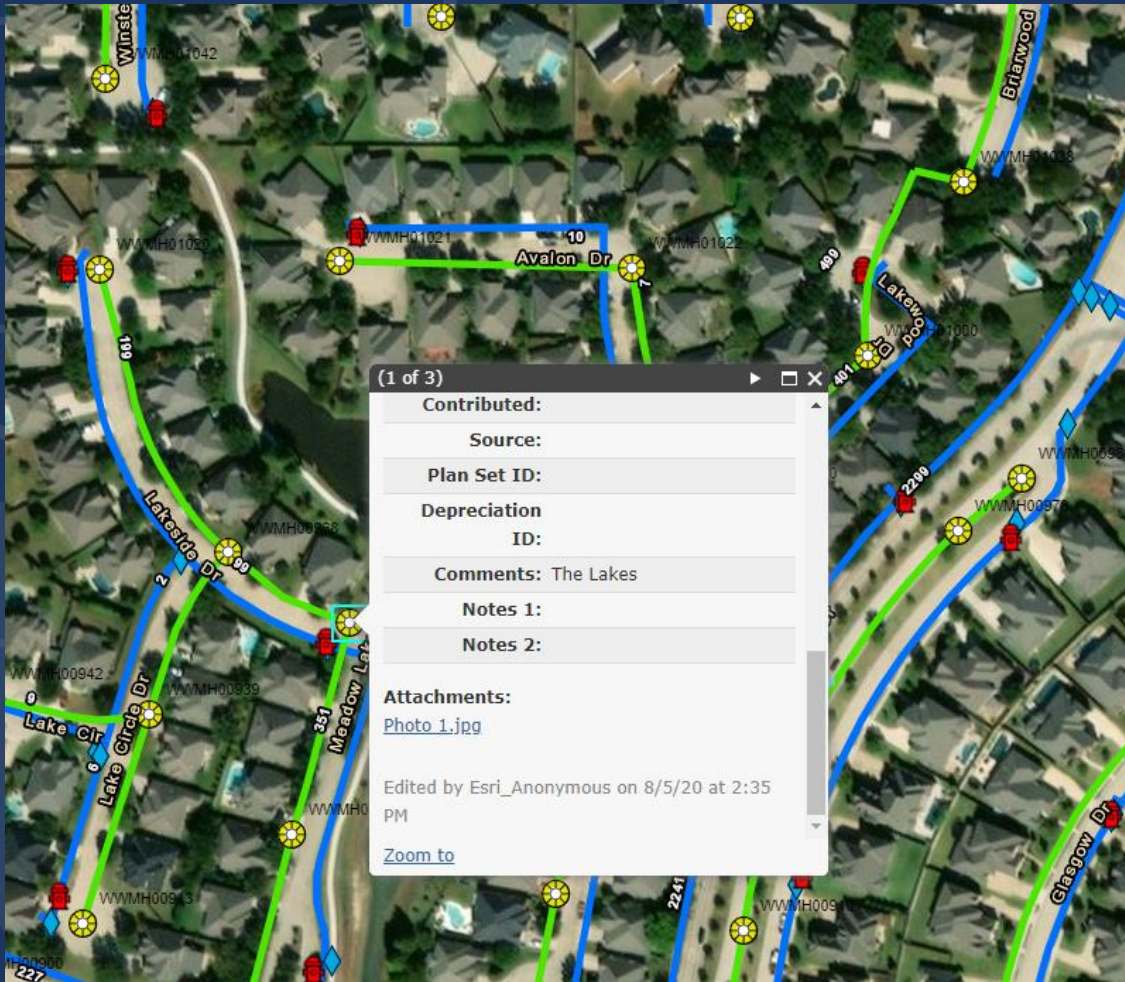


# INITIAL DATA



- Developed Geodatabase Design
  - ❖ Defined data needs such as diameter, material, etc.
- Began with CADD Data and Corresponding Map Book
  - ❖ Basic water and sanitary sewer linework
  - ❖ Required lots of spatial adjusting to match with real world features
- Fire Hydrant GPS data (2019)
  - ❖ Imported many attributes into GIS

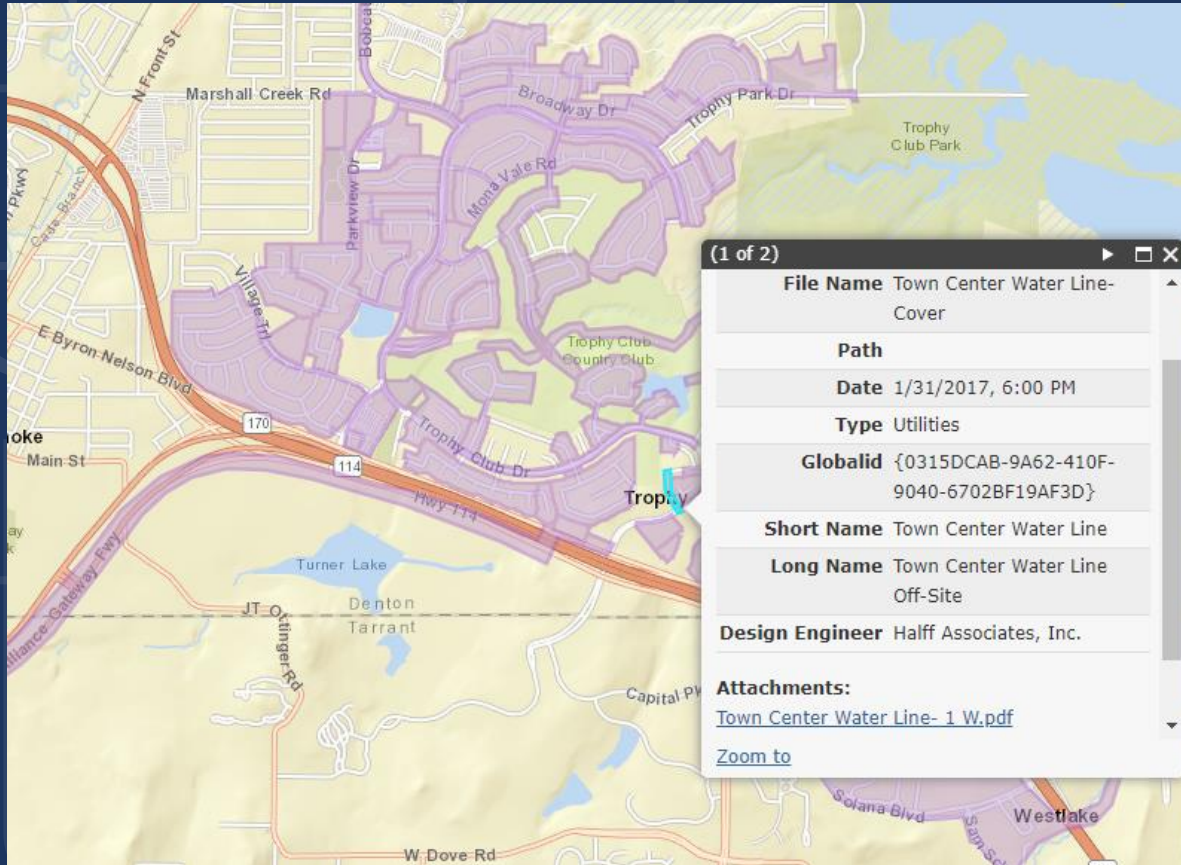
# FIELD VERIFICATION



- Using mapping grade GPS devices, Halff captured accurate locations of:
  - ❖ Wastewater manholes (1070 verified)
  - ❖ Fire hydrants (677 verified)
  - ❖ Water valves (1676 verified)
- District verified 96 additional wastewater manholes for a total of 1166 confirmed system-wide.
- Photos taken of all Halff verified assets and added as a link within webmap attributes.



