DRINKING WATER FACILITIES PLAN

City of Newberry

Woodard & Curran

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COMMITMENT & INTEGRITY DRIVE RESULTS

0234225.01
City of Newberry, FL
March 2023

CERTIFICATION BY ENGINEER

The information contained in this report is true and correct to the best of my knowledge, the report was prepared in accordance with generally accepted engineering principles, and I and my designees have discussed the recommendations, costs, and funding approach with the City of Newberry (City) or the City's delegated representative(s). This Drinking Water Facilities Plan was prepared to meet the requirements of the Florida Drinking Water State Revolving Fund (DWSRF) Program under Chapter 62-552, F.A.C. and this certification pertains only to the planning analysis presented in this report. Certification for design and construction of the proposed facilities will be completed under a separate DWSRF project.

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Date

_____
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List of Acronyms:

AAD Average annual day
AADD Average annual day demand
° C Degrees Celsius
° F Degrees Fahrenheit
3MRAD Three Month Rolling Average Daily F Flow
AADF Average Annual Daily Flow
ac-ft Acre feet
ADF Average daily flow
BMAP Basin Management Action Plan
CDBG Community Development Block Grant
CFR Code of Federal Regulations
CIP Capital Improvement Program
CM Construction Management
CT Contact Time
CWA Critical Wildlife Area
CWA Clean Water Act
D Day
DEP Department of Environmental Protection
DU Dwelling Unit
DW Drinking Water
DWS Drinking Water Standards
EDU Equivalent Dwelling Unit
EPA Environmental Protection Agency
ERC Equivalent residential connection
EST Estimated
F Fahrenheit
F.S. Florida Statute
FAC/ Florida Administrative Code
FDEP Florida Department of Environmental Protection
FDOT Florida Department of Transportation
FL Florida
FP Facilities Plan
Ft Feet
FWC Florida Fish and Wildlife Conservation Commission
FY Fiscal Year
GAO Government Accountability Office
GPCD Gallons per Capita per Day
GPD Gallons per Day
GPM Gallons per minute
GST Ground Storage Tank
GW Groundwater
HP Horsepower
HUD Department of Housing and Urban Development
ID Identification

IPR Indirect Potable Reuse
K Potassium
kW Kilo watt
kWh Kilo Watt hours
lb. Pound
LCCA Life Cycle Cost Analysis
LF Linear feet
MADD Monthly Average Daily Demand
(ADD) Average Day Demand
(MDD) Max Day Demand
(PHD) Peak Hour Demand
(FFD) Fire Flow Demand
MCC Motor Control Center
MCLs Maximum Contaminant Levels
MDD Maximum Daily Demand
MEPS Mechanical, Electrical, Plumbing, and Structrural
MG Million Gallons
mg/L Milligrams per Liter
MGD Million Gallons per Day
MHI Median Household Income
MORs Monthly Operation Reports
MPN Most Probable Number
N Nitrogen
NAVD88 North American Vertical Datum of 1988
NPDES National Pollutant Discharge Elimination System
NPV Net Present Value
O&M Operations and Maintenance
OFW Outstanding Florida Water
OMB Office of Management and Budget
OPC Opinion of Probable Cost
OSTDS Onsite Sewage Treatment & Disposal System
OSWTS Onsite Wastewater Treatment System
P Phosphorous
PBTS Performance Based Treatment Systems
PER Preliminary Engineering Report
pH Hydrogen Ion Concentration
PHF Peak Hour Flow
PDF Peak Day Flow
Plan Alternative Analysis Plan
POC Point of Connection
PVC Polyvinylchloride (pipe)
RAO Rural Area of Opportunity
RD Rural Development
Report Preliminary Engineering Report
RO Reverse Osmosis
RUS Rural Utilities Service
SCADA Supervisory Control and Data Acquisition
SPPW Single Payment Present Worth
SRF State Revolving Fund
SW Surface Water
SWIM Surface Water Improvement Management
TPC Total Permitted Capacity
UFA Upper Floridian Aquifer
USDA United States Department of Agriculture
USDW Underground Source of Drinking Water
USPW Uniform Series Present Worth
UV Ultraviolet Light
WEP Water and Environmental Programs
WK Weeks
WMD Water Management District
WTF Water Treatment Facility
WUP Water Use Permit
Y, Yrs. Years

SUMMARY OF FINDINGS AND RECOMMENDATIONS

This Facilities Plan was prepared for the City of Newberry in a collarborative effort by City Staff and Woodard & Curran, Inc. (Woodard & Curran) to meet the needs of the City and the requirements of the Florida Drinking Water State Revolving Fund (SRF) program. The City developed this Drinking Water Facilities Plan to evaluate utility needs related to drinking water storage to include improved resiliency, health and safety, reliability, O&M efficiencies and a 20 year Census growth. The Facilities Plan is a planning-level document that defines project needs and costs to allow the City to secure grant and low-interest funds for the design and construction of the recommended alternative.

The Facilities Plan is intended to represent the City's needs for a 20-year planning period beginning in the year 2023, through year 2043. The planning area includes the City of Newberry's utility service area and contiguous lands located in Lake County as shown in Figure 1-1. The recommendations resulting from this study are consistent with both the City's and the County's Local Comprehensive Plans.

The drinking water production, treatment, and distribution systems are described in the most recent *FDEP Sanitary Report* (Appendix A). The population projection for the 2023-2043 planning period were evaluated in five-year increments based on population projections from the University of Florida Shimberg Center for Affordable Housing, Bureau of Economic and Business Research (BEBR), and the U.S. Census ACS. Since population projection BEBR data is only available at the county level, the projected population was based on future developments. More specifically, when completing the population projection, the City analyzed all developments with approved and pending Developer Agreements, as well as those with Developer Agreements in progress. The Newberry drinking water utility service area was evaluated to see how the projected growth would impact drinking water demand and how the City should proceed with drinking water storage through year 2043.

Due to the projected growth that the City will undergo over the next 20 years, drinking water system demands are anticipated to require an increase in drinking water storage capacity within the planning period. Based on a life cycle analysis (LCCA), it is most economical and advantageous for the City to provide additional drinking water storage within the water distribution system by way of constructing a 500,000-gallon elevated water tank at a strategic location that will improve water flow, pressure, and quality to their customer base.

It is recommended that a new elevated storage tank of 500,000-gallons be added to the system to provide adequate storage for future population growth and operational redundancy to keep the system operating in automated pump control mode if a tank needs to be taken out of commission for service or repair. The selected alternative improvement project to meet the identified needs and its associated opinion of probable costs (OPC) are shown in Table ES-1-1.

The total cost of the recommended projects is estimated to be $5.75 million in 2023 dollars. Details of the project costs are included in Appendix B.

Table ES-1-1: Selected Plan Proposed Costs

Selected Alternative Opinion of Capital Cost	
Construction Base Cost	$4,448,500
Contingency (10%)	$448,900
Engineering, Permitting, and Design (10%)	$448,900
Engineering Services During Construction (5%)	$224,500
Legal and Administration (3%)	$134,700
Total Opinion of Capital Cost	**$5,745,500**

The FDEP SRF program is expected to be the financing source for the project. A Drinking Water SRF Business Plan (Business Plan) has been prepared to explain the financial impact on the users of the drinking water system. The Business Plan is shown in Appendix E and demonstrates that water and sewer operating expenses; existing debt service obligations; and proposed project debt service associated with capital projects identified in this facility plan can be funded through current utility rates. This includes existing approved annual rate increases, and existing water and sewer impact fees.

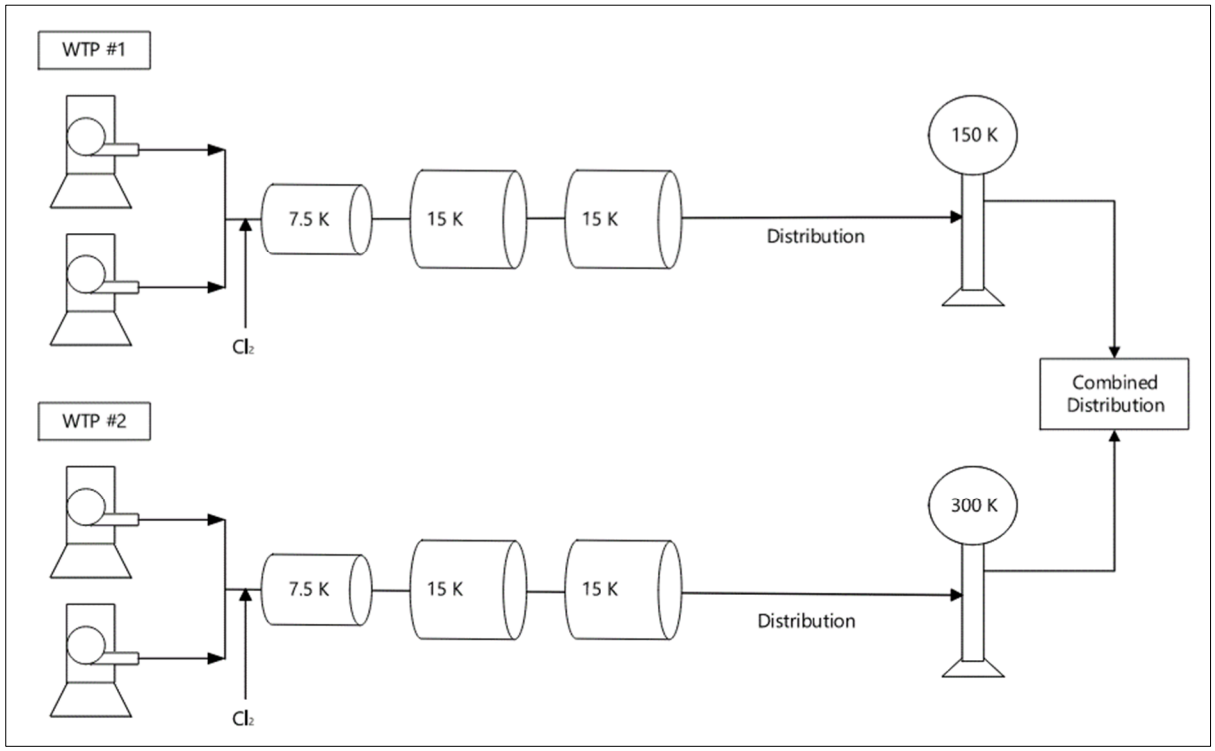
1. INTRODUCTION

This document is provided to meet the planning requirements for the Drinking Water State Revolving Fund (DWSRF) program for the purpose of obtaining funding for new water storage facility within the City of Newberry, Florida (City). This report addresses mechanical, electrical plumbing and structural (MEPS) improvements associated with the development of a new water storage facility. This report presents estimated costs for three alternatives as required by FDEP DWSRF and projects them over the 20-year planning period. This plan was developed to be consistent with the City's adopted 2012 Comprehensive Plan.

1.1 Background

The City of Newberry is located in Alachua County, Florida. The City uses groundwater pumped from the Upper Floridan Aquifer (UFA) and treats the water with sodium hypochlorite for disinfection before distribution to its customers. The potable water treatment and distribution systems consist of two water treatment plants including 6 disinfection contact time tanks, one distribution pressure zone, and two elevated storage tanks. The City's distribution system is classified as a community public water system: Newberry WTP (PWS ID 2010207). See Figure 1-1 for water system details as described in the FDEP Newberry Sanitary Report.

Figure 1-1: Existing Water System Process Flow Diagram



1.2 Need For Project

1.2.1 Finished Water Storage

F.A.C. 62-555.320 (19)(a) requires the total useful finished-water storage capacity connected to a water system to be (at minimum) 25 percent of the water system's maximum-day water demand in addition to any design fire-flow demand. Based on the City's 2022 Monthly Operation Report (MOR) data, the current annual average day demand (AADD) has been approximately 0.7 MGD and the maximum day demand (MDD) has been approximately 1.7 MGD. With the current population, we calculated that the average daily usage is approximately 84 gallons per capita per day. At a projected Census growth rate of 4%, the 2043 projected average day demand is estimated to be 1.5 MGD using the 84 gallons per capita per day (GPCD) average water usage from previous MOR data. The maximum daily demand was projected using 160 gpcd based on MDD data from previous MORs. The projected MDD for 2043 is approximately 2.9 MGD.

The fireflow demand is based on providing a flow rate of 2,000 gallons per minute for two hours. In order to maintain storage for 25% of the maximum day demand plus fireflow, the City must have a total storage volume of approximately 975,000 gallons as shown in the equation below:

$$Minimum\ Storage\ Capacity = 25\%\ of\ Max\ Day\ Demand + Fire\ Flow\ Demand$$

$$Minimum\ Storage\ Capacity = 2{,}941{,}000\ Gal\ x\ 25\% + \left(2{,}000\ GPM \times \frac{60\ min}{hr}\right) x\ 2\ hrs$$

$$Minimum\ Storage\ Capacity = 975{,}000\ gallons$$

The future minimum storage capacity exceeds the current system capacity of 500,000-gallons, (350,000 + 150,000) therefore additional storage capacity is required.

In addition to the expected growth, the City also has also identified a need for additional water storage to aid in the City's water distribution operation. The City operates two elevated water storage tanks (EST) with a capacity of 150,000 gallons and 300,000 gallons. The City's 300,000-gallon EST currently controls all logic for water pumped based on water elevation in that tank. This logic is interrupted during tank maintenance, requiring staff to operate the system in hand mode 24/7, which is not a desirable condition. The existing secondary tank of 150,000-gallons is not adequate to provide reliable automated pump control.

1.3 Scope of Study

The scope of this Facilities Plan consists of:

- Inventory existing water facilities, available service area characteristics, and environmental conditions;
- Establish design criteria for the planning period of 20 years;

- Identify and evaluate three (3) water storage alternatives to satisfy the 20-year planning year needs;
- Recommended ranking of alternatives;
- Detailed description of the recommended facilities and associated estimated cost;
- Implementation schedule of the recommended facilities;
- Identify potential adverse environmental impacts and propose mitigating measures
- Review of infrastructure potable water demand and storage system capability to meet demand

1.4 Facilities Planning Overview

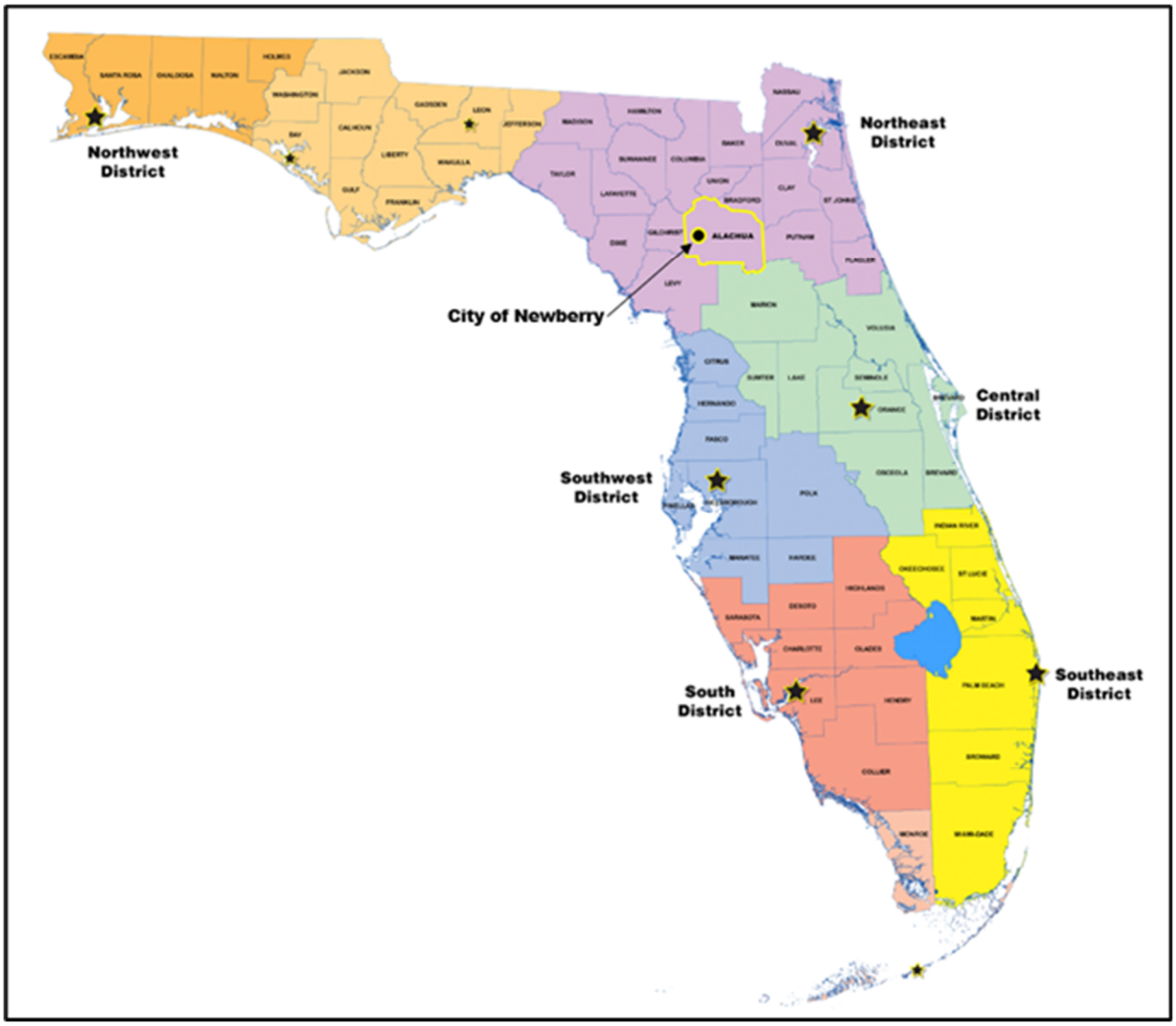
This facilities plan outlines the water system facilities needed for a 20-year planning period. Strategies were developed within the plan to meet estimated system needs, and the planning basis for subsequent design and construction is provided. Additionally, the existing and projected demographic characteristics, topographic, and institutional features of the planning area and their impact on the water system needs are also examined.

The 20-year planning period for the purpose of this work begins in the year 2023 and extends through the year 2043. Three alternatives were identified and evaluated with a recommendation for the most feasible alternative for meeting the City's needs.

1.5 Reference Standards and Guidelines

This Report has been organized such that it is compatible with the Facilities Planning guidance document published by the Florida Department of Environmental Protection (FDEP) in 2000 and modified in 2017. Technical requirements in the Florida Administrative Code (FAC) were referenced for the alternatives analysis and recommendations.

Figure 1-2: Planning Area



2. EXISTING AND FUTURE CONDITIONS

Section 2 describes the existing physical, organizational, environmental, and demographic conditions within the planning area. This information is used to establish the existing conditions, project future development, and assess needs within the planning area related to the future water management requirements. This section describes the existing condition and limitations of the drinking water system. The current water demand is outlined and used in conjunction with demographic projections to estimate the future water demand of the system during the planning period.

2.1 Description of Planning Area

2.1.1 Planning/Service/Project Area

The planning area is located within the City Limits of Newberry, Florida consisting of approximately is bordered by Newberry Road to the North, Southwest 202nd Street to the East, Earnhardt Road to the South, and Southwest 218th Street to the West. Surface features within the planning area include flat lands and sparse trees with a warm climate for most of the year.

2.1.2 Climate

Located in central Florida, the City of Newberry sits within the boundaries of Lake County, Florida. Newberry's climate is characterized as hot and humid for approximately six months out of the year with an average daily high temperature of 91.8 degrees Fahrenheit. Newberry's cold season is relatively short and dry and usually lasts from December to March. The average daily low temperature is 46.4 degrees Fahrenheit during winter. Cooler than most places in Florida, the City has approximately six (6) days when the temperature falls below freezing through the night hours. Rainfall averages approximately 50.5 inches with precipitation approximately 111 days out of the year, which is higher than the United States average of 106.2 days of precipitation a year.

2.1.3 Environmental Sensitive Areas or Features

The environmental assessment is ongoing. To date there have been no findings effecting the proposed project.

2.2 Socio-Economic Conditions

2.2.1 Population and Anticipated Growth

The City of Newberry has population estimates from two sources, the University of Florida's Bureau of Economic Business Research (BEBR) and the U.S. Census Bureau. While BEBR only has estimates from the last 10 years, two decades of data was reviewed of the Census data. Both estimates show that the city has experienced steady growth over the past 10 to 20 years, with an

average growth of between 2.28 percent and 3.39 percent. Table 2-1 presents the population estimate and percent growth based on the BEBR population data.

Table 2-1: BEBR Population Data for Newberry, FL

Year	Population Estimate	% Growth
2010	4,950	-
2011	4,945	-0.10%
2012	4,957	0.24%
2013	5,148	3.85%
2014	5,264	2.25%
2015	5,360	1.82%
2016	5,946	10.93%
2017	5,907	-0.66%
2018	6,249	5.79%
2019	6,573	5.18%
2020	6,873	4.56%
Average Population Growth		**3.39%**

2.2.1.1.1 Planned Developments

The planned developments are either currently in construction, have an approved developer's agreement, or have a pending developer's agreement. The number of units for each development were either provided by City staff or obtained from developer agreements. Table 2-2 below presents the approved housing developments and the anticipated number of units each development will add to the City.

