

Date: **4/19/2023**

Project No.: **20842 (Wright-Pierce)**

To: **Terry Bovaird, City Manager**

From: **Chris Baggett, PE; Roberto Rosario, PE; Lawrence Neal, EI**

Subject: **Water and Wastewater Services for the Morales Recreational Vehicle Park**

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## 1 Introduction

Wright-Pierce developed an Infrastructure Revitalization Plan (Plan) for the City of Williston (City). Part of that Plan identified 20 proposed developments that are expected to connect to City services. The purpose of this technical memorandum (TM) is to summarize the preferred options to provide water and wastewater services to one of those proposed developments - the Morales Recreational Vehicle Park (Morales RV Park). The preferred wastewater option is also capable of serving four of the other proposed developments under consideration (proposed developments 9, 10, 11, and 12).

## 2 Selected Scenario for Providing Water Service to the Morales RV Park

The proposed Morales RV Park will be located just south of the intersection of NE 25<sup>th</sup> St and NE Hwy 27 along the southwest side of NE Hwy 27 (Parcel 0515200300) and is planned to include 683 RV spaces. Representatives of the Morales RV Park indicated that the Morales RV Park may quickly reach buildout conditions after initial construction. Hydraulic modeling was performed to simulate future year 2040 peak hourly demand (PHD) and maximum daily demand (MDD) plus fire flow (FF) (MDD+FF) to determine water system improvements needed to accommodate future water demands, which included the projected buildout demand associated with the Morales RV Park. The future year 2040 model scenarios were selected so that the other anticipated future demands are included in the analyses.

Based on the results of the hydraulic modeling analysis and discussions between the City, Wright-Pierce, and representatives of the Morales RV Park, the selected scenario as presented in Figure 2-1 includes the following:

- Construction of a new water treatment plant (WTP) located at the Morales RV Park, including:
  - One water supply well
  - One 250,000-gallon ground storage tank
  - One high service pump station
  - One sodium hypochlorite (NaOCl) treatment facility
- Construction of 10,800 linear feet (LF) of 12-inch WM, and installation of one pressure reducing valve (PRV) - Extending along NE Hwy 27, from the intersection of NE 13th St and NE 40th St to the future site of Morales RV Park, serving as an interconnect between the new WTP and the eastern portion of the City's existing water distribution system.