# AS-BUILT INDEX



- Also known as Plan Set Polygon layer
- Sorted through all water and wastewater plans and extracted relevant pages
- Created GIS polygon for each site
- Attributed polygons with plan information
- Attached plan PDFs

# FOUNDATION READY



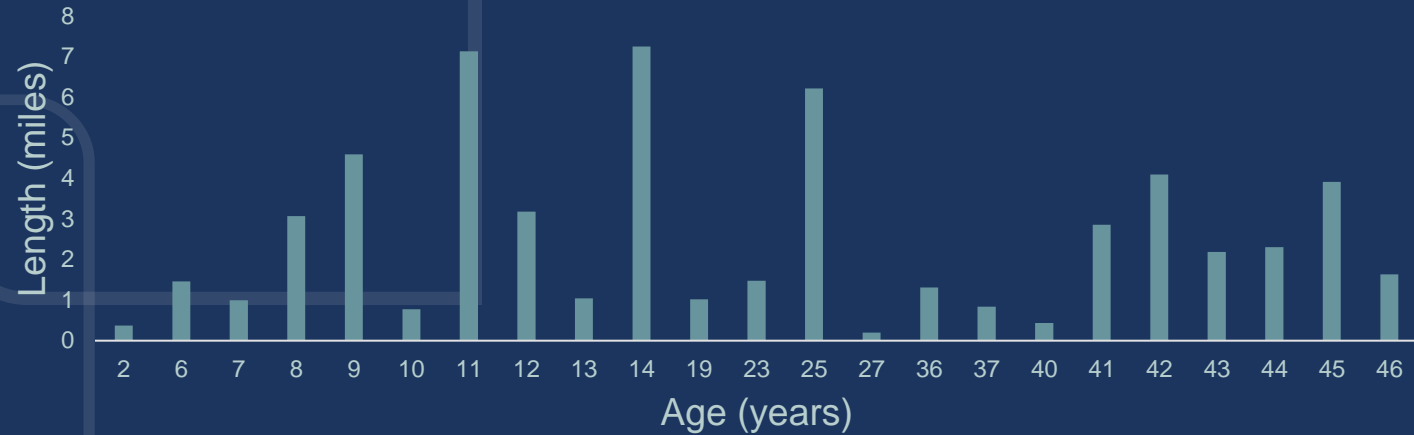
## Asset Inventory Available

- Initial Asset Management Program Developed from Breakdown of Assets
- Models Can be Run -> Water and Wastewater Master Plans Developed
- CIP Developed & Prioritized
- Web Maps Available for District Staff

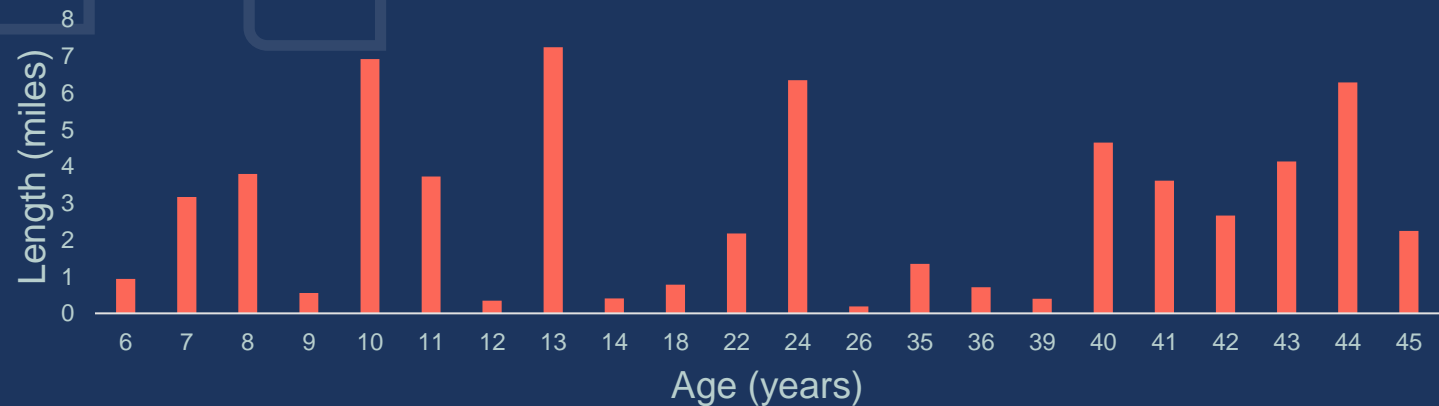
# ASSET INVENTORY AVAILABLE

- Water and WW Pipe Age added for 82% of system where information was available.

### Water System - Age



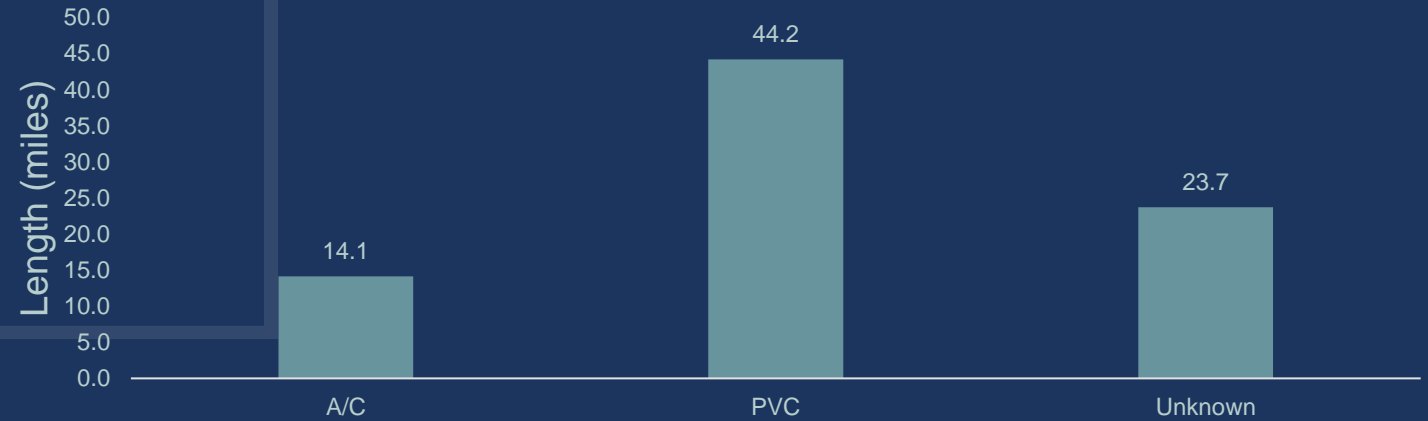
### WW System - Age



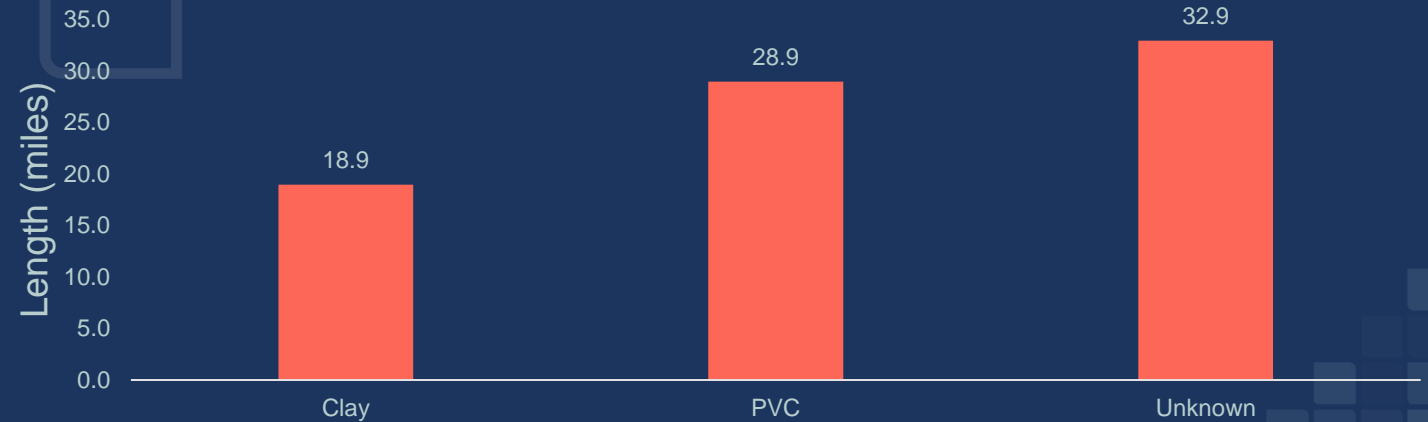
# ASSET INVENTORY AVAILABLE

- Water lines older than 1980: A/C assumed
- WW lines older than 1980: VCP assumed
- Newer lines (Water/WW): PVC assumed

