



ASSET DATA COLLECTION

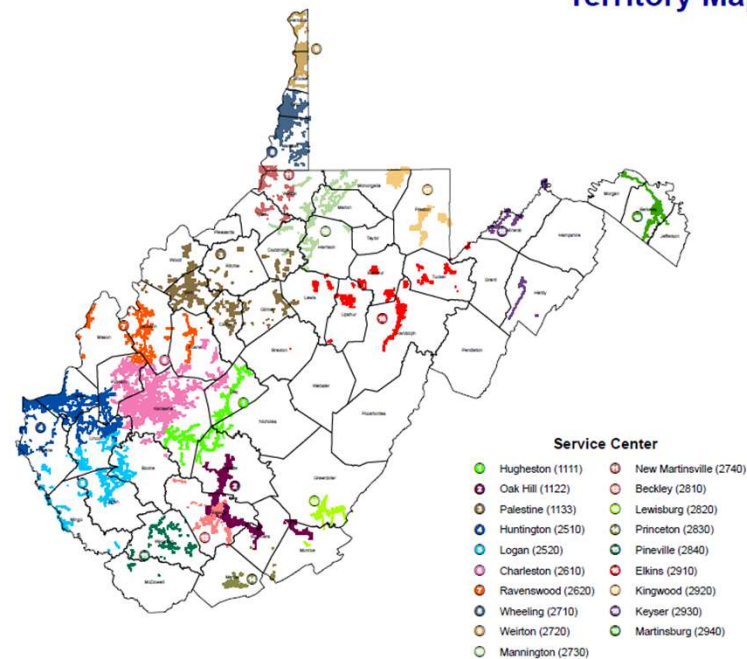
ENGINEERING

MOUNTAINEER GAS COMPANY

- A West Virginia natural gas distribution utility
 - Over 6200 miles of pipeline assets
 - Serve approx. 220,000 customers in 51 of 55 WV counties
- Acquired by UGI Corporation in 2021
 - Other subsidiaries include AmeriGas, UGI Utilities, UGI Energy Services, and UGI International
 - Portfolio includes over 9000 employees, and 2.4 million customers served



Territory Map



WHAT IS TRACKING AND TRACEABILITY?

- **ASTM F2897 – Tracking and Traceability Encoding System for Natural Gas Distribution Components**
 - Developed by a group of ASTM utility members in 2011.
 - Provides an encoding mechanism to identify piping system components through a 16-character code.
 - Includes component, manufacturer, lot number, manufacture date, material, diameter and wall thickness.
- **Plastic Pipeline Rule (2015)**
 - Proposed rule regarding to design, installation, and maintenance of plastic pipe.
 - Introduced the concept of tracking and traceability, requiring operators to maintain manufacturing and design specs, as well as the location of all newly installed plastic pipe.
 - Many plastic manufacturers begin to adopt the ASTM F2897 standard.
- **Plastic Pipeline Final Rule**
 - Effective January 22, 2019.
 - Delayed adoption of tracking and traceability specific rules.
 - Distribution operators are expected to collect some form of tracking and traceability information under 192.1007(a)5 (location of and material specs of newly installed pipeline).
 - Plastic manufacturers were required to adopt the ASTM F2897 barcode standard by December 31, 2019.

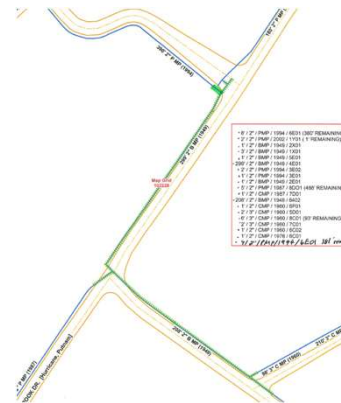
TRACKING AND TRACEABILITY BARCODE

CP	4nP3	5G0	B	51	3Kj	0
Component Manufacturer	George Fischer Central Plastics LLC					
Manufacturer's Lot Code	1044889					
Production Date	8/5/2024					
Component Material	PE2708					
Component Type	Butt Fusion 90 Elbow					
Component Size	2" OD, .216" Wall Thickness					
Currently Unused	0					



OLD DATA COLLECTION WORKFLOW

- Captured pipeline barcode by handwriting on form or taking picture
- Tracking data only available through paper documentation
- New installations were GPS'd after facilities were buried using a submeter GPS unit
- GPS data was used as a reference along with paper maps
- All asset data was populated by a technician