Table 2-2: City of Newberry Approved Subdivision Developments

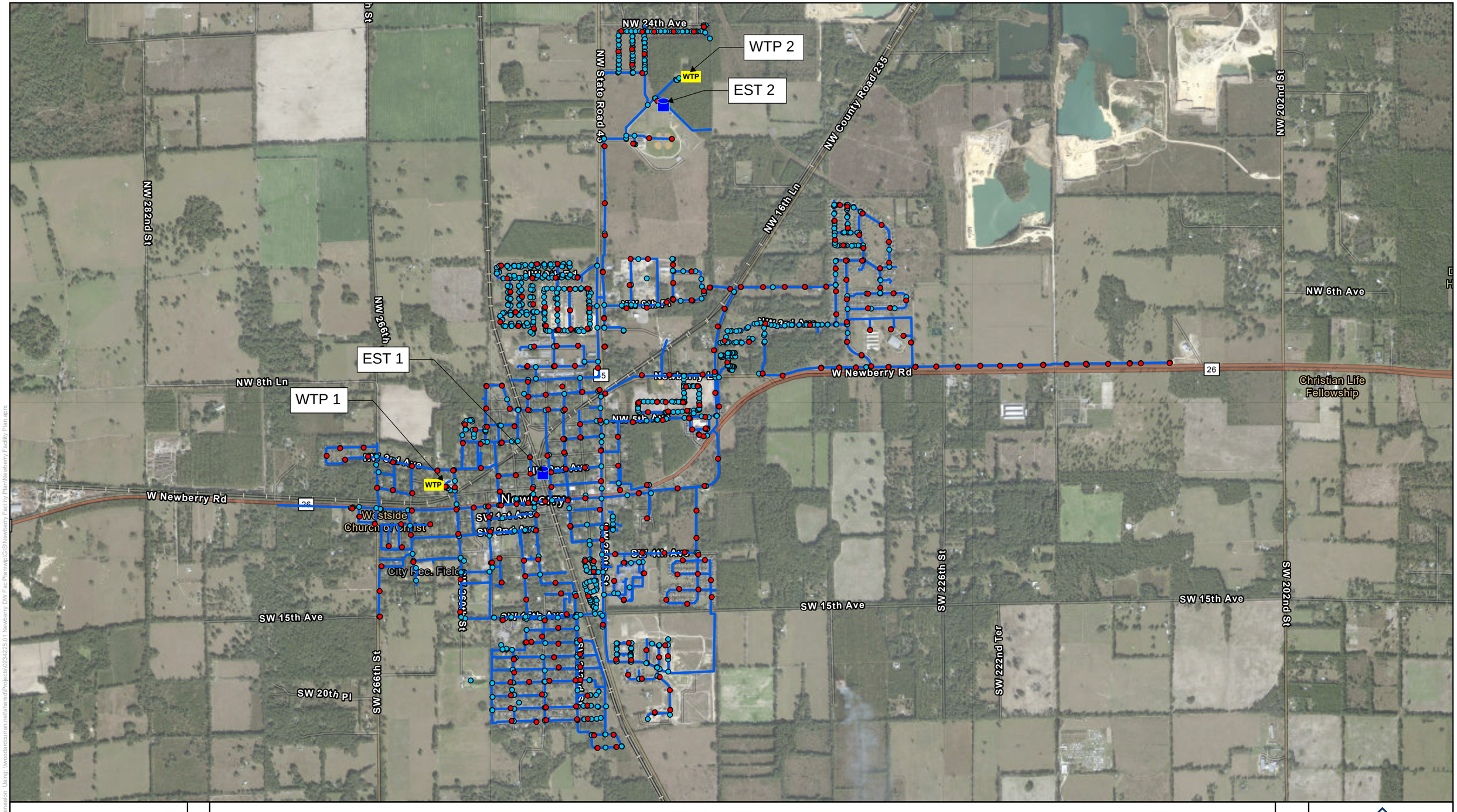
MAJOR SUBDIVISION DEVELOPMENT	TOTAL LOTS APPROVED BY DEVELOPMENT ORDER	TOTAL CERTIFICATES OF OCCUPANCY THROUGH 6/29/2021	REMAINING CERTIFICATES TO BE ISSUED
COUNTRY WAY AT NTC - PH-1	50	49	**1**
COUNTRY WAY AT NTC - PH- 2	36	28	**8**
COUNTRY WAY AT NTC - PH- 3	51	44	**7**
COUNTRY WAY AT NTC- PH-4	64	0	**64**
COUNTRY WAY AT NTC- PH-5A/B	73	0	**73**
COUNTRY WAY AT NTC- PH-6+	91	0	**91**
OAK PARK - PH-1	70	48	**22**
OAK PARK - PH-2	43	0	**43**
AVALON WOODS - PH-1	440	0	**440**
COUNTRY WAY SOUTH PH-1	93	0	**93**
COUNTRY WAY SOUTH PH-2		0	
*SANDIA 600	600	0	**600**
*NEWBERRY ARC 900	900	0	**900**
*TREEHOUSE VILLAGE 800	800	0	**800**

2.3 Description of Existing Water System

This Facilities Plan includes a detailed description of the potable water system. The Newberry potable water system includes two water treatment plants, referred to as the WTP #1 and WTP #2. Both plants supply potable water to the City's combined water distribution system. The drinking water infrastructure is classified as Category V, Class C plants by FAC 62-699. The Florida Department of Environmental Protection (FDEP) has established the combined permitted capacity of treatment plants as 2.16 MGD on an average annual daily basis. Four wells drilled into the Upper Floridian Aquifer (UFA) supply raw water to the WTPs; Each WTP is served by two wells. Both WTPs disinfect the water and serve the distribution system with a single pressure zone. The distribution system also consists of a 150,000-gallon elevated storage tank (EST) fed by WTP #1 and a 300,000-gallon EST fed by WTP #2. Figure 2-1 shows an overview map of the existing water distribution system. The public water system has no interconnections or agreements with adjacent systems. The service area generally covers the downtown and adjacent residential subdivisions. The system serves the incorporated area of the city and portions of the unincorporated county (outside of city limits).

2.3.1 Production Wells & Consumptive Use Permit

All four UFA wells are combined in one consumptive use permit (CUP) issued by the Suwannee River Water Management District (SRWMD). The current CUP allows an annual average daily withdrawal of 0.8381 MGD from the UFA. Refer to Appendix C for the most recent CUP document. The City requested an increase in the permitted withdrawal capacity in December 2022 due to projected growth over the next decade.



Newberry Drinking Water Facility Plan

Existing Distribution System

Legend

- Hydrant
- Valve
- Existing Water Main
- WTP — Water Treatment Plant
- Storage Tank

0 0.13 0.25 0.5 Miles

N

Woodard & Curran

Project #: 0234225.01
Map Created: January 2023

2.3.2 Water Treatment Plant No. 1

WTP #1 is located at the intersection of NW 260th Street and NW 1st Avenue in Newberry, FL. This WTP consists of two raw water wells (Well No. 1 and 3), a chlorination system, three chlorine detention tanks, and an offsite elevated storage tank. Well No. 1 was drilled in 1956 and has a pumping capacity of 450 gallons per minute (GPM). Well No. 3 was drilled in 1990 with a pumping capacity of 500 GPM. The sodium hypochlorite chlorination system is activated when the pump starts and and is paced to the total well flow rate. Each well has a chlorine injection point between the isolation valve and the propeller flow meter. The three detention tanks include one 7,500-gallon and two 15,000-gallon tanks. The three detention tanks are piped in series to provide the required contact time for disinfection. Finished water storage is provided by a 150,000-gallon elevated storage tank located at the intersection of NW 2nd Avenue and NW 253rd Street.

2.3.3 Water Treatment Plant No. 2

WTP #2 is located at 24820 NW 16th Avenue in Newberry, FL. This WTP consists of two raw water wells (Well No. 4 and 5), a chlorination system, three chlorine detention tanks, and an offsite elevated storage tank. Well No. 4 was drilled in 2004 with a pumping capacity of 500 GPM. Well No. 5 was drilled in 2016 and has a pumping capacity of 1,000 GPM. The sodium hypochlorite chlorination system is activated when the pump starts and is paced to the total well flow rate. The chlorine injection point for the two wells is located in a concrete vault between the flow meter and the chlorine detention tanks. The three detention tanks include one 7,500-gallon and two 15,000-gallon tanks. The three detention tanks are piped in series to provide the required contact time for disinfection. Finished water storage is provided by a 300,000-gallon elevated storage tank located at the Easton Newberry Sports Complex along US 27/41.

2.3.4 SCADA

The City of Newberry currently has a proprietary SCADA system integrated with the Xylem MultiSmart Pump Station Manager. Both WTPs are controlled automatically via the master control panel off local instrumentation. The SCADA system currently collects level signals as well as high and low water alarms from the two existing storage tanks. The level indication is sent to the master control panel to start and stop the pumps.

The logic for water distribution is based on the water elevation of the 300,000-gallon elevated storage tank. When this storage tank is taken offline for maintenance, staff is required to operate the system in hand mode 24/7 since the 150,000-gallon storage tank is not able to provide reliable automated pump control due to insufficient volume.

2.3.5 Water Distribution Piping

Newberry's water distribution system consists of approximately 54 miles of water mains, ranging from 0.75-inch to 12-inch in diameter. Most of the water mains are 6 to 8-inch in diameter and

PVC, with some ductile and HDPE pipe. The system has no emergency interconnections with local water systems. See Table 2-3 for a summary of the distribution system pipes by diameter.

Table 2-3: Distribution System Pipe Diameter

Diameter (in)	Length of Pipe (ft)	Length of Pipe (mi)	Percent of System
< 2	8,045	2	2.85%
2	21,141	4	7.48%
2.5	1,133	0	0.40%
3	1,955	0	0.69%
4	6,727	1	2.38%
6	88,046	17	31.14%
8	99,724	19	35.27%
10	2,424	0	0.86%
12	53,535	10	18.94%
Total	**282,730**	**54**	**100.00%**

While the available records show that the distribution mains do not contain lead or copper piping, the material for goosenecks and service lines have not been confirmed by Woodard & Curran. The Lead and Copper Rule Revisions (LCRR) require all water systems to develop a publicly available inventory of all lead service lines (LSL) or to demonstrate their absence and to develop a plan to replace all LSLs in their system by October 16, 2024. Per the Revisions, lines of unknown material are presumed to be lead until identified otherwise. The plan must include procedures for full LSL replacement, procedures to notify consumers prior to a full or partial LSL replacement, and a funding strategy that provides financial assistances to customers who wish to replace their LSL portion but are unable to pay for it.

2.3.6 Performance of Existing Water System

The existing WTPs have both adequately and consistently treated the UFA source water. The City of Newberry has a current water use permit for 0.8381 MGD on an annual average basis. The City requested an increase in allocation to an annual average of 1.2 MGD from the Suwannee River Water Management District in December 2022. This permit modification is an ongoing effort that is outside the scope of this facility plan.

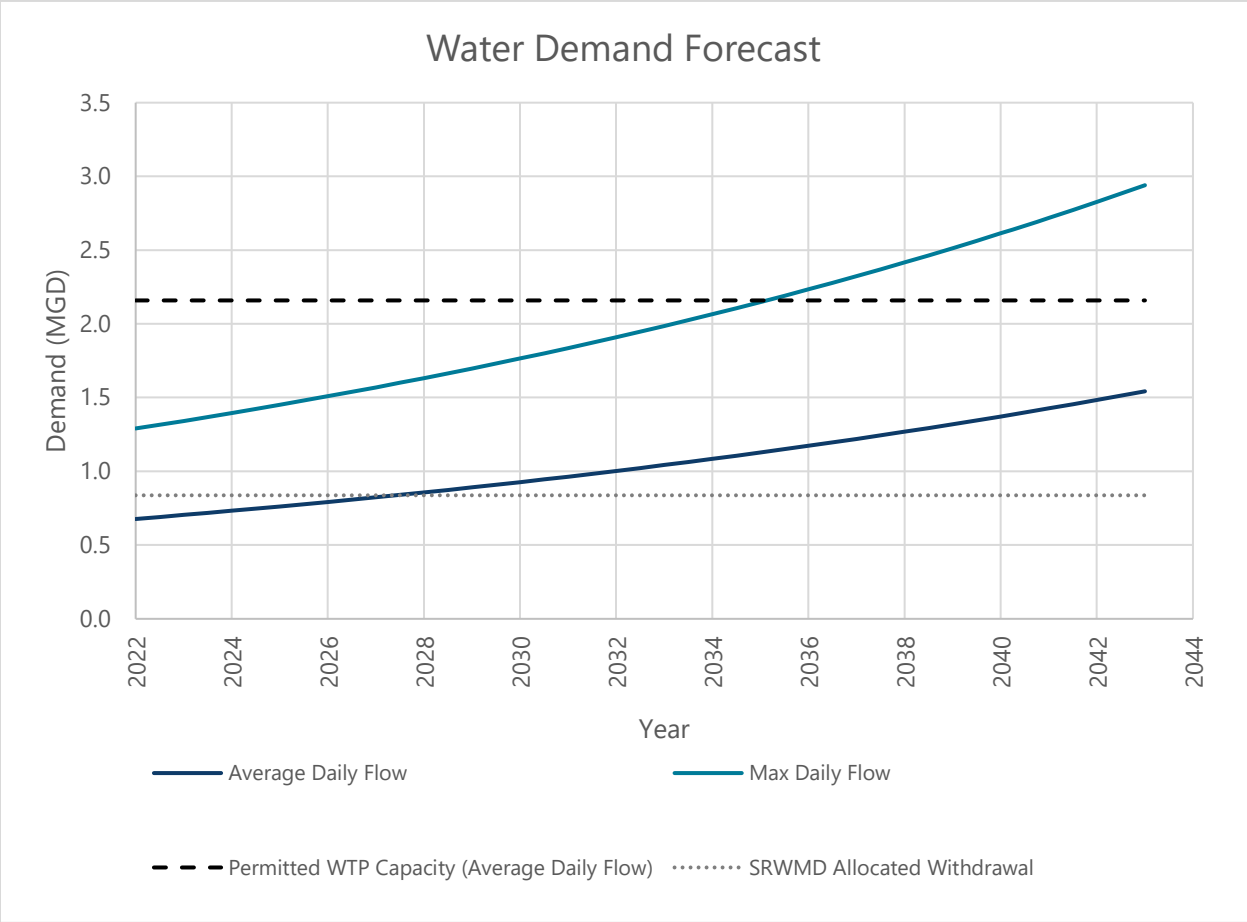
Drinking water storage capacity for the projected demand increase over the next twenty years as discussed in more detail in Section 2.3.4. The City will exceed the required water storage for the projected population increase over the planning horizon, therefore an additional water storage tank is necessary to support future growth.

The City's distribution system is dependent on the operation of at least one WTP to provide water service to customers on both an average demand and maximum demand day. The City is able to operate with only one storage tank in service, however this leads to undesirable operational conditions. As mentioned previously, staff is required to operate the waster system manually when the 300,000-gallon water tank is offline for maintenance. To eliminate the need for manual operations, the City proposes to add an additional storage tank to maintain adequate system pressure and to support reliable automatic operations under all conditions.

2.3.7 Demand Analysis

The 2043 water demand projection is based on a review of the City's population growth and planned developments. Using demand and population data from 2019 through 2022, it was established that the City has an average gross gallons per capita per day (GPCD) of 84. A growth rate of 4% was used to estimate the Newberry population through 2043. Figure 2-2 shows the projected water demands through the planning period against the total permitted capacity of the existing WTPs.

Figure 2-2: Water Demand Forecast



Historical data from January 2022 through October 2022 was analyzed to determine existing water demands and peaking factors. Table 2-4 shows the monthly average daily demand (MADD) and maximum day demand (MDD) for the period stated above. Based on this data, the annual average demand (AADD) is 0.67 MGD and the MDD is 1.675 MGD. The ratio of MDD to AADD is 2.50.

Table 2-4: Historical Demand Data

Month	MADD (MGD)	MDD (MGD)	MDD/MADD
January 2022	0.607	1.506	2.48
February 2022	0.578	0.931	1.61
March 2022	0.606	1.330	2.20
April 2022	0.721	1.367	1.90
May 2022	0.827	1.477	1.79
June 2022	0.792	1.675	2.11
July 2022	0.681	0.981	1.44
August 2022	0.677	1.327	1.96
September 2022	0.499	1.135	2.27
October 2022	0.708	1.281	1.81
Annual Average Daily Demand	**0.670**		
Maximum Day Demand		**1.675**	
MDD/AADD			**2.50**

2.3.8 Capacity Analysis

A capacity evaluation of the existing facilities was completed to determine the magnitude of upgrades needed to handle existing and future demands. Capacity was evaluated based on FAC.

FAC 62-555.320(6) dictates that the capacity of drinking water facilities shall be at least equal to the design maximum day demand including the design fire flow demand for the system. Additionally, the treatment and distribution facilities must be capable of handling peak hour demands of the system through high service pumping and/or through finished water storage capacity. The fire flow demand is 2,000 GPM. The National Fire Protection Association requires a minimum 2-hour flow period, which was used in this evaluation and results in a fire flow volume of 240,000 gallons. Newberry's water system was evaluated for future demands in 2043 using a population growth rate of 4% annual growth. Using a water demand of 84 gallons per person per day, this results in a projected demand of 1.54 MGD. The following sections itemize the components of the water treatment and distribution system to determine future capacity needs of the overall system. The existing and future design demands for the system are summarized in Table 2-5.

Table 2-5: System Demands

Demand Condition	Existing	2043 (4% Growth)
Average Day Demand (ADD)	670,000 GPD	1,544,000 GPD
Max Day Demand (MDD)	1,300,000 GPD	2,941,000 GPD
Peak Hour Demand (PHD)	1,900 GPM	4,300 GPM
Fire Flow Demand (FFD)	2,000 GPM	
Max Day + Fire Flow	1,540,000 GPD	3,181,000 GPD

2.3.8.1 Finished Storage Capacity

The existing elevated water storage tanks at WTP 1 and 2 have a combined storage capacity of 500,000 gallons (150,000-gallon tank at WTP 1 and a 350,000-gallon tank at WTP 2). The water towers are configured with a single pipe connection and therefore are considered passive storage. FAC Chapter 62-555.320(19)(a) states:

> *(a) Except as noted in paragraph (b), below, the total useful finished-water storage capacity (excluding any storage capacity for fire protection) connected to a water system shall at least equal 25 percent of the system's maximum-day water demand, excluding any design fire-flow demand.*

As shown in the calculation below, 25 percent of the water system's maximum-day water demand, plus the fire flow demands requires a minimum tank capacity of 975,000 gallons after subtracting the capacity from the two existing storage tanks:

$$Minimum\ Capacity = 25\%\ of\ Max\ Day\ Demand + Fire\ Flow\ - Existing\ Storage\ Tank\ Vol.$$

$$Minimum\ Capacity = 2{,}941{,}000\ Gal\ x\ 25\% + \left(2{,}000\ GPM \times \frac{60\ min}{hr}\right) x\ 2\ hrs - 500{,}000\ Gal$$

$$Minimum\ GST\ Capacity = 475{,}000\ gallons$$

A water tank volume of 500,000 gallons is recommended to ensure adequate system performance. Detailed design (e.g., foundation, material, diameter, height, etc.) of the tank should be conducted during the preparation of the design report for the construction permit of the new facilities. Detailed design will also involve identifying growth/demand thresholds for improvements with the Client in order to minimize long term stranded capacity ahead of growth.

2.3.8.2 Treatment Facility Capacity

As previously mentioned, the capacity of the system's treatment, pumping and storage facilities must be capable of meeting max day demands plus fire flow. The total permitted capacity of Newberry's existing treatment facilities (WTP #1 and WTP #2) is 2,160,000 GPD (1,500 GPM).

The projected average day drinking water flow in 2043 is 1.5 MGD. The existing WTP should meet projected demand. Table 2-6 summarizes the existing system capacity compared to existing and projected daily demands.

Table 2-6: Capacity Comparison

Demand Condition	2021 - Existing	2043 - 4% Projected Growth
ADD (MGD)	0.67	1.54
MDD (MGD)	1.30	2.94
Treatment Facility Capacity – Average Daily Flow (MGD)	2.16	2.16

2.4 Managerial Capacity

The City's Water Division manages operations and maintenance (O&M) of the water system and maintains responsibility for construction projects. Newberry WTP #1 and WTP #2 are both designated as Plant Category V, Class C per 62-699(4), FAC. A Class C Operator manages the plant activities at each WTP Monday through Friday, with at least one weekend visit.

2.4.1 Operation and Maintenance Program

The Newberry Water Division staff maintains and operates the water system. As needed repairs or rehabilitation of the water mains due to broken pipes and joints are performed by local contractors. Newberry WTP #1 and WTP #2 are operated continuously with regular operator visits. WTP operational parameters including chlorine dosing and water level set points at the two ESTs. Well pump operations are also monitored and adjusted for optimization as demand trends change. Water demands for the system are summarized in Table 2-5.

3. DEVELOPMENT OF ALTERNATIVES

3.1 General

An evaluation of the City's treatment facilities and distribution system was conducted to develop alternatives to address the water system challenges for future development within the 20-year planning period.

The Alternatives evaluated for Drinking Water Storage Upgrades are as follows:

1. Pedesphere Elevated Storage Tank
2. Fluted Column Elevated Storage Tank
3. Ground Storage Tank

3.2 Site Location

A site location has been selected by the City of Newberry for the proposed storage tank. This site was chosen as the prospective location for all of the three proposed alternatives. The site is located near the intersection of West Newberry Road and SW 218th Street. The site is informally known as the Tanglewood site. The preliminary development plan allows the majority of the land to be used as residential area. There is an area of approximately one acre set aside for the proposed water storage tank. This area is shown in Figure 3-1.

Newberry Drinking Water Facility Plan

Newberry, Florida
Proposed Storage Tank Site

Legend

Proposed Storage Tank Site

N

0 125 250 500 US Feet

Woodard & Curran

Project #: 0234225.01
Map Created: December 2022

As seen in Figure 3-1, the proposed tank site is located near the intersection of West Newberry Road and SW 218th Street. The tank site is located east of the distribution system and the tank will be connected to the distribution system with 12-inch piping. The City has extended a 12-inch water main to the proposed tank site, so approximately 1,500 linear feet of additional 12-inch water main will be required to connect the new water storage tank to the existing system.

3.3 Drinking Water Storage Upgrades

3.3.1 Alternative 1 – Pedesphere Elevated Storage Tank

One alternative to increase storage capacity for the City of Newberry is to install an additional 500,000-gallon pedesphere elevated storage tank (EST). This type of tank is an elevated, welded, carbon-steel, spherical water storage tank supported by a single cylindrical carbon-steel support pedestal was a flared conical base. Single pedestal tanks often require a smaller footprint for construction, which makes this type of tank an attractive option when space is limited.

The 500,000-gallon pedesphere EST was designed to handle the increased flow associated with the population growth through 2043 as well as address operational concerns as mentioned previously.

The pedesphere tank will be a spheroid shape tank mounted on a pedestal with a base cone. The spheroid will have a 55′-6″ diameter and a 37′-6″ head range. Approximately 1,200 linear feet of 12-inch ductile iron piping will be installed to connect the new storage tank to the distribution system.

Additional control equipment will be installed onsite to integrate the EST to the existing SCADA system. The SCADA system will pull water level, and high and low water alarms from the new EST. New control equipment will be installed within a small equipment enclosure at the tank site. A small gas generator with an automatic transfer switch will be installed onsite to ensure SCADA operation during a power outage.

A chain link fence and gate will be installed around the perimeter of the proposed tank for security purposes. The personnel door for tank access will be constructed of steel to provide additional security for the tank. The doors will be equipped with cut proof locks to prevent access to the tank.

An advantage of installing a pedesphere tank is that the two existing elevated storage tanks are pedesphere tanks, so the City is already familiar with the associated operation and maintenance requirements.

3.3.2 Alternative 2 – Fluted Column Elevated Storage Tank

A second alternative to increase storage capacity for the City of Newberry is to install an additional 500,000-gallon fluted column elevated storage tank. This type of tank is a single, steel, fluted pedestal supporting a welded-steel container. The fluted column elevated storage tanks are

constructed entirely of carbon steel. These tanks offer more rigidity and stability than composite tanks, which are comprised of a single concrete pedestal supporting a welded steel container. This difference can be beneficial in areas with a high risk of seismic activity.

The 500,000-gallon fluted column EST was designed to handle the increased flow associated with the population growth through 2043 as well as address operational concerns as mentioned previously.

