Town of Orange Park
Town Council Special Meeting
Monday, June 8, 2026
4:00 PM
Agenda

1. Call to Order and Roll Call-Mayor Sandlin
2. Request by Vice-Mayor Benefield to Participate Remotely
3. New Business
   a. Resolution No. 14-26: DWSRF Drinking Water Facilities Plan
4. Adjournment

Item No. 3.a

Town of Orange Park
Agenda Memorandum

To:	Town Council
Agenda Date:	June 8, 2026
Submitting Department:	Public Works

Item Title: Resolution No. 14-26: DWSRF Drinking Water Facilities Plan

Check one:
[ ] Consent Agenda [X] Regular Agenda

Financial Impact if Applicable: None

Background Information: The Town of Orange Park has been awarded a Drinking Water State Revolving Fund (SRF) Loan for water main extension & looping and a water meter replacement plan. The Town's consultant, CPH, has developed the plans and drawings for the project. The public hearing was held on June 2, 2026, and a resolution is required as part of the DWSRF loan agreement. The resolution adopting the Drinking Water Facilities Plan is attached for Council's consideration and adoption.

Action Requested: Approval of Resolution No. 14-26.

Information Attached:
Submittal Letter
Resolution No. 14-26 - Adopting Facilities Plan
Draft Facilities Plan (with attachments)-Exhibit A

580-1 Wells Road
Orange Park, FL 32073
Phone: 904.278.0030

June 3, 2026

Mayor Winnette Sandlin and Town Council
Town of Orange Park
2042 Park Avenue
Orange Park, FL 32073

RE: Draft Facilities Plan Submittal
DWSRF Water Meter Replacements
Town of Orange Park, Florida
Project No. M240104
Client No. 2401-04-1

Dear Mayor Sandlin and Town Council Members:

Following the Town Public Hearing and Council Meeting on June 2, 2026, please find attached the Draft Facilities Plan for the Town's DWSRF Water Meter Replacement Project for consideration of acceptance of the Facilities Plan and adoption of Resolution No. 14-26.

Please note that the Facilities Plan requires incorporation of adopted Resolution No. 14-26 and the associated meeting minutes as an appendix and, therefore, the document is considered a Draft until final action is taken by the Town Council.

The Executive Summary begins on Page 1 and summarizes the report's findings and recommendations. The Facilities Plan is a conceptual planning document intended to confirm the project scope and document the basis for the proposed improvements. Acceptance of the Facilities Plan and adoption of Resolution No. 14-26 do not obligate the Town to proceed with construction or incur additional debt. Rather, these actions satisfy a State Revolving Fund program requirement and maintain eligibility for future construction phase funding consideration, should the Town elect to pursue such funding.

Please feel free to contact me at (904) 278-0030 or via e-mail at jarrod.petrohovich@cphcorp.com if you have any questions or require additional information.

Sincerely,
CPH Consulting, LLC

Jarrod P. Petrohovich, P.E.
Program Manager

JPP/pj
Enclosures

RESOLUTION NO. 14-26

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF ORANGE PARK, FLORIDA, RELATING TO THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) STATE REVOLVING FUND (SRF), ADOPTION OF THE DRINKING WATER FACILITIES PLAN FOR THE IMPLEMENTATION OF THE WATER METER REPLACEMENTS, EFFECTIVE THIS DATE.

WHEREAS, Florida Statutes provide for loans to local government agencies to finance the construction of drinking water facilities; and Florida Administrative Code requires the formal authorization by Town Council to formally adopt a Facilities Plan outlining necessary public water system improvements to comply with State of Florida funding requirements; and

WHEREAS, formal adoption of the proposed Facilities Plan attached hereto as Exhibit A and incorporated herein (the "Facilities Plan") is required for the Town of Orange Park to participate in the State Revolving Loan Fund Program; and

WHEREAS, the Town Council of the Town of Orange Park, Florida agrees with the findings and summary of necessary improvements as outlined in the Facilities Plan for the purpose of replacing aged and deteriorated water meters to improve accuracy and reliability in water metering, identify and address water leakages in order to reduce water losses; and the addition of hydraulic looping in the Town's water distribution system to increase water service pressures; improve fire suppression capabilities and overall water system reliability.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF ORANGE PARK, FLORIDA FORMALLY APPROVES AND ADOPTS THE TOWN OF ORANGE PARK FACILITIES PLAN AS WRITTEN AND PRESENTED TO THE TOWN COUNCIL ON THIS DATE:

SECTION I. The foregoing findings are incorporated herein by reference and made a part hereof.

SECTION II. The Town of Orange Park, Florida, is authorized to approve the proposed Facilities Plan.

SECTION III. The Public Works Director is hereby designated as the authorized representative to provide the assurances and commitments that will be required by the Facilities Plan.

SECTION IV. The Public Works Director is hereby designated as the authorized representative to execute the Facilities Plan which will become the foundation of all activities related to the drinking water system improvements. The Public Works Director is authorized to represent the Town in carrying out the Town's responsibilities under the Facilities Plan. The Public

Works Directors is authorized to delegate responsibility to appropriate Town Staff to carry out technical, financial, and administrative activities associated with the Facilities Plan.

SECTION V. The legal authority for adoption of this Facilities Plan is pursuant to the Town Charter, Town Code of Ordinances, and the Laws of the State of Florida.

SECTION VI. Conflicts. All Resolutions or part of Resolutions in conflict with any of the provisions of this Resolution are hereby repealed.

SECTION VII. Severability. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidated or impair the validity, force, or effect or any other section or part of this Resolution.

SECTION VIII. Effective Date. This Resolution shall take effect upon its approval and adoption by the Town Council.

APPROVED AND ADOPTED this 8th day of June 2026.

_____
Mayor

ATTEST:

_____
Town Clerk

FORM APPROVED:

_____
Town Attorney

Exhibit A

Facilities Plan

FACILITIES PLAN

FOR

TOWN OF ORANGE PARK, FLORIDA

Prepared by:

Orange Park, Florida
Project No. M240104
Client No. 2401-04-1
June 2026

FACILITIES PLAN

FOR

TOWN OF ORANGE PARK, FLORIDA

Prepared by:



Orange Park, Florida
Project No. M240104
Client No. 2401-04-1
June 2026

TABLE OF CONTENTS

1.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS 1

2.0 INTRODUCTION 5
2.1 Location 5
2.2 Existing Water System Facilities 5
2.3 Project Need 5
2.4 Scope of Study 6

3.0 ENVIRONMENTAL IMPACTS 11
3.1 Description of Planning Area 11
3.1.1 Planning Area 11
3.1.2 Climate 11
3.1.3 Topography and Drainage 11
3.1.4 Geology, Soils and Physiography 11
3.1.5 Environmentally Sensitive Areas or Features 12
3.1.5.1 Wetlands 12
3.1.5.2 Plant and Animal Communities (Endangered Species) 12
3.1.6 Flood Plain 12
3.1.7 Air Quality 12
3.2 Socio-Economic Conditions 13
3.2.1 Population 13
3.2.2 Land Use and Development 13
3.3 Water Quality and Uses 13
3.3.1 Surface Water and Groundwater Hydrology, Quality and Uses . . 13
3.3.2 Sourcewater Protection 13
3.4 Water Supply, Treatment, and Transmission/Distribution System 14
3.4.1 Description of the Existing Water Supply & Treatment System . . 14
3.4.2 Population Projections and Water Usage 15
3.4.3 Water Conservation 16
3.4.4 Performance of Existing Water System 16
3.5 Managerial Capacity 16
3.5.1 Operation and Maintenance Program 16

4.0 DEVELOPMENT OF WATER METER REPLACEMENT ALTERNATIVES . . . 27
4.1 General 27
4.2 Cost-Effectiveness 27
4.3 Alternative No. 1 - No Action 28
4.4 Individual Assessment Approach For Alternatives No. 2 through No. 5 . 28

4.5 Alt. No. 2 - Installation of an Automated Meter Reading (AMR) with Directionally drilled Water Main Extension 31
4.5.1 Description. 31
4.5.2 Economic Evaluation 31
4.5.2.1 Capital Costs 31
4.5.2.2 O & M Costs 33
4.5.2.3 Net Present Value. 33
4.5.3 Advantages and Disadvantages 34
4.6 Alternative No. 3 - Installation of an Automated Meter Reading (AMR) with Conventionally Installed Water Main Extension 34
4.6.1 Description. 34
4.6.2 Economic Evaluation 35
4.6.2.1 Capital Costs 35
4.6.2.2 O & M Costs 36
4.6.2.3 Net Present Value. 37
4.6.3 Advantages and Disadvantages 38
4.7 Alternative No. 4 - Installation of AMI Meters with Water Main Extension 38
4.7.1 Description. 38
4.7.2 Economic Evaluation 38
4.7.2.1 Capital Costs 38
4.7.2.2 O & M Costs 39
4.7.2.3 Net Present Value. 39
4.7.3 Advantages and Disadvantages 41
4.8 Alternative No. 5 - Installation of AMI Meters with Conventionally Installed Water Main Extension 41
4.8.1 Description. 41
4.8.2 Economic Evaluation 42
4.8.2.1 Capital Costs 42
4.8.2.2 O & M Costs 43
4.8.2.3 Net Present Value. 44
4.8.3 Advantages and Disadvantages 45
4.9 Economic Evaluation 45
4.10 Recommended Alternative 45

5.0 THE SELECTED PLAN 47
5.1 Description of Proposed Facilities 47
5.2 Environmental Impacts of Proposed Facilities 47
5.3 Cost to Construct Facilities. 48

6.0 FINANCIAL FEASIBILITY 49
6.1 Revenues Required To Repaying The Loan 49
6.2 Existing/Proposed User Charge System 49
6.3 Water Utility Staffing Operation 50

7.0 SCHEDULE AND PROJECT IMPLEMENTATION 52
7.1 Schedule For Implementing The Recommended Facilities 52
7.2 Project Implementation. 52
7.3 Regulatory Agency Review 53

8.0 PUBLIC PARTICIPATION PROCESS 54
8.1 Public Hearing Details 54
8.2 Compliance with Local Requirements For Advertising To The Public . . 54

9.0 PROJECT AUTHORIZATION **55**
9.1 Adopting Resolution 55

TABLES

3-1 Population Growth 2025 Through 2050 (Projected) 15
4-1 Engineer's Opinion of Probable Project Cost for Alternative No. 2 - AMR Meters with Directionally Drilled Water Main Extension 31
4-2 Advantages and Disadvantages for Alternative No. 2. 34
4-3 Engineer's Opinion of Probable Project Cost for Alternative No. 3 - AMR Meters with Conventionally Installed Water Main Extension 35
4-4 Advantages and Disadvantages for Alternative No. 3. 38
4-5 Engineer's Opinion of Probable Project Cost for Alternative No. 4 - AMI Meters with Directionally Drilled Water Main Extension. 39
4-6 Advantages and Disadvantages for Alternative No. 4. 41
4-7 Engineer's Opinion of Probable Project Cost for Alternative No. 5 - AMI Meters with Conventionally Installed Water Main Extension 42
4-8 Advantages and Disadvantages for Alternative No. 5. 45
7-1 Project Schedule. 52

FIGURES

2-1 Location & Service Map 7
2-2 Existing Water Meters. 8
2-3 Existing Water Mains 9
2-4 Proposed Water Main Extension. 10
3-1A Soils Map 17
3-1B Soils Map Legend & Information. 18
3-1C Soils Map Unit Legend 19
3-2 U.S. Fish & Wildlife Wetlands Inventory Map 20
3-3A Wetlands Map. 21
3-3B Wetlands Map. 22
3-3C Wetlands Map. 23
3-4 Orange Park 2024 Zoning Map. 24
3-5 Orange Park 2040 Future Map 25
3-6 Historical Water Usage & Water Use Projections from 2025-2030. 26

APPENDICES

A 2025 Water Supply Facilities Work Plan
B USGS Quad Map
C NRCS Soil Survey Report
D Clay County Federally Listed Species
E FDEP Sanitary Survey Report
F FDEP Drinking Water Analysis Documents
G DWSRF Planning and Design Loan Application
H FDEP SRF Business Plan
I Public Hearing Minutes and Ad Affidavit
J Adopting Resolution

1.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

This Facilities Plan (Plan) has been prepared by CPH Consulting, LLC, for the Town of Orange Park, Florida (Town), to meet the requirements of the Florida Department of Environmental Protection (FDEP) Drinking Water State Revolving Fund (DWSRF) Program for the current Planning and Design Agreement No. DW100110. This Plan evaluates the Town's current water metering infrastructure and water distribution system assets, and identifies the need for upgrades associated with aged/outdated water meters and distribution system hydraulic concerns. The conclusions and recommendations of this study are consistent with both the Town of Orange Park's and Clay County's Comprehensive Plans.

