

TECHNICAL MEMORANDUM

DATE: November 24, 2025

TO: Alan Berg, President
Tyrone Water and Wastewater Association

FROM: Tyler Hopkins, PE 
Brittany Trejo, EI

SUBJECT: Tyrone Wastewater Collection System Condition Assessment

1 PURPOSE OF MEMORANDUM

The purpose of this technical memorandum is to evaluate the existing wastewater collection system to determine what components, if any, can be rehabbed or in need of replacement. The evaluation includes a camera inspection of a portion of the collection system.

2 EXISTING WASTEWATER SYSTEM

The Tyrone wastewater collection system is a gravity-based system that drains to a lift station where it is then pumped via a forcemain to the Silver City collection system and treated at the Silver City WWTP. Tyrone has approximately 321 sewer connections with 318 of them being residential. The three non-residential consist of a post office, fire station, and community center.

The collection system was originally installed in the 1960s by Phelps Dodge and consists of vitrified clay pipe and brick manholes. There is a total of about 19,000 linear feet of 6-in, 8-in, and 10-in collection lines with over 100 manholes. This system has been in service for over 60 years. There has been no major capital improvement projects completed on the collection system in Tyrone, only general repair and maintenance work when necessary.

Bohannon Huston, Inc. contracted with Southwest Envirotec to video each of the sewer lines to determine the current condition of the sewer lines. Based on the video of the sewer system root intrusion, pipe deformity, grease/scum build-up, and pipe settling are issues seen through the video inspection. Brick manholes also show signs of deterioration.

3 NEED FOR PROJECT

3.1 HEALTH AND PUBLIC SAFETY ISSUES

Vitrified clay pipes are prone to leaks due to pipe joints not sealed like in modern day PVC pipe joints and can lead to root intrusion and sewage leaking into the nearby soil. While the videos do not specifically show gaps at the pipe joints, the presence of root intrusion, including at service lateral

locations, indicates leaks are occurring throughout the system. The mortar within the manholes also show signs of deterioration. Both of these contribute to raw wastewater into the surrounding soil and groundwater infiltration during rain events.

4 RECOMMENDATIONS AND CONCLUSIONS

4.1 PROJECT DESCRIPTION

Based on the materials and current conditions of the pipelines and manholes, both should be replaced throughout the collection system. The Association should remove approximately 18,680-feet of existing 6-inch, 8-inch, and 10-inch VCP wastewater collection pipes and approximately 103 sewer manholes with PVC piping and pre-cast concrete manholes. The new wastewater collection system would generally be installed in the same location where the existing wastewater collection system is. The current pipe sizes, grades, and depths of the system should be re-evaluated to determine if there is a more efficient layout that could shallow some parts of the system to save on costs.

The Association additionally would need to install approximately 7,600-feet of wastewater collection PVC service piping and reconnect all residents back into the new wastewater collection system.

4.2 COST ESTIMATE

A preliminary cost estimate is shown in Table 4-1.

Table 4-1. Cost Estimate

| Item | Description | Unit | Quantity | Unit Price | Extension |
|--|---|------|----------|------------|----------------------|
| 1 | Mobilization/Demobilization | LS | 1 | \$ 361,990 | \$ 361,990 |
| 2 | Field Surveying and Staking | LS | 1 | \$ 80,000 | \$ 80,000 |
| 3 | Storm Water Pollution Prevention Plan | LS | 1 | \$ 30,000 | \$ 30,000 |
| 4 | Traffic Control Plan | LS | 1 | \$ 67,500 | \$ 67,500 |
| 5 | Material Testing | ALW | 1 | \$ 20,000 | \$ 20,000 |
| 6 | Bypass Pumping | LS | 1 | \$ 300,000 | \$ 300,000 |
| 7 | Pavement Removal, Complete-in-Place | SY | 69,700 | \$ 3 | \$ 174,250 |
| 8 | 2-inch Pavement Replacement | SY | 69,700 | \$ 45 | \$ 3,136,500 |
| 9 | Curb and Gutter Removal and Replacement | LF | 2,250 | \$ 65 | \$ 146,250 |
| 10 | 4-in Sidewalk Removal and Replacement | SF | 8,530 | \$ 20 | \$ 170,600 |
| 11 | Vitrified Clay Pipe (VCP) Removal | LF | 18,680 | \$ 5 | \$ 93,400 |
| 12 | Sanitary Sewer Manhole Removal | EA | 103 | \$ 1,500 | \$ 154,500 |
| 13 | 8-in SDR 35 PVC Pipe | LF | 16,160 | \$ 25 | \$ 404,000 |
| 14 | 10-in SDR 35 PVC Pipe | LF | 2,520 | \$ 30 | \$ 75,600 |
| 15 | Trenching (≤8-ft) | LF | 12,520 | \$ 50 | \$ 626,000 |
| 16 | Trenching (≥8-ft, ≤12-ft) | LF | 6,240 | \$ 80 | \$ 499,200 |
| 17 | 4-ft Diameter Manholes (≤8-ft) | EA | 61 | \$ 8,500 | \$ 518,500 |
| 18 | 4-ft Diameter Manholes (≥8-ft, ≤12-ft) | EA | 37 | \$ 12,000 | \$ 444,000 |
| 19 | 4-ft Diameter Manholes (≥12-ft) | EA | 5 | \$ 16,000 | \$ 80,000 |
| 20 | 4-in Service Connection | EA | 326 | \$ 1,500 | \$ 489,000 |
| 21 | 4-in Sewer Service Piping - Collection Side | LF | 7,600 | \$ 30 | \$ 228,000 |
| SUBTOTAL OF ITEMS 1 - 21 | | | | | \$ 8,099,290 |
| CONSTRUCTION | | | | | |
| Construction | | | | | \$ 8,099,290 |
| Contingencies (20%) | | | | | \$ 1,619,858 |
| Construction NMGR (6.3125%) | | | | | \$ 613,521 |
| CONSTRUCTION TOTAL | | | | | \$ 10,332,669 |
| PROFESSIONAL SERVICES | | | | | |
| Engineering Design Services ¹ | | | | | \$ 424,900 |
| Additional Engineering Services ² | | | | | \$ 48,350 |
| Construction Engineering Services ³ | | | | | \$ 121,000 |
| Engineering RPR Services | | | | | \$ 307,560 |
| Professional Services NMGR (6.3125%) | | | | | \$ 47,883 |
| PROFESSIONAL SERVICES TOTAL | | | | | \$ 828,693 |
| TOTAL PROJECT COST | | | | | |
| Professional services | | | | | \$ 828,693 |
| Construction w/ Contingencies | | | | | \$ 10,332,669 |
| TOTAL PROJECT COST w/ NMGR | | | | | \$ 11,161,362 |