The fluted column tank will have a tank diameter of 58′ and will be mounted on a 34′ pedestal. The head range of the tank is 30′. Approximately 1,200 linear feet of 12-inch ductile iron piping will be installed to connect the new storage tank to the distribution system.

Additional control equipment will be installed onsite to integrate the EST to the existing SCADA system. The SCADA system will pull water level, and high and low water alarms from the new EST. New control equipment will be installed within a small equipment enclosure at the tank site. A small gas generator with an automatic transfer switch will be installed onsite to ensure SCADA operation during a power outage.

A chain link fence and gate will be installed around the perimeter of the proposed tank for security purposes. The personnel door for tank access will be constructed of steel to provide additional security for the tank. The doors will be equipped with cut proof locks to prevent access to the tank.

3.3.3 Alternative 3 – Ground Storage Tank

Another alternative to increase storage capacity for the City of Newberry is to install a 500,000-gallon ground storage tank (GST). This type of tank is a ground-level concrete domed storage tank with a 4-inch membrane concrete slab on grade.

The ground storage tank will have a tank diameter of 55′ with a height of 28′-2″. These dimensions were chosen to minimize the footprint of the proposed tank. Approximately 1,200 linear feet of 12-inch ductile iron piping will be installed to connect the new storage tank to the distribution system.

This alternative will also include the installation of a pump station on the proposed site to pump finished water from the GST into the distribution pump. The pump station is proposed to include five pumps with four pumps acting as duty pumps and one as a standby for redundancy. The pump station would be designed to handle a total flow of 3,042 GPM to be able to pump at the projected 2043 MDD and provide adequate fireflow in the case where WTP #2 is offline. When both existing WTPs are in service, the proposed pump station will only be responsible for pumping the difference between the existing WTP well capacity and the projected 2043 MDD plus fire flow. The pump station scenario where both existing WTPs are in service is shown below.

$$2043\ Projected\ MDD = 2.94\ MGD = 2{,}042\ GPM$$

$$Fire\ Flow = 2{,}000\ GPM$$

$$WTP\ \#1\ Well\ Capacity = 1{,}000\ GPM$$

$$WTP\ \#2\ Well\ Capacity = 1{,}500\ GPM$$

$$Pump\ Station\ Flow = 2043\ MDD + Fire\ Flow - WTP\ \#1\ Well\ Capacity - WTP\ \#2\ Well\ Capacity$$

$$Pump\ Station\ Flow = 2{,}042\ GPM + 2{,}000\ GPM - 1{,}000\ GPM - 1{,}500\ GPM = 1{,}542\ GPM$$

As shown in the above calculation, if both existing WTPs are in service the pump station will only be responsible for pumping 1,542 GPM. However, the pump station should be designed for a scenario where one of the WTPs are offline. If WTP #2 is offline, the pump station will need to pump an additional 1,5000 GPM to account for the missing flow. In this case, the pump station would need to handle a flow of 3,042 GPM.

$$2043\ Projected\ MDD = 2.94\ MGD = 2{,}042\ GPM$$

$$Fire\ Flow = 2{,}000\ GPM$$

$$WTP\ \#1\ Well\ Capacity = 1{,}000\ GPM$$

$$WTP\ \#2\ Well\ Capacity = 1{,}500\ GPM$$

$$Pump\ Station\ Flow = 2043\ MDD + Fire\ Flow - WTP\ \#1\ Well\ Capacity$$

$$Pump\ Station\ Flow = 2{,}042\ GPM + 2{,}000\ GPM - 1{,}000\ GPM = 3{,}042\ GPM$$

The pump station was designed to handle a flow of 3,600 GPM to ensure the 2043 MDD and fire flow demand can be met with WTP #2 offline. This flow will be pumped using four duty pumps and one standby pump for redundancy. Each pump had a design point of 900 GPM at 180 ft TDH. In addition to these four pumps, the proposed pump station will also be equipped with VFD's for pump operation and a standby emergency generator. It should be noted that the ground storage tank alternative requires additional labor and maintenance since a pump station is included with this alternative. Operators will need to spend additional time monitoring pump runtimes and maintaining the high service pumps.

Additional control equipment will be installed onsite to integrate the GST to the existing SCADA system. The SCADA system will pull water level, and high and low water alarms from the new storage tank. New control equipment will be installed within a small equipment enclosure at the

tank site. The standby emergency generator will include an automatic transfer switch to ensure pump station and SCADA operation during a power outage. Since this alternative requires more electrical equipment than the other two alternatives, a small electrical building will also be necessary.

A chain link fence and gate will be installed around the perimeter of the proposed tank for security purposes. The personnel door for tank access will be constructed of steel to provide additional security for the tank. The doors will be equipped with cut proof locks to prevent access to the tank. The door for the small electrical building will also be made of steel and equipped with a cut proof lock for security. A ground storage tank is generally associated with greater security concerns since the tank itself is on the ground. This makes it more easily accessible to the public, even if the appropriate security measures are in place. Security concerns bring a disadvantage to the ground storage tank alternative.

Another disadvantage of the ground storage tank alternative is the complexity it will bring to the existing distribution system. The current water distribution system operates based on the water elevation in the two existing elevated storage tanks. Adding a ground storage tank with high service pumping increases the complexity of the operating system since operating conditions would then need to be based on a combination of elevated water pressure and high service pumping. The City would benefit by adding another elevated storage tank since it will be easier to incorporate into the existing operations.

The ground storage tank is proposed as a concrete tank for cost effectiveness while the two elevated storage tanks are proposed to be made of steel, therefore the difference in materials should be considered in the alternative analysis. A concern of concrete materials is that concrete is not flexible and is subject to expansion and contraction which may cause cracks, leaks, and additional maintenance. Possibilities of cracking in a water storage tank need to be minimized to reduce the potential of water losses. The associated maintenance expenses, as well as the impact of having the tank out of service for maintenance, will add up and may have negative impacts on the distribution system.

3.4 Additional Project Considerations

3.4.1 Operational Improvements

As mentioned previously, the new storage tank will aid in the automated operation of water pumped to the City's distribution system. The logic controlling automated water pumping is currently dependent on the existing 300,000-gallon elevated storage tank, so the additional system pressure provided by the new 500,000-gallon elevated storage tank will offset the need for manual operations while any tank is offline for maintenance. The new 500,000-gallon storage tank would be fitted with backup controls such that all tanks can receive routine and energy maintaince without disrupting automated pump control.

The storage tank wil be connected to the existing Xylem SCADA MultiSmart system. The system will collect level signals and high and low water alarms from the new storage tank and transmit this information to the master control panel to start and stop the pumps. The new storage tank will also be equipped with the Sensus Smart Gateway Sensor Interface to allow for remote monitoring of the new elevated storage tank. This tank will act as an additional way for the City to monitor tank level and will be incorporated into the existing AMI system.

3.4.2 Tank Coating

It is recommended that the City apply advanced interior and exterior coatings to the proposed storage tank to increase the predicted service life of the storage tank. Painting and coating materials have the ability to significantly extend the lifespan of the proposed storage tank. The coatings described in this section will be applied to any of the three alternatives to improve the tank's weatherability and durability.

The recommended material for the interior tank coating is the Phenoline Tank Shield, which is manufactured by Carboline. This material is a 99% solids, phenolic epoxy coating designed for internal tank lining. This material has high impact resistance and super adhesion to steel surfaces. This product is resistant to water and has excellent abrasision resistance and flexibility, which makes it an ideal liner material for the inside of the proposed tank. This material meets all drinking water criteria of NSF/ANSI/CAN 600. Refer to Appendix D for a performance summary of the interior coating system.

It is recommended that the City apply a siloxane exterior coating on any of the three alternatives to increase the predicted service life of the storage tank. A siloxane coating system has a longer life expectancy that traditional polyurethane topcoats. A longer service life yields a lower life-cycle cost and reduces maintenance costs for the proposed tank. The proposed siloxane topcoat to be applied to the tank is the Carboxane 2000 siloxane coating, which is also manufactured by Carboline. This coating provides outstanding resistance to ultra-violet light degradation and therefore is expected to extend the lifespan of the proposed storage tank. The siloxane topcoat will also retain gloss and color of the tank as well as excellent corrosion protection for exterior exposures. The proposed primer is the Carbozinc 859, Which is an organic zinc-rich epoxy steel primter with low VOC content. This material has excellent adhesion and protects against undercutting corrosion. Refer to Appendix D for a performance summary of the exterior coating system.

3.4.3 Tank Piping and System Connection

The City of Newberry has already extended a 12" water main to the proposed tank site for this project. The tank will connect into the City's distribution system by installing approximately 1,200 linear feet of 12" of water main to connect. The proposed water main alignment is shown in Section 4. The 12" water main will be designed to provide service laterals to houses built in the

Tanglewood planned development along the proposed path to connect to the existing distribution system.

3.5 Water Storage Upgrade Alternatives Cost Comparison

A capital and total life cycle cost comparison of the three water storage upgrade alternatives is presented below. The cost estimates shown, and any resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project and resulting feasibility will depend on actual labor and materials costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variable factors. As a result, the final project costs will vary from the estimate presented here. All costs are presented in 2023 dollars.

Table 3-1: Water Storage Upgrade Alternatives Cost Comparison

Item No.	Cost Item	Alternative 1 – Pedesphere EST	Alternative 2 – Fluted Column EST	Alternative 3 - GST
CAPITAL COST SUMMARY				
1	Capital Base Cost	$ 4,488,500	$ 6,254,800	$ 4,479,800
2	Contingency (10%)	$ 448,900	$ 625,500	$ 448,000
3	Engineering, Permitting, and Design (10%)	$ 448,900	$ 625,500	$ 448,000
4	Engineering Services During Construction (5%)	$ 224,500	$ 312,800	$ 224,000
5	Legal and Administration (3%)	$ 134,700	$ 187,700	$ 134,400
	Total Opinion of Capital Cost	**$ 5,745,500**	**$ 8,006,300**	**$ 5,734,200**
ANNUAL O&M COST SUMMARY				
	Operations			
	Annual Electrical Cost	$ 22,776.00	$ 22,776.00	$ 204,984.00

3.5.1 Life Cycle Cost Analysis

The following tables provide the 20-year life cycle cost analysis (LCCA) for the three proposed water storage alternatives. The analysis is important for comparing the alternatives on an equivalent basis over the project life. Average service lives were established based on values provided in Florida Administrative Code Rule 25-30.140(2)a), assuming a class C, small utility.

Table 3-2: Alternative 1 – Pedesphere EST Present Worth Analysis

DESCRIPTION	CONSTRUCTION CAPITAL COST	ANNUAL O&M	LIFE CYCLE COST (LCCA)
0.5 MG Storage Tank	$2,350,000	$47,000	$1,993,000
Tank Coating	$40,000	$800	$54,000
8" DI Pipe	$208,000	$4,160	$213,000
12" DI Pipe	$612,000	$12,240	$628,000
Connect to Existing 8" and 12" Mains	$20,000	$400	$20,000
Hydrant Assembly	$11,400	$228	$11,000
Valve + Fitting Allowance	$84,500	$1,690	$114,000
Chain Link Fence + Gate	$56,000	$1,120	$75,000
Gas Generator	$5,000	$100	$7,000
Electrical Site Work	$5,100	$102	$7,000
Uninterruptible Power Supply	$1,500	$30	$2,000
Driveway (Asphalt)	$77,000	$1,540	$103,000
Crushed Stone (Tank Washdown)	$8,000	$160	$9,000
Concrete Energy Blocks (Tank Washdown)	$1,125	$23	$2,000
Site Clearing + Grading	$65,000	$1,300	$87,000
Loam and Seed Disturbed Area	$27,000	$540	$36,000
Instrumentation	$45,000	$900	$94,000
Traced Wires (along 12" WM)	$3,000	$60	$6,000
SCADA Implementation	$4,500	$22,866	$401,000
Testing Allowance	$15,000	$0	$15,000
Maintenance of Traffic Allowance	$10,000	$0	$10,000
Mobilization/ Demobilization (5%)	$182,456	$0	$182,000
Insurance and Bonds (3%)	$109,474	$0	$109,000
General Conditions (5%)	$182,456	$0	$182,000
Overhead & Profit (10%)	$364,913	$0	$365,000
TOTAL:	**$4,488,500**	**$95,300**	**$4,725,000**
Contingency	$448,900	$0	$449,000
Engineering, Permitting, and Design	$448,900	$0	$449,000
Engineering Services during Construction	$224,500	$0	$225,000
Legal and Administration	$134,700	$0	$135,000
TOTAL:	**$5,745,500**		**$5,983,000**

Table 3-3: Alternative 2 – Fluted Column EST Present Worth Analysis

DESCRIPTION	CONSTRUCTION CAPITAL COST	ANNUAL O&M	LIFE CYCLE COST (LCCA)
0.5 MG Storage Tank	$3,800,000	$76,000	$3,224,000
Tank Coating	$40,000	$800	$54,000
8" DI Pipe	$208,000	$4,160	$213,000
12" DI Pipe	$612,000	$12,240	$628,000
Connect to Existing 8" and 12" Mains	$6,000	$120	$6,000
Hydrant Assembly	$11,400	$228	$11,000
Valve + Fitting Allowance	$84,500	$1,690	$114,000
Chain Link Fence + Gate	$56,000	$1,120	$75,000
Gas Generator	$5,000	$100	$7,000
Electrical Site Work	$5,100	$102	$7,000
Uninterruptible Power Supply	$1,500	$30	$2,000
Driveway (Asphalt)	$77,000	$1,540	$103,000
Crushed Stone (Tank Washdown)	$8,000	$160	$9,000
Concrete Energy Blocks (Tank Washdown)	$1,125	$23	$2,000
Site Clearing + Grading	$65,000	$1,300	$87,000
Loam and Seed Disturbed Area	$27,000	$540	$36,000
Instrumentation	$45,000	$900	$94,000
Traced Wires (along 12" WM)	$3,000	$60	$6,000
SCADA Implementation	$4,500	$22,866	$401,000
Testing Allowance	$15,000	$0	$15,000
Maintenance of Traffic Allowance	$10,000	$0	$10,000
Mobilization/ Demobilization (5%)	$254,256	$0	$254,000
Insurance and Bonds (3%)	$152,554	$0	$153,000
General Conditions (5%)	$254,256	$0	$254,000
Overhead & Profit (10%)	$508,513	$0	$509,000
TOTAL:	**$6,254,800**	**$124,000**	**$6,274,000**
Contingency	$625,500	$0	$626,000
Engineering, Permitting, and Design	$625,500	$0	$626,000
Engineering Services during Construction	$312,800	$0	$313,000
Legal and Administration	$187,700	$0	$188,000
TOTAL:	**$8,006,800**		**$8,027,000**

Table 3-4: Alternative 3 – GST Present Worth Analysis

DESCRIPTION	CONSTRUCTION CAPITAL COST	ANNUAL O&M	LIFE CYCLE COST (LCCA)
0.5 MG Storage Tank	$510,000	$10,200	$433,000
Tank Coating	$40,000	$800	$54,000
8" DI Pipe	$208,000	$4,160	$213,000
12" DI Pipe	$816,000	$16,320	$836,000
Connect to Existing 8" and 12" Mains	$6,000	$120	$6,000
Hydrant Assembly	$11,400	$228	$11,000
Valve + Fitting allowance	$175,500	$3,510	$236,000
Chain Link Fence + Gate	$56,000	$1,120	$75,000
Gas Generator	$168,500	$3,370	$249,000
Electrical Site Work	$107,050	$2,141	$144,000
Uninterruptible Power Supply	$1,500	$30	$2,000
Driveway (Asphalt)	$77,000	$1,540	$103,000
Crushed stone (Tank Washdown)	$8,000	$160	$8,000
Concrete Energy Blocks (Tank Washdown)	$1,125	$23	$1,000
Site clearing + Grading	$65,000	$1,300	$87,000
Loam and Seed Disturbed Area	$27,000	$540	$36,000
Instrumentation	$70,000	$1,400	$146,000
Traced Wires (along 12" WM)	$3,000	$60	$6,000
SCADA Implementation	$7,000	$205,124	$3,534,000
Testing Allowance	$15,000	$0	$15,000
Maintenance of Traffic Allowance	$10,000	$0	$10,000
High Service Pump Station	$1,250,900	$25,180	$1,427,000
Mobilization/Demobilization (5%)	$182,104	$0	$182,000
Insurance and Bonds (3%)	$109,262	$0	$109,000
General Conditions (5%)	$182,104	$0	$182,000
Overhead & Profit (10%)	$364,208	$0	$364,000
TOTAL:	**$4,479,800**	**$277,400**	**$8,469,000**
Contingency	$448,000	$0	$448,000
Engineering, Permitting, and Design	$448,000	$0	$448,000
Engineering Services during Construction	$224,000	$0	$224,000
Legal and Administration	$134,400	$0	$134,000
TOTAL:	**$5,734,200**		**$9,723,000**

The previous tables show detailed information for the life cycle cost analysis of all three proposed alternatives. Table 3-5 provides a summary of the capital cost, O&M costs, and life cycle cost for each of the alternatives. As shown in this table, Alternative 1 has the lowest O&M costs, and therefore has the lowest total life cycle cost. The highest O&M costs are associated with Alternative 3 due to the presence of a pump station. There is a significant cost difference between the pedesphere EST and the fluted column EST which causes a large cost difference between Alternative 1 and Alternative 2.

Table 3-5: LCCA Summary

	Design Life (Years)	Capital Cost	Annual O&M Cost	Lifetime O&M Cost	Total Life Cycle Cost (2022 Dollars)
Alternative 1 (Pedesphere EST)	20	$ 5,745,500.00	$95,258.50	$1,710,369.14	$5,983,000.00
Alternative 2 (Fluted Column EST)	20	$ 8,006,300.00	$123,978.50	$2,226,037.58	$8,027,000.00
Alternative 3 (GST)	20	$ 5,734,200.00	$252,145.50	$4,527,279.79	$9,723,000.00

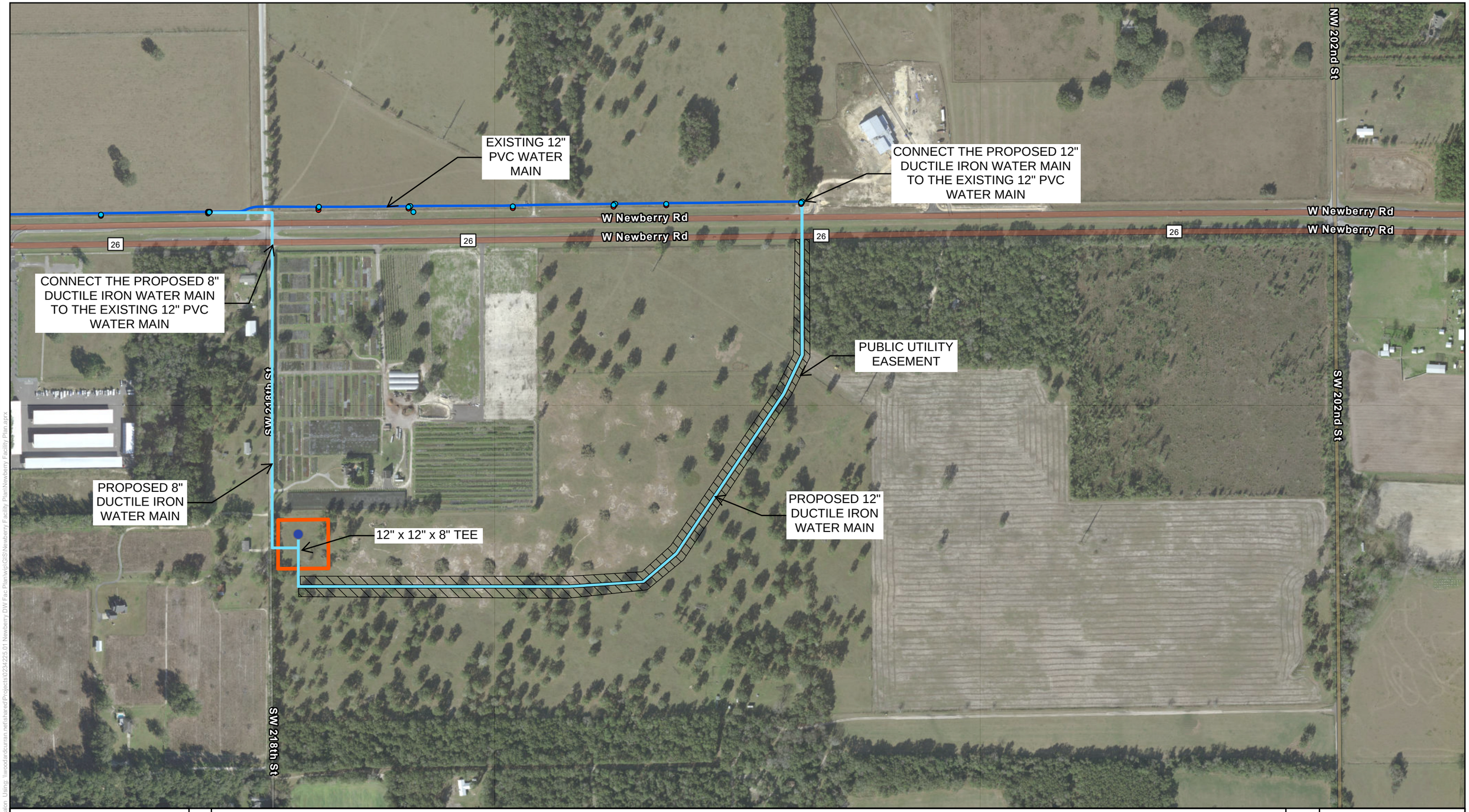
4. SELECTED PLAN

This section of the report presents the recommended alternatives for the water system. The recommended plan is based on Woodard & Curran's evaluations described within this report. An investigation into environmental impacts and cost estimates of the recommended plan are also included in this section. The recommended facilities are located on existing properties owned by the City.

4.1 Description of Proposed Storage Upgrade

The recommended alternative for increasing system storage is Alternative 1. Constructing a 0.5 MG pedesphere elevated storage tank will address issues of redundancy and auxiliary water storage and the community water system's ability to accommodate projected demands.

As depicted previously in Figure 2-2, the City's water demand is expected to grow significantly and therefore the City must increase their storage capacity. The City does not currently have adequate storage to support the projected growth over the planning horizon and therefore requires an additional water storage tank. In addition to addressing the anticipated growth, the City will also benefit by improving water distribution operations as the additional tank will eliminate the need for operators to operate the system manually during maintenance of any storage tanks. The proposed water main alignment and site plan for Alternative 1 is shown in Figure 4-1.



Newberry Drinking Water Facility Plan

Proposed Water Main Alignment

Legend

- Hydrant
- wSystemValve
- Existing Water Main
- Proposed Piping
- Proposed EST
- Proposed Storage Tank Site

0 125 250 500 US Feet

N

Woodard & Curran

Project #: 0234225.01
Map Created: December 20, 2023

4.2 Environmental Impacts of Recommended Facilities

The environmental assessment is ongoing. To date there have been no findings effecting the proposed project.