The Town of Orange Park's water distribution system consists of approximately 239,000 linear-feet (LF) of water mains ranging in size from 1" to 14" in diameter with approximately 3,150 service connections. The majority of the system is made of PVC and Asbestos-Cement (AC) materials. The Town's water system is aging, and existing analog and radio-signal meters have reached the end of their useful life. Analysis of Town water usage data compared to water pumping/production data indicates there are likely inaccurate readings being provided by the Town's meters. It is estimated approximately 60% to 70% of the distribution system was initially constructed in the middle to third quarter of the 20th century. The metering components and portions of the distribution system have been periodically replaced as needed, however, the majority of the components remain at 15-20+ years of age. Utilities typically plan for a 15-year to 20-year meter replacement cycle to address metering inefficiencies and incorporate updated technologies.

Within the past three years, the Town periodically replaced approximately 750 existing water meters with ultrasonic meters incorporating Advanced Metering Infrastructure (AMI) system communication, monitoring, and billing capabilities. Coordination with Town staff resulted in the desire to move forward with a full-system AMI meter upgrade project combined with a selected water main extension route. The Town approved an application to the FDEP DWSRF program for planning and design funding in October of 2024. Planning and design funding was officially awarded by FDEP and approved by the Town in April 2025. Through this funding and acceptance of the Facilities Plan, the Town intends to modernize its water metering infrastructure. The Town plans to transition the remaining meters to the pre-established AMI system, improving accuracy, operational efficiency, monitoring capabilities, and billing processes. Additionally, the Town plans to construct a water

main extension to improve service capabilities to a designated sector of the service area. These improvements will aim to enhance water circulation, increase water service pressures, improve fire suppression capabilities, and improve overall water system reliability. Ensuring reliable water pressure, service, quality, and accounting supports public health, safety, and conservation goals while benefitting residents, businesses, and the environment.

The project outlined and recommended herein will replace the remaining approximate 2,400 active and inactive analog and radio signal water meters within the Town of Orange Park's water system with AMI water meters, resulting in a fully integrated AMI metering system. This project includes a 2,300 LF Water Main Extension along Fromhart Street creating a hydraulic loop between the Gano Avenue corridor, Grove Park Drive, and Fromhart Street. A fully integrated AMI system will allow for real-time monitoring of water consumption, improved billing accuracy, enhanced operational efficiency, and reduced operation and maintenance costs. It will also allow for leak detection capabilities, enabling the Town to identify potential issues in the water distribution system quickly in order to reduce water losses and promote water conservation efforts.

As required by the FDEP SRF program, this Planning document must evaluate potential alternatives to the proposed project goal. The alternatives are required to evaluate associated environmental impacts, potential economic impacts, and overall feasibility. The selected alternative confirms the project scope and is to be consistent with the design documents. A project of this nature associated with water meter replacements and a water main extension has limited alternative options available. However, to satisfy the FDEP DWSRF planning requirements, the evaluated options include:

1. **Alternative No. 1** - "No Action" Alternative

2. **Alternative No. 2** - Automatic Meter Reading (AMR) Meters with Directionally Drilled Trenchless Water Main Extension

3. **Alternative No. 3** - AMR Meters with Conventionally Installed Water Main Extension

4. **Alternative No. 4** - AMI Meters with Directionally Drilled Trenchless Water Main Extension

5. **Alternative No. 5** - AMI Meters with Conventionally Installed Water Main Extension

A breakdown of the estimated conceptual costs associated with each alternative are presented below:

ALTERNATIVE	TOTAL CONSTRUCTION PHASE-COST	NET PRESENT VALUE
1	N/A	N/A
2	$3,768,000	-$13,135,650
3	$3,637,000	-$13,039,625
4	$4,659,000	-$13,881,250
5	$4,528,000	-$13,785,224

Due to marginal differences in the 20-year Net Present Values (NPV) and project feasibility, the recommended alternative is Alternative No. 5, consistent with the Town's initial project intent/goal to implement a fully integrated AMI metering system with a designated water main extension. The total project cost of the proposed scope is conservatively estimated at approximately $4,528,000. Final project costs will be dependent on construction bid values, as the estimated costs are primarily derived from the average of recent project construction bid tabulations, supplier quotes, and engineering judgement. The presented costs were utilized for comparative purposes to confirm the project scope. Town staffing decisions and structuring following system improvements along with additional captured water sales revenue will likely further increase the NPV of Alternative No. 5.

It is anticipated that the project will be funded from the following sources should the Town desire to move forward to the construction phase utilizing FDEP SRF funds:

SOURCE	AMOUNT
SRF Loan (77%)	$3,486,560
SRF Principal Forgiveness/Grant (23%)	$1,041,440
Total	**$4,528,000**

Anticipated SRF Principal Forgiveness percentage, SRF interest rate, and associated Debt Service are dependent on the recognized Town median household income (MHI) compared to the state-wide median household (SMHI) valuations at the time of funding application. Current published data provide a Town MHI of $77,106 and a SMHI of $77,735, equating to a construction-phase Principal Forgiveness percentage of approximately 23% and SRF Construction Loan interest rate of 2.87%.

Adoption of Resolution No. 14-26 by the Town formally accepts the Facilities Plan, and therefore, establishes the selected project scope, provides conformance with the design documents and Town's project goals, and allows the project planning and design phase to be complete. Acceptance of the Facilities Plan and confirmation of the project scope allows the project to be eligible for construction-phase funding consideration.

2.0 INTRODUCTION

2.1 LOCATION

The Town of Orange Park is located in northeast Clay County. **Figure 2-1** provides a location map for the Town with Town limits, which provides a depiction of the areas served by the Town's potable water infrastructure (Water System). The Town water system is bounded on the east side by the St. Johns River, on the south and west by the Clay County Utility Authority (CCUA) service area, and on the north by the JEA utility service area. Due to the location of the adjacent utility service areas and land features, the Town is not anticipated to extend or expand its water system service area outside of the current limits.

The Town limits occupy an area of approximately 5.3 square miles, as shown in **Figure 2-1**, and the municipal limits generally corresponds to the Town's water system service area limits. The service area includes many commercial properties, as well as single-family and multi-family residential areas.

2.2 EXISTING WATER SYSTEM FACILITIES

The Town's water supply system (FDEP PWS ID No. 2101182) includes two water treatment plants and distribution network, and is owned and operated by the Town of Orange Park. The spatial locations of the system's existing water meters and water mains are shown in **Figure 2-2** and **Figure 2-3**. Additional information related to the Town's existing water system infrastructure, supply permits and, capabilities are provided in **Section 3.4** and **Appendix A - Water Supply Facilities Work Plan** completed by the Town and CPH Consulting, LLC in 2025.

2.3 PROJECT NEED

Currently Town employees spend approximately 3-5 days each month physically reading the Town's active water meters. Approximately 750 existing water meters were recently replaced with AMI ultrasonic water meters leaving 2,400 analog or radio-signal water meters remaining throughout the Town. The remaining meters are beyond their expected useful life and have an average age in excess of 20 years. In addition to reading the meters, it takes the Town's staff members approximately 3-5 days each month to manually input this data, increasing labor costs and the chance for human error. Upgrading the Town's water metering infrastructure will

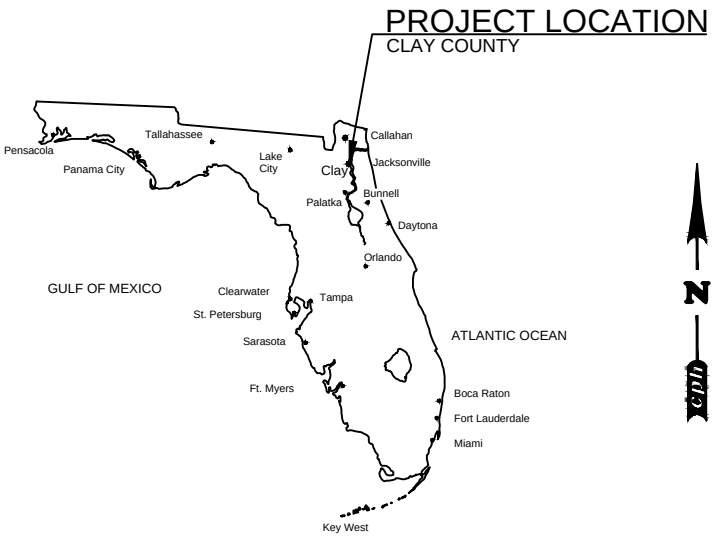
reduce operational costs and improve billing accuracy. Ensuring this data is accurate, recorded in a timely manner, and properly analyzed is essential for increasing revenue and cash flow, and enhancing customer satisfaction.

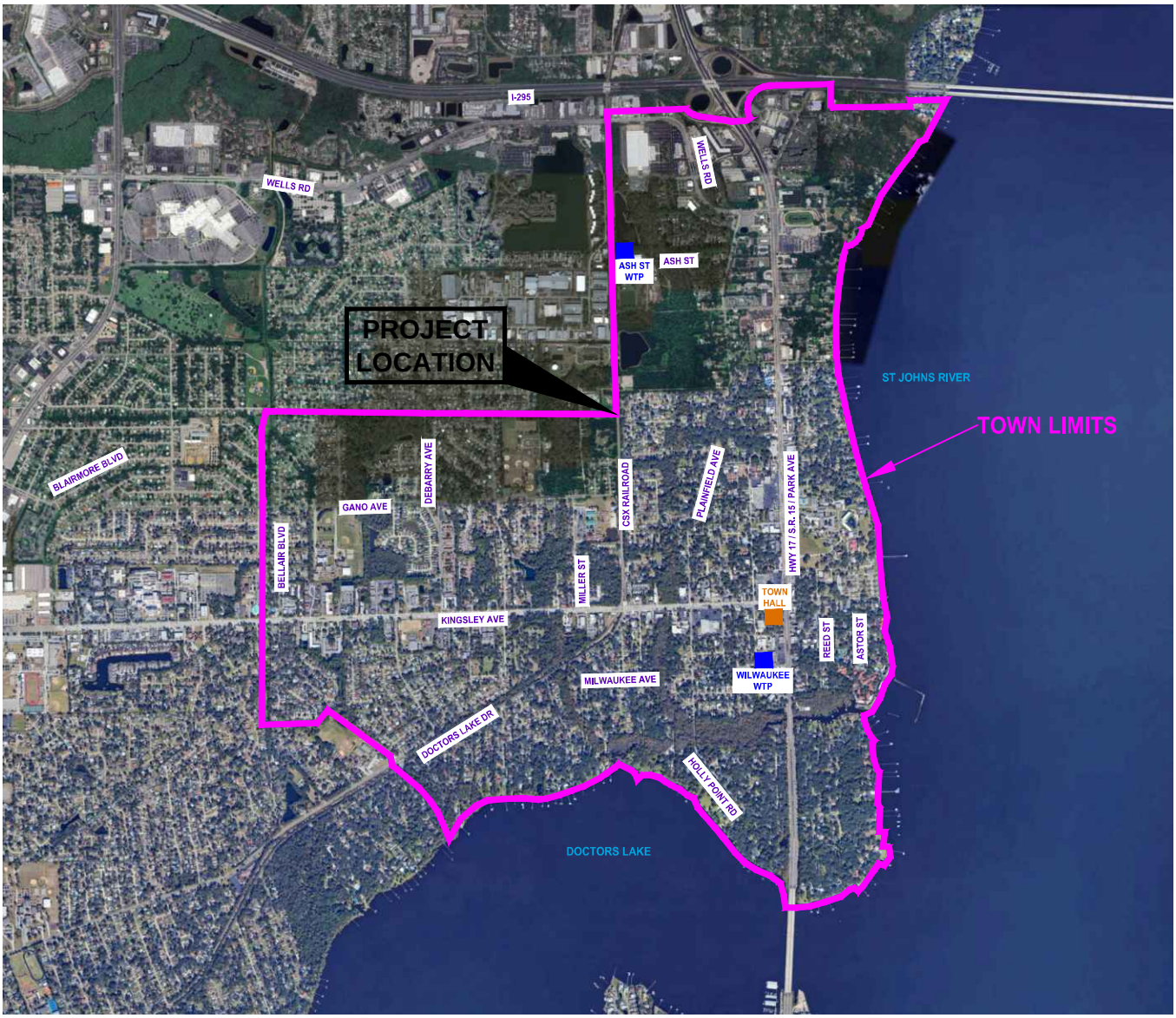
Throughout the Town's existing Water System, water mains and service piping consist of aged AC, CAS, DIP, and VCP with areas of more recently constructed PVC piping. The Town reported experiencing insufficient water pressure in select areas and potential lower water quality due to the presence of dead ends and lack of hydraulic looping. The targeted priority area to be addressed by the Town consists of the residential area on the northwestern sector of the service area generally consisting of the Gano Ave, Fromhart St, and Grove Park Dr corridors. The proposed water main route required for system hydraulic improvements is presented in **Figure 2-4** and the associated design Drawings. The proposed water main extension will create a hydraulic loop in the water system to improve fire protection capabilities, enhance water circulation, and maintain higher water system reliability.