## Water Pipe Material



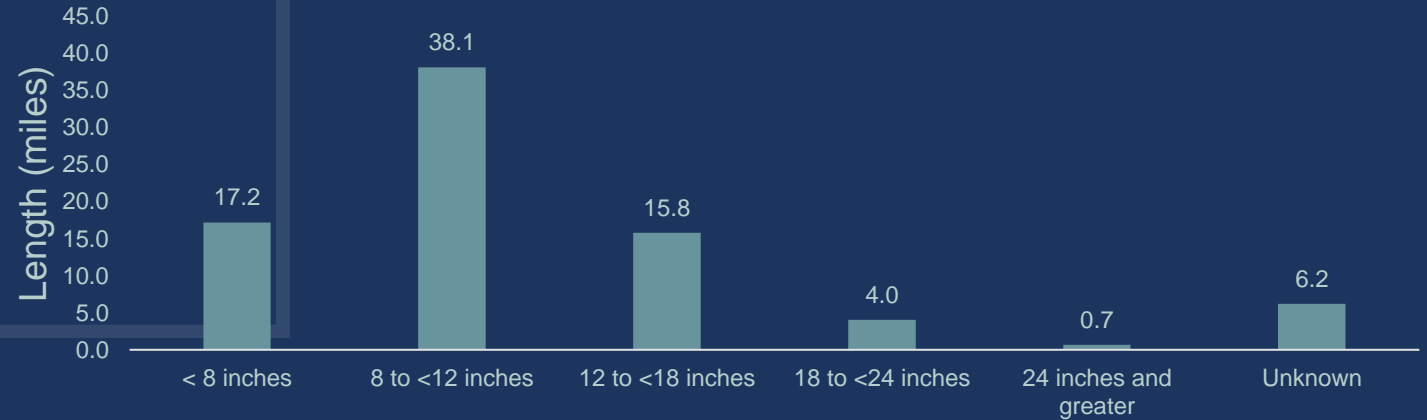
## Wastewater Pipe Material



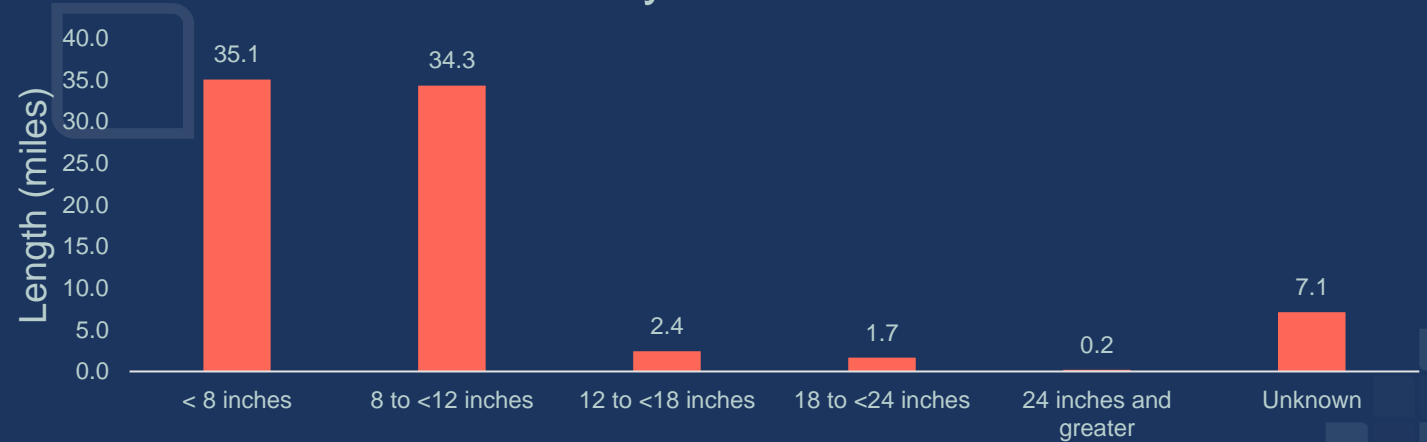
# ASSET INVENTORY AVAILABLE

Size (inch)	Water Main	Gravity Sewer	Force Main Sewer
<8	43%	46%	4%
8 to <12	42%	48%	1%
12 to <18	3%	3%	None
18 to <24	2%	2%	None
24 and greater	<1%	<1%	None
Unknown	9%	<1%	None

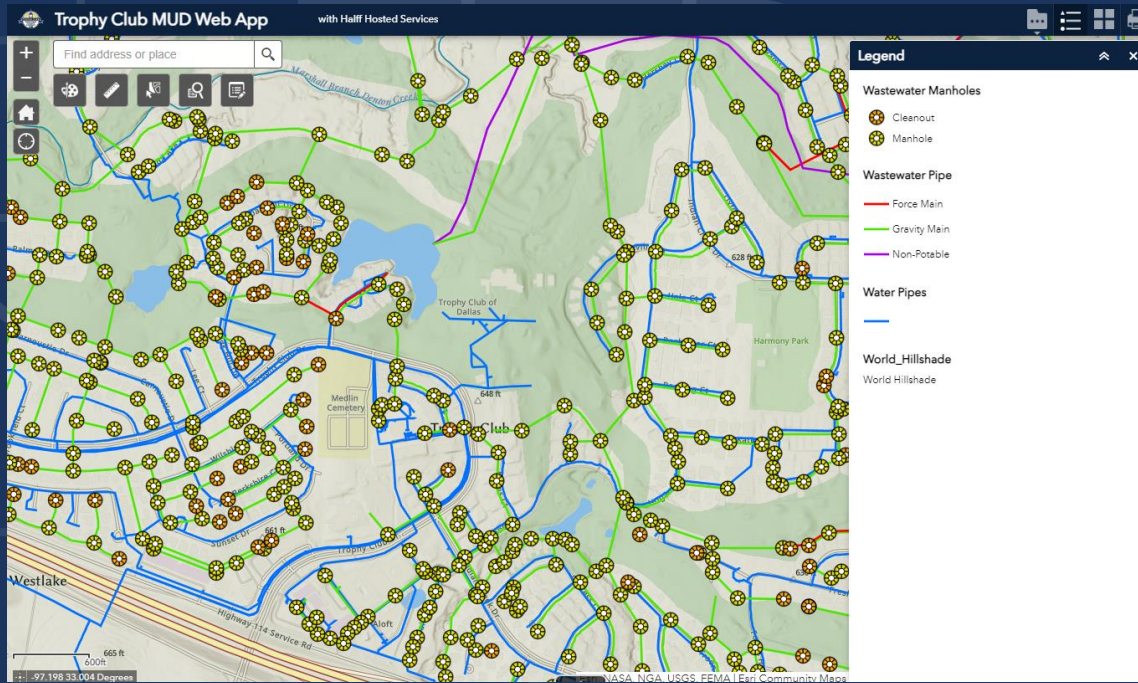
## Water System - Size



## WW System - Size



# FOUNDATION READY

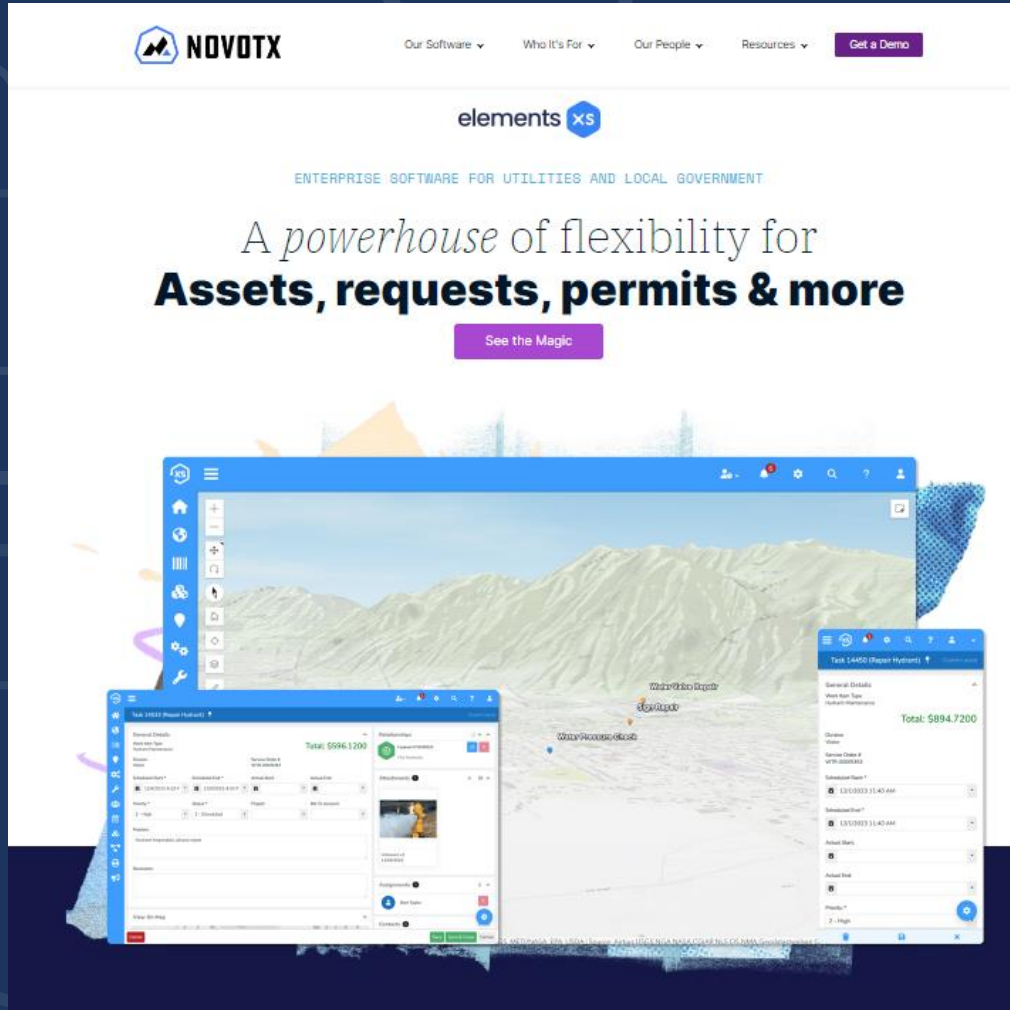


Data & Maps Now Available....but the District needed a way to account for preventative and corrective work on the systems.