Figure 2-1 Selected Water Scenario to Serve Morales RV Park

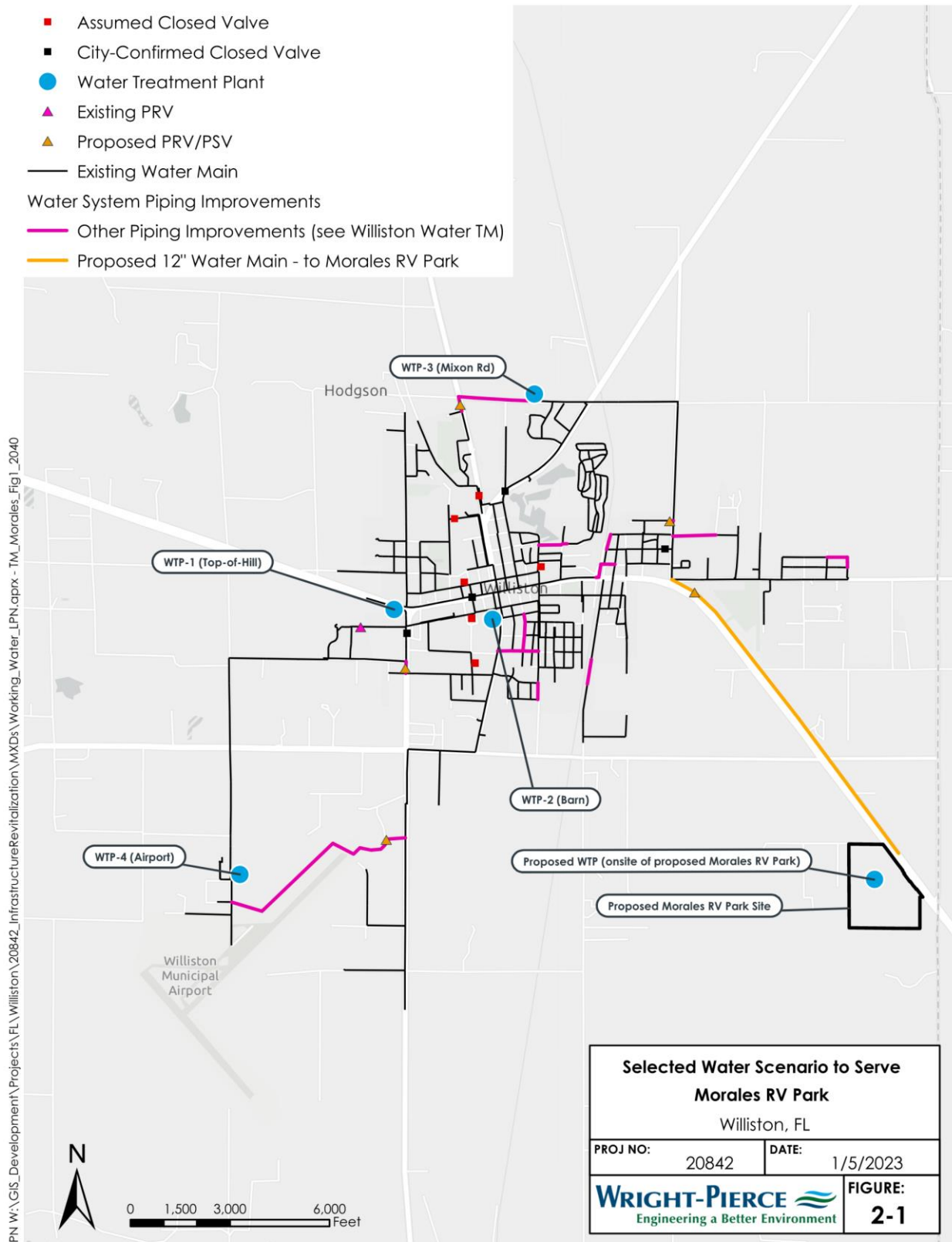


Table 2-1 presents the opinion of probable project cost (OPPC) for the selected scenario for providing water service to the Morales RV Park. Note the following:

- Costs are represented in January 2023 dollars. Original Costing efforts were performed as part of the *Williston Water TM*, in July 2022 dollars. Costs have since been escalated to present-day (January 2023) dollars using an escalation ratio based on Engineering News-Record (ENR) Construction Cost Index (CCI) values, as summarized below:
  - July 2022 ENR CCI: 13167.84
  - January 2023 ENR CCI: 13175.03
  - 2023 / 2022 ENR CCI Escalation Ratio: 1.000546027
- Unit costs are based on engineering experience and conceptual budget estimates for various vendors.
- A 30% factor is included to account for contingency.
- A 10% factor is included to account for study, engineering design, survey, and geotechnical services.

**Table 2-1 Selected Water Scenario OPPC**

Item No.	Description	Cost
1	Construction of 10,800 LF of 12-inch WM, and installation of one PRV - Extending along NE Hwy 27, from the intersection of NE 13th St and NE 40th St to the future site of Morales RV Park	\$ 2,484,000
2	Construction of new WTP at the future site of Morales RV Park	\$ 2,513,000
Total OPPC		\$ 4,997,000

### 3 Selected Scenario for Providing Sewer Service to the Morales RV Park and Proposed Developments 9 through 12

Four of the five proposed developments are located near the southeast portion of the wastewater service area, with the fifth proposed development, the Morales RV Park, located further southeast of the existing service area, along US 27. **Error! Reference source not found.** provides descriptions and location details for each of the five developments being considered for connecting to the City's WWCTS.

**Table 3-1 Proposed Developments Summary**

Development ID	Development Name	Description	Location
9	Hanson	20 Single Family Residences (SFRs)	Adjacent parcels 0505901000, 0505900000, 0510000200, and 0510000000 bounded to the west by SE 4 <sup>th</sup> St, to the north by existing homes along SE 6 <sup>th</sup> Ave, to the east by the railroad, and to the south by Robert Philpot Way
10	Langston	Apartment complex with anticipated 145 units	
11	Orlando	25-acre parcel, undefined	
12	Townes of Williston	55 SFRs	
15	Morales RV Park	213 RV Cottages and 470 RV Sites	Parcel 0515200300 along the southwest side of US 27 just south of NE 25 <sup>th</sup> St.