2.4 SCOPE OF STUDY

The development of this Plan included assessments of the following data:

- Existing water meters and meter boxes
- Service area characteristics, conditions, and environmental impacts.
- Projected service area needs for the planning period
- Evaluating alternative solutions including Automated Meter Reading (AMR) & Advanced Metering Infrastructure (AMI) water meters, directionally drilled trenchless pipe installation, and conventional pipe installation.
- Addressing distribution system extension and/or replacement needs to improve water pressure, enhance water circulation, and enhance fire suppression capabilities.
- Recommended solution and implementation costs





cph
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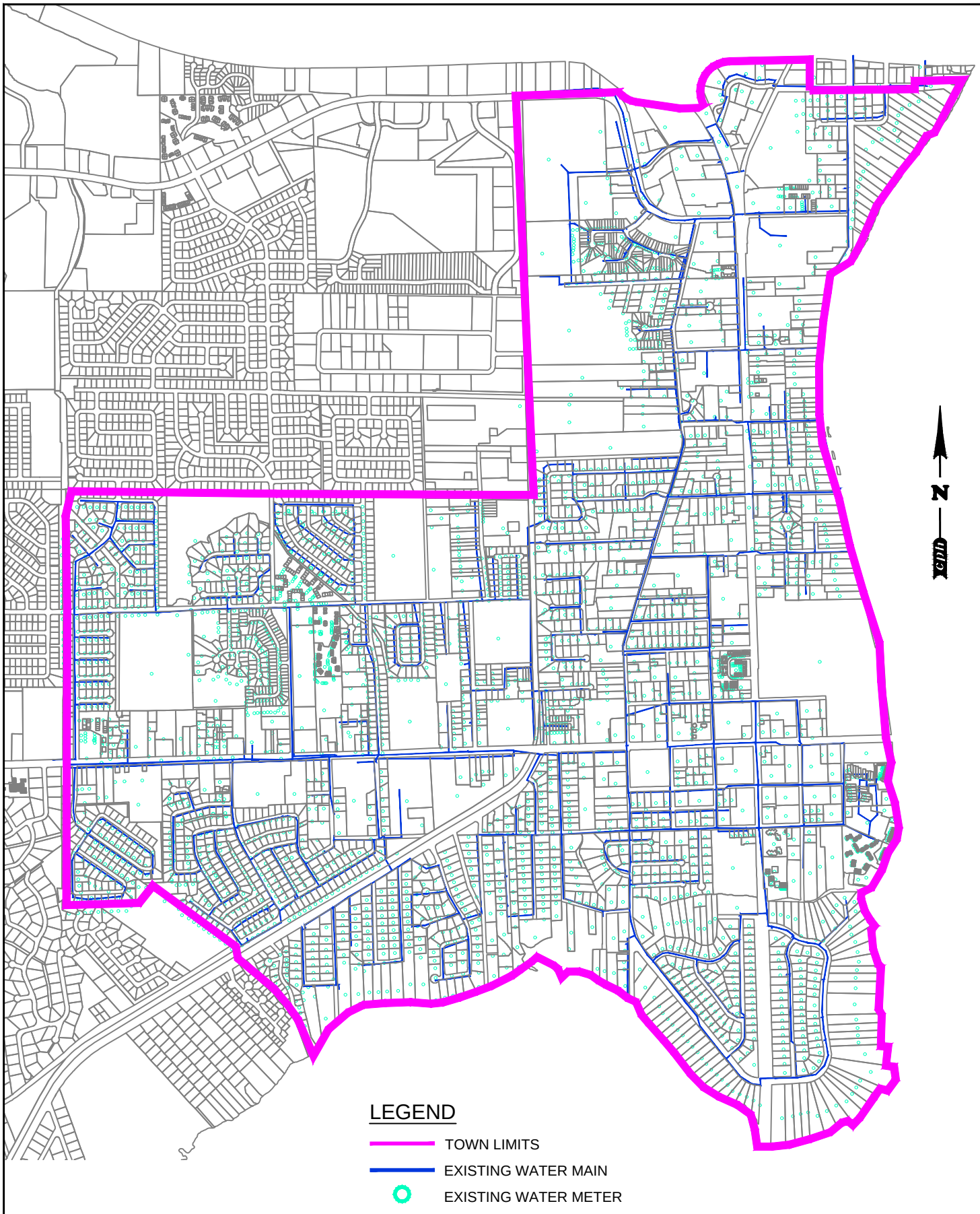
Orange Park, FL 32073
Ph: 904.278.0030

TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
Location & Service Map
Clay County, Florida

FIGURE
2-1
MARCH 2026
Client No.
2401-04-1



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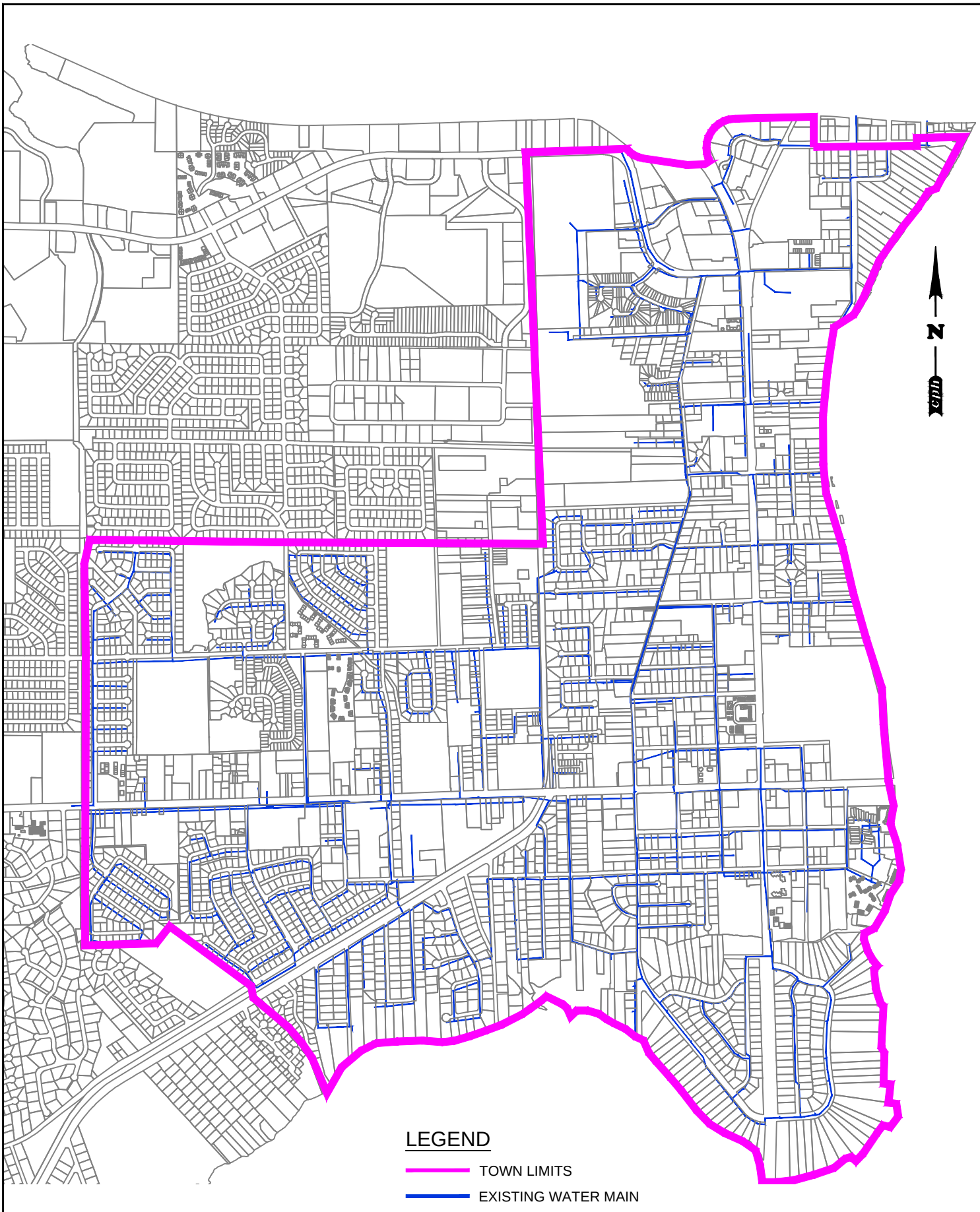
TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
Existing Water Meters
Clay County, Florida