NEW WORKFLOW REQUIREMENTS

- GPS and asset data collected during construction
- Capture and decode ASTM barcode data
- Utilize high accuracy GPS, when available
- Workflow needs to be as simple as possible



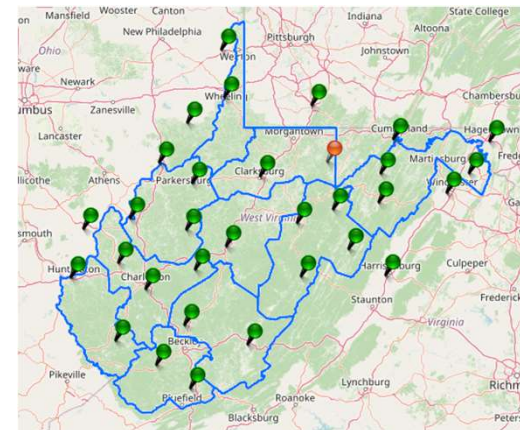


BAD ELF FLEX GPS UNIT

- Bad Elf Flex Extreme
 - \$6000 MSRP (with RTK enabled)
 - Accuracy: 1 FT to 3 FT non-RTK/ ~0.5 IN RTK
 - Multi-Constellation & Multi-Frequency
 - 11 HR battery life
 - IP65 rated for water and dust.

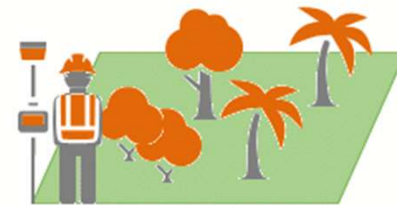
REAL-TIME KINEMATIC (RTK)

- A satellite navigation technique that provides precise, real-time positioning information.
- Uses a base station and a mobile receiver to calculate the position of the mobile receiver.
- MGC is using WVRTN CORS Network which is a free service.
- Need cellular service to connect to the network.



ASSET DATA COLLECTION STATISTICS

- 300 Work Orders with data collection
- 13,000 fittings
 - 2,500 valves (includes curb valves)
- 7,300 pipe sections
- 87 miles of pipeline (mains and services)

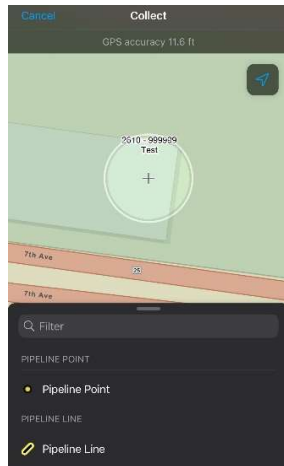


MGC SOLUTION WORKFLOW

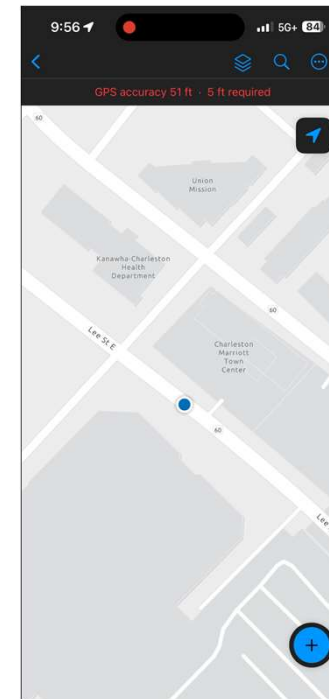
- Performed in Field Maps on mobile device.



- Barcode contains component value, allowing for a more simplistic approach.

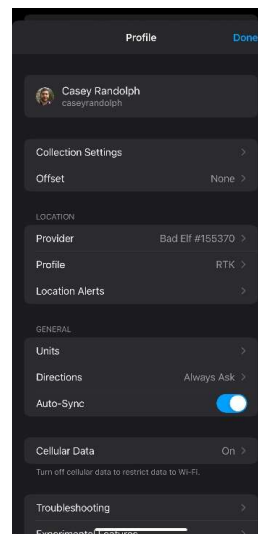
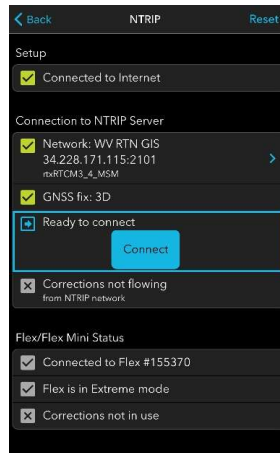


- Barcode is decoded during collection, allowing collector to verify data.