# Implementing the Asset Management Software

# HOSTED ENVIRONMENTS



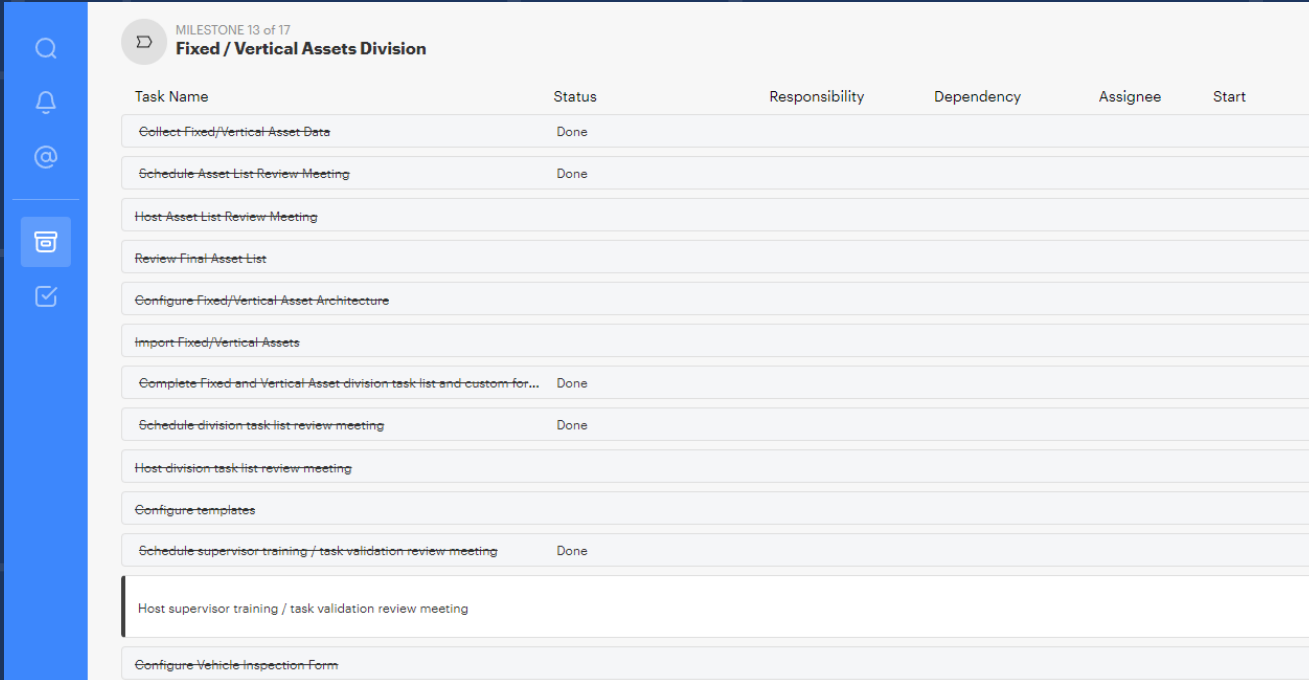
The District selected Novotx ElementsXS for their asset management software.

Novotx is the company. ElementsXS is the asset management software.

- Halff hosts the GIS enterprise geodatabase & web maps.
- Halff hosts ElementsXS in Azure cloud environment.
- District has no IT administration duties or burden.



# IMPLEMENTATION PROCESS



The screenshot displays a project management interface for a milestone titled "Fixed / Vertical Assets Division". The interface includes a sidebar with navigation icons and a main table listing tasks. The table has columns for Task Name, Status, Responsibility, Dependency, Assignee, and Start. The tasks listed are:

Task Name	Status	Responsibility	Dependency	Assignee	Start
Collect Fixed/Vertical Asset Data	Done				
Schedule Asset List Review Meeting	Done				
Host Asset List Review Meeting					
Review Final Asset List					
Configure Fixed/Vertical Asset Architecture					
Import Fixed/Vertical Assets					
Complete Fixed and Vertical Asset division task list and custom for...	Done				
Schedule division task list review meeting	Done				
Host division task list review meeting					
Configure templates					
Schedule supervisor training / task validation review meeting	Done				
Host supervisor training / task validation review meeting					
Configure Vehicle Inspection Form					

- Kick-Off Meeting to Identify Stakeholders and Process
- Weekly/Bi-Weekly Meetings
- Novotx PM, Halff PM, District Representatives
- District Workflows Documented
- Novotx uses project management software to track tasks and responsible parties.

# IMPLEMENTATION PROCESS

## Contents

- Introduction
- Overview
- 1 – Configure Optional Dependencies
- 2 – Configure the Organization
- 3 – Configure Core Objects
- 4 – Link GIS and Elements (if using GIS)
- 5 – Configure Core Document Framework
- 6 – Populate Core Documents
- 7 – Populate Core Objects
- Optional Next Steps

## Facilities and Vertical Assets 101

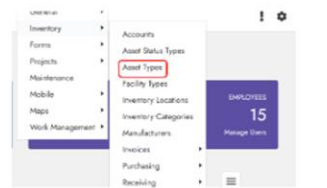
**Skill Level:** Beginner / Intermediate

**Objective:** At the end of this course students should be able to create and manage non-spatial assets.

### Task 1: Define Asset Types

Add Asset Types in Admin Tools –  
*Tasks are based on Asset Type.*

**Step 1:** In Admin Tools > Lists >  
Inventory > Asset Types



## Contents

- Task 1: Define Asset Types
- Task 2: Define Asset Attributes
- Task 3: Define Asset Location Hierarchy
- Task 4: Add new Assets and Facilities
- Task 5: Create a Service Order Template for Assets
- 5. Create a Task against the newly created asset

Configuration: Definition of assets, processes and routines, users

- Horizontal ready in GIS
- Vertical needed to be documented in templates, parts and schedules
- Both Halff and Novotx accessible/flexible