FIGURE
2-2
MARCH 2026
Client No.
2401-04-1



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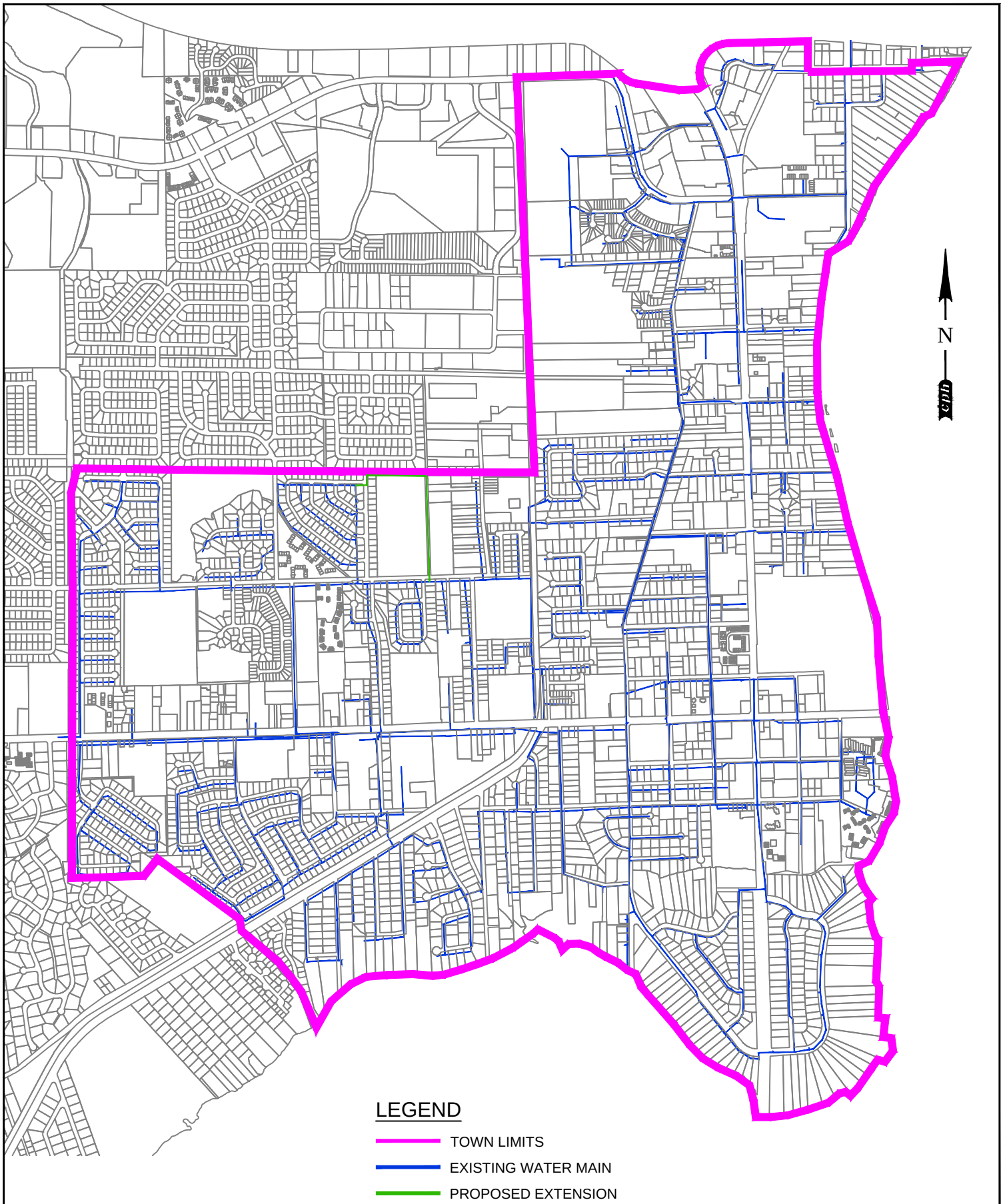
TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
Existing Water Mains
Clay County, Florida

FIGURE
2-3
MARCH 2026
Client No.
2401-04-1



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TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
Proposed Water Main Extensions
Clay County, Florida

FIGURE
2-4
MARCH 2026
Client No.
2401-04-1

3.0 ENVIRONMENTAL IMPACTS

3.1 Description of Planning Area

3.1.1 Planning Area

The planning area is focused on the Town's existing service area and is not anticipated to change significantly over the 20-year planning period. The Town's service area is largely build out and work is anticipated to be conducted entirely in established right-of-way and developed property.

3.1.2 Climate

The Project Area has a moderate climate with long, hot, and humid summers and cool to occasionally cold winters. The average winter low is around 46°F, while the average summer high reaches 91°F. Clay County receives approximately 52 inches of annual precipitation.

3.1.3 Topography and Drainage

The planning area is generally flat to gently sloping, as identified in the Natural Resources Conservation Service (NRCS) soil survey and United States Geologic Survey (USGS) topographic maps. Available topographic data shows the average elevation of the area is 16 feet-NAVD, with a minimum elevation of -3 feet-NAVD and a maximum elevation of 56 feet-NAVD. Drainage in the area is primarily facilitated by natural low-lying areas and tributaries, with water flowing toward the St. Johns River. This historic USGS Quadrangle Map is provided in **Appendix B**.

3.1.4 Geology, Soils and Physiography

According to the USDA Soils Survey Report provided in **Appendix C**, the soils in the Orange Park area mostly consist of sandy sediments typical of Florida's coastal plain, with gently sloping to nearly level terrain. The USDA soil survey identifies predominant soil types as Ortega-Urban Land complex soil, Sapelo-Urban land complex soil, and urban soils, which are generally poorly to moderately drained. **Figures 3-1A, 3-1B** and **3-1C** includes soils mapping documents of the Town's municipal area.

3.1.5 Environmentally Sensitive Areas or Features

3.1.5.1 Wetlands

The U.S. Fish and Wildlife Wetlands Inventory Map, shown In **Figure 3-2,** indicates that the project area has Freshwater Forested/Shrub Wetland tracts adjacent to and contiguous with the northwestern and western and southern parts of Orange Park.

3.1.5.2 Prime and Unique Farmlands

According to the USDA Soil Survey Report, provided in **Appendix C**, there are no prime or unique farmlands within the planning area

3.1.5.3 Plant and Animal Communities (Endangered Species)

Appendix D provides a list of endangered and threatened species known to be present in Clay County. The project is not expected to impact these species.

3.1.6 Flood Plain

The Fema Flood Insurance Rate Map shown in **Figures 3-3A, 3-3B, and 3-3C** for the project area shows that flood plains are located adjacent to the water bodies in the planning area. The facility improvements, as proposed by this project, are located outside of the 100-year flood plain and generally within the existing road right-of-way. According to the Federal Flood Risk Management Standard (FFRMS) report, the flood plain area is located mainly along the St. Johns River.

3.1.7 Air Quality

The Town of Orange Park has an Air Quality Index (AQI) rating of 31, which falls within the "Good" range (0–50). This indicates that the air quality is considered ideal for the general population. The AQI for Orange Park is notably lower than the national average of 39 in 2024, suggesting that the area experiences cleaner air than many other regions across the United States.

3.2 Socio-Economic Conditions

3.2.1 Population

According to the 2020 U.S. Census, Orange Park has a population of 9,089 people. The Town's water system serves the residents of Orange Park as well as businesses within the Town.

3.2.2 Land Use and Development

The Town of Orange Park generally consists of low- to medium-density residential and commercial development. Both residential and commercial development are expected to experience low growth during the planning period.

Figure 3-4 includes the Town's 2024 Zoning Map provided by the Town of Orange Park. As previously noted, the Town is predominately composed of parcels for residential and commercial uses, with the remaining parcels designated for industrial or public uses.

Figure 3-5 includes the Town's Future Land Use Map (FLUM) for the year 2040, which indicates that the Town mostly consists of low- to medium-density residential and commercial developments with an industrial development and conservation areas. Conservation areas will not be impacted from the proposed project.

3.3 Water Quality and Uses

3.3.1 Surface Water and Groundwater Hydrology, Quality and Uses

There are no Outstanding Florida Waters (OFW) within the planning area.

3.3.2 Sourcewater Protection

Chapter 62-521, F.A.C., establishes groundwater protection measures within Wellhead Protection Areas. For the Town of Orange Park, the Wellhead Protection Area includes a 500-foot radial setback surrounding the Town's raw water supply wells to help safeguard groundwater quality.

3.4 Water Supply, Treatment, and Transmission/Distribution System

3.4.1 Description of the Existing Water Supply & Treatment System

The Town currently owns and operates a water supply and distribution system (PWS No. 2101182) that consists of distribution piping and two water treatment plants (WTPs) containing four public water supply wells, two hydropneumatic tanks, two aerated ground storage tanks (GSTs), four high service pumps (HSPs), and associated appurtenances. These system components provide potable water and fire protection capabilities to the Town's developed areas. No external potable water interconnection is incorporated in the Town's system.

A general summary of the major WTP components are as follows:

Ash Street WTP:

- Ash St Well No. 1
- Ash St Well No. 2
- Aerated GST No. 1
- Hypochlorite Storage Tanks
- Chlorination Pump Nos 1, 2, and 3
- High Service Pumps No. 1, 2, and 3
- Hydropneumatic Tank No. 1
- Generator

Milwaukee WTP:

- Milwaukee Ave Well No. 1
- Milwaukee Ave Well No. 2
- Aerated GST No. 1
- Hypochlorite Storage Tanks
- Chlorination Pump Nos 1, 2, and 3
- High Service Pumps No. 1, 2, and 3
- Hydropneumatic Tank No. 1
- Generator

The Town's two WTP each have a permitted maximum-day capacity of 2.90 MGD (2,014 gpm). **Appendix E** provides the most recent 2025 FDEP Sanitary Survey Report with additional water system analysis provided in **Appendix A**.

The Town's Water System operates under Consumptive Use Permit No. 453 issued by SJRWMD. The SJRWMD has authorized the use of 513.0 million gallons per year (MGY), which corresponds to a annual average of 1.405 million gallons per day (MGD).

3.4.2 Population Projections and Water Usage

The Bureau of Economic and Business Research (BEBR) of the University of Florida 2025 population estimates for Clay County and the Town were 238,605 and 9,158 persons, respectively. In comparison the 2020 Census population estimates were 218,245 (+9.3% change or +1.9% per year) and 9,089 (+0.8% change or +0.2% change per year) persons, respectively. This demonstrates the Town has not experienced as much growth as other areas of Clay County, and is not anticipated to experience as much growth in the future.

BEBR does not have population projections for the Town of Orange Park, but does provide population projections for Clay County. To conservatively project future Town population from the County projections, the following criteria are used: (1) the Town service area will experience population growth equal to that of the "medium growth" projections published for Clay County as a whole; (2) population growth outside the existing service area will not be considered. Table III-1 represents the growth in the Town from 2025 through 2050 projection indicating a total population of 11,046 persons.

TABLE 3-1
POPULATION GROWTH 2025 THROUGH 2050 (PROJECTED)

Year	Town Population	Percent Change (Total)	Average Percent Change Per Year
2025	9,158		
2030	9,791	6.9%	1.4%
2035	10,271	4.9%	1.0%
2040	10,605	3.3%	0.7%
2045	10,847	2.3%	0.5%
2050	11,046	1.8%	0.4%

The current per capita water production from the wells, based on the EN-50 data reported the SJRWMD, is approximately 96 GPD, while the per capita billed consumption is approximately 100 GPD. This discrepancy indicates that the Town's meters are likely reporting inaccurate data and supports the need for meter replacements. The estimated average daily demand for the system is approximately 0.880 MGD. **Figure 3-6** provides historical water usage and water use projections from 2025-2050. This demonstrates the Town's consumptive use permit is not anticipated to be surpassed for the project planning period or foreseeable future.

3.4.3 Water Conservation

Water service customers are typically individually metered and billed based on their consumption via a tiered rate structure, thereby providing an incentive for water conservation. However, a significant number of facilities are master metered, which can limit the ability to assess individual usage for bulk users. **Appendix A** further highlights the Town's conservation efforts by demonstrating compliance with SJRWMD reporting requirements, implementing a Landscape Irrigation Ordinance (36-227), addressing conservation goals in the Town 2040 Comprehensive Plan, and implementing/updating a Capital Improvement Plan to continuously upgrade the Town water system.