4.3 Cost Analysis

4.3.1 Conceptual Level Projected Cost

The conceptual level Opinion of Probable Cost (OPC) for the overall recommended plan is $5.75M in 2023 dollars and is summarized in Table 4-1. Cost details are presented in Appendix B.

Table 4-1: Conceptual Level Cost Estimate Summary – Recommended Plan

Item No.	Cost Item	Alternative 1 – Pedesphere EST
CAPITAL COST SUMMARY		
1	Capital Base Cost	$ 4,488,500
2	Contingency (10%)	$ 448,900
3	Engineering, Permitting, and Design (10%)	$ 448,900
4	Engineering Services During Construction (5%)	$ 224,500
5	Legal and Administration (3%)	$ 134,700
	Total Opinion of Capital Cost	**$ 5,745,500**
ANNUAL O&M COST SUMMARY		
1	Annual Electrical Cost	$ 22,776.00

5. IMPLEMENTATION AND COMPLIANCE

5.1 Regulatory Agency Review

To qualify for a subsidized loan from the SRF, various government agencies must be satisfied with the way that the City is proposing to address their water system challenges. Copies of the Facilities Plan adopted by the City are being sent to Local, State and Federal Agencies via the "State Clearing House Process" for their review and comment.

5.2 Financial Planning

The FDEP SRF program is expected to be the financing source for the project. A Drinking Water SRF Business Plan (Business Plan) has been prepared to explain to the public and to the State Agency the financial impact on the users of the drinking water system. The Business Plan is shown in Appendix E and demonstrates that operating expenses; existing debt service obligations; and proposed project debt service associated with capital projects identified in this facility plan can be funded through current utility rates. This includes existing approved annual rate increases, and existin water and sewer impact fees.

The Business Plan is based on the current utility rates and the rate ordinance that the City adopted with a consumer price index (CPI) increase annually, as well as water and sewer impact fees.

5.3 Project Implementation

The City of Newberry has the sole responsibility and authority to implement the recommended facilities.

5.3.1 Implementation Schedule

The implementation schedule is estimated to follow the timeline below:

- November 2021 – Submit draft Facilities Plan to FDEP & other government agencies
- January 2021 - Prepare Final Facility Planning documentation to include all comments for the State
- February 2022 – Hold public meeting on the Facilities Plan and Capital Financing Plan;
- February 2022 – Publication of Department's environmental information document in the Florida Administrative Weekly;
- November 2021 – Submit Request for Inclusion (RFI) to FDEP (Tallahassee) for design funding;
- December 2022 – End of 30-day comment period for the environmental information document approval of planning documents;
- March 2022 – Submit loan application to FDEP (Tallahassee) for Design Phase;

- April 2022 – Resolution and council approval of FDEP loan agreements for design;
- June 2022 – Complete loan agreements for design phase and release contract for design;
- June 2022 – May 2023 – Project Design
- June 2023 - Submit plans and specifications to the FDEP (Tallahassee) and submit the construction permit application for Phase 1A to the FDEP (District Office);
- July 2023 – Notice of intent to permit construction of Phase 1A issued and project added to the priority list;
- July 2023– Submit Request for Inclusion (RFI) for addition of the Phase 1A construction to FDEP's project priority list;
- August 2023 – Hearing to add Phase 1A to the Fundable portion of the priority list;
- August 2023 – Submit loan application for Phase 1A to FDEP (Tallahassee) for construction phase;
- September 2023 – Resolution and council approval of FDEP loan agreements for construction of Phase 1A;
- October 2023 – Complete Phase 1A loan agreements for construction phase;
- October 2023 – Advertise for Phase 1A bids;
- December 2023 – Open construction Phase 1A bids;
- February 2024 – Award Phase 1A contract;
- April 2024 – Issue a notice to proceed (NTP) to Start Phase 1A project construction;
- October 2025 – Complete construction of the Phase 1A project;
- January 2026 – Certify operation performance of the project and close out the Phase 1A project; and
- July 2026 – Begin SRF loan repayments to FDEP for Phase 1A.

5.4 Compliance

1. The selected alternatives will allow the City to meet the compliance for FDEP drinking water standards with, since these do not require unknown treatment and or distribution process and or strategies.
1. The selected alternatives will allow the City to meet the reliability requirements as per Chapter 62-555, Florida Administrative Code (F.A.C.).
2. Environmental aspects of the proposed facilities are based on generally acceptable engineering criteria and assumed by W&C to be satisfactory.

3. The recommended facilities are consistent with the City of Newberry's Comprehensive Plan.

APPENDIX A: FDEP SANITARY SURVEY REPORT

Florida Department of Environmental Protection

Northeast District
8800 Baymeadows Way West, Suite 100
Jacksonville, Florida 32256

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Ryan E. Matthews
Interim Secretary

October 27, 2020

Jamie Jones
City of Newberry
Post Office Box 369
Newberry, Florida 32669
jamie.jones@ci.newberry.fl.us

Re: Newberry WTP
PWS ID No. 2010207
Alachua County – Drinking Water

Dear Mr. Jones:

Department personnel conducted a sanitary survey inspection of the above-referenced facility on June 18, 2020. Based on the information provided during and following the inspection, the system was determined to be in compliance with the Department's Drinking Water rules and regulations. A copy of the inspection report is attached for your records.

The Department appreciates your efforts to maintain this system in compliance with state and federal rules. Should you have any questions or comments, please contact Ben Piltz at (904) 256-1639, or via e-mail at benjamin.piltz@dep.state.fl.us.

Sincerely,

Vincent Clark
Environmental Manager
Compliance Assurance Program

Enclosures: Inspection Report

c: FDEP: Vincent Clark, Joni Petry, Benjamin Piltz, DEP_NED
James Greenwalt, City of Newberry - james.greenwalt@ci.newberry.fl.us

Florida Department of Environmental Protection
Northeast District Public Water System Sanitary Survey Inspection Report

Water system: Newberry WTP Plant #1	**System PWS #: 2010207-01**	**Survey date: 6/18/20**
Facility type class: **Community** - (5C)	Source type: Ground	4-Log approved: Yes
Facility address: NW 260th St & NW 1st Avenue, Newberry, Florida 32669		
Facility phone(s): 352-474-6025	Facility email/fax: jamie.jones@ci.newberry.fl.us	
Facility contact: Jamie Jones	Facility contact phone(s): 352-472-1537	
Facility contact email/fax: jamie.jones@ci.newberry.fl.us		
Owner name: Jamie Jones, Utilities Director	Company name: City of Newberry	
Owner/Corp address: Post Office Box 369	City: Newberry	State: FL Zip: 32669
Owner/Corp phone(s): 352-472-1537	Owner e-contact(s): jamie.jones@ci.newberry.fl.us	
Operator name: Chad Purvis	Certification: C-22486	
Operator phone(s): 352-231-9085	Operator email/fax: chad.purvis@ci.newberry.fl.us	
On-site Rep: Chad P, James G.	**Immediate Action Required?**: No	Inspection recap given? Yes

SERVICE AREA CHARACTERISTICS

Municipal system

Food Service: ☐ Yes ☐ No ☒ N/A

GENERAL INFORMATION

Number of Service Connections 1,481
Population Served 3,885 Basis ServCon x 2.5
Plant Design Capacity 2.16 MGD
Basis Plants 1&2 Capacity from 2010 Permit
Average Day (from MORs) 192,078 gpd
Max. Day (from MORs) 923,000 gpd
Total Storage Capacity 187,500 gallons
Comments C1+C2+C3+EST1=TSC.
Combined S.C./population. For future MORs, report total from each plant instead of by well.

LOCATION

Latitude 29° 38' 49.2956" North
Longitude 82° 37' 5.3953" West
GPS: No Date: DPHO 5/05
Directions Take I95 N to I10W and continue towards FL 121. Go south on FL 121 towards Lake Butler ~33 mi. Make a slight right on CR 239 (8mi) and turn rt on FL 235. Continue on NW 140th St/CR 235 11 mi. Turn rt on W Newberry Rd and rt on NW 260th St. System on left @ intersection with NW 1st Ave.

OPERATION & MAINTENANCE

Certified Operator: ☒ Yes ☐ No ☐ Not required
Plant visits conducted by: Chad Purvis
O&M Log: ☒Yes ☐No O&M Manual: ☒Yes ☐No
Visitation Frequency
Hrs/day: *Required* N/A *Actual* N/A
Hrs/wk: *Required* 0.6 *Actual* >0.6
Days/wk: *Required* 5+1 *Actual* 7
Non-consecutive Days? ☐ Yes ☐ No ☒ N/A
MORs submitted regularly? ☒ Yes ☐ No ☐ N/A
Data missing from MORs? ☒ No ☐ Yes ☐ N/A

RAW WATER SOURCE

☒ GROUND; Number of Wells 2
☐ SURFACE/UDI; Source
☐ PURCHASED from PWS ID #
☐ Emergency Water Source
Emergency Water Capacity

AUXILIARY POWER SOURCE

☒ Yes ☐ None ☐ Not Required
Source Auxiliary Generator
Capacity of Standby (kW) 100
Switchover: ☒ Automatic ☐ Manual
Standby Plan: ☒ Yes ☐ No
Hrs Operated Under Load 4 hrs/mo.
What equipment does it operate?
☒ Well pumps Well #1 & Well #3
☐ High Service Pumps
☒ Treatment Equipment Hypochlorination
Satisfy 1/2 max-day demand? ☐Yes ☐No ☐Unk
Comments

TREATMENT PROCESSES IN USE

Hypochlorination- 4 log approved

Is additional treatment needed? ☐ Yes ☒ No
If so, for control of what deficiencies?
Not applicable at this time.

DISTRIBUTION SYSTEM

Flow Measuring Device Flow Meter
Meter Size & Type McCrometers @ each well
Meter tested w/i 5 yrs? ☒ Yes ☐ No ☐ Unk ☐ N/A
Backflow Prevention :☒ Yes ☐ No
Cross-connections None observed
Cross-connection Control Program: ☒Yes ☐No ☐N/A
Coliform Sampling Plan: ☒ Yes ☐ No
Stage 2 DBPs Sampling Plan: ☒ Yes ☐ No ☐N/A
Lead & Copper Sampling Plan: ☒Yes ☐ No ☐N/A
Comments Cross Connection Control Plan included as part of City Ordinances. Meter verified 5/26/20.

Newberry WTP Plant #1

PWS ID # 2010207-01
Survey Date 6/18/20

GROUND WATER SOURCE

Well Number (PWS Identification)		1	4	
Well Name (System Identification)		Well #1	Well #3	
Year Drilled		1956	1991	
Depth Drilled		200’	142’	
Latitude		29° 38‘ 49.3090“ N	29° 38‘ 50.7920“ N	
Longitude		82° 37‘ 5.1010“ W	82° 37‘ 4.1540“ W	
GPS (Y or N) / Date (if applicable)		Y- DGPS 7/09	Y- DGPS 7/09	
Florida Well ID		AAE 1418	AAL 2489	
Static Water Level		40’	40’	
Normal Yield (if different than rated capacity)		Unknown	Unknown	
Strainer		Unknown	Unknown	
Length (outside casing)		100’	84’	
Diameter (outside casing)		10”	10”	
Material (outside casing)		Steel	Steel	
Well Contamination History		Ok	Ok	
Is inundation of well possible?		Not likely	Not likely	
6’ X 6’ X 4” Concrete Pad		Ok	Ok	
SET BACKS	Septic Tank	>200’	>200’	
	Reuse Water	>200’	>200’	
	WW Plumbing	>200’	>200’	
	Other Sanitary Hazard	>200’	>200’	
PUMP	Type	Vertical Turbine	Vertical Turbine	
	Manufacturer Name	Unknown	Unknown	
	Model Number	Unknown	Unknown	
	Rated Capacity (gpm)	500	500	
	Motor Horsepower	40	40	
Well casing 12” above grade?		Ok	Ok	
Well Casing Sanitary Seal		Ok	Ok	
Raw Water Sampling Tap		Downturned/smooth	Downturned/smooth	
Above Ground Check Valve		After raw/before trmt	After raw/before trmt	
Fence/Housing		Secured Fence	Secured Fence	
Well Vent Protection		Ok	Ok	

COMMENTS _____

Newberry WTP Plant #1

PWS ID # 2010207-01
Survey Date 6/18/20

CHLORINATION (Disinfection)
Type: Hypo-Chlorination
Make Stenner Capacity 40 gpd (each)
Chlorine Feed Rate Set at 6
Avg. Amount of Cl_2 gas used N/A
Chlorine Residuals: Plant 0.76 Remote 1.54
Remote tap location Newberry Corners Office
DPD Test Kit: ☒ On-site ☒ With operator
☐ None ☐ Not Used Daily
Injection Points Before Contact time tanks.
Booster Pump Info N/A
Comments

Chlorine Gas Use Requirements	YES	NO	Comments N/A
Dual System	☐	☐	
Auto-switchover	☐	☐	
Alarms:			
Loss of Cl_2 capability	☐	☐	
Loss of Cl_2 residual	☐	☐	
Cl_2 leak detection	☐	☐	
Scale	☐	☐	
Chained Cylinders	☐	☐	
Reserve Supply	☐	☐	
Adequate Air-pak	☐	☐	
Sign of Leaks	☐	☐	
Fresh Ammonia	☐	☐	
Ventilation	☐	☐	
Room Lighting	☐	☐	
Warning Signs	☐	☐	
Repair Kits	☐	☐	
Fitted Wrench	☐	☐	
Housing/Protection	☐	☐	

AERATION (Gases, Fe, & Mn Removal)
Type N/A Capacity
Aerator Condition
Bloodworm Presence
Visible Algae Growth
Protective Screen Condition
Comments

STORAGE FACILITIES
(B) Bladder (CW) Clearwell (C) Contact (E) Elevated
(G) Ground (H) Hydropneumatic (S.C.) See Comments

Tank Type/Number	C1	C2	C3	EST 1
Capacity (gal)	7.5k	15k	15k	150k
Material	Steel	Steel	Steel	Steel
By-pass Piping	No	No	No	No
Gravity Drain	Yes	Yes	Yes	Yes
PRV/ARV	PRV	PRV	PRV	ARV
Protected Openings	N/A	N/A	N/A	Yes
Pressure Gauge	Yes	Yes	Yes	Yes
Sight Glass or Level Indicator	No	No	No	L.I.
Fittings for Sight Glass	No	No	No	N/A
Access Padlocked	Yes	Yes	Yes	Yes
Last Inspection Date (for tanks with access manholes)	2016/6	2016/6	2016/6	2016/6
On/Off Pressure	40/60	40/60	40/60	40/60
Height to Bottom of Elevated Tank	N/A	N/A	N/A	Unk
Height to Max. Water Level	N/A	N/A	N/A	Unk

Comments New tank insp completed. Report to be forwarded when available

HIGH SERVICE PUMPS

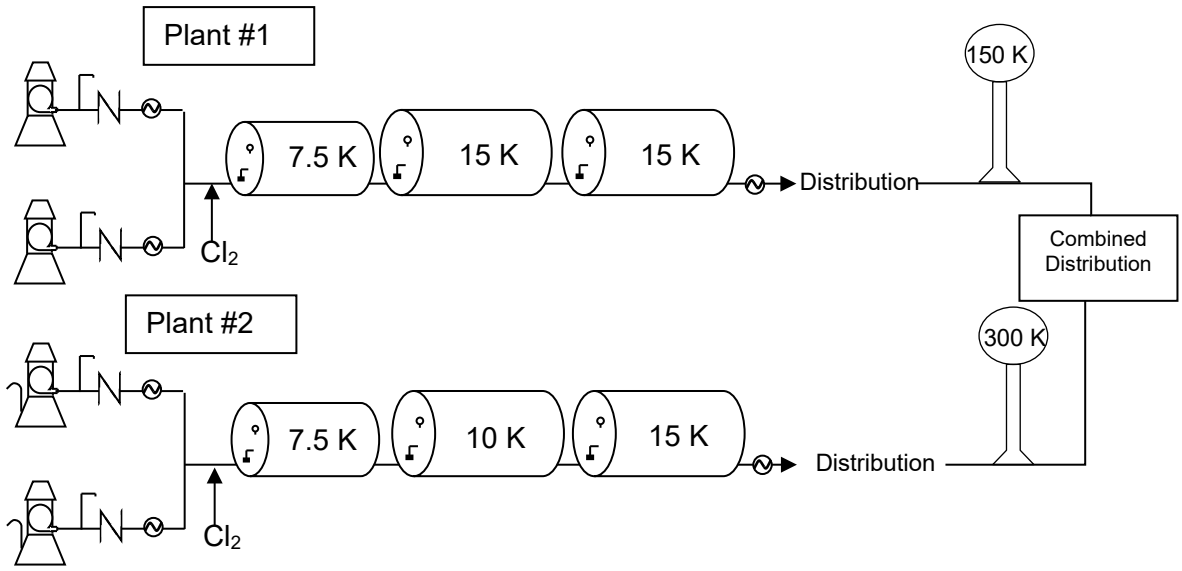
Pump Number	N/A		
Type			
Make			
Model			
Capacity (gpm)			
Motor HP			
Date Installed			
Maintenance			

Comments

Newberry WTP Plant #1

PWS ID # 2010207-01
Survey Date 6/18/20

SCHEMATIC (not to scale):



SCHEMATIC KEY					
Well w/ Vertical turbine		Check valve			
Raw Tap		Flow meter			
Contact time tank		Elevated Storage Tank		Well vent	

Monitoring Schedule					
Chemical	**Next Due**	**Comments**	**Chemical**	**Next Due**	**Comments**
Bacteriologicals	Monthly		VOCs	2023	
Disinfectant Levels	Monthly	with bacti	SOCs	2020	Second set or waiver
Nitrate & Nitrite	2021	N/N due annually	Rads	2026	
Inorganics	2023		DBPs	2021	July@SW 242 Terr, LS 21
Asbestos	2029	or waiver	Pb-Cu	2023	Jun-Sep
Secondaries	2023		WQPs	N/A	

**Sample locations vary. If you have any questions, please contact your inspector.*

MONITORING VIOLATIONS	MCL VIOLATIONS
N/A	N/A

DEFICIENCIES:

#	Deficiency	Rule Reference	Corrective Action	Severity	Corrected
	No deficiencies observed at WTP #1 during the inspection.				

Any deficiency marked with an asterisk (*) is a repeat violation.

ADDITIONAL COMMENTS:

No deficiencies observed during the inspection at WTP #1

Inspector: Ben Piltz
Ben Piltz, Environmental Specialist II (904) 256-1639
benjamin.piltz@dep.state.fl.us

Approved by: Joni Petry
Joni Petry, Environmental Consultant

Florida Department of Environmental Protection
Northeast District Public Water System Sanitary Survey Inspection Report

Water system: Newberry WTP Plant #2	**System PWS #: 2010207-02**	**Survey date: 6/18/20**
Facility type class: **Community** - (5C)	Source type: Ground	4-Log approved: Yes
Facility address: 24820 NW 16th Avenue, Newberry, Florida 32669		
Facility phone(s): 352-472-1537	Facility email/fax: jamie.jones@ci.newberry.fl.us	
Facility contact: Jamie Jones	Facility contact phone(s): 352-472-1537	
Facility contact email/fax: jamie.jones@ci.newberry.fl.us		
Owner name: Jamie Jones, Utility Director	Company name: City of Newberry	
Owner/Corp address: Post Office Box 369	City: Newberry	State: FL Zip: 32669
Owner/Corp phone(s): 352-472-1537	Owner e-contact(s): jamie.jones@ci.newberry.fl.us	
Operator name: Chad Purvis	Certification: C-22486	
Operator phone(s): 352-231-9085	Operator email/fax: chad.purvis@ci.newberry.fl.us	
On-site Rep: Chad P, James G.	**Immediate Action Required?**: No	Inspection recap given? Yes

SERVICE AREA CHARACTERISTICS

Municipal system

Food Service: ☐ Yes ☐ No ☒ N/A

GENERAL INFORMATION

Number of Service Connections 1,481
Population Served 3,885 Basis ServCon x 2.5
Plant Design Capacity 2.16 MGD
Basis Plants 1&2 Capacity from 2010 Permit.
Average Day (from MORs) 234,000 gpd
Max. Day (from MORs) 1,004,000 gpd
Total Storage Capacity 332,500 gallons
Comments C1+C2+C3+EST1=TSC.
Combined S.C./population. For future MORs, report total from each plant instead of by well.

LOCATION

Latitude 29° 40' 21.8168" North
Longitude 82° 36' 4.2588" West
GPS: No Date: DPHO 9/04
Directions From WTP #1, head south on NW 260th Street. Turn left onto W Newberry Road, and left onto US 27N/US-41, SW 250th Street. Turn right on NW 16th Avenue, and WTP #2 will be on the left further behind the Newberry Sports Complex.

OPERATION & MAINTENANCE

Certified Operator: ☒ Yes ☐ No ☐ Not required
Plant visits conducted by: Chad Purvis
O&M Log: ☒Yes ☐No O&M Manual: ☒Yes ☐No
Visitation Frequency
Hrs/day: *Required* N/A *Actual* N/A
Hrs/wk: *Required* 0.6 *Actual* >0.6
Days/wk: *Required* 5+1 *Actual* 7
Non-consecutive Days? ☐ Yes ☐ No ☒ N/A
MORs submitted regularly? ☒ Yes ☐ No ☐ N/A
Data missing from MORs? ☒ No ☐ Yes ☐ N/A

RAW WATER SOURCE

☒ GROUND; Number of Wells 2
☐ SURFACE/UDI; Source
☐ PURCHASED from PWS ID #
☐ Emergency Water Source
Emergency Water Capacity

AUXILIARY POWER SOURCE

☒ Yes ☐ None ☐ Not Required
Source Auxiliary Generator
Capacity of Standby (kW) 105
Switchover: ☒ Automatic ☐ Manual
Standby Plan: ☒ Yes ☐ No
Hrs Operated Under Load 4 hrs/mo.
What equipment does it operate?
☒ Well pumps Well #4 & #5
☐ High Service Pumps
☒ Treatment Equipment Hypochlorination
Satisfy 1/2 max-day demand? ☒Yes ☐No ☐Unk
Comments

TREATMENT PROCESSES IN USE

Hypochlorination- 4 log approved

Is additional treatment needed? ☐ Yes ☒ No
If so, for control of what deficiencies?
Not applicable at this time.

DISTRIBUTION SYSTEM

Flow Measuring Device Flow Meter
Meter Size & Type Mccrometers @ each well
Meter tested w/i 5 yrs? ☒ Yes ☐ No ☐ Unk ☐ N/A
Backflow Prevention :☒ Yes ☐ No
Cross-connections None observed
Cross-connection Control Program: ☒Yes ☐No ☐N/A
Coliform Sampling Plan: ☒ Yes ☐ No
Stage 2 DBPs Sampling Plan: ☒ Yes ☐ No ☐N/A
Lead & Copper Sampling Plan: ☒Yes ☐ No ☐N/A
Comments Meters verified 5/26/20.