A preliminary hydraulic analysis was performed using hydraulic modeling software, which included establishing boundary conditions, assignment of pipe inside-diameters and Hazen-Williams C-factors, distribution of flows, and sizing improvements for each of the options.

Based on the results of the hydraulic modeling analysis and discussions between the City, Wright-Pierce, and representatives of the Morales RV Park, the selected scenario is Scenario 3. Figure 3-1 presents an overview of the selected scenario for providing sewer service to the proposed developments. For this scenario, sewer flows from all five developments are assumed to be served by two future City-maintained lift stations, one future lift station collecting wastewater from the Morales RV Park (identified herein as LS-A), and the other collecting wastewater from developments 9 through 12 (identified herein as LS-B). The scenario consists of three sections. For the first section, a new 6-inch diameter force main will convey flows from the proposed lift station located at the Morales RV Park (LS-A), northwestward along US 27, Robert Philpot Way, and SE 4<sup>th</sup> St, manifolded to the force main from the proposed lift station associated with Developments 9 through 12 (LS-B). For the second section, a new 8-inch diameter force main will convey the combined flows from the Morales RV Park and developments 9 through 12, northwestward along SE 4<sup>th</sup> St, NE 4<sup>th</sup> St, NE 1<sup>st</sup> Ave, NE 1<sup>st</sup> St, NE 2<sup>nd</sup> Ave, and NW 2<sup>nd</sup> Ave, to the receiving manhole of LS-1. For the third section, the combined flows from the Morales RV Park and Developments 9 through 12 are pumped by LS-1 through an existing 10-inch diameter force main to the WWTF. Details related to this scenario are summarized below:

- **Section 1:** Morales RV Park to Developments 9 through 12
  - Construct duplex lift station at Morales RV Park (LS-A)
    - Preliminary pump condition: 250 gallons per minute (GPM) at 146 FT of total dynamic head (TDH) (per pump)
    - 6-foot diameter wet well
    - 25 LF of 10-inch diameter influent gravity main and receiving manhole.
  - Construct 13,170 LF of 6-inch diameter force main via open-cut along US 27, Robert Philpot Way, and SE 4<sup>th</sup> St.
  - Trenchless jack & bore construction:
    - Construct 110 LF of 6-inch diameter force main inside steel casing under railroad.
- **Section 2:** Developments 9 through 12 to LS-1
  - Construct 1,500 LF of local 8-inch gravity trunk main and four manholes.
  - Construct duplex Lift Station near Development 12 (LS-B)
    - Preliminary pump condition: 300 GPM at 80 FT TDH (per pump)
    - 6-foot diameter wet well
    - 25 LF of 10-inch diameter influent gravity main and receiving manhole.
  - Construct 7,650 LF of 8-inch diameter force main via open-cut along SE 4<sup>th</sup> St, NE 4<sup>th</sup> St, NE 1<sup>st</sup> Ave, NE 1<sup>st</sup> St, NE 2<sup>nd</sup> Ave, and NW 2<sup>nd</sup> Ave.
  - Trenchless jack & bore construction:
    - Construct 460 LF of 8-inch diameter force main inside steel casing under E Noble Ave
    - Construct 260 LF of 8-inch diameter force main inside steel casing under N Main St
- **Section 3:** LS-1 to WWTF
  - Upgrade LS-1 to increase pumping capacity by 550 GPM, to convey combined flows from all five developments.
  - Note: The existing 10-inch diameter discharge force main is assumed to be adequately sized.



Table 3-2 presents the OPPC associated with the selected scenario, based on the following assumptions:

- Costs are represented in January 2023 dollars.
- Unit costs are based on engineering experience and conceptual budget estimates for various vendors.
- A 30% factor is included to account for contingency.
- A 10% factor is included to account for study, engineering design, survey, and geotechnical services.

**Table 3-2 Selected Sewer Scenario OPPC**

Item No.	Item Description	Cost
1	Proposed Collection and Transmission System	\$ 6,975,000
2	Upgrade Existing Collection and Transmission System	\$ 630,000
Option 3 OPPC		\$ 7,605,000