3.4.4 Performance of Existing Water System

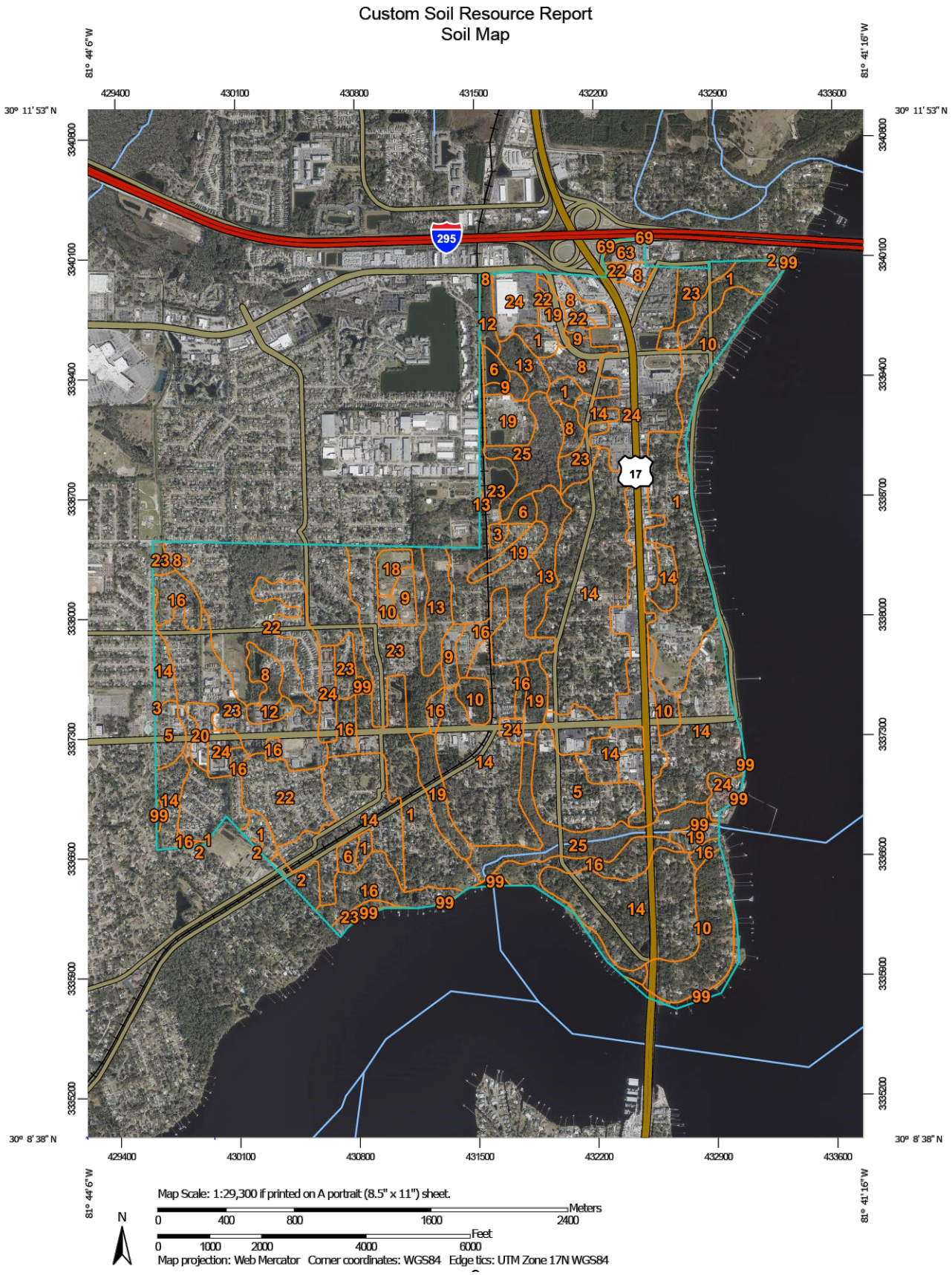
Appendix F consists of the results of analytical testing of the Town's finished water and the 2025 Consumer Confidence Report (CCR). This demonstrates the responsibility and compliance of the Town's system operation & maintenance.

3.5 Managerial Capacity

The Town's public water system is operated by Mr. Brandon Hoffman, License No. A-21357, who serves as the Lead Operator under contract with the Town.

3.5.1 Operation and Maintenance Program

Mr. Brandon Hoffman serves as the Lead Operator for the Town's public water system and has a public works team managed under the Public Works Director. Maintenance and repairs are made on an as-needed basis, but with ongoing efforts, the Town is constantly working towards implementing a more proactive maintenance program.



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TOWN OF ORANGE PARK
SRF Water Meter Replacement
Soils Map
Clay County, Florida

FIGURE
3-1A
MARCH 2026
Client No.
2401-04-1

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clay County, Florida
Survey Area Data: Version 21, Aug 20, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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TOWN OF ORANGE PARK
SRF Water Meter Replacement
Soils Map Legend & Information
Clay County, Florida

FIGURE
3-1B
MARCH 2026
Client No.
2401-04-1

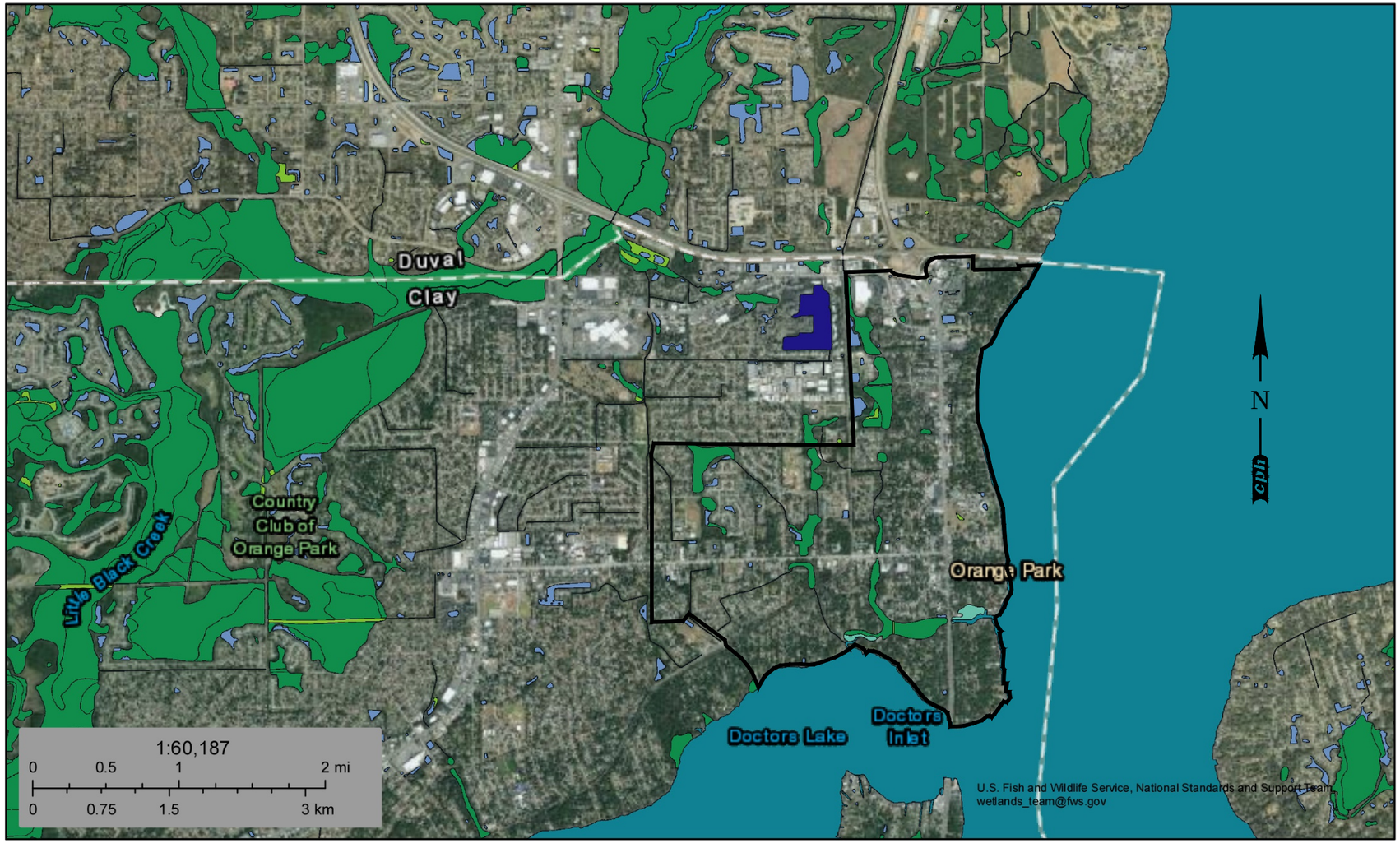
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Albany fine sand, 0 to 5 percent slopes	213.9	9.1%
2	Blanton fine sand, 0 to 5 percent slopes	11.2	0.5%
3	Hurricane fine sand, 0 to 5 percent slopes	3.3	0.1%
5	Penney fine sand, 0 to 5 percent slopes	69.1	3.0%
6	Mandarin fine sand, 0 to 2 percent slopes	17.1	0.7%
8	Sapelo fine sand	63.6	2.7%
9	Leon fine sand, 0 to 2 percent slopes	24.9	1.1%
10	Ortega fine sand, 0 to 5 percent slopes	117.9	5.0%
12	Surrency fine sand, depressional	15.3	0.7%
13	Meggett fine sandy loam	64.6	2.8%
14	Ortega-Urban land complex, 0 to 5 percent slopes	572.5	24.4%
16	Hurricane-Urban land complex, 0 to 5 percent slopes	131.3	5.6%
18	Ridgewood fine sand, 0 to 5 percent slopes	9.8	0.4%
19	Osier fine sand	81.2	3.5%
20	Scranton fine sand	10.2	0.4%
22	Pelham fine sand, 0 to 2 percent slopes	203.2	8.7%
23	Sapelo-Urban land complex	343.0	14.6%
24	Urban land	271.7	11.6%
25	Maurepas muck, frequently flooded	92.1	3.9%
99	Water	17.0	0.7%
Subtotals for Soil Survey Area		2,332.9	99.6%
Totals for Area of Interest		2,341.9	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Albany fine sand, 0 to 5 percent slopes	0.6	0.0%
63	Sapelo fine sand, 0 to 2 percent	7.1	0.3%
69	Urban land	1.2	0.1%
99	Water	0.1	0.0%
Subtotals for Soil Survey Area		9.0	0.4%
Totals for Area of Interest		2,341.9	100.0%

U.S. Fish and Wildlife Service
National Wetlands Inventory

Town of Orange Park Wetlands Inventory



May 23, 2025

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

LEGEND

TOWN LIMITS

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Orange Park, FL 32073
Ph: 904.278.0030

TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
U.S. Fish & Wildlife Wetlands Inventory Map
Clay County, Florida

FIGURE 3-2
MARCH 2026
Client No. 2401-04-1

81°43'7.93"W 30°11'21.6"N



81°41'14.57"W 30°9'15.92"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes Zone X
- Area with Flood Risk due to Levee Zone D
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs

OTHER AREAS
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

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For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 6/2/2025 2:49 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

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SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

N

0 50 100 200 300 400 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

PANEL 87 OF 500

Panel Contains:

COMMUNITY	NUMBER	PANEL
CLAY COUNTY	120064	0087
CITY OF JACKSONVILLE	120077	0087
TOWN OF ORANGE PARK	120066	0087

MAP NUMBER
12019C0087E
EFFECTIVE DATE
March 17, 2014

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Orange Park, FL 32073
Ph: 904.278.0030