# IMPLEMENTATION PROCESS

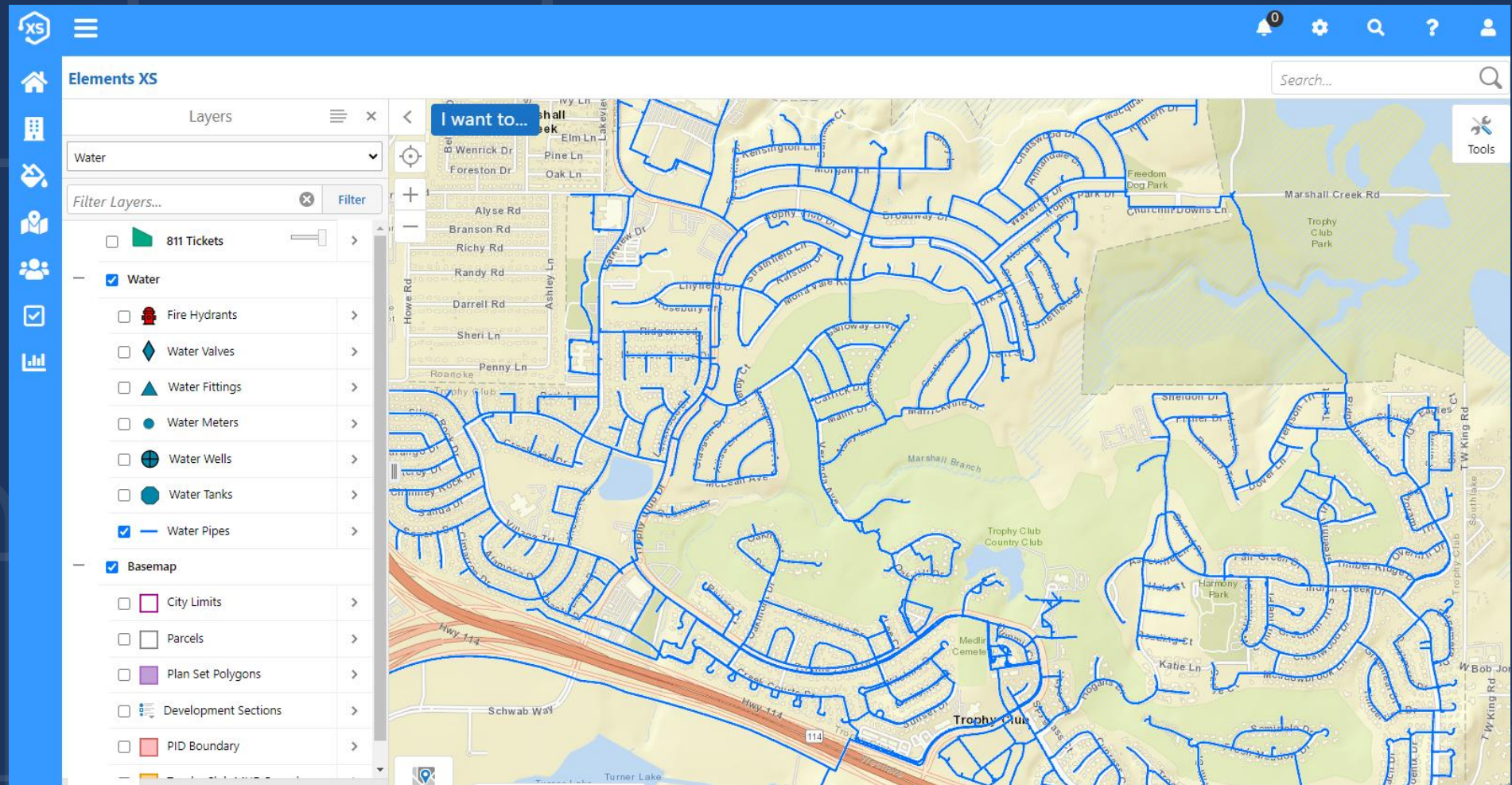
## Fixed (Vertical) Asset Template

AssetID	Asset Title/Description	Serial Number	Status	ItemCategory	Manufacturer2	Installation Date	Location	Location 2
9	BR-103	Solenoid Air Valve on SS Pipe S. Blower #1	1419152	In Service	Mechanical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
10	BR-104	Overhead Crane Motor	G3WA3532PF	In Service	Mechanical		Wastewater Treatment Plant	Membrane Bio Reactor 1
11	BR-105	Pre-Aeration recirculation Pump 1	6502633331	In Service	Mechanical	12/1/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
12	BR-106	Wastewater Pump 1	2.70065E+12	In Service	Mechanical	12/1/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
13	BR-107	Analysis Transmitter	N/A	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
14	BR-108	RIO Mbr 1-2	N/A	In Service	Electrical	6/16/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
15	BR-109	WAS magmeter	M6096D16000	In Service	Electrical	12/1/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
16	BR-110	Oxidation Reduction Potential (ORP)	16311129	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
17	BR-112	DO Dissolved Oxygen Probe (DO)	16080315	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
18	BR-113	Ammonium Probe (NH4)	16392046	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
19	BR-114	NH4 Analysis Transmitter	N/A	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
20	BR-115	Suspended Solids Sensor (TSS)	16100516	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
21	BR-116	Analysis indicating Transmitter	N/A	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
22	BR-117	Oxidation Reduction Potential (ORP) Probe	16311129	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
23	BR-118	Air Scour Flowmeter	L4079316000	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
24	BR-119	(ORP)Analysis indicating Transmitter	N/A	In Service	Electrical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
25	BR-120	Low Range Turbidimeter Probe	1603C0155780	In Service	Electrical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
26	BR-121	Turbidimeter Analysis indicating Transmitter	N/A	In Service	Electrical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
27	BR-122	Permeate Flow Meter	L4079416000	In Service	Electrical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
28	BR-123	Pressure Transmitter for PEP Piping	L412D201052	In Service	Electrical	12/20/21	Wastewater Treatment Plant	Membrane Bio Reactor 1
29	BR-124	Was magmeter display unit	M6096E16000	In Service	Electrical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
30	BR-125	Solenoid Freeze Protection Valve at PEP#1	1419154	In Service	Electrical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
31	BR-126	MOV (diffuser cleaning valve)	B631170102	In Service	Electrical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
32	BR-127	RAS flow meter	1.60301E+11	In Service	Electrical	1/12/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
33	BR-128	Flow Indicating Transmitter	1.60801E+11	In Service	Electrical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
34	BR-129	Self-priming Pump 1	PP26692	In Service	Mechanical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 1
35	BR-201	AN Submersible Mixer 2	6502633333	In Service	Mechanical	12/1/16	Wastewater Treatment Plant	Membrane Bio Reactor 2
36	BR-202	MBR Blower 2 Hood Fan included	15057-025-A2	In Service	Mechanical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 2
37	BR-203	Solenoid Air Valve on SS Pipe S. Blower #1	141951	In Service	Mechanical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 2
38	BR-228	Pre-aeration Blower 2 Hood Fan included	15057-025-B2	In Service	Mechanical	12/15/16	Wastewater Treatment Plant	Membrane Bio Reactor 2
39	BR-205	Pre-Aeration recirculation Pump 2	6502633330	In Service	Mechanical	12/1/16	Wastewater Treatment Plant	Membrane Bio Reactor 2
40	BR-206	Wastewater Pump 2	2.70065E+12	In Service	Mechanical	12/1/16	Wastewater Treatment Plant	Membrane Bio Reactor 2
41	BR-229	Self-priming Pump 2	PP26688	In Service	Mechanical	12/20/16	Wastewater Treatment Plant	Membrane Bio Reactor 2
42	BR-208	Scum Removal Pump 1,2	KRTE80-200/34HG-S	In Service	Mechanical	1/4/17	Wastewater Treatment Plant	Membrane Bio Reactor 2
43	BR-209	Scum Removal Pump 1,2	KRTE80-200/34HG-S	In Service	Mechanical	1/4/17	Wastewater Treatment Plant	Membrane Bio Reactor 2
44	BR-210	Oxidation Reduction Potential (ORP)	16330857	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 2
45	BR-211	Analysis Transmitter	N/A	In Service	Electrical	12/14/16	Wastewater Treatment Plant	Membrane Bio Reactor 2

# HORIZONTAL ASSETS

ElementsXS is highly configurable and tracks preventative and reactive maintenance for horizontal and vertical assets.

Implemented for the District for water distribution, wastewater collection and their corresponding vertical assets.

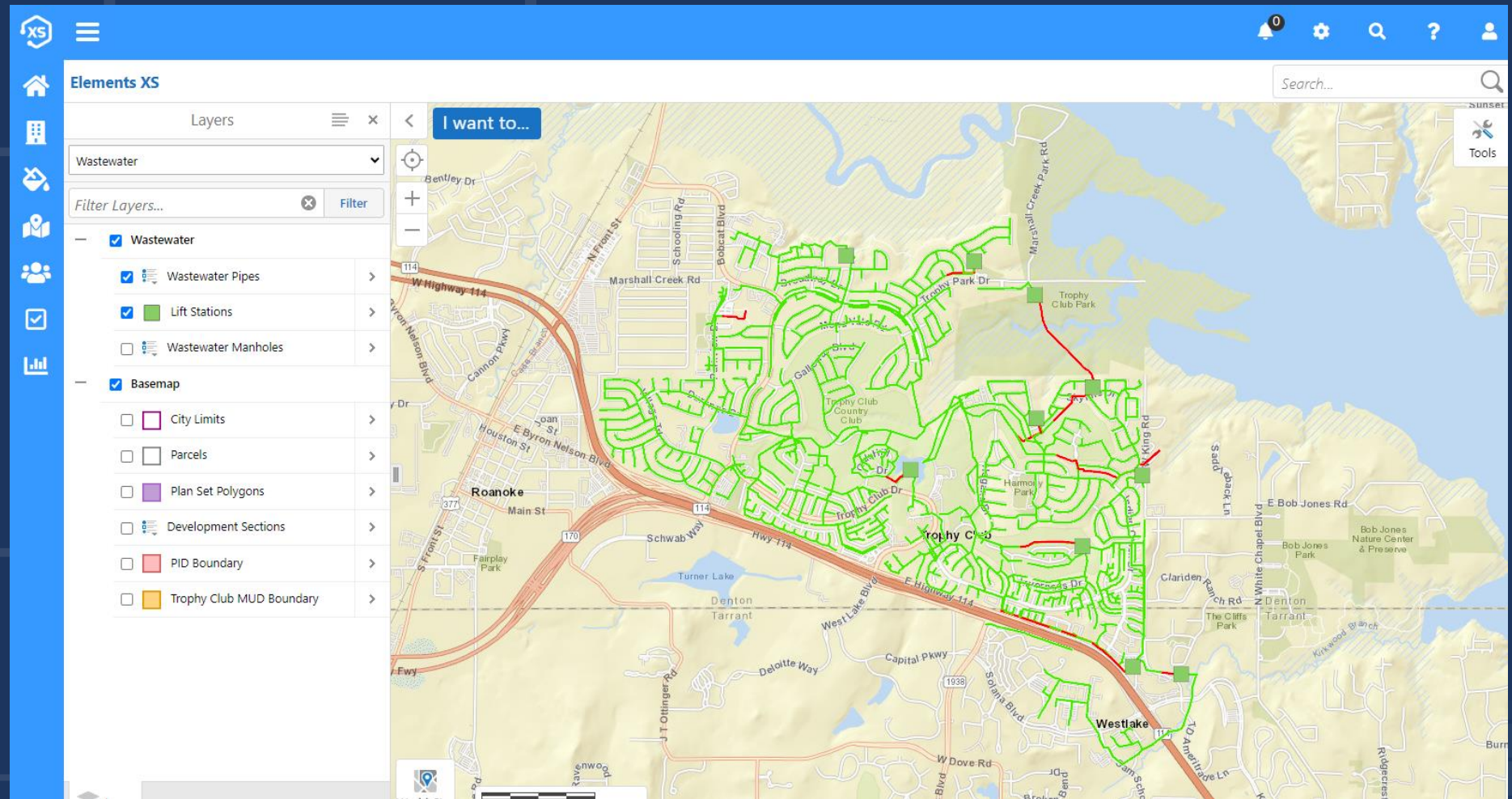


Water Distribution System

# HORIZONTAL ASSETS

ElementsXS is highly configurable and tracks preventative and reactive maintenance for horizontal and vertical assets.

Implemented for the District for water distribution, wastewater collection and their corresponding vertical assets.