Newberry WTP Plant #2

PWS ID # 2010207-02
Survey Date 6/18/20

GROUND WATER SOURCE

Well Number (PWS Identification)		1	2	
Well Name (System Identification)		Well #4	Well #5	
Year Drilled		2004	2011	
Depth Drilled		160’	132’	
Latitude		29° 40‘ 22.5426“ N	29° 40‘ 23.6841“ N	
Longitude		82° 36‘ 4.0948“ W	82° 36‘ 3.1335“ W	
GPS (Y or N) / Date (if applicable)		N – DPHO 9/11	N – DPHO 9/11	
Florida Well ID		AAL 2487	AAL 2488	
Static Water Level		Unknown	Unknown	
Normal Yield (if different than rated capacity)		Unknown	Unknown	
Strainer		Unknown	Unknown	
Length (outside casing)		100’	84’	
Diameter (outside casing)		12”	16”	
Material (outside casing)		Steel	Steel	
Well Contamination History		Ok	Ok	
Is inundation of well possible?		Not likely	Not likely	
6’ X 6’ X 4” Concrete Pad		OK	OK	
SET BACKS	Septic Tank	>200’	>200’	
	Reuse Water	>200’	>200’	
	WW Plumbing	>200’	>200’	
	Other Sanitary Hazard	>200’	>200’	
PUMP	Type	Vertical Turbine	Vertical Turbine	
	Manufacturer Name	Christensen	US Motors	
	Model Number	9RCHC	F766A	
	Rated Capacity (gpm)	500	1000	
	Motor Horsepower	50	75	
Well casing 12” above grade?		Ok	Ok	
Well Casing Sanitary Seal		S.C.	Ok	
Raw Water Sampling Tap		Downturned/smooth	Downturned/smooth	
Above Ground Check Valve		After raw/before trmt	After raw/before trmt	
Fence/Housing		Secured Fence	Secured Fence	
Well Vent Protection		Ok	Ok	

COMMENTS _____

Newberry WTP Plant #2

PWS ID # 2010207-02
Survey Date 6/18/20

CHLORINATION (Disinfection)
Type: Hypo-Chlorination
Make Stenner Capacity 40 gpd (each)
Chlorine Feed Rate Set at 6.25 & 7
Avg. Amount of Cl_2 gas used N/A
Chlorine Residuals: Plant 2.2+ Remote 1.54
Remote tap location Newberry Corners Office
DPD Test Kit: ☐ On-site ☒ With operator
☐ None ☐ Not Used Daily
Injection Points before contact time tanks
Booster Pump Info N/A
Comments

Chlorine Gas Use Requirements	YES	NO	Comments N/A
Dual System	☐	☐	
Auto-switchover	☐	☐	
Alarms:			
Loss of Cl_2 capability	☐	☐	
Loss of Cl_2 residual	☐	☐	
Cl_2 leak detection	☐	☐	
Scale	☐	☐	
Chained Cylinders	☐	☐	
Reserve Supply	☐	☐	
Adequate Air-pak	☐	☐	
Sign of Leaks	☐	☐	
Fresh Ammonia	☐	☐	
Ventilation	☐	☐	
Room Lighting	☐	☐	
Warning Signs	☐	☐	
Repair Kits	☐	☐	
Fitted Wrench	☐	☐	
Housing/Protection	☐	☐	

AERATION (Gases, Fe, & Mn Removal)
Type N/A Capacity
Aerator Condition
Bloodworm Presence
Visible Algae Growth
Protective Screen Condition
Comments

STORAGE FACILITIES
(B) Bladder (CW) Clearwell (C) Contact (E) Elevated
(G) Ground (H) Hydropneumatic (S.C.) See Comments

Tank Type/Number	C1	C2	C3	EST2
Capacity (gal)	7.5k	10k	15k	150k
Material	Steel	Steel	Steel	Steel
By-pass Piping	No	No	No	No
Gravity Drain	Yes	Yes	Yes	Yes
PRV/ARV	PRV	PRV	PRV	ARV
Protected Openings	N/A	N/A	N/A	Yes
Pressure Gauge	Yes	Yes	Yes	Yes
Sight Glass or Level Indicator	No	No	No	L.I.
Fittings for Sight Glass	No	No	No	N/A
Access Padlocked	Yes	Yes	Yes	Yes
Last Inspection Date (for tanks with access manholes)	2016/6	2016/6	2016/6	2016/6
On/Off Pressure	40/60	40/60	40/60	40/60
Height to Bottom of Elevated Tank	N/A	N/A	N/A	Unk
Height to Max. Water Level	N/A	N/A	N/A	Unk

Comments New tank insp completed. Report to be forwarded when available.

HIGH SERVICE PUMPS

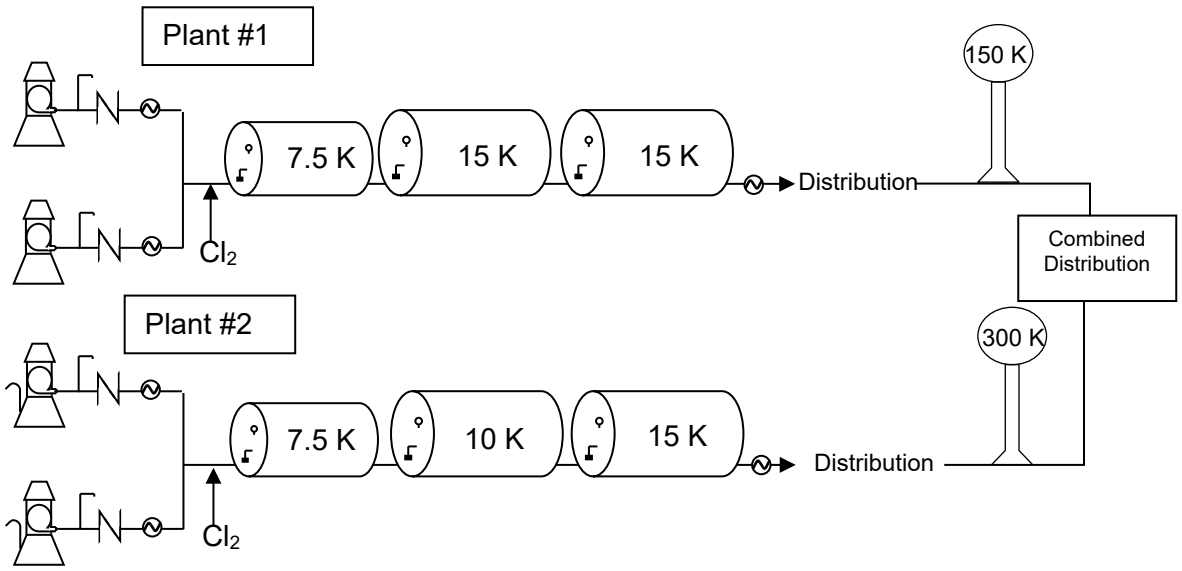
Pump Number	N/A		
Type			
Make			
Model			
Capacity (gpm)			
Motor HP			
Date Installed			
Maintenance			

Comments

Newberry WTP Plant #2

PWS ID # 2010207-02
Survey Date 6/18/20

SCHEMATIC (not to scale):



SCHEMATIC KEY					
Well w/ Vertical turbine		Check valve			
Raw Tap		Flow meter			
Contact time tank		Elevated Storage Tank		Well vent	

Newberry WTP Plant #2

PWS ID # 2010207-02
Survey Date 6/18/20

Monitoring Schedule					
Chemical	**Next Due**	**Comments**	**Chemical**	**Next Due**	**Comments**
Bacteriologicals	Monthly		VOCs	2023	
Disinfectant Levels	Monthly	with bactis	SOCs	2020	Second set or waiver
Nitrate & Nitrite	2021	N/N due annually	Rads	2026	
Inorganics	2023		DBPs	2021	July@SW 242 Terr, LS 21
Asbestos	2029		Pb-Cu	2023	Jun-Sep
Secondaries	2023		WQPs	N/A	

**Sample locations vary. If you have any questions, please contact your inspector.*

MONITORING VIOLATIONS	MCL VIOLATIONS
N/A	N/A

DEFICIENCIES:

#	Deficiency	Rule Reference	Corrective Action	Severity	Corrected
	No deficiencies observed at WTP #2 during the inspection.				

ADDITIONAL COMMENTS:

No deficiencies observed during the inspection at WTP#2.

Inspector: Ben Piltz
Ben Piltz, Environmental Specialist II (904) 256-1639
benjamin.piltz@dep.state.fl.us

Approved by: Joni Petry
Joni Petry, Environmental Consultant

APPENDIX B: COST INFORMATION ON SELECTED ALTERNATIVE

NEWBERRY STORAGE TANK
ALTERNATIVE 1 - PEDESPHERE EST

ITEM NO.	DESCRIPTION	UNITS	UNIT COST	QTY	TOTAL	EXPECTED LIFE	YEARS REMAINING	SALVAGE VALUE	REPLACEMENT COST	ANNUAL O&M	LIFE CYCLE COST (LCC)
CONSTRUCTION COSTS											
1	0.5 MG Storage Tank	EA	$ 2,350,000.00	1	$2,350,000	60	40	$1,567,000	$0	$47,000	$1,993,000
2	Tank Coating	LS	$ 40,000.00	1	$40,000	20	0	$0	$0	$800	$54,000
3	8" DI Pipe	LF	$ 260	800	$208,000	35	15	$89,000	$0	$4,160	$213,000
4	12" DI Pipe	LF	$ 510	1200	$612,000	35	15	$262,000	$0	$12,240	$628,000
5	Connect to Existing 8" and 12" Mains	EA	$ 10,000	2	$20,000	35	15	$9,000	$0	$400	$20,000
6	Hydrant Assembly	EA	$ 5,700	2	$11,400	40	20	$6,000	$0	$228	$11,000
7	Valve + Fitting Allowance	LS	$ 84,500	1	$84,500	20	0	$0	$0	$1,690	$114,000
8	Chain Link Fence + Gate	LF	$ 70	800	$56,000	20	0	$0	$0	$1,120	$75,000
9	Gas Generator	EA	$ 5,000	1	$5,000	17	-3	$0	$1,000	$100	$7,000
10	Electrical Site Work	LS	$ 5,100	1	$5,100	20	0	$0	$0	$102	$7,000
11	Uninterruptible Power Supply	EA	$ 1,500	1	$1,500	17	-3	$0	$0	$30	$2,000
12	Driveway (Asphalt)	SY	$ 55	1400	$77,000	20	0	$0	$0	$1,540	$103,000
13	Crushed Stone (Tank Washdown)	CY	$ 40	200	$8,000	35	15	$3,000	$0	$160	$9,000
14	Concrete Energy Blocks (Tank Washdown)	EA	$ 75	15	$1,125	35	15	$0	$0	$23	$2,000
15	Site Clearing + Grading	LS	$ 65,000	1	$65,000	20	0	$0	$0	$1,300	$87,000
16	Loam and Seed Disturbed Area	SY	$ 3	9000	$27,000	20	0	$0	$0	$540	$36,000
17	Instrumentation	LS	$ 45,000	1	$45,000	10	-10	$0	$45,000	$900	$94,000
18	Traced Wires (along 12" WM)	LF	$ 2	1500	$3,000	10	-10	$0	$3,000	$60	$6,000
19	SCADA Implementation	LS	$ 4,500	1	$4,500	10	-10	$0	$5,000	$22,866	$401,000
20	Testing Allowance	LS	$ 15,000	1	$15,000	20	0	$0	$0	$0	$15,000
21	Maintenance of Traffic Allowance	LS	$ 10,000	1	$10,000	20	0	$0	$0	$0	$10,000
22	Mobilization/Demobilization (5%)	5%	$ 182,456	1	$182,456	20	0	$0	$0	$0	$182,000
23	Insurance and Bonds (3%)	3%	$ 109,474	1	$109,474	20	0	$0	$0	$0	$109,000
24	General Conditions (5%)	5%	$ 182,456	1	$182,456	20	0	$0	$0	$0	$182,000
25	Overhead & Profit (10%)	10%	$ 364,913	1	$364,913	20	0	$0	$0	$0	$365,000
SUBTOTAL					**$4,488,500**			**$1,936,000**	**$54,000**	**$95,300**	**$4,725,000**
NON-CONSTRUCTION COSTS											
26	Contingency	10%	$ 448,850	1	$448,900	20	0	$0	$0	$0	$449,000
27	Engineering, Permitting, and Design	10%	$ 448,850	1	$448,900	20	0	$0	$0	$0	$449,000
28	Engineering Services during Construction	5%	$ 224,425	1	$224,500	20	0	$0	$0	$0	$225,000
29	Legal and Administration	3%	$ 134,655	1	$134,700	20	0	$0	$0	$0	$135,000
	Opinion of Capital Cost				**$5,745,500**						**$5,983,000**

APPENDIX C: CONSUMPTIVE USE PERMIT

April 06, 2021

Mike New
City of Newberry
PO Box 369
Newberry, FL 32669-0369

SUBJECT: Water Use Permit Number 2-001-216450-5
City of Newberry Project

Dear Sir/Madam:

Enclosed is your permit as authorized by the Suwannee River Water Management District (District) on April 06, 2021.

Please be advised that the period within which a person may file a formal objection and request that the permit application be considered by the District's Governing Board does not expire until fourteen (14) days after an application receipt notice is published by the District. If a substantial objection is received by the District prior to that date, then this permit will become null and void and the application will be scheduled for consideration at a meeting of the District's Governing Board. Also, please note that a third party may request an administrative hearing on this permit twenty-six (26) days from the date on which a decision notice is deposited in the mail, or twenty-one (21) days from publication of a decision notice, pursuant to Sections 120.569 and 120.57, Florida Statutes. It is the permittee's responsibility to publish notice of the District's decision to issue this permit pursuant to rule 40B-1.1010, Florida Administrative Code.

Permit issuance does not relieve you from the responsibility of obtaining permits from any federal, state and/or local agencies asserting concurrent jurisdiction over this work. The enclosed permit is a legal document and should be kept with your other important records. Please read the permit and conditions carefully since the referenced conditions may require submittal of additional information. All information submitted as compliance with permit conditions should include the above referenced permit number.

Sincerely,

Tilda Musgrove

Tilda Musgrove
Resource Management

Enclosures: Permit, Conditions for Issuance, Map

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
Live Oak, Florida 32060

PERMIT NO: 2-001-216450-5 **DATE ISSUED:** April 06, 2021
PROJECT NAME: City of Newberry

A PERMIT AUTHORIZING:

Allocation Summary		
Average Daily Rate (Million Gallons Per Day)	**Freeze Protection (Million Gallons Per Year)**	**Allocation Change (Million Gallons Per Day)**
0.8381		0.0000

LOCATION:
SITE: City of Newberry
TRS: S4 T10S R17E, S27 T9S R17E
County: Alachua

ISSUED TO:
Mike New
City of Newberry
PO Box 369
Newberry, FL 32669-0369

Permittee agrees to hold and save the Suwannee River Water Management District and its successors harmless from any and all damages, claims, or liabilities which may arise from permit issuance. Said application, including all plans and specifications attached thereto, is by reference made a part hereof.

This permit does not convey to permittee any property rights nor any rights or privileges other than those specified herein, nor relieve the permittee from complying with any law, regulation or requirement affecting the rights of other bodies or agencies. This permit may be revoked, modified or transferred at any time pursuant to the appropriate provisions of Chapter 373, Florida Statutes and 40B-2, Florida Administrative Code.

PERMIT IS CONDITIONED UPON:
See conditions on attached “Exhibit A”, dated April 06, 2021

AUTHORIZED BY: Suwannee River Water Management District

By: 

Hugh Thomas , Executive Director

"EXHIBIT A"
CONDITIONS FOR ISSUANCE OF PERMIT NUMBER 2-001-216450-5
City of Newberry
DATED April 06, 2021

1. Nothing in this permit should be construed to limit the authority of the Suwannee River Water Management District to declare a water shortage and issue orders pursuant to Section 373.175, Florida Statutes, or to formulate a rule for implementation during times of water shortage pursuant to Section 373.246, Florida Statutes. In the event of water shortage as declared by the Board, the permittee shall adhere to any limitations on withdrawal or use ordered by the District.

2. Use classification is **Public Supply**.

3. The permittee shall allow District personnel at reasonable times and at District expense or with District equipment to monitor withdrawal rates and volumes authorized by this permit.

4. Capping of withdrawals not in use: any wells not in use, and in which pumping equipment is not installed shall be capped or valved in a water tight manner in accordance with Rule 40B-3.521, Florida Administrative Code.

5. City of Newberry shall correct any unforeseen adverse impact on existing legal uses, existing off-site land uses, and to the natural systems as a consequence of withdrawals permitted herein. If adverse impacts occur, or are imminent, the District reserves the right to curtail future withdrawal rates or otherwise modify the permit. Adverse impacts include: a. Cumulative reduction in well water levels that impairs the ability of the well to produce water; b. Cumulative reduction in levels in an adjacent water body such as a lake, pond, or retention/detention area that impairs the designated function of the water body or the ability for a permitted withdrawal facility to produce water; c. Saline water intrusion or induced movement of pollutants into the water supply of an adjacent water use, resulting in harm due to a reduction in water quality; d. Land collapse or subsidence caused by reduction in water levels; e. Damage to crops and other types of vegetation; f. Harm to a naturally occurring water body such as lake, pond, or wetland by reducing water levels or changing the hydroperiod; and, g. Harm to the natural system including damage to habitat for endangered or threatened species, or species of special concern.

6. City of Newberry shall implement measures to reduce the unaccounted for water loss to a level of 10% or less by reducing non-metered uses, replacement of faulty meters, detection and correction of leaks or other appropriate means.

7. City of Newberry shall maintain an accurate, non-resettable, totalizing flow meter(s) at each water withdrawal point for public supply use. The meters shall be accurate to within 5 percent of actual flow. The meters shall be calibrated at a minimum every 5-years with a report of the calibration submitted to the District within 30 days of completion. Meters found to be outside the 5 percent flow measurement requirement shall be repaired or replaced within 30 days of discovery. The District shall be notified of any broken meters within 15-days of discovery and the reported flow shall be estimated and submitted to the District for the time the meter was out-of-service.

8. City of Newberry shall notify the District of any change in municipal potable water service area within 30 days of change in boundary.

9. City of Newberry shall provide to the District a copy of the monthly operating report submitted to Florida Department of Environmental Protection showing daily wellfield pumpage not later than 15 working days after the end of each month. The water use permit number shall be displayed on all reports.

10. City of Newberry will implement all water conservation practices as submitted as part of the application.

11. The permittee is authorized to withdraw 0.8381 mgd of groundwater for public supply use. Daily allocations are calculated on an average annual basis.

12. This permit shall expire on **12/10/2022**. The permittee must submit the appropriate application form incorporated by reference in subsection 40B-2.402(8)(a), F.A.C., and the required fee to the District pursuant to section 40B-2.361, F.A.C., up to one year prior to this expiration date in order to continue the use of water

Withdrawal Point Information

Site Name: City of Newberry

Well Details						
District ID	**Station Name**	**Casing Diameter (inches)**	**Capacity (GPM)**	**Source Name**	**Status**	**Use Type**
118844	Well No. 1	10	450	Groundwater	Active	Public Supply
119187	Well No. 2	12	500	Groundwater	Inactive	unknown
119891	Well No. 5	16	1000	Groundwater	Active	Public Supply
120375	Well No. 3	10	500	Groundwater	Active	Public Supply
120737	Well No. 4	12	500	Groundwater	Active	Public Supply

NOTICE OF RIGHTS

1. A person whose substantial interests are or may be determined has the right to request an administrative hearing by filing a written petition with the Suwannee River Water Management District (District), or may choose to pursue mediation as an alternative remedy under Section 120.569 and 120.573, Florida Statutes, (F.S.), before the deadline for filing a petition. Choosing mediation will not adversely affect the right to a hearing if mediation does not result in a settlement. The procedures for pursuing mediation are set forth in Sections 120.569 and 120.57 F.S. Pursuant to Rule 28-106.111, Florida Administrative Code, (F.A.C.), the petition must be filed at the office of the District Clerk at District Headquarters, 9225 C.R. 49, Live Oak, Florida 32060 within twenty-one (21) days of receipt of written notice of the decision or within twenty-one (21) days of newspaper publication of the notice of District decision (for those persons to whom the District does not mail actual notice). A petition must comply with Chapter 28-106, F.A.C.

2. If the Governing Board takes action which substantially differs from the notice of District decision to grant or deny the pe1mit application, a person whose substantial interests are or may be determined has the right to request an administrative hearing or may choose to pursue mediation as an alternative remedy as described above. Pursuant to Rule 28-106.111, F.A.C. the petition must be filed at the office of the District Clerk at District Headquarters, 9225 C.R. 49, Live Oak, Florida 32060 within twenty-one (21) days of receipt of written notice of the decision or within twenty-one (21) days of newspaper publication of the notice of District decision (for those persons to whom the District does not mail actual notice). Such a petition must comply with Chapter 28-106, F.A.C.

3. A substantially interested person has the right to a formal administrative hearing pursuant to Section 120.569 and 120.57(1), F.S., where there is a dispute between the District and the party regarding an issue of material fact. A petition for formal hearing must comply with the requirements set forth in Rule 28-106.201, F.A.C.

4. A substantially interested person has the right to an informal hearing pursuant to Section 120.569 and 120.57(2), F.S., where no material facts are in dispute. A petition for an informal hearing must comply with the requirements set forth in Rule 28-106.301, F.A.C.

5. A petition for an administrative hearing is deemed filed upon receipt of the petition by the Office of the District Clerk at the District Headquarters in Live Oak, Florida.

6. Failure to file a petition for an administrative hearing within the requisite time frame shall constitute a waiver of the right to an administrative hearing pursuant to Rule 28-106.111, F.A.C.

7. The right to an administrative hearing and the relevant procedures to be followed is governed by Chapter 120, F.S., and Chapter 28-106, F.A.C.

8. Pursuant to Section 120.68, F.S., a person who is adversely affected by final District action may seek review of the action in the District Court of Appeal by filing a notice of appeal pursuant to the Florida Rules of Appellate Procedure, within 30 days of the rendering of the final District action.

9. A party to the proceeding before the District who claims that a District order is inconsistent with the provisions and purposes of Chapter 3 73, F. S., may seek review of the order pursuant to Section 373.114, F.S., by the Florida Land and Water Adjudicatory Commission, by filing a request for review with the Commission and serving a copy of the Department of Environmental Protection and any person named in the order within 20 days of adoption of a rule or the rendering of the District order.

10. For appeals to the District Courts of Appeal, a District action is considered rendered after it is signed on behalf of the District, and is filed by the District Clerk.