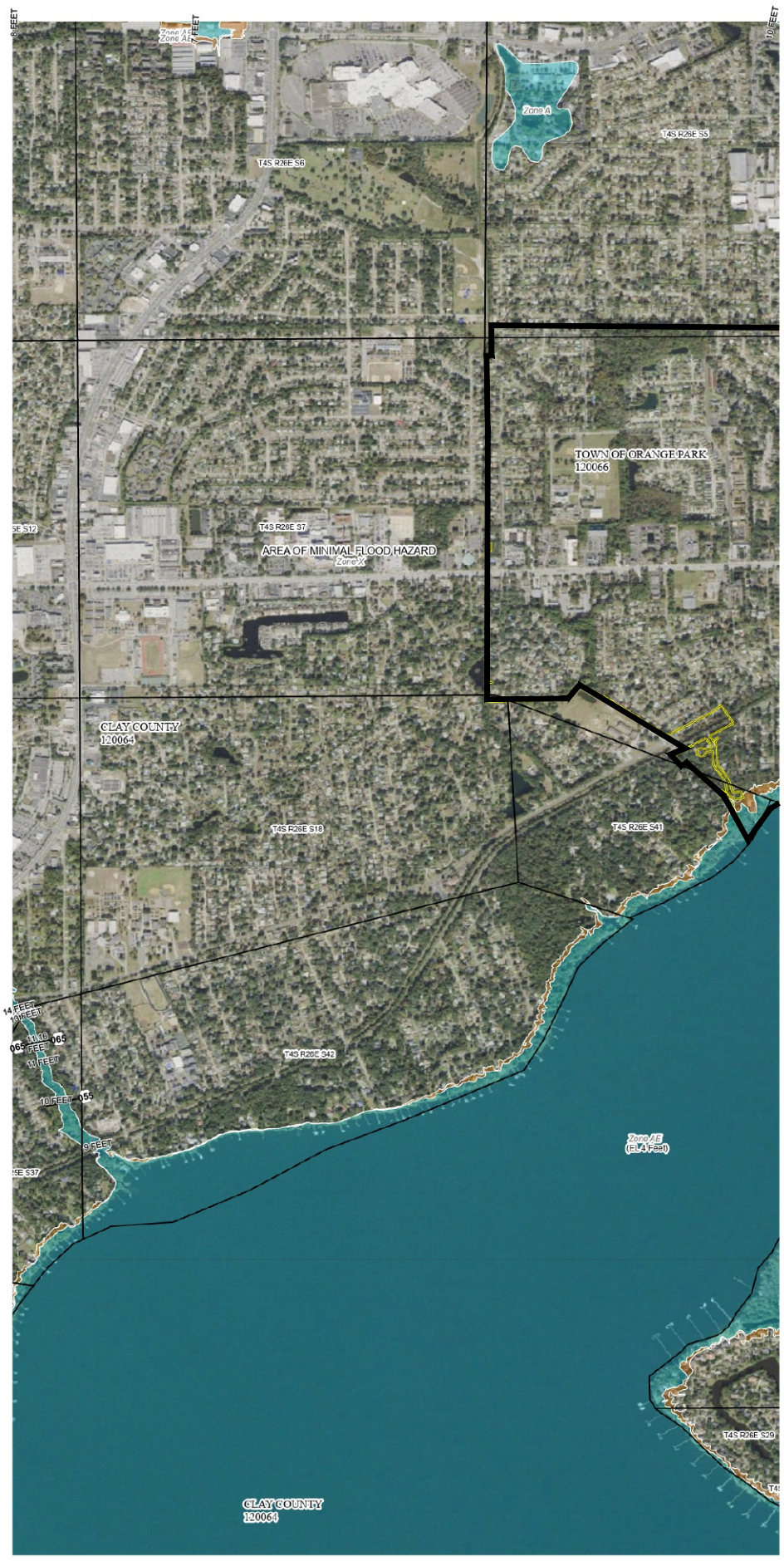
LEGEND

TOWN LIMITS

TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
FEMA Flood Map
Clay County, Florida

FIGURE
3-3A
MARCH 2026
Client No.
2401-04-1

81°45'57.11"W 30°11'28.19"N



81°42'10.4"W 30°7'16.84"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

- SPECIAL FLOOD HAZARD AREAS
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- OTHER AREAS OF FLOOD HAZARD
  - Area with Flood Risk due to Levee *Zone D*
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- OTHER AREAS
  - Area of Undetermined Flood Hazard *Zone D*
- GENERAL STRUCTURES
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- OTHER FEATURES
  - 20.2 Cross Sections with 1% Annual Chance
  - 17.5 Water Surface Elevation
  - Coastal Transect
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
  - Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary

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SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88

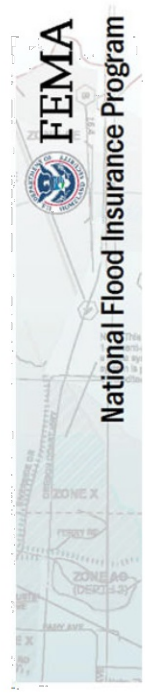
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 1,000 feet 1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

N

0 105 210 420 630 840 Meters



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
PANEL 90 OF 500

Panel Contains:

COMMUNITY	NUMBER	PANEL
CLAY COUNTY	120064	0090
TOWN OF ORANGE PARK	120066	0090

MAP NUMBER
12019C0090E
EFFECTIVE DATE
March 17, 2014

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LEGEND

TOWN LIMITS

TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
FEMA Flood Map
Clay County, Florida

FIGURE
3-3B
MARCH 2026
Client No.
2401-04-1

81°43'7.93"W 30°9'29.1"N



81°41'14.57"W 30°7'23.43"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*

LINK> </CLR>for official maps and additional

- Area with Reduced Flood Risk due to Levee See Notes *Zone X*

OTHER AREAS OF FLOOD HAZARD
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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SCALE

Map Projection:
GCS. Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

0 50 100 200 300 400 Meters

N



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
PANEL 89 OF 500

Panel Contains:

COMMUNITY	NUMBER	PANEL
CLAY COUNTY	120064	0089
CITY OF JACKSONVILLE	120077	0089
TOWN OF ORANGE PARK	120066	0089

MAP NUMBER
12019C0089E
EFFECTIVE DATE
March 17, 2014

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LEGEND

TOWN LIMITS

TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
FEMA Flood Map
Clay County, Florida

FIGURE 3-3C
MARCH 2026
Client No. 2401-04-1

LEGEND

		Town Limits
	RS-1	Residential, Single Family Estate
	RS-2	Residential, Single Family Estate
	RS-3	Residential, Single Family Estate
	RG-1	Residential, General
	RG-2	Residential, General
	CPO	Commercial, Professional Office
	CN	Commercial, Neighborhood
	CG	Commercial, General
	CI	Commercial, Intensive
	IW	Industrial, Warehouse
	GU	Governmental Use
	PUD	Planned Unit Development
		Interstate Impact Area
		RG-2 Overlay

Duval County

Clay County

St. Johns River

Doctors Lake

N

P:\115038.01\GIS\OP Zoning 24x36.mxd

Source: Town of Orange Park

Zoning Map

0 600 1,200 Feet

Revised April 30, 2024
August 25, 2022
July 1, 2022
August 16, 2021

Project No. 115038.01

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Orange Park, FL 32073
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TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
Orange Park 2024 Map
Clay County, Florida

FIGURE 3-4
MARCH 2026
Client No. 2401-04-1

LEGEND

	Town Limits
LDR	Low Density Residential
MDR	Medium Density Residential
CLI	Commercial Low Intensity
CMI	Commercial Medium Intensity
CHI	Commercial High Intensity
I	Industrial
MU	Mixed Use
P	Public / Semi-Public
	Conservation (Overlay)

Duval County

Clay County

St. Johns River

Doctors Lake

N

P:\115038.01\GIS\OP FLU 24x36.mxd

Source: Town of Orange Park

Future Land Use Map 2040

Figure A.2

0 600 1,200 Feet

Revised April 30, 2024
February 8, 2021
October 8, 2020

Project No. 115038.01

TOWN of ORANGE PARK
Closer To What Matters

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Orange Park, FL 32073
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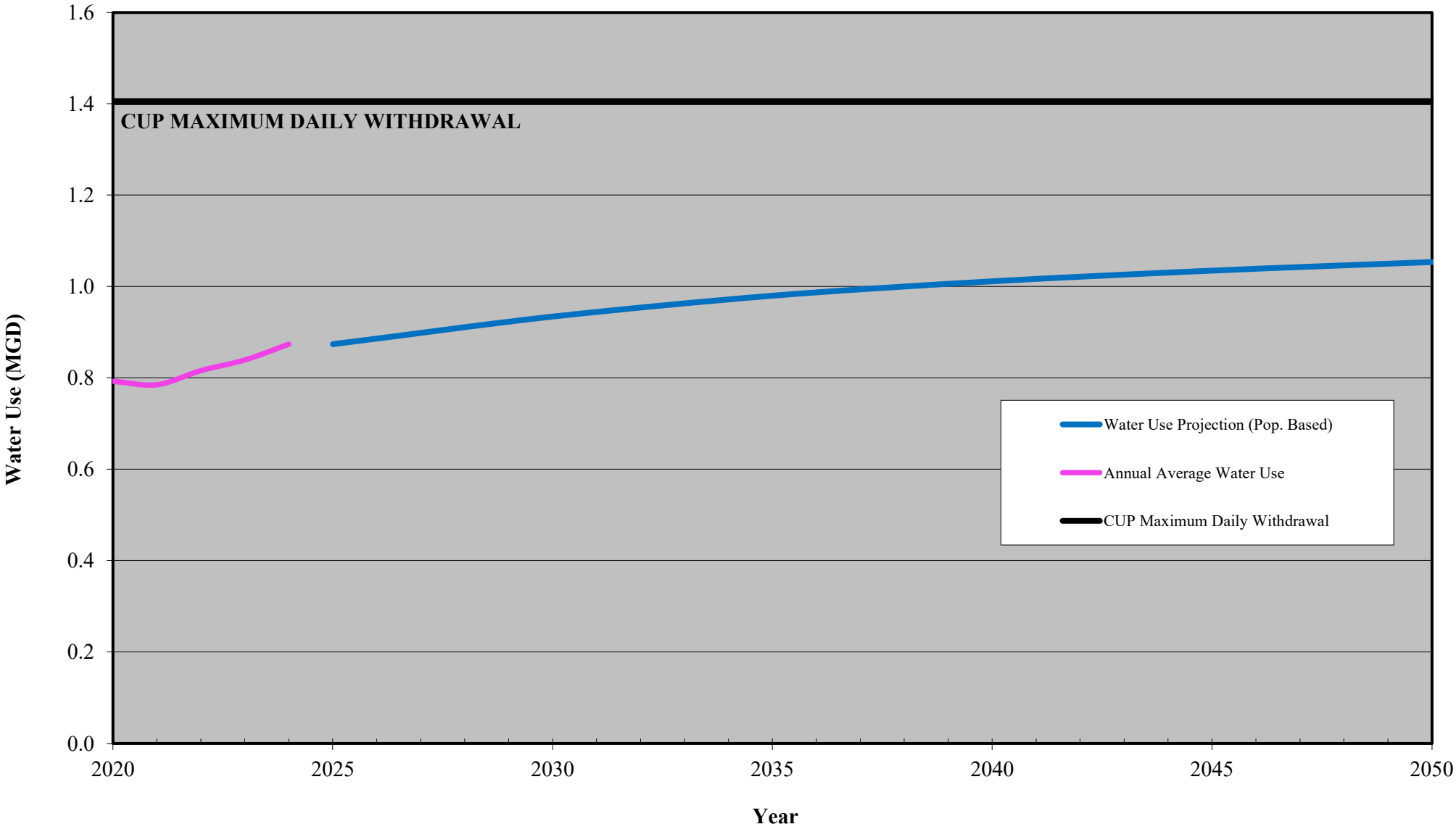
TOWN OF ORANGE PARK
DWSRF Water Meter Replacement
Orange Park 2040 Future Map
Clay County, Florida

FIGURE 3-5
MARCH 2026
Client No. 2401-04-1

Town of Orange Park
DWSRF Water Meter Replacements
Figure 3-6: Population Based Water Use Projection



4.0 DEVELOPMENT OF WATER METER REPLACEMENT ALTERNATIVES

4.1 General

The objectives of this project are to replace approximately 2,400 aged analog and radio-signal water meters ensuring compliance with the drinking water standards outlined in Chapter 62-550, F.A.C. The project will also include constructing a 2,300 linear foot water main extension along Fromhart Street creating a hydraulic loop between the Gano Avenue corridor, Grove Park Drive, and Fromhart Street, abandon existing 2" PVC water main on Fromhart Street, along with installing new hydrants and valves for the Town. For a project of this scope, limited alternatives are available for a water meter upgrade/replacement effort and a water main extension. In order to satisfy FDEP DWSRF planning requirements, five alternatives have been developed and are described below, including a “No Action” alternative.

The options evaluated include:

- **Alternative No. 1** - “No Action” Alternative
- **Alternative No. 2** - AMR Meters with Directionally Drilled Trenchless Water Main Extension
- **Alternative No. 3** - AMR Meters with Conventionally Installed Water Main Extension
- **Alternative No. 4** - AMI Meters with Directionally Drilled Trenchless Water Main Extension
- **Alternative No. 5** - AMI Meters with Conventionally Installed Water Main Extension

4.2 Cost-Effectiveness

A Net Present Value or Net Present Worth analysis has been used to compare the various alternatives in this facilities plan. The present worth calculations for the viable alternatives incorporate the following considerations:

1. A planning period of 20 years.

2. The Office of Management and Budget (OMB) Federal Water Project discount rate for October 1, 2025 through and including September 30, 2026 is 3.25%.