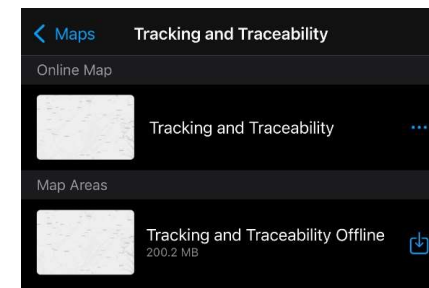
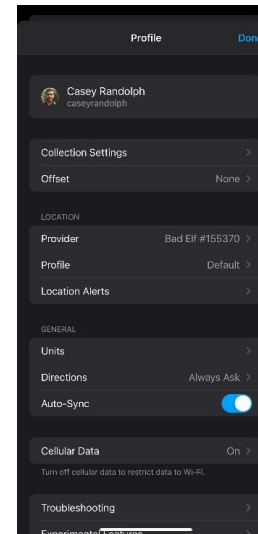


ONLINE/OFFLINE SETUP

■ Online Setup

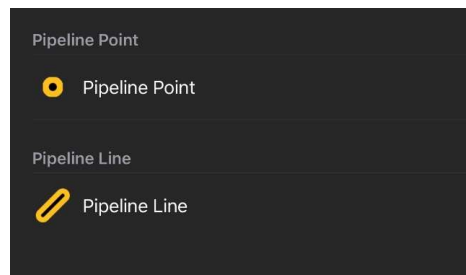


■ Offline Setup



DATA COLLECTION OVERVIEW

- Data should be captured for any pipeline or component permanently installed.
- User selects if they are collecting a point (fitting) or line (pipeline/casing).
- If barcode is damaged or lost in transportation, or if a pipeline/component is steel, attributes can be manually populated.
- User populates length of pipe, depth, facility type, etc.

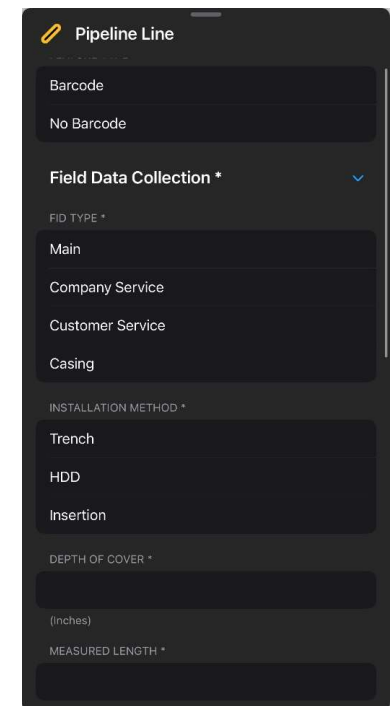


Pipeline Point

Pipeline Point

Pipeline Line

Pipeline Line



Pipeline Line

Barcode

No Barcode

Field Data Collection *

FID TYPE *

Main

Company Service

Customer Service

Casing

INSTALLATION METHOD *

Trench

HDD

Insertion

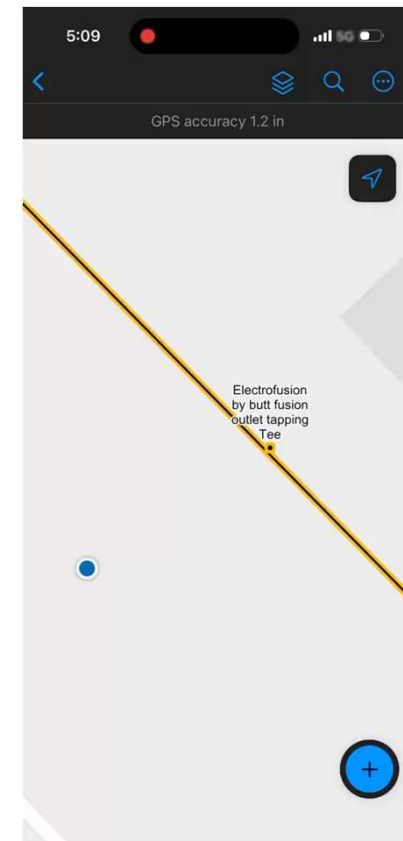
DEPTH OF COVER *

(inches)