Wastewater Collection System

# VERTICAL ASSETS

XS

Home

Assets

Materials

Users

Reports

Settings

Help

Profile

Lift Station #1 ()

Address 1: -- Address 2: -- City: -- State: -- Zip: --

Root Level | Wastewater Treatment Plant | Lift Station #1

Show Inactive Items

7 ASSETS

0 MATERIALS

Assets

Asset ID	Asset Name	Type	Status
WW1	Wet Well	Stationary	In Service
WW2	Pump #1	Pump	In Service
WW3	Pump #2	Pump	In Service
WW4	Floats\Fogrod	Instrument	In Service
WW5	Control Panel	Control Interface	In Service
WW6	Antenna	Instrument	In Service
WW7	Generator	Generator	

# VERTICAL ASSETS

Service Order Documents Activity Phone Call Note Email

**Lift Station #1**

GIS Details Refresh Share GIS Asset Relationships

Name: Lift Station #1  
AssetID: WWLS00001

History Maintenance Attachments External Links

Show: All History

Item	Type	Created	Start Date	Division	Status	Created By
<a href="#">Clean &amp; Vacuum L/S Wet Well (Task ID: 32525)</a>	Service Order Task	07/08/2024 08:19 AM	07/08/2024 12:00 AM	Wastewater	Completed	Clayton Roberts
226 Fresh Meadow Dr - The lift station wet well has grease and debris buildup, Using a pool net, scoop out the floating grease and debris from the lift station. Add breakdown to the wet well after netting out as much as possible.						
WW00005260 (Corrective Maintenance)	Service Order	07/08/2024 08:19 AM	07/08/2024 12:00 AM	Wastewater	Complete	Clayton Roberts
Lift Station Maintenance (Task ID: 31047)	Service Order Task	05/20/2024 09:16 AM	05/17/2024 12:00 AM	Wastewater	Completed	Clayton Roberts
226 Fresh Meadow Dr - Clean up the lift station by weedeating the outside of the station. Come back next week and spray roundup and brush killer.						
WW00005170 (Corrective Maintenance)	Service Order	05/20/2024 09:16 AM	05/17/2024 12:00 AM	Wastewater	Complete	Clayton Roberts
Lift Station Maintenance (Task ID: 30627)	Service Order Task	05/06/2024 03:28 PM	05/07/2024 08:00 AM	Wastewater	Completed	Clayton Roberts
L/S #1 - 226 Fresh Meadow Dr - Please add 5 gals of breakdown to the lift station. Knock any grease buildup loose with a shovel.						
WW00005113 (Corrective Maintenance)	Service Order	05/06/2024 03:28 PM	05/07/2024 08:00 AM	Wastewater	Complete	Clayton Roberts
Lift Station Maintenance (Task ID: 28718)	Service Order Task	03/18/2024 09:07 AM	03/26/2024 08:00 AM	Wastewater	Completed	Clayton Roberts
226 Fresh Meadow Dr - Spray weed killer and pick up all debris in Lift station. Add degreaser as needed. Note any wet wells that need to be vacuumed out.						

I want to...

Layers

WWLS00001 1 of 3

Filter

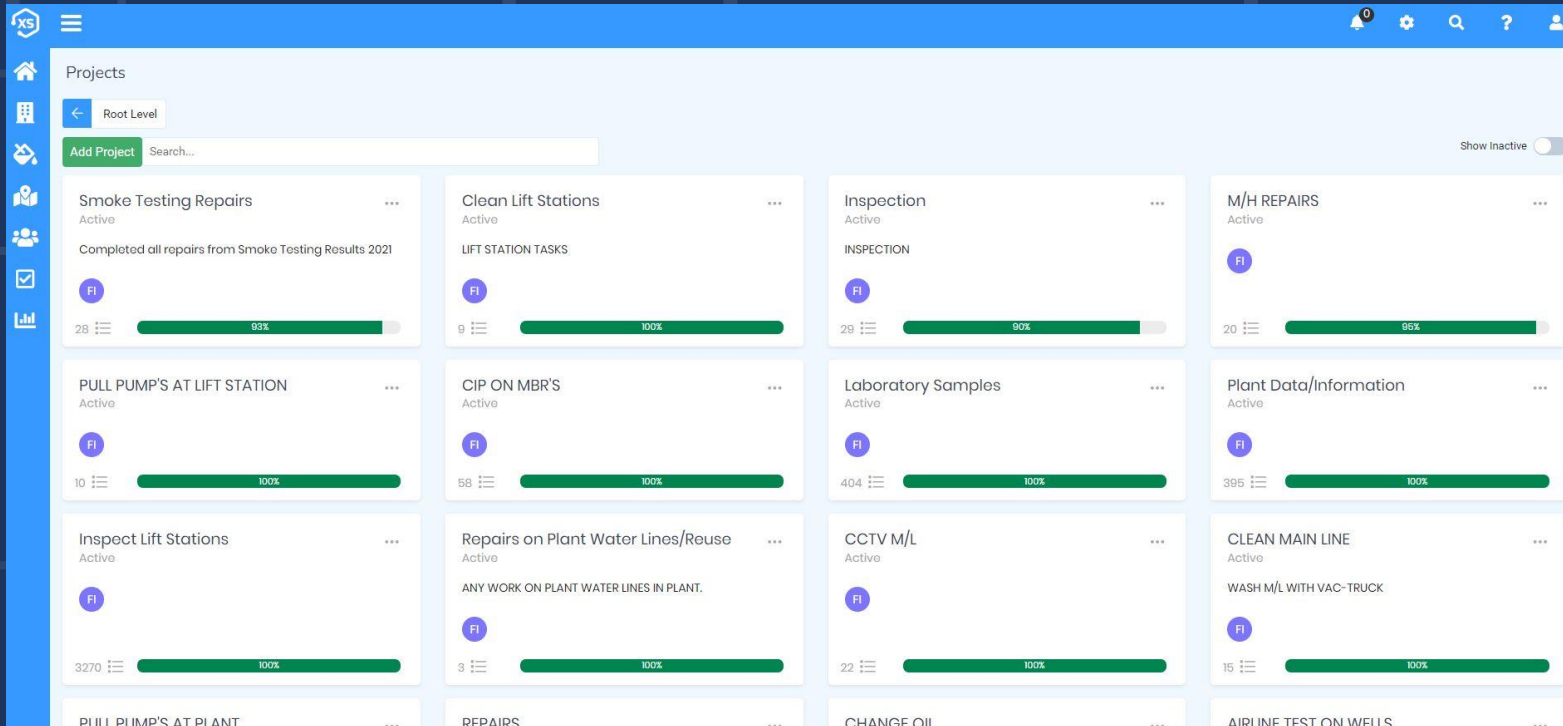
Wastewater

Lift Station #1

Load Asset - Create Service Order

Add to Results View Additional Details

# PREVENTATIVE MAINTENANCE



- Daily & Monthly Water Sampling
- Hydrant Flushing
- Valve Turning



# PREVENTATIVE MAINTENANCE

- Reoccurring work orders on multiple assets

Task 33554 (Daily WWTP Checklist)

### Wastewater Treatment Plant Checklist

Date: 08/06/2024 Degrees F: 74°F Rain (in.): 0" Flume/GPM (L\_/0.0): 0.2534" / 0.0 GPM

Influent: 497,421,000 Lake "A": 675,748,100 Creek: 1,459,379,000

Lake "B": 232,268,000

MBR-1	MBR-2	MBR-3	MBR-5	MBR-6
Air %	Air %	Air %	Air %	Air %
100	100	100	100	100
PERM	PERM	PERM	PERM	PERM
24.16	23.81	43.27	48.44	25.85
TMP	TMP	TMP	TMP	TMP
0.56	0.67	0.40	0.26	0.41
Flow	Flow	Flow	Flow	Flow
321	325	311	307	256
Flux	Flux	Flux	Flux	Flux
14.11	14.27	13.81	13.48	11.22