3. Capital costs, including construction, contingencies, engineering, legal, fiscal, and administrative expenses.

4. Costs associated with daily operation and maintenance

5. Salvage values based on the useful lives of various project components (Piping - 50 years, Hydrants & Valves - 40 years, Meters - 20 years)

6. Cost estimates based on recent bids, equipment supplier quotes, and engineering judgement.

4.3 Alternative No. 1 - No Action

Under this alternative, the existing water metering system and water distribution system would remain unchanged and continue to age. This would likely result in continued issues, such as inadequate metering and billing accuracy and insufficient water pressure in isolated areas. Given ongoing issues, including metering inaccuracies and the risk of unaccounted water, this alternative is not viable and has been rejected.

4.4 Individual Assessment Approach For Alternatives No. 2 Through No. 5

For **Alternatives No. 2** through **No. 5**, an Individual Assessment approach is utilized to evaluate the Town's water distribution needs and existing water metering infrastructure. Using this approach, AMI or AMR metering systems and directional drilling or conventional installation methods for the proposed water main extension are considered and analyzed individually to determine the most appropriate and cost-effective solution.

The analysis of these components includes a review of existing maps of the water system, records of previous rehabilitation efforts, water treatment plant (WTP) and water system flow data, vendor product information, and input from Town Staff contributing to the overall analysis and scope of the project. Also taken into consideration, were the restoration needs, the locations of the existing components, the surrounding areas likely to be impacted during construction, and the potential effects the construction would have on citizens and businesses.

In general, there are various options for water meter replacement and water main extension installation methods. Common methods consist of the following:

Water Meter Replacement Options

1. Automated Meter Reading (AMR) Meters
2. Advanced Metering Infrastructure (AMI) Meters

Water Main Extension Methods

1. "Trenchless Directional Drilling" (90% directional drilling with 10% conventional installation); and
2. "Conventional Trench Open-Cut Installation" (90% conventional installation with 10% directional drilling)

Automated Meter Reading (AMR) refers to a system that collects aggregated water utility usage, and in some cases demand, is retrieved through automatic means such as a drive-by vehicle or walk-by handheld system. AMR technology, allows water usage over a billing period to be acquired without physical access to the meter.

AMR technology significantly reduces the time required for conventional meter reading and offers the following advantages over traditional methods:

1. Reduces the financial burden of correcting mistakes from manual readings

2. Provides more accurate meter readings

3. Improves billing accuracy

The Town currently has AMR technology or radio-signal meters in place, and it is seen as an upgrade to conventional touch or analog-read meters.

Advanced Metering Infrastructure (AMI) builds upon the concepts of AMR by enabling two-way communication between the water meter and the utility provider. The Federal Energy Regulatory Commission (FERC) defines AMI as a metering system that records customer consumption hourly or more frequently and transmits these measurements over a communication network to a central collection point. AMI provides real-time feedback, allowing the utility to access immediate data.

AMI technology offers the latest advancement in metering solutions, is seen as an upgrade to AMR and offers the following advantages over AMR:

1. Lowers the cost and time required for meter reading

2. Provides real-time billing information, allowing the Town to address water leakage, and reduce water losses.

3. Reduces billing errors and disputes.

4. Promotes water conservation by offering time-of-use consumption data

5. Expands beyond AMR by incorporating remote utility management and smart meters.

6. Notifies system administrators of unusual consumption patterns.

7. Eliminates labor, fuel, and transportation costs associated with manual-read or drive-by read meters.

8. Ease of transitioning to fully implemented AMI system due to existing AMI meters and previously installed software.

Conventional Trench Open-Cut Installation ("Conventional Installation") for water main installation provides the Town with new pipeline in common right-of-way. While this water main extension method is the least expensive, it is also the most disruptive. It sometimes may not be practical based on location and associated restoration. As a result, the conventional installation method includes an assumption of 10% directionally drilled water main for conflict crossings.

Directional Drilling, a trenchless installation method, consists of creating a pilot hole, attaching a reamer to the drill, pulling the reamer back through the pilot holes to enlarge the holes, and following with the proposed carrier pipe. Directional drilling does require some excavation of launching and receiving pits for the installation to be drilled and pulled, along with the installation of fittings, valves, and hydrants. As a result, the directional drilling method includes an assumption of 10% conventionally installed/trenched water main. While directional drilling is more expensive than conventional installation, it requires the least surface disruption and associated restoration.

4.5 Alternative No. 2 - Installation of an Automated Meter Reading (AMR) with Directionally Drilled Water Main Extension

4.5.1 Description

Specifically, **Alternative No. 2** consists of the following scope:

1. Replace approximately 2,400 aged analog and radio signal meters throughout the Town with new AMR Meters.

2. Construct 2,300 LF of 6" Water Main Extension along Fromhart Street creating a hydraulic loop between the Gano Avenue corridor, Grove Park Drive, and Fromhart Street, including associated hydrants and valves, using directional drilling installation.

4.5.2 Economic Evaluation

4.5.2.1 Capital Costs

The following **Table 4-1** provides and Engineer's Opinion of Probable Cost for **Alternative No. 2.** Capital costs for this alternative were developed by utilizing bid pricing from similar water main replacement projects, water meter replacement projects, water system product manufacturer's price quotes, and engineering judgement. A standard construction contingency of 10% and non-construction costs of 18% (Technical Services During Construction) will be included for each alternative for consistency.

TABLE 4-1

ENGINEER'S OPINION OF PROBABLE PROJECT COST FOR ALTERNATIVE NO. 2 - AMR METERS WITH DIRECTIONALLY DRILLED WATER MAIN EXTENSION

Description	Unit	Est. Qty	Unit Price	Estimated Cost
1. Mobilization and General Conditions	LS	1	$294,400	$294,400
2. Fusible PVC Water Main Directionally Drilled				
a. 6-inch	LF	2,070	$140	$289,800

TABLE 4-1

ENGINEER'S OPINION OF PROBABLE PROJECT COST FOR ALTERNATIVE NO. 2 - AMR METERS WITH DIRECTIONALLY DRILLED WATER MAIN EXTENSION

Description	Unit	Est. Qty	Unit Price	Estimated Cost
2. PVC Water Main, Conventional Installation				
a. 6-inch	LF	230	$80	$18,400
3. DI Fittings - Cement Lined	Lbs	470	$15	$7,050
4. Gate Valves & Boxes				
a. 6-inch	EA	2	$3,200	$6,400
5. Fire Hydrant Assembly	EA	2	$10,000	$20,000
6. AMR Water Meter Replacement				
a. 0.75-inch to 1-inch (Residential)	EA	2,232	$800	$1,785,600
b. 1.5-inch to 2-inch (Intermediate)	EA	110	$2,000	$220,000
c. ≥3-inch (Large)	EA	35	$8,000	$280,000
7. Connections to Existing Main				
a. 6-inch Tapping Sleeve & Valve	EA	2	$10,000	$20,000
8. Restoration	LF	230	$10	$2,300
ESTIMATED CONSTRUCTION COST				**$2,943,950**
CONSTRUCTION CONTINGENCY (10%)				**$294,395**
TOTAL ESTIMATED CONSTRUCTION				**$3,238,345**
ESTIMATED NON-CONSTRUCTION COSTS (18%)				**$529,911**
TOTAL ESTIMATED PROJECT COST				**$3,768,000**

4.5.2.2 O&M Costs

The Town's annual O&M costs for this alternative were developed using its annual water operating expenses for the past three (3) fiscal years of available audit information, 2022-2024. The overall water-related O&M expenses minus depreciation over these three years averaged approximately $661,462 per year. These costs have fluctuated each year. With the proposed improvements, the Town will see a reduction in O&M costs associated with repairs and maintenance, labor, and operating supplies. Final recaptured water service revenues will also benefit the Town's financial status. Actual O&M savings values will depend on Town staffing decisions and structure following system improvements, and ongoing analysis of billing data trends. For purposes of this comparative analysis, a conservative (worst-case) savings of $10,000 per year will be used for AMR alternatives.

4.5.2.3 Net Present Value

A NPV analysis of **Alternative No. 2** is performed taking into account its capital cost, projected O&M cost, and salvage value. The 2026 Office of Management and Budget (OMB) Federal Water Project discount rate of 3.25% is used in determining the present worth of the corresponding O&M costs and salvage value of the alternative. The salvage value includes the estimated costs for piping, valves, and hydrants. A 20-year analysis period is utilized.

(P/A, 3.25%, 20 yrs) = 14.54
(P/F, 3.25%, 20 yrs) = 0.528

Total Estimated Capital Cost = $3,768,000
Present Value = -$3,768,000

Annual O&M Cost = $651,462
Present Value = -($651,462)(14.54) = -$9,472,258

Salvage Value

Piping (50 years) = ($308,200)(0.528)(30 yr) / (50 yr) = $97,638

Valves & Hydrants (40 yrs) = ($26,400)(0.528)(20yr)/(40 yrs)
= $6,970

Meters (20 years) = $0

Total Salvage Present Value = $104,608

TOTAL NET PRESENT VALUE

-$3,768,000 - $9,472,258 + $104,608 = **-$13,135,650**

4.5.3 Advantages and Disadvantages

TABLE 4-2
ADVANTAGES AND DISADVANTAGES FOR ALTERNATIVE NO. 2

Advantages	Disadvantages
1. Addresses water system deficiencies and increases efficiency and accuracy of meter readings compared to traditional methods.	1. Requires drive-by meter readings with associated labor, fuel, and transportation costs.
2. Minimal trenching involved leads to less disruption of existing infrastructure.	2. Unable to detect leaks, continuous flow, or high usage until next reading/billing period.
3. Faster installation than conventional open-cut installation.	3. Higher capital costs for alternatives with directional drilling method.
4. AMR System components require lower capital costs compared to AMI System components.	

4.6 Alternative No. 3 - Installation of an Automated Meter Reading (AMR) with Conventionally Installed Water Main Extension.

4.6.1 Description

Specifically, **Alternative No. 3** consists of the following scope:

1. Replace approximately 2,400 aged analog and radio signal meters throughout the Town with AMR Meters.

2. Construct 2,300 LF of 6" Water Main Extension along Fromhart Street creating a hydraulic loop between the Gano Avenue corridor, Grove Park Drive, and Fromhart Street, including associated hydrants and valves, using the conventional installation method.

4.6.2 Economic Evaluation

4.6.2.1 Capital Costs

The following **Table 4-3** provides and Engineer's Opinion of Probable Cost for **Alternative No. 3.** Capital costs for this alternative were developed by utilizing bid pricing from similar water main replacement projects, water meter replacement projects, water system product manufacturer's price quotes, and engineering judgement. bid pricing from similar water main replacement projects, water system product manufacturer's price quotes, and engineering judgement. A standard construction contingency of 10% and non-construction costs of 18% (Technical Services During Construction) will be included for consistency.