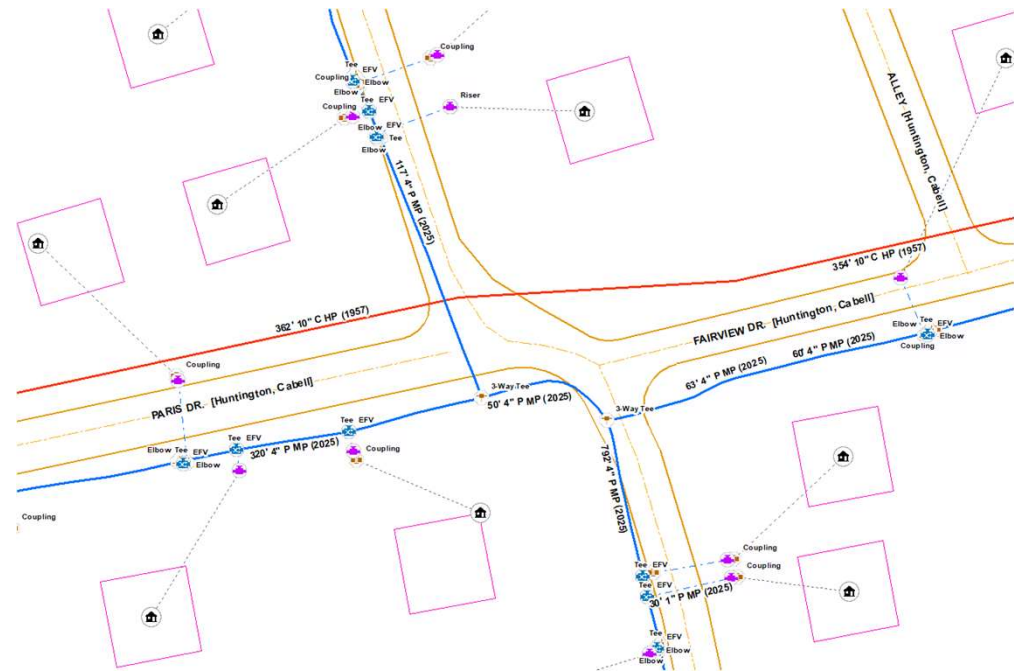
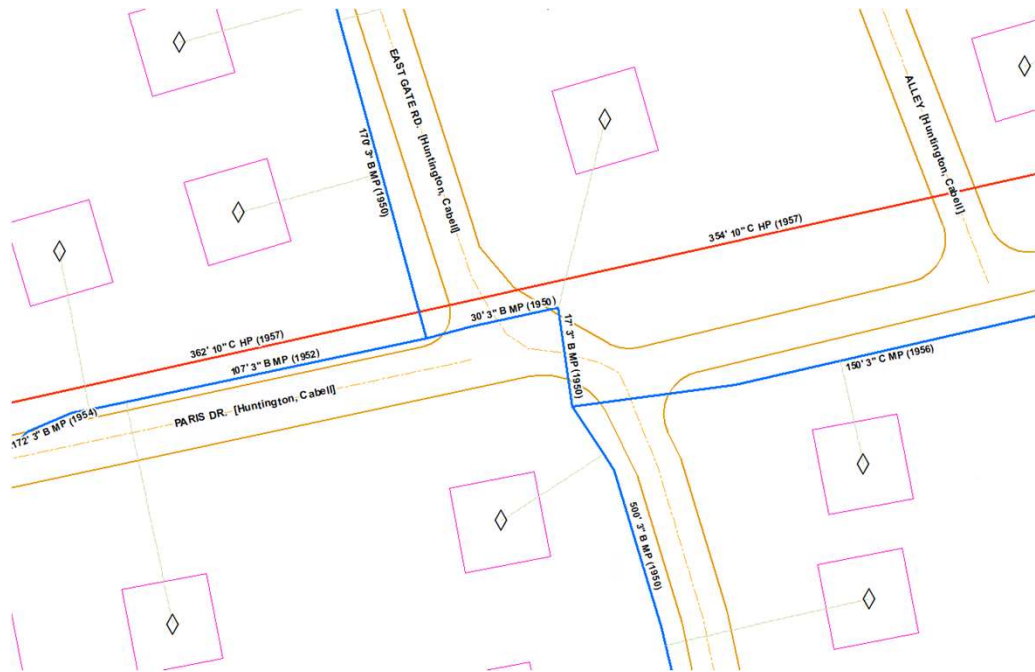
MEASURED LENGTH *

EXISTING SERVICES

- During construction, if an existing company service is good plastic, it can be “tied over” to the newly installed main.
- For this scenario, existing assets can also be captured through the asset data collection workflow.
- This allows for all company services and curb valves to be mapped when construction is complete in an area.