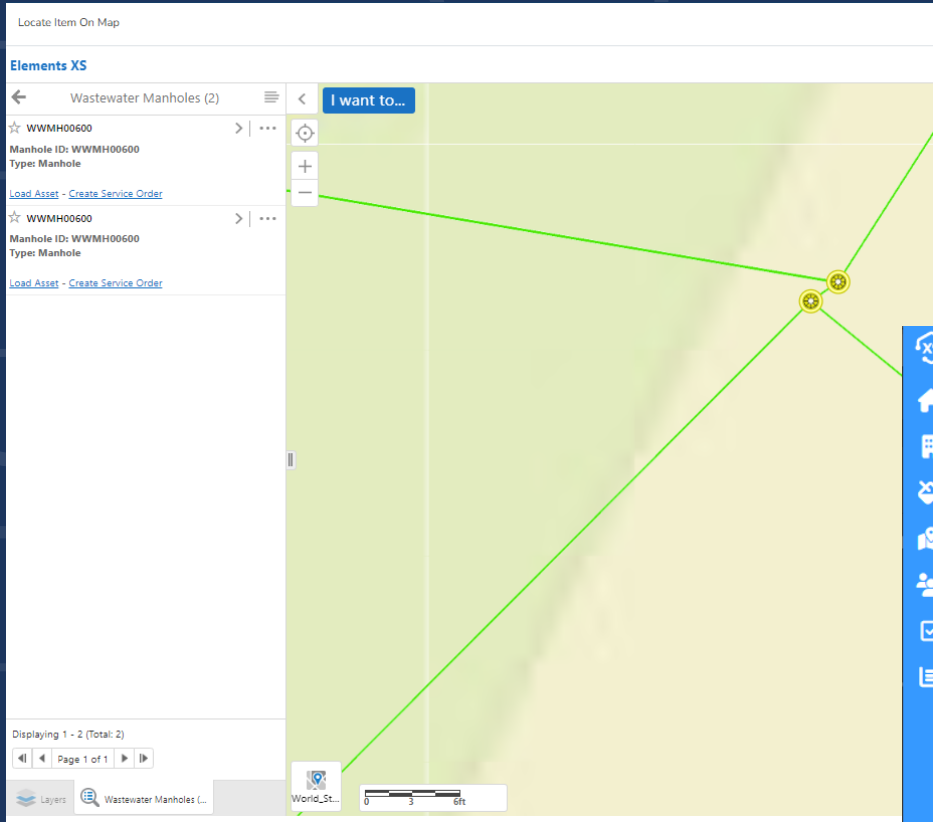
### Inventory Storage

Root Level | Wastewater Treatment Plant

membran

- Membrane Bio Reactor 1**  
Wastewater Treatment Plant -> Membrane Bio Reactor 1  
Facility: No | Allow Ship To: No
- Membrane Bio Reactor 2**  
Wastewater Treatment Plant -> Membrane Bio Reactor 2  
Facility: No | Allow Ship To: No
- Membrane Bio Reactor 3**  
Wastewater Treatment Plant -> Membrane Bio Reactor 3  
Facility: No | Allow Ship To: No
- Membrane Bio Reactor 5**  
Wastewater Treatment Plant -> Membrane Bio Reactor 5  
Facility: Yes | Allow Ship To: Yes
- Membrane Bio Reactor 6**  
Wastewater Treatment Plant -> Membrane Bio Reactor 6  
Facility: No | Allow Ship To: No

# PREVENTATIVE MAINTENANCE



- Reoccurring work orders on multiple assets

**Task 32353 (Clean Inverted/Syphon)**

**General Details**

Work Item Type: Wastewater **Total: \$0.0000**

Division: Wastewater Service Order #: WW00004923 **Add Task**

Scheduled Start: 7/4/2024 7:00 AM Scheduled End: 7/9/2024 7:00 AM Actual Start: 7/6/2024 9:22 AM Actual End: 7/6/2024 9:22 AM

Priority: Medium Status: Completed Project: Bill To Account:

**Relationships**

Manhole ID: WWMH00600 Wastewater Manholes

**Assignments**

Clayton Roberts

**Attachments**

No attachments found

**Contacts**

**Related Documents**

**Problem:**

Check Inverted Syphon, note any abnormal flows through the pipe. Both pipes should have even flow. Document with pictures before and after jetting the main line if need be.

**Resolution:**

inverted syphon was clear and both pipes were flowing evenly about 1/2 pipe.

# INTEGRATION FOR LINE LOCATES

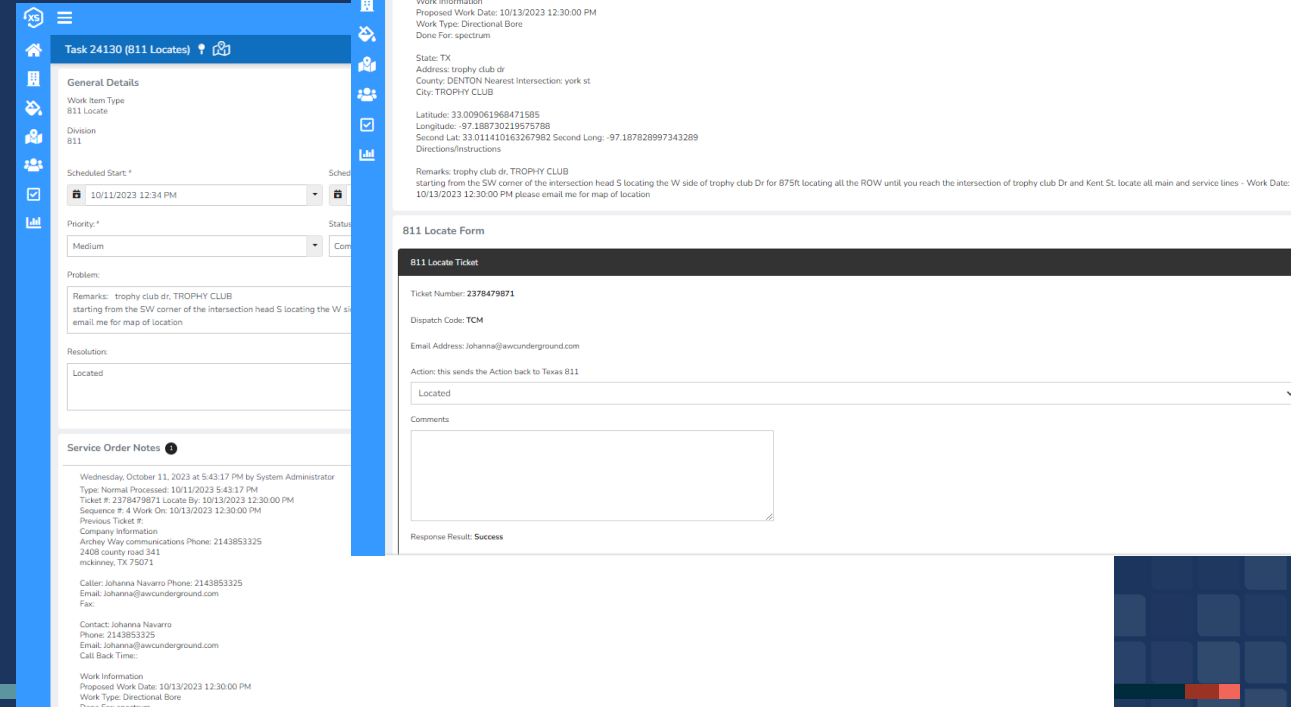
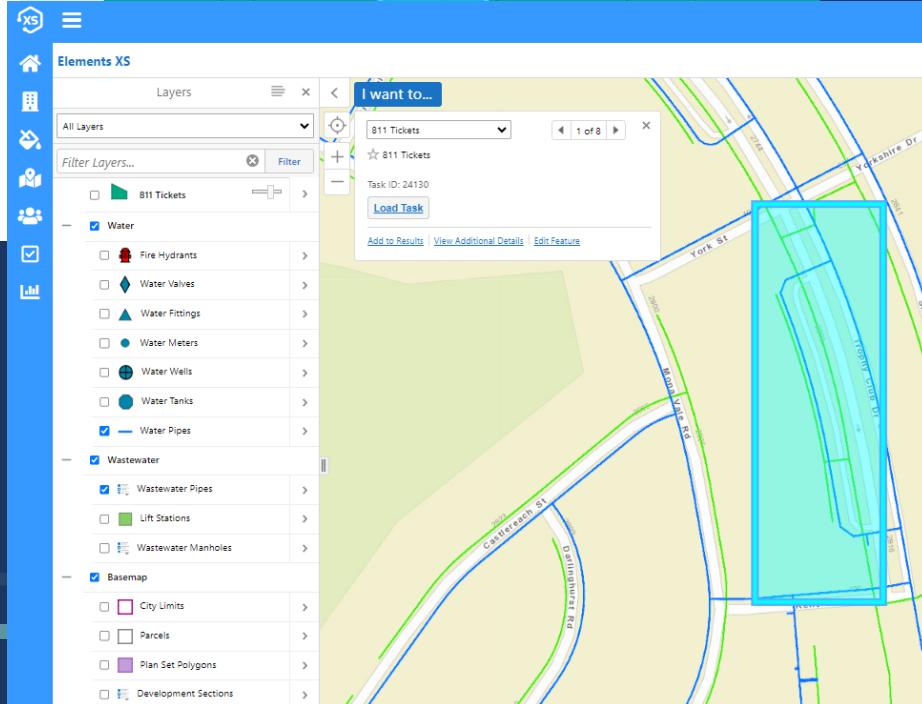
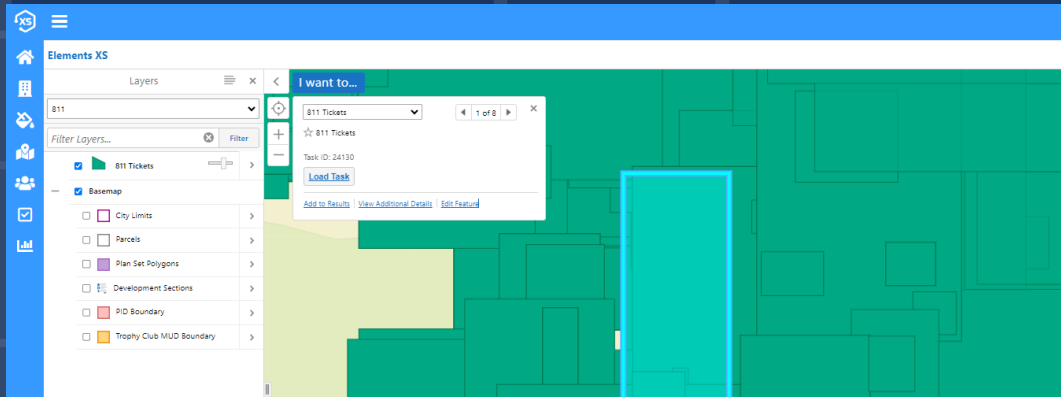