11. Failure to observe the relevant time frames for filing a petition for judicial review, or for Commission review, will result in waiver of the right to review.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Notice of Rights has been sent by U.S. Mail to:

Mike New
City of Newberry
PO Box 369
Newberry, FL 32669-0369

This April 06, 2021

_____
Deputy Clerk
Suwannee River Water Management District
9225 C.R. 49
Live Oak, Florida 32060
386.362.1001 or 800.226.1066 (Florida only)

cc: Permit Number: 2-001-216450-5

APPENDIX D: CARBOLINE TANK COATING DOCUMENTATION

Phenoline® Tank Shield

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	Phenolic epoxy novolac
Description	This product is a solvent-free, high performance epoxy coating designed as an internal tank, valve and pipe lining for chemical or other commodity storage. It is a unique blend of resins and curing agents that allow batch mixing for ease of application. Plural component spray equipment is not required. The product is blush resistant and is typically applied at film thicknesses of 20 mils (500 microns) or thicker as needed (tank floors). It can handle exposures typically seen in the oil and gas industries; crude oils and fuels. It is resistant to NGL condensates, produced water, brines, industrial process water, waste water, and sewage. Ideal for municipal wastewater and water treatment facilities. Phenoline Tank Shield may be used as a patching and seam sealer by adding Carboline Thixatrope D to the pre-mixed kit at a ratio between 2:1 and 1:1 by volume resin:powder. For potable water service topcoat with Phenoline Tank Shield.
Features	• Batch mix formulation, single leg airless spray • High impact resistance • Superior adhesion to steel • Excellent resistance to water and salt water • Resistance to a broad range of fuels • Passes EI 1541 requirements for internal protective coating systems used in aviation fuel handling systems, including the jet fuel gum test • Adheres to API 653 inspection and API 652 guidelines for inspection intervals. • Resistant to hot water up to 180°F (82°C) • Excellent abrasion resistance and flexibility • Can be applied down to 35 °F (2 °C) • Can be applied as a single or multi-coat system • Non-blushing with a long recoat window • NSF/ANSI 61 compliant for use in potable water tanks, pipes, and valves.* • Certified by UL to meet the drinking water criteria of NSF/ANSI/CAN 600 • Low odor Contact Carboline Technical Service for approved dimensions. *Valid when manufactured at a certified location.
Color	Standard: Grey (N700), White (N800), Blue (N100)
Finish	Gloss
Primer	Coating is normally applied direct to metal. May be applied over other primers as recommended by Carboline.
Dry Film Thickness	12 - 30 mils (305 - 762 microns) per coat Depends on service and existing condition of the substrate, product is typically applied in a one coat application at the appropriate film thickness depending on the application. Higher film thicknesses (60+ mils/1500+ microns) are used for more aggressive or abrasive conditions or for severely pitted steel (tank bottoms). Maximum vertical film build is 30 mils (750 microns). **For potable water applications:** 1 or 2 coats to a maximum of 50 mils (1250 microns).
Solids Content	By Volume 99% +/- 1%

SELECTION & SPECIFICATION DATA

Theoretical Coverage Rate	1588 ft²/gal at 1.0 mils (39.0 m²/l at 25 microns) 132 ft²/gal at 12.0 mils (3.2 m²/l at 300 microns) 53 ft²/gal at 30.0 mils (1.3 m²/l at 750 microns) Allow for loss in mixing and application.
VOC Values	**As Supplied** : 9 g/l
Wet Temp. Resistance	Immersion temperature resistance depends upon exposure, consult Carboline Technical Service for specific information

SUBSTRATES & SURFACE PREPARATION

General	Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating
Steel	Cleanliness: Abrasive blast to SSPC-SP10 (minimum) Profile: Minimum 3 mil (75 micron) dense, sharp anchor profile free of peening, as measured by ASTM D 4417. Defects exposed by blasting must be repaired.
Stainless Steel	Prepare by abrasive blasting to SSPC-SP 17 Thorough Abrasive Blast to a minimum of 3 mils (75 microns) dense angular anchor profile.
Concrete	Concrete: Clean and dry. Remove all loose, unsound concrete. Do not apply coating unless concrete has cured at least 28 days @ 70°F (21°C) and 50% RH or equivalent. Prepare surfaces in accordance with ASTM D4258 Surface Cleaning of Concrete and ASTM D4259 Abrading Concrete. Voids in concrete may require filling/surfacing.

MIXING & THINNING

Mixing	This product may be batch mixed and applied using standard airless spray equipment. IMPORTANT: Power mix each component separately, then combine and power mix until homogenous. Component Details for Colors: Grey (N700): The Part A is black (N909) and the Part B is white (N800) Blue (N100): The Part A is blue (N910) and the Part B is white (N800) White (N800): The Part A is clear (N000) and the Part B is white (N800)
Thinning	Thinning not normally required.
Ratio	1:1 by volume (Part A to Part B)
Pot Life	30 minutes at 75°F (24°C). Consult Carboline Technical Service for techniques to maximize pot life.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

General

This is a high solids coating and may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from equipment manufacturers.

Airless Spray

Airless spray equipment capable of minimum 6000 psi (60:1 ratio or higher is preferred)with a minimum 180 cc lower. Fluid hose shall be minimum 3/8" I.D. Airless spray gun shall be rated minimum 7000 psi utilizing reverse-a-clean tips sizes 0.021-0.027” with fan size range between #5 to #9. A wider tip fan size facilitates break up and reduces fingering.
Fixed-ratio (1:1 by volume) plural component equipment may also be used if the material cannot be sprayed within the pot life of the mixed material. Plural spray rig shall have heated hoppers, heated hoses to a mixer manifold through (at least two) static mixers to a 15-25 ft. 3/8" I.D. whip hose. Pre-mix the separate components prior to adding or incorporating into plural component equipment to break the gel. Do not heat material above 110°F (43°C).
See "Phenoline Tank Shield Application Guide" for more detailed instructions.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	55°F (13°C)	35°F (2°C)	35°F (2°C)	0%
Maximum	90°F (32°C)	125°F (52°C)	110°F (43°C)	85%

This product requires the substrate temperature to be above the dew point. Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions.

CURING SCHEDULE

Surface Temp.	Dry to Handle	Immersion Service (Most Chemical Service)
35°F (2°C)	74 Hours	7 Days
50°F (10°C)	30 Hours	5 Days
75°F (24°C)	10 Hours	3 Days
90°F (32°C)	5 Hours	24 Hours

Dry to Touch and Dry to Recoat is normally 6 hours at 75°F (24°C).
Cure for Service: Cure for service times are dependent on curing conditions and expected immersion exposure. Film hardness (Shore D of 75 or greater) and/or solvent resistance (passes a 25 MEK solvent double-rubs*); are good indications that the lining is suitable for immersion service. Typically this can be from 24-72 hours or longer depending on the curing conditions.
Maximum recoat time is 30 days at 75°F (24°C) and reduces in half for each additional 15°F increase of surface temperature. If the product has exceeded the maximum recoat time, de-gloss and roughen by light sanding or mechanically abrade the surface and remove dust prior to topcoating.
*No significant color pick-up and some down-glossing is acceptable

CLEANUP & SAFETY

Cleanup

Thinner #2 or #76 are recommended for clean up.

Safety

Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions.

TESTING / CERTIFICATION / LISTING

Potable Water Certifications	**Potable Water Use Limitations @ 75°F (24°C):** *Meets drinking water criteria of NSF/ANSI/CAN 600* Max DFT: 50 mils (1270 microns) # Coats: 1 to 2 Tank Rating: >500 gal (1892.71 Liters) Pipe Rating: 12" or larger (30.48 cm) Valve Rating: 4" or larger (10.16 cm) Thinning: N/A 4 Day Cure Required before service Approved Colors: N800 (White), N700 (Grey), N100 (Blue)

PACKAGING, HANDLING & STORAGE

Packaging	100 gal. kit (378 L) 10 Gal (37.8 L) Kit 4 Gal (15.1 L) Kit
Shelf Life	12 months
Storage Temperature & Humidity	40-110 °F (4-43 °C) 0-90% Relative Humidity
Shipping Weight (Approximate)	12 lbs/gal (5.5 kg/gal)
Flash Point (Setaflash)	Part A: 166 °F (74 °C) Part B: 204 °F (95 °C)

WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated.

Phenoline® Tank Shield

PRODUCT PERFORMANCE SUMMARY

ADHESION

Method	Pneumatic Adhesion (ASTM D4541)
System	One coat @ 20-30 mils DFT
Cure	Minimum 7 days at lab ambient
Surface Profile	3.0 mil profile
Results	3500 psi (24 MPa)

ADHESION

Method	Knife Adhesion (ASTM D6677)
System	One coat @ 20-25 mils DFT
Cure	Minimum 7 days at lab ambient
Surface Profile	3.0 mil profile
Results	10

ABRASION RESISTANCE

Method	ASTM D4060
Exposure	1000 cycles; 1000 gram weight; CS-17 wheel
System	One coat @ 20-30 mils DFT
Results	96 mg loss

CATHODIC DISBONDMENT

Method	Modified ASTM G95 CD
Exposure	30 days at -1.5 volt with 3% NaCl
System	**System 1:** One coat @ 8-13 mils DFT at Lab Ambient **System 2:** One coat @ 25-33 mils DFT at Lab Ambient **System 3:** One coat @ 25-35 mils DFT at 150ºF
Substrate & Surface Profile	ASTM A36 carbon steel, SSPC-SP5 with a 3-4 mil anchor profile
Results	**System 1:** 16 mm total disbondment **System 2:** 14 mm total disbondment **System 3:** 18 mm total disbondment

DIRECT IMPACT RESISTANCE

Method	ASTM D2794
Exposure	Highest impact in inch-lbs without failure (cracking)
System	One coat @ 20-25 mils DFT
Surface Profile	3.0 mil profile
Results	58 in/lbs

JET FUEL GUM TEST

Method	EI1541
System	One coat @ 20-25 mils DFT
Results	Pass (Full Results and Report from Intertek available upon request)

MIL-PRF-4556F TESTING

MIL-PRF-4556F Section	Test	Results
4.13.15	Knife Test	Adhered tightly to substrate with no delamination between coats
4.3.17	Fuel and water resistance	No blistering or softening observed
Modified 4.3.18	ASTM D4541 Pneumatic Adhesion	Fuel phase: 2400 psi, Tank Shield cohesion Water phase: 1600 psi, Tank Shield adhesion
Modified 4.3.18	ASTM D6677 Knife Test	Fuel phase: 10 Water phase: 8
4.3.19	Impact resistance	No cracking or delamination observed

NSF 61 POTABLE WATER

Method	UL NSF/ANSI 61
System	Maximum film build of 50 mils
Tank Rating	Greater than or equal to 500 gallons
Pipe Rating	Diameter greater than or equal to 12 inches
Valves and Fittings	4 inches and greater

TENSILE STRENGTH AND/OR ELONGATION

Method	ASTM D638
System	System 1: One coat @ 25-28 mils DFT System 2: One coat @ 45-53 mils DFT
Surface Profile	3.0 mil profile
Results	**System 1:** Tensile strength 3100 psi Elongation: 1.1% **System 2:** Tensile strength: 3900 psi Elongation: 1.6%

PETROLEUM PRODUCTS IMMERSION RESISTANCE

Method	NACE Standard TM-01-74 (Procedure B)
Exposure	See Results
Duration	12 months immersion
System	One coat @ 20-30 mils DFT
Surface Profile	3.0-3.5 mil profile
Results	The following exposures were found suitable for Tank Shield
	Sweet Crude Oil up to 200ºF (93ºC) Pump Gasoline up to 122ºF (49ºC) Gasoline/Ethanol Blends up to 120ºF (49ºC) Jet Fuels and Diesel up to 120ºF (49ºC) Ethylene Glycol up to 150°F (66°C) UAN, 32% up to 200°F (93°C)

WATER AND OTHER CHEMICAL IMMERSION RESISTANCE

Method	NACE Standard TM-01-74
Exposure	See Results
Duration	12 months immersion
System	One coat @ 25-30 mils DFT
Surface Profile	3.0 mil profile
Results	The following exposures were found suitable for Tank Shield
	Deionized Water @ 180ºF (82ºC) Salt Water (5%) @ 150ºF (65ºC) Diethanolamine up to 130ºF (54ºC) 50% NaOH @ 200ºF (93ºC) 10-50% H_2SO_4 @ 75ºF (24ºC) 73% H_2SO_4 @ 75ºF (24ºC) 50% Potassium Hydroxide @ 100°F (38°C) 83% Ammonium Nitrate @ 250°F (121°C) 32% and 50% Calcium Chloride @150°F (66°C) 60% Choline Chloride @150°F (66°C)

*Linings are evaluated for surface attack, softening, blistering, penetration, discoloration, flaking and delamination. Some high temperature exposures may discolor the lining.

NOTE

The technical data presented in this document is accurate to the best of Carboline's knowledge based on laboratory testing of the product(s) or system(s) described. Actual results in the field may vary depending on field conditions and application methods. The performance characteristics stated do not constitute a guarantee or warranty that the products will meet the stated results under all circumstances. Contact Carboline technical staff with questions. TP05718, 06085T, 06270T,

Carbozinc® 859

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	Organic Zinc-Rich Epoxy
Description	Low VOC organic zinc epoxy steel primer with extremely fast cure-to-topcoat characteristics for in-shop applications and quick turnaround requirements in the field. Carbozinc 859 has less than 3 lbs/gallon (359.5 g/l) VOC (thinned) and is used extensively in virtually all industrial markets.
Features	• Meets Class B slip co-efficient and creep testing criteria for use on faying surfaces • Rapid cure. Dry to recoat in 30 minutes at 75°F (24°C) and 50% relative humidity. • Complies with SSPC Paint 20 (Type II) • Low temperature cure down to 35°F (2°C) • Excellent adhesion • Protects against undercutting corrosion • Field proven primer that applies well by spray methods • Excellent touch-up primer by brush or roll for small areas. • VOC compliant to current AIM regulations • Approved for MPI #20
Color	Green (0300); Gray (0700)
Finish	Flat
Primer	Self Priming
Dry Film Thickness	3 - 5 mils (76 - 127 microns) per coat Dry film thickness in excess of 10.0 mils (250 microns) per coat is not recommended.
Total Zinc Dust in Dry Film	By Weight: 81%
Solids Content	By Volume 66% +/- 2% Tested in accordance with ASTM D2697.
Theoretical Coverage Rate	1059 ft²/gal at 1.0 mils (26.0 m²/l at 25 microns) 353 ft²/gal at 3.0 mils (8.7 m²/l at 75 microns) 212 ft²/gal at 5.0 mils (5.2 m²/l at 125 microns) Allow for loss in mixing and application.
VOC Values	Thinner 236 E : 13 oz/gal: 2.72 lbs/gal (326 g/l) Thinner 2 : 13 oz/gal: 3.12 lbs./gal (374 g/l) Thinner 33 : 13 oz/gal: 3.15 lbs./gal (378 g/l) **As Supplied** : 2.72 lbs./gal (326 g/l) These are nominal values. *Use Thinner 76 for projects requiring non-photochemically reactive solvents.
Dry Temp. Resistance	Continuous: 400°F (204°C) Non-Continuous: 425°F (218°C)
Topcoats	Acrylics, epoxies, polyurethanes and others as recommended by your Carboline sales representative. Under certain conditions, a mist coat is required to minimize topcoat bubbling.

SUBSTRATES & SURFACE PREPARATION

General

Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel

SSPC-SP6 with a 1.0-3.0 mil (25-75 micron) surface profile.
SSPC-SP2 or SP3 with a roughened surface for touch-up.

When using under fireproofing products, defer to the primer surface preparation requirements in the product data sheet of the fireproofing product.

PERFORMANCE DATA

All test data was generated under laboratory conditions. Field testing results may vary.

Test Method	System	Results
ASTM D2794 Impact	A. 859 B. 859/ Polyurethane Gardner Impact Tester, Direct (Intrusion), inch-pounds, over 1/8" (0.32 cm) steel	A. 160 B. 100 min.
ASTM D4541 Adhesion	A. Carbozinc 859 B. 859 / Polyurethane C. 859 / Epoxy/Polyurethane	A. 841 psi Pneumatic B. 1,100 min. psi Pneumatic C. 602 psi Elcometer
ASTM D522 Flexibility	A. 859 B. 859/Polyurethane	A. >6% B. >5%
ASTM D870 Immersion	A. Carbozinc 859/Epoxy/Polyurethane Salt Water (5% sodium chloride) at 75°F (24°C), 30 days B. 859 / Epoxy/ Polyurethane; Fresh Water @75°F for 30 d	A & B had no rusting in the scribe; and no blistering, softening or discoloration with either environment
Slip Co-efficient	Carbozinc 859 A-490 bolt spec; 6 mils dry film maximum 10% max thinning	Meets requirements for class B rating

Test reports and additional data available upon written request.

MIXING & THINNING

Mixing

Power mix Part A completely. Then slowly sift in the zinc filler under agitation. Power mix Part B separately and add slowly to the mixture. Pour mixture through a 30 mesh screen. DO NOT MIX PARTIAL KITS.
Tip: Sifting zinc through a window screen will aid in mixing process by breaking up or catching dry zinc lumps.

Thinning

Normally not required but may be thinned up to 13 oz/gal (106.8 g/l) (10%) with Thinner 2, Thinner 76 or Thinner 236E. In hot or windy conditions, may be thinned up to 13 oz/gal (106.8 g/l) with Thinner 33. Use of thinners other than those supplied by Carboline may adversely affect product performance and void product warranty, whether expressed or implied. Use of Carboline Thinner 236E to thin this product will minimize HAP and VOC emissions. Consult Carboline Technical Service for guidance

Ratio

0.80 Gal. Kit (3.03 Liters)
Part A: 0.35 gallons (1.32 L)
Part B: 0.20 gallons (0.76 L)
Zinc Filler: 14.6 lbs (6.62 kg)
4.00 Gal. Kit (15.1 Liters)
Part A: 1.77 gallons (6.7 L)
Part B: 1 gallon (3.78 L)
Zinc Filler: 73 lbs. (33.1 kg)

MIXING & THINNING

Pot Life	4 Hours at 75°F (24°C) and less at higher temperatures. Pot life ends when coating loses body and begins to sag.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Spray Application (General)	The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco. Keep material under mild agitation during application.
Conventional Spray	Agitated pressure pot equipped with dual regulators, 3/8” (0.95 cm) I.D. minimum material hose, 0.070” (0.18 cm) I.D. fluid tip and appropriate air cap.
Airless Spray	Pump Ratio: 30:1 (min.) with pail agitator* GPM Output: 3.0 (min.) Material Hose: 3/8” I.D. (0.95 cm) (min.) Tip Size: 0.017-0.023” (0.04-0.06 cm) Output PSI: 2000-2200 Filter Size: 60 mesh *PTFE packings are recommended and available from the pump manufacturer
Brush & Roller (General)	For small areas and touch-up only. Preferred method for large areas is spray application.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	40°F (4°C)	35°F (2°C)	35°F (2°C)	0%
Maximum	90°F (32°C)	120°F (49°C)	110°F (43°C)	95%

Industry standards are for the substrate temperatures to be 5°F (3°C) above the dew point. This product simply requires the substrate temperature to be above the dew point. Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions which are as follows: material 60-85°F (16-29°C), surface & ambient 60-90°F (16-32°C) and humidity 0% - 90%.

CURING SCHEDULE

Surface Temp.	Dry to Handle	Dry to Recoat & Topcoat w/ other finishes
35°F (2°C)	8 Hours	6 Hours
50°F (10°C)	5 Hours	2 Hours
75°F (24°C)	2 Hours	30 Minutes
100°F (38°C)	1 Hour	30 Minutes

These times are based on a 3.0 mil (75 micron) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure.
The general requirement is a 24 hour cure for Carboline epoxy intumescent applications. Maximum recoat time is unlimited. Recoat intervals may vary from those listed above when using under intumescent fireproofing products. Consult Carboline Technical Service for recommended cure times before applying Carboline intumescent products.
Must have a clean, dry surface free of chalk, zinc salts, etc. per typical good painting practices. Consult Carboline Technical Service for specific information.

CLEANUP & SAFETY

Cleanup	Use Thinner 2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.
Safety	Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.
Ventilation	When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. In addition to ensuring proper ventilation, appropriate respirators must be used by all application personnel. This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

PACKAGING, HANDLING & STORAGE

Shelf Life	Part A: 36 months at 75°F (24°C) Part B: 24 months at 75°F (24°C) Part C: 24 months at 75°F (24°C) *Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.
Storage Temperature & Humidity	40-120°F (4-49°C) Store indoors Can be stored down to 20°F (-7°C) for no longer than 30 days 0-100% Relative Humidity
Storage	Store Indoors
Shipping Weight (Approximate)	0.80 Gallon (3.02 L) Kit - 22 lbs (10 kg) 4.00 Gallon (15.1 L) Kit - 105 lbs (48 kg)
Flash Point (Setaflash)	Part A: 49°F (9°C) Part B: 38°F (3°C) Zinc Filler: NA

WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated.

Carboxane® 2000

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	Modified Siloxane Hybrid
Description	Carboxane 2000 is an isocyanate free, ultra-durable coating that provides outstanding color and gloss retention as well as excellent corrosion protection for exterior exposures. When used over a suitable primer (as a two coat system) Carboxane 2000 provides the barrier, corrosion resistance properties, and weatherability normally achieved with a three-coat system (primer, epoxy intermediate with an acrylic-polyurethane finish) for most environments. This significantly speeds up the painting process, saves labor, and saves money without sacrificing performance. This tightly cross-linked film utilizes a UV-resistant siloxane binder resulting in a finish with excellent corrosion protection and weathering performance that far exceeds aliphatic polyurethanes.
Features	• Isocyanate free • Exceptional weatherability • Outstanding color and gloss retention • Exceeds SSPC Coating Specification No. 36 Level 3A • Excellent corrosion protection • Meets ISO 12944 C3 High and C4 Medium, one coat applied at 5 to 7 mils DFT • High build, 3 to 7 mils DFT • Saves significant time, labor, and money • Long service life • VOC compliant • Excellent durability • Good flexibility and abrasion resistance • Long pot life
Color	Refer to Carboline Color Guide
Finish	Gloss
Primer	Compatible with inorganic and organic zinc rich primers, epoxies and others as recommended by Carboline Technical Service
Dry Film Thickness	3 - 7 mils (76 - 178 microns) per coat As the finish of a two coat system (over a primer) a minimum of 5 mils (125 microns) is recommended. As the finish of a three coat system (primer and intermediate coat), a minimum of 3 mils (75 microns) is recommended. See Severe Exposures below.
Solids Content	By Volume 75% +/- 2%
Surface Burning Characteristics	Flame Spread Index: 0 Smoke Developed Index: 10
Theoretical Coverage Rate	1203 ft²/gal at 1.0 mils (29.5 m²/l at 25 microns) 401 ft²/gal at 3.0 mils (9.8 m²/l at 75 microns) 172 ft²/gal at 7.0 mils (4.2 m²/l at 175 microns) Allow for loss in mixing and application.
Severe Exposures	For severe marine environments (offshore structures) a three coat system is recommended. For other severe exposures, a two coat system may be used provided the minimum film thickness of 5 mils (125 microns) is achieved.