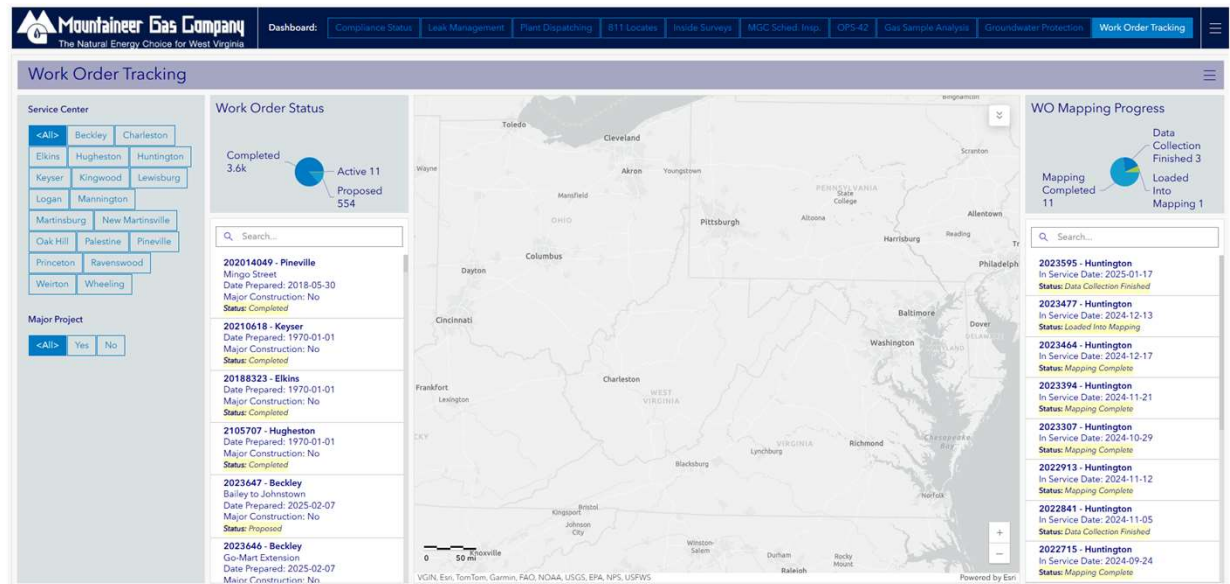


MAPPING BEFORE AND AFTER



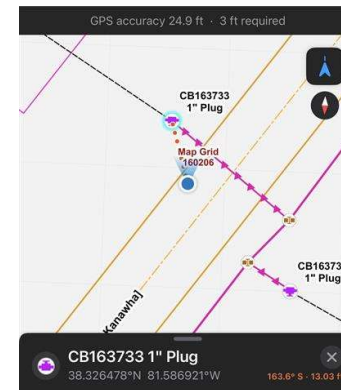
WORK ORDER TRACKING

- Utilizes ArcGIS Dashboards.
- Data collection can be viewed live.
- Field can track mapping progress after construction is complete.



USING DATA TO FIND ASSETS

- The data collected in the field makes it back to the company facilities maps and can be used to find assets in the field.



- Individual lot numbers can be searched within the database to identify areas of installation.

	ComponentType	MANUFACTURER	MANUFACTURELOTNO	Count
1	Tee	Innoge	4922	267
2	Tee	Innoge	5022	219
3	Coupling	Innoge	619811	199
4	Tee	Innoge	2523	187
5	Tee	Innoge	2822	175
6	Tee	Innoge	4122	150
7	Elbow	Elster Perfection	2771686	138
8	Elbow	Georg Fischer Central Pla...	1035016	132
9	Coupling	Innoge	3623	127
0			2722	121

FUTURE ENHANCEMENTS

- Looking to utilize T-Mobile T-Satellite to use RTK in locations without cell service.
- Adding GPS meta data to line features.
 - Currently only available on point features (fittings).
- Improvements to the Bad Elf app to streamline RTK connection.
- Addition of collectible features such as test stations.
- Addition of a tee type field to better understand tapping tee function (bypass, purge point, service).

QUESTIONS