## Planned Integrations: Texas811 and Utility Billing

- Common for ElementsXS
- Initial set-up fee and maintenance fee, in addition to 811 service
- District Changing Utility Billing Software so Integration was put on hold

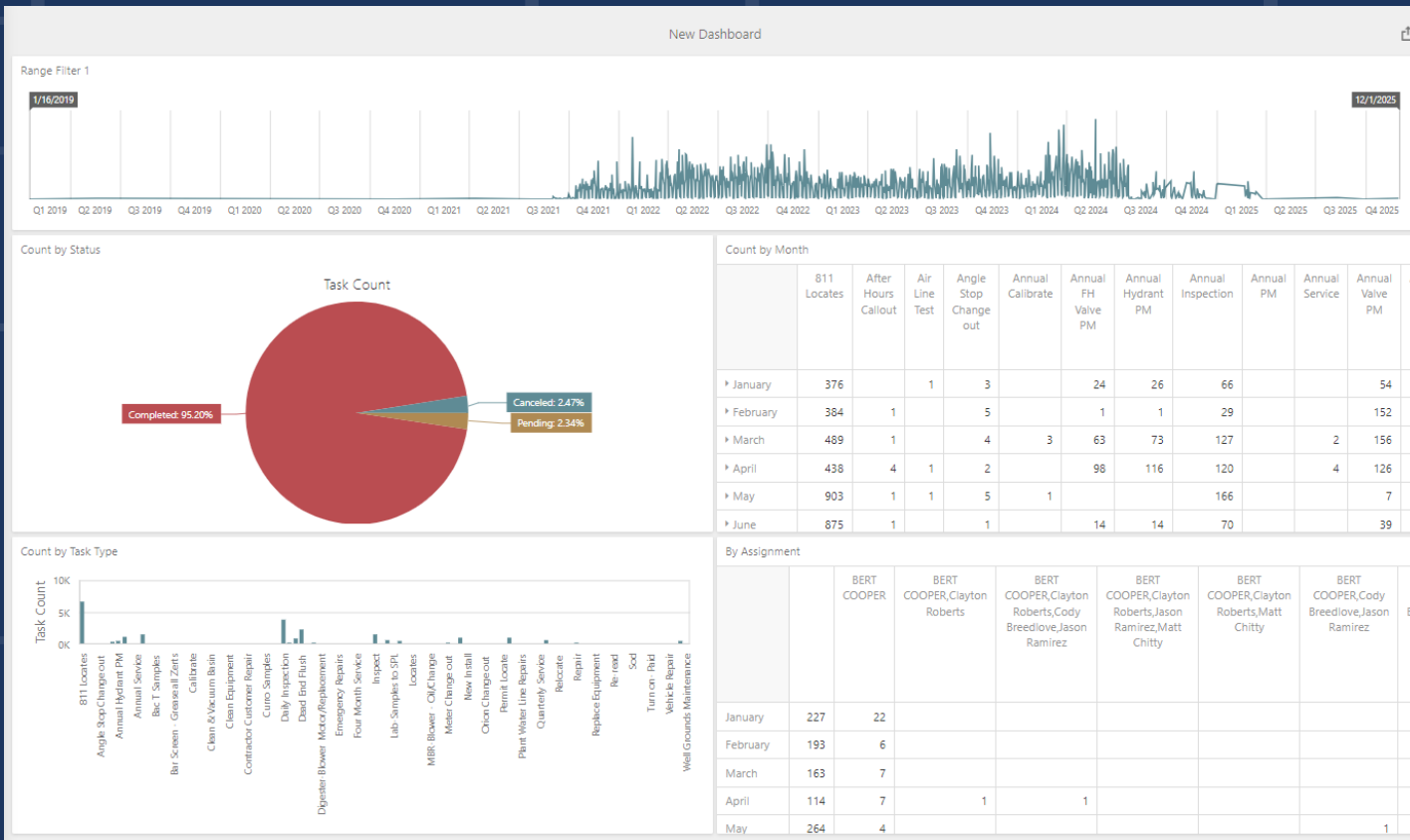
# INTEGRATION WITH 811

Novotx integrated ElementsXS with Texas811 for ticket generation. Requests for line locates automatically come in from Texas811 to ElementsXS and auto-generate service orders.



# How It's Going Now

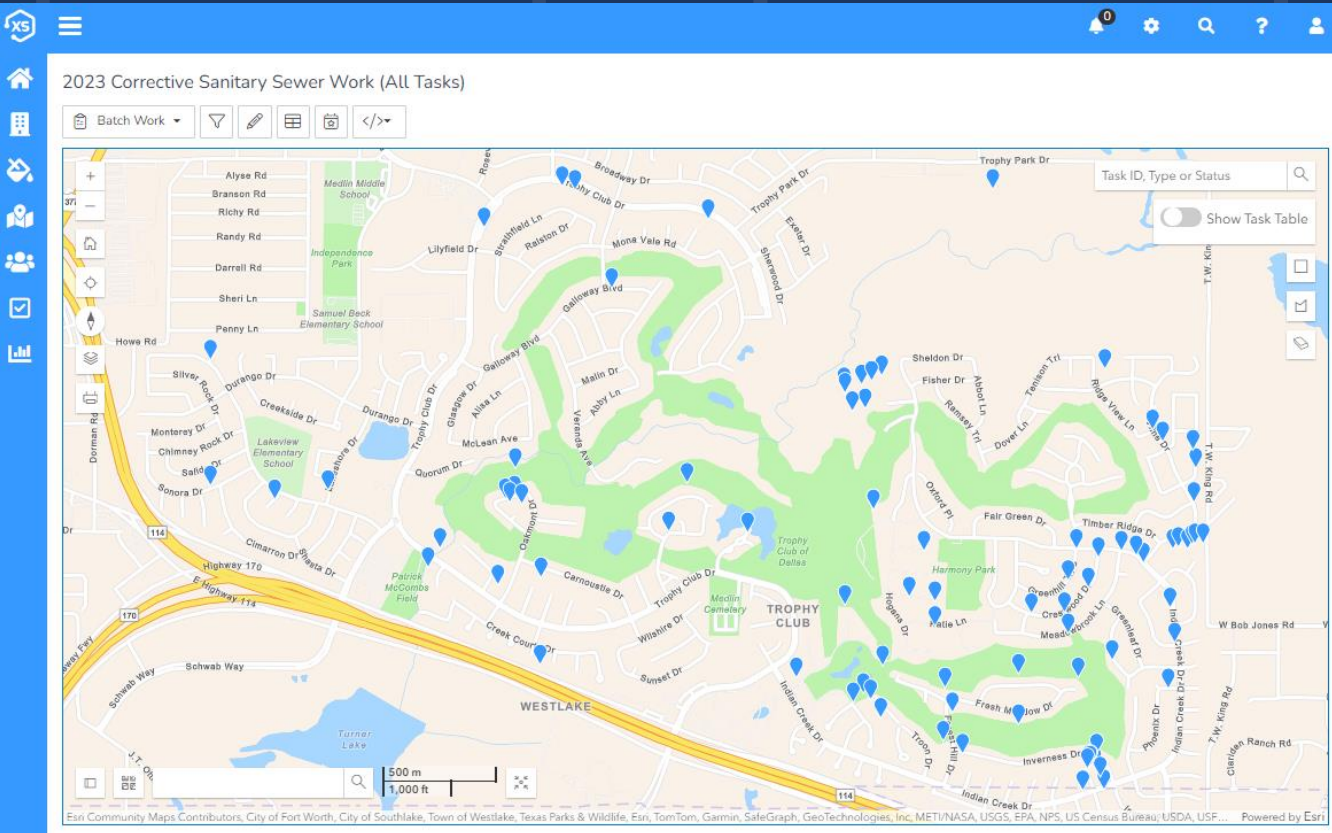
# BENEFITS OF ELEMENTS XS



## Three Biggest Wins from Implementation:

- Significant benefit from having preventative maintenance schedules at asset level on vertical assets. No more running to failure.
- Line locates process much more efficient with Texas811 integration.
- Batch work on numerous assets and recurring task orders.

# LESSONS LEARNED



- Incorporate review & approvals in workflows.
- Budgeting & tracking for all components, like integrations-initial and annual subscriptions.
- Ensure communication and terms are consistent throughout organization.

# || NEXT STEPS



- Live Risk Scoring
- Data-Driven Replacement Schedule
- Evaluation of Utility Billing Integration



# QUESTIONS?



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GIS Director

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