SELECTION & SPECIFICATION DATA

VOC Values	**As Supplied** : 1.8 lbs/gal (216 g/l) mixed Thinner 10 : 13 oz/gal: 2.29 lbs/gal (275 g/l) These are nominal values and may vary with color
Dry Temp. Resistance	Continuous: 302°F (150°C) Non-Continuous: 338°F (170°C) Some discoloration and loss of gloss may be experienced at elevated temperatures.

SUBSTRATES & SURFACE PREPARATION

General	Remove all contaminants per SSPC-SP 1. Refer to specific primer's Product Data Sheet for detailed requirements of the specified primer
Steel	Minimum Commercial Blast Clean per NACE No. 3/SSPC-SP 6 with 1.5-2.5 mil (37.5-62.5 micron) anchor profile for maximum protection. SSPC-SP2 or SP3 as minimum requirement.
Galvanized Steel	Clean and prepare per SSPC-SP 16 with 1.0-3.0 mils (25-75 microns) anchor profile or prime as recommended by your Carboline Sales Representative.

MIXING & THINNING

Mixing	Power mix Part A separately. Part B requires no mixing. Then combine power mix. DO NOT MIX PARTIAL KITS.
Thinning	Not normally required. May be thinned up to 10% (13 oz/gal) with Thinner #10 for spray, and Thinner 214, 215, or 238 for brush and roll.
Ratio	2.2:1 by volume: Part A to Part B
Pot Life	8 hours at 75°F (23°C) and less at higher temperatures. Material is moisture sensitive. If left uncovered for extended periods or under very high humidity conditions, check for and remove any skinning that may occur.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Spray Application (General)	This is a high solids coating and may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers.
Airless Spray	Pump Ratio: 30:1 (min.) Volume Output: 2.5 gpm min. (11.5 l/min min.) Material Hose: ½" I.D. min. (12.5mm min.) Tip Size: 0.017-0.021" (0.43-0.53mm) Output Pressure: 1500-2000 psi (105-140kg/cm²)
Brush & Roller (General)	Multiple coats may be required to obtain desired appearance, recommended dry film thickness and adequate hiding. Avoid excessive re-brushing or re-rolling.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Brush | Use a medium natural bristle brush.

Roller | Use a short to medium-nap mohair roller cover with solvent resistant core.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	50°F (10°C)	35°F (2°C)	35°F (2°C)	20%
Maximum	90°F (32°C)	110°F (43°C)	110°F (43°C)	90%

Industry standards are for substrate temperatures to be 5°F (3°C) above the dew point. Protect from high humidity, dew and direct moisture contact until fully cured. Application and/or curing in humidities above maximum, or exposure to moisture from rain or dew may result in a loss of gloss and/or staining of the product.

CURING SCHEDULE

Surface Temp.	Dry to Recoat	Dry to Touch	Hard Cure
35°F (2°C)	24 Hours	8 Hours	30 Hours
60°F (16°C)	12 Hours	3 Hours	24 Hours
75°F (24°C)	6 Hours	2 Hours	18 Hours

These times are based on recommended coverage rates. Curing under low humidity conditions will extend times. Maximum recoat for this product is 30 days. After this period, it is best to degloss the surface by abrasive blasting or sanding prior to recoating.
Note: Like many coatings, this coating will develop full adhesion over the initial weeks following application.
*Hard Cure = Fingernail hard

CLEANUP & SAFETY

Cleanup | Use Thinner #2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety | Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions.

Ventilation | When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.

PACKAGING, HANDLING & STORAGE

Shelf Life | Part A: 24 months at 76°F (24°C)
Part B: 24 months at 76°F (24°C)

*Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.

Storage Temperature & Humidity | 40 -110°F (4°C-43°C)
0-90% Relative Humidity

PACKAGING, HANDLING & STORAGE

Storage	Store Indoors. KEEP DRY. This product is solvent based and not affected by excursions below these published storage temperatures, down to 10°F, for a duration of no more than 14 days. Always inspect the product prior to use to make sure it is smooth and homogeneous when properly mixed.
Shipping Weight (Approximate)	1 Gallon Kit - 13 lbs (6 kg) 5 Gallon Kit - 67 lbs (30 kg)
Flash Point (Setaflash)	Part A: 96°F (36°C) Part B: 75°F (24°C) Thinner 10: 83°F (28°C) Thinner 214: 102°F (38°C) Thinner 215: 128°F (53°C) Thinner 238: 102°F (38°C) Thinner 2: 23°F (-5°C)

WARRANTY

Carboxane® 2000

PRODUCT PERFORMANCE SUMMARY

WEATHERING PERFORMANCE

Method	ASTM D4587 Cycle 2 per SSPC Coating Specification No. 36. *Level 3A is the highest level. It requires minimum exposure time of 3,000 hours with color change ≤ 2.0 delta E and maximum gloss reduction of 25% or less from the original reading.
System	Carboxane 2000, one coat applied DTM at 4 to 6 mils DFT. Color 1864 made with dry grind pigments.
Results	At 3,000 hours: Gloss Reduction -- 11%; Color Change – 0.32 delta E. At 5,000 hours: Gloss Reduction – 11%; Color Change – 0.35 delta E. At 7,000 hours: Gloss Reduction – 22%; Color Change – 0.28 delta E. At 10,000 hours: Gloss Reduction – 24%; Color Change – 0.26 delta E.

WEATHERING PERFORMANCE

Method	EMMAQUA - actual concentrated sunlight
System	Carboxane 2000
Exposure	25 months EMMAQUA exposure = 2866 MJ/m2 Average 12 months of actual south Florida weathering = 280 MJ/m2 Approximately 2.5 months of EMMAQUA exposure is equivalent to 12 months south Florida weathering
Duration	32 months
Results	At 12 months: 90% gloss retention At 25 months: 73% gloss retention At 32 months: 61% gloss retention

WEATHERING PERFORMANCE

Method	South Florida Exposure				
System	Carboxane 2000: 3 different colors (Grey, White, and Black)				
Exposure	10 years South Florida Direct Inland; 45º Facing South				
Evaluation	Panels evaluated for resistance to: Dirt Retention (ASTM D3274); Mildew (ASTM D3274); Chalking (ASTM D4214); Color Change (dE) (ASTM D2616)				
Results	**Color**	**Dirt Retention***	**Mildew***	**Chalking***	**Color (dE)**
	Grey (C705)	10/10	10/10	10/10	2.02
	White (0895)	10/10	9.75/10	10/10	1.16
	Black (C900)	10/10	10/10	10/10	0.80

*Rating out of 10 (10 being highest/best)

WEATHERING PERFORMANCE

Method	ASTM G53 Method D; QUV-A340 bulbs
System	Carboxane 2000
Exposure	Cycle: 8 hours UV/60 ºC followed by 4 hours condensation @ 45 ºC
Results	At 4,779 hours: Gloss Reduction 2% At 7,967 hours: Gloss Reduction 3.5% At 12,157 hours: Gloss Reduction 19% At 11,000 hours: Color Change 0.46 delta E

WEATHERING PERFORMANCE

Method	ASTM G53 Method D; QUV-B313 bulbs
System	Carboxane 2000
Exposure	Cycle: 8 hours UV/60ºC followed by 4 hours condensation A@ 45ºC Duration: 1500 hours total
Results	At 1,500 hours: Gloss Reduction 35%; Color Change 1.25 delta E

CORROSION PROTECTION OVER GRIT BLASTED CARBON STEEL

Method	ISO 12944-6: 2018
System	Carboxane 2000, one coat applied DTM at 5 to 7 mils DFT.
Results	Meets Corrosivity Category C3 High

CORROSION PROTECTION OVER GRIT BLASTED CARBON STEEL

Method	ISO 20340
Duration	25 cycles (4200 hours)
System	Carbozinc 859 Carboxane 2000
Surface Prep	SSPC-SP10
Results	Corrosion Undercutting: 0 mm Plane Area: No effects Adhesion: 853 psi (5.9 MPa)

CORROSION PROTECTION OVER GRIT BLASTED CARBON STEEL

Method	ASTM D5894 Cyclic Salt Fog/UV Exposure
Duration	6,048 hours
System	Carbozinc 859 Carboxane 2000
Surface Prep	SSPC-SP10
Results	Corrosion Undercutting: 3 mm Plane Area: No effects

CORROSION PROTECTION OVER GRIT BLASTED CARBON STEEL

Method	ASTM B117 Slat Spray
Duration	6,000 hours
System	Carbozinc 859 Carboxane 2000
Surface Prep	SSPC-SP10
Results	Corrosion Undercutting: 0 mm Plane Area: No effects

CHEMICAL SPOT TESTING

Method	ASTM D1308 (Chemical spot test)
System	Carboxane 2000
Exposure	1 hour @ 75ºF followed by 1 hour recovery
Results	Deionized water: Resistant; no effect Methyl ethyl ketone: Resistant; no effect Mineral spirits: Resistant; no effect 5% Sulfuric acid: Resistant; no effect 5% Hydrochloric acid: Resistant; no effect Glacial acetic acid: Resistant; no effect 5% Sodium hydroxide: Resistant; no effect Deionized water: Resistant; no effect

HARDNESS

Method	ASTM D3363 – Pencil Hardness
System	Carboxane 2000
Results	Pencil Hardness: 3H

ADHESION (WET)

Method	Total immersion in water at 75ºF for 7 days; followed by X-cut" test
System	Carboxane 2000
Results	No failure after 7 days in liquid or vapor phases

FLEXIBILITY

Method	ASTM D522 – Conical mandrel
System	Carboxane 2000
Cure	a. 3 week ambient cure b. 24 hour cure at 140ºF
Results	a. >3/8" b. >9/16"

NOTE

The technical data presented in this document is accurate to the best of Carboline's knowledge based on laboratory testing of the product(s) or system(s) described. Actual results in the field may vary depending on field conditions and application methods. The performance characteristics stated do not constitute a guarantee or warranty that the products will meet the stated results under all circumstances. Contact Carboline technical staff with questions. 425, 03748-1, 03873,06299T, 09564, 09665, 096666.

APPENDIX E: SRF BUSINESS PLAN

DRINKING WATER STATE REVOLVING FUND BUSINESS PLAN

Sponsor Name:	City of Newberry			System Population:	7,662		
DWSRF Project #:	DW01081			PWS ID#:			
Contact Person and Title:	Jamie Jones, Director of Utilities & Public Works			Telephone:	352-472-1537		
Mailing Address:	25440 W Newberry Road	City:	Newberry	State:	FL	Zip:	32618
Contact for Finance Plan (if different):	Dallas Lee			Telephone:	352-472-2161		
Mailing Address:	Same	City:		State:		Zip:	
e-mail:	dlee@NewberryFL.gov			Fax:			

Source Type: X Ground Water ☐ Purchase Water

☐ Surface Water ☐ Surface/Ground Combined

The Drinking Water State Revolving Fund Program (DWSRF), authorized by the 1996 amendments to the Safe Drinking Water Act, provides financial assistance to public water systems (PWS). To obtain this assistance, project sponsors must demonstrate Capacity Development or demonstrate how the assistance will ensure these requirements are met. The term Capacity Development takes into consideration three vital areas of a public water system: Technical, Managerial, and Financial capabilities.

FINANCIAL

A financial capability demonstration (and certification) is required well before the evaluation of the actual loan or grant application. This demonstration is necessary to ensure that the system has the financial capability to repay the loan, if applicable, and to adequately operate and maintain the system. Financial capability also includes funding future capital improvements that may be required. Please see Rule 62-552.700(4) in Chapter 62-552, F.A.C. for further details.

It is expected that the revenues to be dedicated to repaying a loan will be generated either from water and sewer utility operations or from water utility operations alone. If the source of revenues will not be from such enterprises, this set of worksheets alone will not satisfy the Department's needs. (Please contact the Department for further guidance if dedicated revenues will be generated externally to such utilities.)

The following worksheets have been developed to identify the minimum information needed. The completed worksheets should be used in disclosing DWSRF project financing to the public during the required dedicated revenue hearing. The worksheets can serve to identify the impacts of the SRF project on residential users and how the project fits into the project sponsor's overall capital improvement program for the water and sewer utility (or water utility, as appropriate). Supplemental capital financing documentation may be submitted with these worksheets and may be presented at the required dedicated revenue hearing.

The revenues being dedicated to repayment of the DWSRF loan are:	Water and Sewer Fund Revenues
What is the frequency of water system billing?	Monthly
How often are system rates reviewed for adequacy?	3-5 years
When was the last time rates were reviewed?	Every Year in September – September 2022
What resources and guidance does the water system use for setting water user rates, fees or charges?	Municipal Cost Index AWWA Manual 1 Principals of Water Rates
What is your water system bond rating?	No Bond Rating
Is a rate increase necessary as a result of this project?	No
What is the Median Household Income (MHI) for the entire system?	$22,851

Which, if any, of the following activities must be undertaken to implement the DWSRF project?

Acquire privately held land?	Yes	X	No	☐
Acquire land held by another public water system entity?	Yes	☐	No	X
Enter into inter-local or inter-project sponsoring agency's agreements?	Yes	☐	No	X
Does the system have an annual budget with a separate reserve account for equipment replacement and/or capital improvement?	Yes	X	No	☐
Does the system have a capital improvement plan? How many years does it cover? 5	Yes	X	No	☐
Does the system have a governing board of directors?	Yes	☐	No	X
Does the water system employ the services of a professional engineer?	Yes	☐	No	X

Are there procedures for billing and collection?	Yes X	No ☐	
Does the system have audited financial statements?	Yes X	No ☐	
Are there standard purchasing procedures that provide controls over expenditures?	Yes X	No ☐	
What year will construction be completed, and repayments begin (for the first project)?	2026		
What is the estimated cost of your SRF project?	$5,745,500		

Please attach a copy of the user charge ordinance.

Table 1
WATER RATE REVENUE SUMMARY

		LAST YR. 2022	YEAR 1 (Current Year) 2023	YEAR 2 2024	YEAR 3 2025		SRF Project 2025
1.	Number of Residential Customers	2,357	2,451	2,549	2,651		2,651
2.	Number of New Residential Service Connections	102	94	98	102		102
3.	Annual Residential Water Sales (Gallons)	161,387,000	168,206,834	174,935,107	181,932,511		181,932,511
4.	Avg Daily Residential Usage (Gal/day) (Line 3 divided by line 1 divided by 365)	187	188	188	188		188
5.	Annual Residential Water Sales ($)	742,167.00	791,150.02	843,365.92	899,028.07		899,028.07
6.	Average Annual Residential Bill (line 5 divided by line 1)	$314.88	$322.75	$330.82	$339.09		$339.09
7.	Annual Residential Bill Amount Uncollected	$1,954.50	$2,769.03	$2,951.78	$3,146.60		$3,146.60
8.	Total Residential Rates Collected (Line 5 minus line 7)	$740,212.50	$788,381.00	$840,414.14	$895,881.48		$895,881.48
9.	Impact and Connection Fees per Residential Service	$1,035	$1,164.62	$1,310.19	$1,310.00		$1310.00
10.	Total Residential Impact and Connection Fees (Line 2 times line 9)	$105,592	$109,800	$128,466	$133,585		$133,585
11.	Number of Commercial Customers	212	222	232	242		242
12.	Number of New Commercial Service Connections	7	10	10	10		10
13.	Annual Commercial Water Sales (Gallons)	33,548,000	34,889,920	36,285,517	37,736,937		37,736,937
14.	Annual Commercial Water Sales ($)	$132,617.61	$137,922.00	$143,439.00	$149,177.00		$149,177.00
15.	Annual Commercial Bill Amount Uncollected	0	$344.81	$358.60	$372.94		$372.94
16.	Total Commercial/Industrial Bills Collected (Line 14 minus line 15)	$132,617.61	$137,578.00	$143,094.00	$148,832.00		$148,832.00
17.	Impact and Connection Fees for Commercial Service	$675	$759	$854	$855		$855
18.	Total Commercial Impact and Connection Fees (Line 12 times line 17)	$4,728.00	$7594.00	$8543.00	$8,550.00		$8550.00
19.	Bulk Water Sales	0	0	0	0		0
20.	Total Projected Water Revenue (Line 8+10+16+18+19)	$983,150	$1,043,352.41	$1,115,000.80	$1,175,593.94		$1,175,593.94

* Large meters should be checked annually for accuracy.

Instructions for Completing Table 1

Identify the source of the above information and explain methods used to develop the projections (*Attachment #* _____). Include an explanation of any revenue and expense growth or other adjustments; for example, any rate increases, service growth, inflation adjustments, expense adjustments reflecting the cost of operating additional facilities, or other considerations. In completing this table assume through year 3 that no SRF project is constructed. In the " SRF Project" column enter the numbers that reflect the first year in which the SRF loan will begin repayments. When completing the numbers in this column assume that the SRF project will be financed using 100% loan funding.

Line 1 Include the actual number of customers for last year and year 1 (current year). The numbers in years 2 and 3 should reflect an estimated number of residential customers, adjusted for growth. In the SRF column include the expected number of customers based on constructing your SRF project.

Line 2 This line is a subset of line 1. It should reflect the number of new customers for that year.

Line 3 This line is your total volume (gallons) of water used by your residential customers. Use actual gallons sold for Last Year and do an estimate for the current year based on total to-date. To determine Year 2 and 3 water sales, first calculate the average daily residential usage in gallons per day on line 4. The estimated water sales for Year 2 and 3 can now be determined by multiplying line 4 by line 1.

Line 4 This is the average daily residential usage (gallons per day) by a single residential customer. To get this number divide line 3 by line 1. Use Last Year and Current Year to project usage for Year 2 and 3. Usage should be fairly constant.

Line 5 This is your total residential water sales in dollars. Year 2 and 3 water sales should reflect any increases in rates (i.e. due to inflation). In the SRF column list what the sales would need to be if the SRF project was a 100% loan (to meet all expenses).

Line 6 To obtain the average annual residential bill, divide line 5 by line 1.

Line 7 This is the amount of the uncollected residential bills outstanding for the year.

Line 8 Line 5 minus line 7.

Line 9 This line is the impact and connection fee for new residential service.

Line 10 Multiply line 2 by line 9.

Line 11 Include the actual number of customers for last year and year 1 (current year). The numbers in years 2 and 3 should reflect an estimated number of commercial customers, adjusted for growth. In the SRF column include the expected number of customers based on constructing your SRF project.

Line 12 This line is a subset of line 11. It should reflect the number of new customers that will be charged an impact or connection fee.

Line 13 This line is your total volume (gallons) of water used by your commercial accounts.

Line 14 This is your total commercial water sales in dollars. Year 2 and 3 water sales should reflect any increases in rates (i.e. due to inflation). In the SRF column list what the sales would need to be if the SRF project was a 100% loan (to meet all expenses).

Line 15 This is the amount of the uncollected residential bills outstanding for the year.

Line 16 Total revenue collected for commercial accounts (line 14 minus line 15).

Line 17 This line is the impact and connection fee for new commercial/industrial accounts.

Line 18 Multiply line 12 by line 17.

Line 19 Total revenue for bulk water sales to consecutive systems.

Line 20 Total of line 8+10+16+18+19.

TABLE 2

INCOME, EXPENSES, AND CASH FLOW STATEMENT

	Income, Expense, and Cash Flow Statement	Last Yr. 2022	Year 1 2023	Year 2 2024	Year 3 2025	SRF Project 2025
	OPERATING REVENUES					
1	Water Rates	$945,016.21	$973,366.70	$1,002,567.70	$1,032,644.73	$1,032,644.73
2	Fire Protection					
3	Fees and Services	97,009.61	99,919.90	102,917.50	106,005.01	$106,005.01
4	Interest Income					
5a	Other –					
5b	Other –					
6	**Total (Lines 1 - 5)**	$1,042,025.82	$1,073,286.60	$1,105,485.20	$1,138,649.74	$1,138,649.74
	NON-OPERATING REVENUES					
7	Interest Income	$31,400.65	$32,342.65	$33,312.93	$34,312.32	$34,312.32
8	Interfund Transfer					
9	Proceeds from the Sale of Assets					
10	Leases and Extraction Fees					
11	Construction Grants					
12	Proceeds from Borrowing					
13	Equity Contribution					
14	Other -	$126, 009.05	$129,789.32	$133,683.00	$137,693.49	$137,693.49
15	**Total (Lines 7 - 14)**	$157,409.70	$162,131.97	$166,995.93	$172,005.81	$172,005.81
	OPERATING EXPENSES					
	OPERATION AND MAINTENANCE					
16	Salaries (Operators)	$153,996.33	$158,616.22	$163,374.70	$168,275.95	$168,275.95
17	Benefits	$55,936.00	$57,614.08	$59,342.50	$61,112.78	$61,112.78
18	Utilities	$28,969.78	$29,838.87	$30,734.04	$31,656.06	$31,656.06
19	Chemicals & Treatment					
20	Monitoring					
21	Materials, Supplies & Parts	$134,268.22	$138,296.22	$142,225.11	$146,491.86	$146,491.86
22	Transportation	$8,314.95	$8,564.40	$8,821.40	$9,086.40	$9,086.40
23	Purchased Water Costs					
24	Outside Services –	$23,823.69	$24,538.69	$25,274.69	$26,032.69	$26,032.69
25	Other –					
26	**Total (Lines 16 – 25)**	$405,308.97	$417,468.48	$429,772.44	$442,665.74	$442,665.74

	ADMINISTRATIVE					
27	Salaries and Benefits	$40,892.37	$42,119.14	$43,382.72	$44,684.20	$44,684.20
28	Building Overhead					
29	Office Supplies & Postage	$6,241.65	$6,428.90	$6,621.77	$6,820.41	$6,820.41
30	Insurance	$22,869.77	$23,555.86	$24,262.54	$24,330.42	$24,330.42
31	Customer Billing & Collection	$189,520.00	$195,205.60	$201,061.77	$207,093.62	$207,093.62
32	Accounting and Legal	$5,281.62	$5440.07	$5,603.27	$5771.37	$5771.37
33	A/E & Professional Services	$30,184.04	$31,089.56	$32,022.25	$32,982.92	$32,982.92
34	Other -	$4,549.40	$4,685.88	$4,826.46	$4,971.25	$4,971.25
35	**TOTAL (Lines27 – 34)**	$299,538.85	$308,525.01	$317,780.78	$326,654.19	$326,654.19
36	**Net Operating Income (Line 6 minus 26 minus 35)**	$337,178.00	$347,293.11	$357,931.98	$369,329.81	$369,329.81
	NON-OPERATING EXPENSES					
37	Debt-Repayment – Principal and Interest	$-545.50				
38	Capital Improvements Acquisition of Plant Equipment	$441,620.78	$454,869.40	$468,515.48	$482,570.94	$482,570.94
39	Interfund Transfers	$35,000.00	$36,050.00	$37,131.50	$38,245.45	$38,245.45
40	To General Fund					
41	To Replacement Fund					
42	To Emergency Fund					
43	Depreciation Expenses (If money is set aside)	$300,000.00	$309,000.00	$318,270.00	$327,818.10	$327,818.10
44	Other -					
45	**TOTAL (Lines 37 + 44)**	$742,166.28	$799,919.40	$823,916.98	$848,634.49	$848,634.49
46	**Net Non-Operating Income (Line 15 minus Line 45)**	$584,756.58	$637,787.43	$656,921.05	$676,628.68	$676,628.68
47	**Net Income Before Taxes (Lines 36 + 46)**	$921,934.50	$985,080.54	$1,014,853.03	$1,014,853.03	$1,014,853.03
	TAXES (N/A for publicly owned systems)					
48	Income Taxes					
49	Other Taxes					
50	**TOTAL (Lines 48 + 49)**					
51	**Net Income After Taxes (Line 47 minus 50)**					

Instructions for Completing Table 2

Identify the source of the above information and explain methods used to develop the projections (*Attachment* # _____). Include an explanation of any revenue and expense growth or other adjustments; for example, any rate increases, service growth, inflation adjustments, expense adjustments reflecting the cost of operating additional facilities, or other considerations.