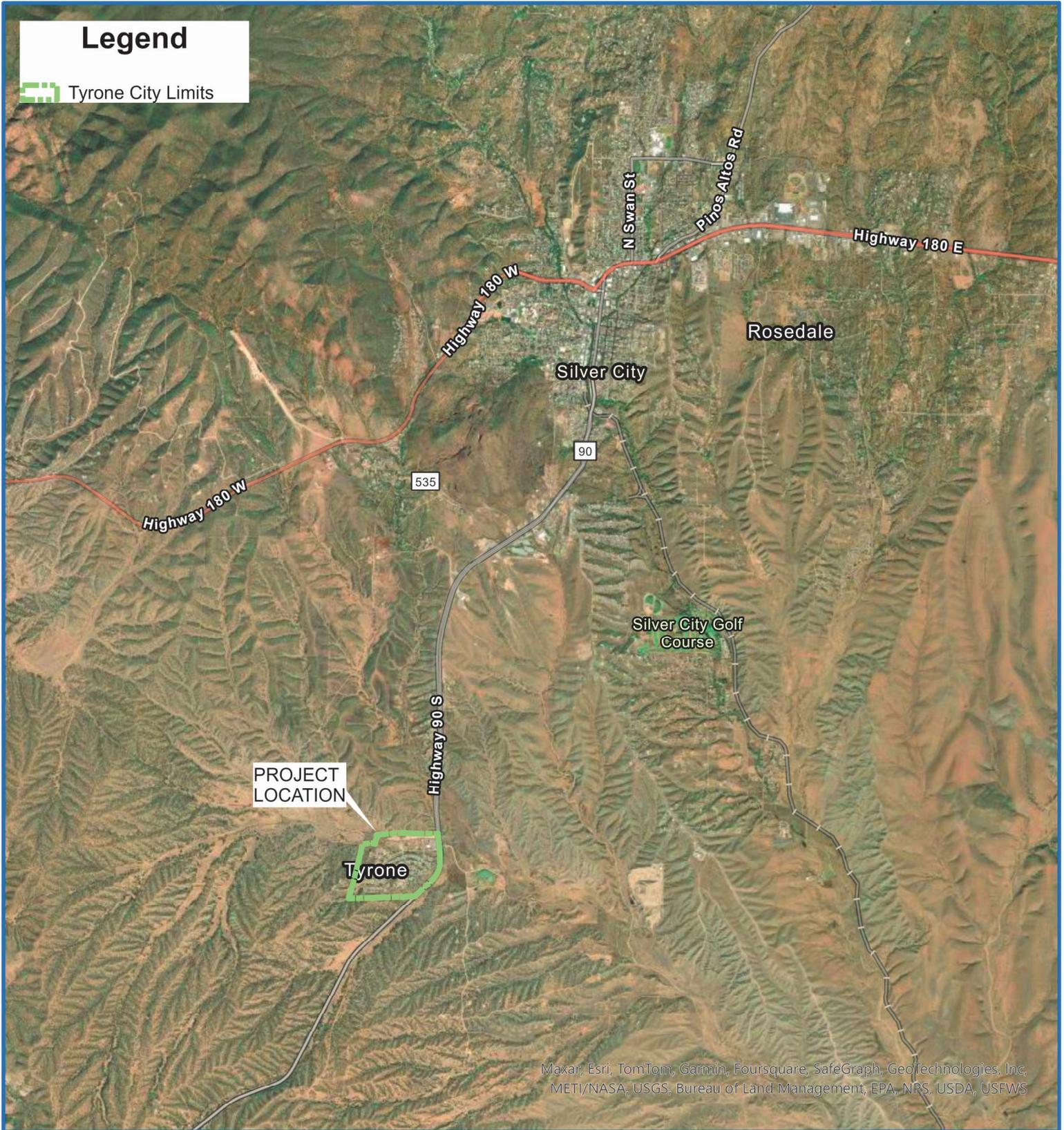
¹Includes project management, preliminary design, and final design

²Includes design survey and geotechnical investigation

³Includes bidding administration and construction administration

Legend

 Tyrone City Limits



Maxar, Esri, TomTom, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NRS, USDA, USFWS



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Feet

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Figure 1: Site Vicinity Map

Legend

-  City Limits
-  Sewer Manhole
-  Ex. Sewer Pipe



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**Figure 2: Existing Wastewater
Collection System**