REVENUES- Revenues include all sources of income to the system. They are separated on this form as: "Operating", lines 1-6 and "Non-Operating", lines 7-15. When using the subcategory "other" under any item, please write a descriptive term.

EXPENSES- Expenses include all those activities or purchases which incur cost for the system. Expenses can be estimated in various ways. One method bases the projections on historical expense. This can be accomplished by using historical costs and escalating them from known and projected changes. An example of a known change would be an increase in labor costs for the budget period due to known or anticipated salary increases. An example of a projected increase or escalation in costs would be a 5% annual inflation rate. Materials and Supplies expense, for instance, would be expected to increase with the projected inflation rate. Expenses are separated on this form in the same fashion as Revenues with further subtopics to more clearly define expenses. When using the subcategory "other" under any item please write a descriptive term and cross out the word "other". Expenses are separated on this form as "Operating", lines 16-26, "Administrative", lines 27-35, "Non-Operating", lines 37-45, and "Taxes" lines 48-50.

Lines 1 This line includes all money received for supplying water service. Information should come from completed Attachment 1.

Line 2 If a separate fee is charged for fire protection include on this line.

Line 3 Include all miscellaneous fees and charges generated by providing water service other than for the actual water service (for example, connection fees, bad check fees, reconnect fees, meter testing fees, etc.).

Line 4 Interest earned from cash on hand or on fees financed by the utility.

Line 5 If used, please describe.

Non-operating revenues are funds generated outside the water system and used by the water system to cover expenses.

Lines 7-15 Items should be clear, modify topics if needed.

Lines 16-17 Salaries and Benefits (Operators), include all compensation to employees of your system when the work is related to the system's O&M. This account should not include compensation of officers, directors, or general and administrative staff. Volunteer labor cannot be applied.

Line 18 Utilities, includes the cost of all electric power, gas, telephone, water (at least account for what is being used at the plant), and any other system-related expenses incurred in producing and delivering water.

Line 19 Chemicals and treatment is intended to cover the cost of all chemicals used in the treatment of your water.

Line 20 Monitoring, includes all water monitoring costs incurred by the system. This should include both in-house monitoring and analysis costs as well as outside laboratory costs.

Line 21 Materials, supplies, and parts means all materials and supplies used in the O&M of the water system and in providing and delivering the water to the customer. Include any repairs or parts needed in producing and delivering water. This would include grease, oil, and minor repairs to equipment. This should not include materials for administrative purposes such as postage, copying or copy machine supplies, billing forms, or letterhead.

Line 22 Transportation is intended to include all expenses related to trucks, automobiles, construction equipment, and other vehicle expense used in producing and delivering water to the customer.

Line 23 Include the cost of purchasing water. Use only if a consecutive system.

Administration expenses are considered overhead but not those directly related to O&M of the daily production and delivery of water to the customer. This category includes billing and administrative costs incurred by the system. For example, all meter reading costs, secretarial costs, postage, publications, reference materials, uncollectible debts insurance accounting services, and all other overhead items belong in this subsection.

Lines 27 Salaries and Benefits include all compensation to employees of your system in which the work is related to the administration of the system, such as officers, directors, secretarial, and meter reading salaries and benefits. This account should not include compensation of operators. If an employee performs both operation and meter reading a percentage of their salary should appear under the appropriate topic. For example, if an operator reads meters 25% of the time, ¾ of their salary should be shown on line 16 and ¼ of their salary on line 27.

Line 28 Overhead associated with the building itself such as, mortgage payment, insurance, taxes, maintenance, etc.

Line 29 Office supplies and postage includes all materials and supplies in administration of the water system. This includes office supplies, postage, copier charges, and paper.

Line 30 Insurance (Vehicles, Liability, Workers' Compensation) includes all insurance costs associated with the coverage for the vehicles, general liability, workers' compensation insurance, and other insurance costs related to the operation and administration of the system.

Line 31 Customer billing and collection should include all expenses specific to this function such as, special billing forms or software.

Lines 32 Accounting and legal expenses includes all salaries and wages with legal and accounting functions for the system even if they are outside services.

Line 33 A/E and professional services means all engineering and other professional services expenses associated with water system planning and design requirements.

Line 34 Other means expenses such as employee training and water certification requirements (classes, registration fees, travel, etc.), public relations campaigns and public notifications, etc. Also include any recurring expenses that did not fit into any of the above line items.

Non-operating expenses are ones that are necessary and paid by the water system, but are not part of daily O&M or Administration of the system. Debt Repayment and Capital Improvements are typical items that may appear on this type of analysis.

Lines 37-42 Expenses that are involved in operating or administering the water system that were not considered in the totals appearing on lines 26 and 35 should be shown in these items, modify if necessary.

Line 38 Capital improvements include facility and non-facility costs related to: 1) Meeting growth requirements or improving your system's infrastructure to provide better service and reliability to existing customers, 2) replacing or renovating existing facilities, or 3) to ensure compliance with drinking water regulations.

Line 39-42 Identify any transfer of funds used to offsets other non-water system related capital expenditures. These lines represent some possible categories, modify if needed.

Line 43 Depreciation expense only applies to systems which are currently depreciating investments made in the past (recovery of previously invested funds). Include amounts on this line only if money is actually set aside.

Line 44 Include any recurring non-operating expenses that did not fit into any of the above line items.

Taxes can be incurred in a variety of ways such as a state utility tax, business and occupation tax, property tax or federal income tax. Each of these taxes can be accounted for separately within the operating budget, modify if necessary.

Lines 48-49 Include any incurred taxes.

Table 3

SCHEDULE OF PRIOR, PARITY, AND PROJECTED LIENS

List annual debt service beginning two years before the anticipated loan agreement date and continuing at least fifteen fiscal years. Include all existing and projected liens on the system. Use additional pages as necessary.

Identify Each Obligation			Coverage		Insured?
#1	DW010810		15%		Y
#2	WW010800		15%		Y
#3	Water & Sewer Rev. Bonds, S 202		15%		Y
#4					
#5					

Annual Debt Service (Principal Plus Interest)

Fiscal Year	#1	#2	#3	#4	#5	Total Debt Service	Total Debt Service Incl. Coverage
2023		$64,732	$116,827				$181,559
2024		$64,732	$116,827				$181,559
2025	$17,268	$64,732	$116,827				$198,827
2026	$17,268	$64,732	$116,827				$198,827
2027	$17,268	$64,732	$116,827				$198,827
2028	$17,268	$64,732	$116,827				$198,827
2029	$17,268	$64,732	$116,827				$198,827
2030	$17,268	$64,732	$116,827				$198,827
2031	$17,268	$64,732	$116,827				$198,827
2032	$17,268	$64,732	$116,827				$198,827
2033	$17,268	$64,732					$82,000
2034	$17,268	$64,732					$82,000
2035	$17,268	$64,732					$82,000
2036		$64,732					$64,732
2037		$64,732					$64,732
2038		$64,732					$64,732
2039		$64,732					$64,732
2040		$64,732					$64,732
2041		$64,732					$64,732
2042		$64,732					$64,732
2043		$64,732					$64,732
2044							$0
2045							$0

SCHEDULE OF PRIOR, PARITY, OR PROJECTED REVENUES AND DEBT COVERAGE FOR RATE-BASED SYSTEM PLEDGED REVENUE

(Provide information beginning with the two fiscal years preceding the anticipated date of the first SRF loan repayment.)

	FY22	FY23	FY24	FY25	FY26
(a) Net Operating Revenues. (Table 2 line 36)	$337,178	$347,293	$357,932	$369,330	$380,410
(b) Debt Service (including required coverage) pledged to all prior, parity, or projected projects (last column of Table 3).		$181,559	$181,559	$198,827	$198,827
(c) Net Revenue (= a – b)	$337,178	$176,373	$176,373	$170,503	$181,583

(d) Attach audited annual financial report(s), or pages thereof, and any other documentation necessary to support the above information. Include any notes or comments from the audit reports regarding compliance with covenants of debt obligations having a prior or parity lien on the revenues pledged for repayment of the SRF loan. (*Attachment* # 1)

(e) Attach worksheets reconciling this page with the appropriate financial statements (for example, backing out depreciation and interest payments from operating expenses). (*Attachment* # 2)

(f) If the net revenues were not sufficient to satisfy the debt service and coverage requirement, please explain what corrective action was taken. (Attachment #N/A)

(k) Identify the source of the above information and explain methods used to develop the projections (Attachment # _____). Include an explanation of any revenue and expense growth or other adjustments; for example, any rate increases, service growth, inflation adjustments, expense adjustments reflecting the cost of operating additional facilities, or other considerations.

LIST OF ATTACHMENTS (use additional sheets if necessary)

Attachment	Number
CAFR	1
Worksheets	2

TECHNICAL: Accurate answers to the following questions will help identify the technical strengths as well as areas that may need improving within your system. If a question or section does not apply to your system, please write N/A for not applicable. For questions that ask you to rate your system from 1 to 5, answer 1 for worst case scenario and answer 5 for the best case scenario.

- System has current and accurate data showing average and peak gpd used — Yes X No ☐
- System's capacity exceeds peak demand by more than 20% (Percentage - %) — Yes ☐ No X
- System can meet peak demand without pumping at peak capacity for extended periods. — Yes X No ☐
- System has an emergency plan in place to meet system demand during a shortage (natural disaster or largest pump/well out, etc.) — Yes X No ☐
- System has accurate records indicating types and percentage of customers use: — Yes ☐ No ☐

Residential _____% Commercial _____% Industrial _____% Dedicated Irrigation Meter _____%

- System has comprehensive water loss program that compares amount of water produced (plant meter) with total delivered through metered and unmetered service connections (system's unaccounted for water is _22.5____%) — Yes X No ☐

*Unaudited Water Loss

Purchase Water Systems NA X

System has a written agreement with the supplier that:

- ensures adequate supply of water during shortage conditions, — Yes ☐ No ☐
- does not require the purchase of a minimum amount of water (water is supplied through a meter), — Yes ☐ No ☐
- assures supplying water system will remain in compliance with the appropriate State or federal regulations, and — Yes ☐ No ☐
- assures purchasing system will be notified of any water quality issues. — Yes ☐ No ☐

Surface Water Systems and Systems Using Ground Water Under the Influence of Surface Water NA X

- System has redundancy for all critical treatment components — 1 2 3 4 5
- System monitors raw, settled, and individual filtered water turbidity — 1 2 3 4 5
- System consistently (95% of the time) has a filtered water turbidity of _____%, which is within the current standard of .3 NTU — 1 2 3 4 5
- System has the capability to add coagulant before the filter and disinfect at various points in the treatment process — 1 2 3 4 5
- System is evaluating (or has evaluated) changes necessary to meet the Enhanced Surface Water Treatment Rule — 1 2 3 4 5

  Some needed changes are: _____

_____

- System is evaluating (or has evaluated) changes needed to meet requirements in the Disinfection By Products Rule — 1 2 3 4 5

  Some planned modifications are: _____

_____

Ground Water System NA ☐

- A minimum of two sources of groundwater are provided — Yes X No ☐
- Source water protection area provides a minimum 500 foot radius around each drinking water well — Yes X No ☐
- Groundwater source capacity equals or exceeds the design maximum day demand and equals or exceeds the design average day demand with the largest producing well out of service — Yes X No ☐

- System monitors raw water quality to determine appropriate treatment 1 2 3 (4) 5
- System's well(s) have; air/vacuum relief valve, check valve, blow-off, by-pass, meter, working sanitary seal, construction/maintenance records and are properly vented 1 2 3 (4) 5
- System routinely monitors drawdown 1 2 (3) 4 5

Disinfection

- System has adequate contact time of _____ minutes following disinfection and before the first user in the distribution system Yes X No ☐
- Disinfection equipment is regularly inspected and maintained Yes X No ☐
- A chlorine residual is maintained throughout the distribution system 1 2 3 (4) 5

Distribution System

- System has accurate information, including age, for pipe materials that currently make up the distribution system 1 2 (3) 4 5
- Water mains providing fire protection are a minimum of 6-inches in diameter Yes X No ☐
- System is free of severe "water hammer" problems 1 2 (3) 4 5
- System tracks ranges of operating pressure, especially during peak demand 1 2 3 (4) 5
- System maintains a minimum operating pressure of 20 psi Yes X No ☐
- Normal operating pressure is kept between 40 and 100 psi 1 2 3 4 (5)
- System has a routine leak detection program that uses (type of equipment) subsurface LD15. repairs identified leaks quickly, and keeps water loss in the distribution system below 22.5%. Average number of leak repairs per year is 107. 1 2 (3) 4 5
- System has a cross connection control program in place that addresses: evaluation of each service connection, installation of specified backflow preventer, training, record keeping, annual testing, and education 1 2 (3) 4 5
- System is working to eliminate dead ends in the mains 1 2 (3) 4 5
- System has a flushing program that operates 2 times a year 1 2 3 (4) 5
- System has a map showing the bacteriological, lead and copper, and TTHM (if applicable) sampling points 1 2 (3) 4 5
- System has accurate "as-built" maps of the distribution system posted that show: location of sources (or intakes), size of mains, dead end mains, valves, curb stops on service lines, and proximity of mains to other utilities (gas, electric, etc.) 1 2 3 (4) 5
- System has a routine valve exercise program 1 (2) 3 4 5
- All customers are metered and all meters are routinely calibrated 1 2 3 4 (5)
- Customer complaints are relatively infrequent 1 2 (3) 4 5
  List number of complaints in the past year: 1383

Pumping

- System has a pump maintenance program that includes annual inspection, scheduling of repair, and routine maintenance that is conducted by a qualified contractor 1 2 (3) 4 5
- System has standby or emergency power equipment that is routinely tested under load and can provide 100% of the average daily demand for 3 days 1 2 3 4 (5)

Storage

- System is able to meet peak demand without the high service pumps running at peak capacity for extended period 1 2 (3) 4 5
- System has adequate reserve capacity for fire protection. 1 (2) 3 4 5
  Total storage capacity of the system is 450,000 gals
- System's 2 storage tanks receive routine inspection (every 3-5 years) to

determine and schedule any needed maintenance 1 2 3 (4) 5

- All storage tanks are equipped with an altitude valve to prevent overflowing and are sized appropriately to ensure adequate turnover and no loss of water quality (1) 2 3 4 5
- Storage tanks are covered and the surrounding areas are fenced 1 2 3 4 (5)
- Storage tanks have a drain valve and an entry hatch to allow access for cleaning and painting of the interior of the tank 1 2 3 4 (5)

MANAGERIAL: Answering the next set of question will help the system clearly define responsible parties, staffing needs, operational needs, policies, and internal standard that guide system performance. For questions that ask you to rate your system from 1 to 5, answer 1 for worst case scenario and answer 5 for the best case scenario.

- System has a current organizational chart and accompanying position descriptions that clearly define responsibilities of staff members 1 2 3 (4) 5
- The plant is a category 1 plant operating 24 hours per day.

List names, class, and license numbers for all operators fulfilling staffing requirements:

Jamie Jones A-7830

Brandon Massimillio C-24598

George Allen B-24113

- System is satisfied with service provided by contract operator(s) (NA) 1 2 3 4 5
- The operator's authority and responsibilities are clearly defined 1 2 3 4 (5)

Policies and Plans: Please indicate with a check mark the items for which the water system has written policies or plans.

☐ standard specifications	X connection policies	☐ main extension policies
X bacteriological sampling plan	X emergency operation plan	X Lead & Copper sample plan
X cross connection control plan	X record management plan	X TTHM
X general rules	X disconnection policy	X public education & outreach
X disaster response plan	X personnel policy	X Safety/Risk Management Policy

- Based on the answers above the system has: clear organizational structure, defined staffing requirements, and appropriate rules/policies 1 2 3 (4) 5

Operations and Maintenance: The items that follow are elements that may be contained in a thorough Operations and Maintenance (O&M) manual. A complete O&M manual is useful as a quick reference for anything from trouble shooting to emergency procedures. Please indicate with a check mark those items contained in the system's O&M manual.

Introduction and Overview

X System name	X System ID#	X location
X design flow capacity	X type of treatment	X water source
☐ available training	☐ publications available	

☐ Statement of the purpose of the manual and relay to the operator how to best obtain pertinent information

☐ organizational chart (note which activities require qualified and licensed/certified personnel)

General System Description

X a flow schematic (source to distribution)

X pumping capabilities (source, chemicals, and high service)

X storage (raw, finished water, and chemicals)

X system map showing location of all wells, intake structures, pumping stations, storage tanks, and the defined service area

System Operation and Control

X identification of major system components including a description of the normal operation of each component
☐ possible alternative operation modes and circumstances under which they would be used
X schematic diagrams of each treatment process
☐ preventative maintenance program (include inspections performed when the facility is off-line)
☐ common operating problems with methods of bypassing while being repaired
☐ importance of and how to use laboratory tests for process control
☐ routine system operation for each major system component this should include startup and shutdown procedures, safety procedures, and meter reading
☐ evaluation of overall system performance

Laboratory Testing

X identification of samples and tests needed for compliance as well as for process control.
X sampling locations, time, and methods
☐ how to interpret laboratory results and the use of these results to improve the process
☐ what should be in laboratory supply and chemicals inventory
☐ list of laboratory references;
☐ instructions for filling out worksheets for a sample (include completed example)
X for tests to be performed by outside laboratories, the name of the laboratory, contact person, telephone number, and method of requesting sample pick-up or schedule for sample pick-up

Records and Reports Section

☐ a general explanation of the purpose and importance of accurate records and reports
☐ a log of complaints and responses
X daily logs, maintenance records, laboratory records, monthly reports, monitoring reports, sanitary surveys, annual reports, operating cost reports, and accident reports.
X historical records (permits, standards, pumping capacity, consumption, and drawdown)
X list of equipment warranties and provisions
X specific area for filing records
X procedures for reporting to appropriate agencies (specify how long records should be kept)

Maintenance

☐ general information including purpose and value of scheduled and preventative maintenance
☐ preventative maintenance schedule and sample worksheets with instructions
X specifications for fuels, lubricants, filters, etc. for equipment
☐ troubleshooting charts or guides which reference pages in manufacturers' O&M manual or system's O&M manual as appropriate
X a record of data plate information on each piece of equipment maintained, this should include manufacturers' maintenance schedule for routine adjustments
X a work order system for maintenance of equipment with sample forms to accurately track O&M costs for each piece of equipment
☐ brief operation instructions for each piece of equipment with reference to the manufacturers' technical specifications for major system components
☐ a mechanism for storage and check out of specialized equipment used infrequently
X list of outside contract maintenance tasks
X contact person and phone numbers for equipment manufacturers, major suppliers, and all utilities serving the system
☐ list of special tools used and how to replace
X stocks of spare parts, supplies, chemicals and other items vital to system operation

X a system of requisitions and/or work orders used to distribute parts, supplies, chemicals, etc. for reorder purposes

Emergency Response Program

X pre-response activity such as; personnel assignments, emergency equipment inventory, filling a storage tank before a storm hits, copies of all emergency numbers. Laminated copy of phone numbers to keep readily accessible should include water system personnel responsible for making decisions in specific situations; including name, job title, home and work phone number (pager/cell phone number if available), police, fire departments, and for chemical spills or exposure CHEMTECH 800-424-9300.

X safety procedures for all personnel involved in the response

X a contingency plan to ensure proper treatment of water even in adverse conditions which may include agreements with nearby water systems for equipment or personnel

X procedures for putting standby and emergency sources into active service

X procedures for notifying customers, the local health jurisdiction, and EPA of water quality problems

X systematic procedure for returning to normal operation

Appendix

The appendix can contain documents and other information that cannot be easily incorporated into the body of the manual. Large documents such as copies of plans and specifications may be stored separately from the main manual. The following list has examples of items that might be included in appendices. Please check all that apply to your O&M Manual.

X Detailed design criteria	X User Charge System	X Approved shop drawings
X Schematics	☐ Piping color codes	☐ Valve indices or schedule
X As-built drawings	X Drinking water rules/Ordinance	X Manufacturers' manuals

- Based on the answers above please rate the system's current O&M Manual. 1 (2) 3 4 5

The last set of questions is designed to help you evaluate the systems' source(s). Please read the item then circle the number from 1 (needs improving) to 5 (top notch) that you feel best describes your systems' current status relative to that item or check boxes as appropriate.

- System has an active Source Water Assessment Program 1 2 (3) 4 5

For Ground Water Systems:

- System has accurate historical information (like well driller's log and construction records) for each well 1 2 (3) 4 5
- Well(s) have the "zone of contribution" identified on a map 1 2 (3) 4 5
- No storage of potential contaminants in close proximity of well(s) 1 2 (3) 4 5
- Well(s) are housed and fenced and have an appropriate concrete pad 1 2 3 (4) 5
- Well casing(s) extend at least 12" above floor or ground 1 2 3 4 (5)

Name of aquifer is known: X Yes ☐ No

Aquifer is: FLORIDAN X Confined ☐ Unconfined

For Surface Water Systems: N/A

- Commercial, industrial, or agricultural operations up stream are identified 1 2 3 4 5
- System has provided a contact to these facilities in case of an accidental release 1 2 3 4 5
- System performs up stream monitoring 1 2 3 4 5
- System has a raw water reservoir of _____ gallons that acts as a buffer 1 2 3 4 5

Overall:

- System has adequate knowledge and program activity to protect and ensure an adequate supply of drinking water 10 years into the future 1 2 3 (4) 5

CERTIFICATION: I, the undersigned authorized representative of the applicant, hereby certify that all information contained in this form and attachments is true, correct, and complete to the best of my knowledge and belief. I also certify that I have been duly authorized to file the business plan and to provide these assurances.

Signature Of Authorized Representative 

Name (Please Print) Jamie Jones

Title Assistant City Manager /Director of Utilities & Public Works

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COMMITMENT & INTEGRITY DRIVE RESULTS