TABLE 4-3

ENGINEER'S OPINION OF PROBABLE PROJECT COST FOR ALTERNATIVE NO. 3 - AMR METERS WITH CONVENTIONALLY INSTALLED WATER MAIN EXTENSION

Description	Unit	Est. Qty	Unit Price	Estimated Cost
1. Mobilization and General Conditions	LS	1	$284,200	$284,200
2. Fusible PVC Water Main Directionally Drilled				
a. 6-inch	LF	230	$140	$32,200
2. PVC Water Main, Conventional Installation				
a. 6-inch	LF	2,070	$80	$165,600
3. DI Fittings - Cement Lined	Lbs	470	$15	$7,050
4. Gate Valves & Boxes				
a. 6-inch	EA	2	$3,200	$6,400

TABLE 4-3 ENGINEER'S OPINION OF PROBABLE PROJECT COST FOR ALTERNATIVE NO. 3 - AMR METERS WITH CONVENTIONALLY INSTALLED WATER MAIN EXTENSION				
Description	**Unit**	**Est. Qty**	**Unit Price**	**Estimated Cost**
5. Fire Hydrant Assembly	EA	2	$10,000	$20,000
6. AMR Water Meter Replacement				
a. 0.75-inch to 1-inch (Residential)	EA	2,232	$800	$1,785,600
c. 1.5-inch to 2-inch (Intermediate)	EA	110	$2,000	$220,000
e. ≥3-inch (Large)	EA	35	$8,000	$280,000
7. Connections to Existing Main				
a. 6-inch Tapping Sleeve & Valve	EA	2	$10,000	$20,000
8. Restoration	LF	2,070	$10	$20,700
ESTIMATED CONSTRUCTION COST				**$2,841,750**
CONSTRUCTION CONTINGENCY (10%)				**$284,175**
TOTAL ESTIMATED CONSTRUCTION				**$3,125,925**
ESTIMATED NON-CONSTRUCTION COSTS (18%)				**$511,515**
TOTAL ESTIMATED PROJECT COST				**$3,637,000**

4.6.2.2 O&M Costs

Similar to the other alternatives, the Town's annual O&M costs for this alternative were developed using the annual water & sewer system expenses for the past three (3) fiscal years of available audit information, 2022-2024. The overall water-related O&M expenses minus depreciation over these three years averaged approximately $661,462 per year. With the proposed improvements, the Town will see a reduction in O&M costs associated with repairs and maintenance, labor, and operating supplies. Final recaptured water service revenues will also benefit the Town's financial

status. Actual O&M savings values will depend on Town staffing decisions and structure following system improvements, and ongoing analysis of billing data trends. For purposes of this comparative analysis, a conservative (worst-case) savings of $10,000 per year will be used for AMR alternatives.

4.6.2.3 Net Present Value

A NPV analysis of **Alternative No. 3** is performed taking into account its capital cost, projected O&M cost, and salvage value. The 2026 Office of Management and Budget (OMB) Federal Water Project discount rate of 3.25% is used in determining the present worth of the corresponding O&M costs and salvage value of the alternative. The salvage value includes the estimated costs for piping. A 20-year analysis period is utilized.

(P/A, 3.25%, 20 yrs) = 14.54
(P/F, 3.25%, 20 yrs) = 0.528

Total Estimated Capital Cost = $3,637,000
Present Value = -$3,637,000

Annual O&M Cost = $651,462
Present Value = -($651,462)(14.54) = -$9,472,258

Salvage Value
Piping (50 years) = ($197,800)(0.528)(30 yr) / (50 yr) = $62,663
Valves & Hydrants (40 yrs) = ($26,400)(0.528)(20yr) / (40 yrs) = $6,970
Meters (20 yrs) = $0
Total Salvage Present Value = $69,633

TOTAL NET PRESENT VALUE
-$3,637,000 - $9,472,258 + $69,633 = -$-13,039,625

4.6.3 Advantages and Disadvantages

TABLE 4-4 ADVANTAGES AND DISADVANTAGES FOR ALTERNATIVE NO. 3	
Advantages	**Disadvantages**
1. Addresses water system deficiencies and increases efficiency and accuracy of meter readings compared to traditional method.	1. Requires drive-by meter readings with associated labor, fuel, and transportation costs.
2. Lowest capital cost and highest net present value of all alternatives.	2. Unable to detect leaks, continuous flow, or high usage until next reading/billing period.
3. Ease of accessibility in future.	3. More disturbance of existing infrastructure and more restoration required than alternatives with directional drilling method.

4.7 Alternative No. 4 - Installation of an Advanced Metering Infrastructure (AMI) with Water Main Extension

4.7.1 Description

Specifically, **Alternative No. 4** consists of the following scope:

1. Replace the approximately 2,400 aged analog and radio signal meters throughout the City with AMI ultrasonic meters, same model that was recently installed.

2. Construct 2,300 LF of a 6" Water Main Extension along Fromhart Street creating a hydraulic loop between the Gano Avenue corridor, Grove Park Drive, and Fromhart Street, including associated hydrants and valves, using the directional drilling method.

4.7.2 Economic Evaluation

4.7.2.1 Capital Costs

The following **Table 4-5** provides and Engineer's Opinion of Probable Cost for **Alternative No. 4.** Capital costs for this alternative were developed by utilizing bid pricing from similar water main replacement projects, water system product manufacturer's price quotes, and engineering judgement. A standard construction contingency of 10% and non-construction costs of 18% (Technical Services During Construction) will be included for consistency.

TABLE 4-5

ENGINEER'S OPINION OF PROBABLE PROJECT COST FOR ALTERNATIVE NO. 4 - AMI METERS WITH DIRECTIONALLY DRILLED WATER MAIN EXTENSION

Description	Unit	Est. Qty	Unit Price	Estimated Cost
1. Mobilization and General Conditions	LS	1	$364,000	$364,000
2. Fusible PVC Water Main Directionally Drilled				
a. 6-inch	LF	2,070	$140	$289,800
2. PVC Water Main, Conventional Installation				
a. 6-inch	LF	230	$80	$18,400
3. DI Fittings - Cement Lined	Lbs	470	$15	$7,050
4. Gate Valves & Boxes				
a. 6-inch	EA	2	$3,200	$6,400
5. Fire Hydrant Assembly	EA	2	$10,000	$20,000
6. AMI Water Meter Replacement				
a. 0.75-inch to 1-inch (Residential)	EA	2,232	$1,000	$2,232,000
c. 1.5-inch to 2-inch (Intermediate)	EA	110	$3,000	$330,000
e. ≥3-inch (Large)	EA	35	$10,000	$350,000
7. Connections to Existing Main				
a. 6-inch Tapping Sleeve & Valve	EA	2	$10,000	$20,000
8. Restoration	LF	230	$10	$2,300
ESTIMATED CONSTRUCTION COST				**$3,639,950**
CONSTRUCTION CONTINGENCY (10%)				**$363,995**
TOTAL ESTIMATED CONSTRUCTION				**$4,003,945**
ESTIMATED NON-CONSTRUCTION COSTS (18%)				**$655,191**
TOTAL ESTIMATED PROJECT COST				**$4,659,000**

4.7.2.2 O&M Costs

Similar to the other alternatives, the Town's annual O&M costs for this alternative were developed using the annual water expenses for the past three (3) fiscal years of available audit information, 2022-2024. The overall water-related O&M expenses minus depreciation over these three years averaged approximately $661,462. With the proposed improvements, the Town will see a reduction in O&M costs associated with repairs and maintenance, labor, and operating supplies. Final recaptured water service revenues will also benefit the Town's financial status. Actual O&M savings values will depend on Town staffing decisions and structure following system improvements, and ongoing analysis of billing data trends. For purposes of this comparative analysis, a conservative (worst-case) savings of $20,000 per year will be used for AMI alternatives.

4.7.2.3 Net Present Value

A NPV analysis of **Alternative No. 4** is performed taking into account its capital cost, projected O&M cost, and salvage value. The 2026 Office of Management and Budget (OMB) Federal Water Project discount rate of 3.25% is used in determining the present worth of the corresponding O&M costs and salvage value of the alternative. The salvage value includes the estimated costs for piping, valves, and hydrants. A 20-year analysis period is utilized.

(P/A, 3.25%, 20 yrs) = 14.54
(P/F, 3.25%, 20 yrs) = 0.528

Total Estimated Capital Cost = $4,659,000
Present Value = -$4,659,000

Annual O&M Cost = $641,462
Present Value = -($641,462)(14.54) = -$9,326,858

Salvage Value
Piping (50 years) = ($308,200)(0.528)(30 yr) / (50 yr) = $97,638
Valves & Hydrants (40 yrs) = ($26,400)(0.528)(20yr) / (40 yrs) = $6,970
Water Meters (20 yrs) = $0
Total Salvage Present Value = $104,608

TOTAL NET PRESENT VALUE

-$4,659,000 - $9,326,858 + $104,608 = -$13,881,250

4.7.3 Advantages and Disadvantages

TABLE 4-6
ADVANTAGES AND DISADVANTAGES FOR ALTERNATIVE NO. 4

Advantages	Disadvantages
1. Addresses water system deficiencies	1. Highest capital cost lowest net present value of all alternatives.
2. Eliminates operation and maintenance costs required to collect meter readings	
3. Reduces water loss, long-term O&M costs, and can provide leak detection capabilities with better diagnostics.	
4. Improves billing accuracy, efficiency, and customer/owner satisfaction.	
5. Minimal trenching involved leads to minimal surface disruption and restoration.	
6. Faster Installation than conventional installation alternatives.	
7. Town currently has ~750 Badger AMI meters and AMI Software implemented.	

4.8 Alternative No. 5 - Installation of an Advanced Metering Infrastructure (AMI) Meters with Conventionally Installed Water Main Extension.

4.8.1 Description

Specifically, **Alternative No. 5** consists of the following scope:

1. Replace the approximately 2,400 aged analog and radio signal water meters throughout the City with new AMI Badger Meters, same model that was recently installed.

2. Construct 2,300 LF of water main extension along Fromhart Street creating a hydraulic loop between the Gano Avenue corridor, Grove Park Drive, and Fromhart Street, including associated hydrants and valves, using the conventional installation method.

4.8.2 Economic Evaluation

4.8.2.1 Capital Costs

The following **Table 4-7** provides and Engineer's Opinion of Probable Cost for **Alternative No. 5.** Capital costs for this alternative were developed by utilizing bid pricing from similar water main replacement projects, water system product manufacturer's price quotes, and engineering judgement. A standard construction contingency of 10% and non-construction costs of 18% (Technical Services During Construction) will be included.

TABLE 4-7

ENGINEER'S OPINION OF PROBABLE PROJECT COST FOR ALTERNATIVE NO. 5 - AMI METERS WITH CONVENTIONALLY INSTALLED WATER MAIN EXTENSION

Description	Unit	Est. Qty	Unit Price	Estimated Cost
1. Mobilization and General Conditions	LS	1	$353,800	$353,800
2. Fusible PVC Water Main Directionally Drilled				
a. 6-inch	LF	230	$140	$32,200
2. PVC Water Main, Conventional Installation				
a. 6-inch	LF	2,070	$80	$165,600
3. DI Fittings - Cement Lined	Lbs	470	$15	$7,050
4. Gate Valves & Boxes				
a. 6-inch	EA	2	$3,200	$6,400
5. Fire Hydrant Assembly	EA	2	$10,000	$20,000
6. AMI Water Meter Replacement				
a. 0.75-inch to 1-inch (Residential)	EA	2,232	$1,000	$2,232,000
c. 1.5-inch to 2-inch (Intermediate)	EA	110	$3,000	$330,000
e. ≥3-inch (Large)	EA	35	$10,000	$350,000

TABLE 4-7 ENGINEER'S OPINION OF PROBABLE PROJECT COST FOR ALTERNATIVE NO. 5 - AMI METERS WITH CONVENTIONALLY INSTALLED WATER MAIN EXTENSION				
Description	**Unit**	**Est. Qty**	**Unit Price**	**Estimated Cost**
7. Connections to Existing Main				
a. 6-inch Tapping Sleeve Valve	EA	2	$10,000	$20,000
8. Restoration	LF	2,070	$10	$20,700
ESTIMATED CONSTRUCTION COST				**$3,537,750**
CONSTRUCTION CONTINGENCY (10%)				**$353,775**
TOTAL ESTIMATED CONSTRUCTION				**$3,891,525**
ESTIMATED NON-CONSTRUCTION COSTS (18%)				**$636,795**
TOTAL ESTIMATED PROJECT COST				**$4,528,000**

4.8.2.2 O&M Costs

Similar to the other alternatives, The Town's annual O&M costs for this alternative were developed using its annual water & sewer system expenses for the past three (3) fiscal years of available audit information, 2022-2024. The overall water-related O&M expenses minus depreciation over these three years averaged approximately $661,462 per year. With the proposed improvements, the Town will see a reduction in O&M costs associated with repairs and maintenance, labor, and operating supplies. Final recaptured water service revenues will also benefit the Town's financial status. Actual O&M savings values will depend on Town staffing decisions and structure following system improvements, and ongoing analysis of billing data trends. For purposes of this comparative analysis, a conservative (worst-case) savings of $20,000 per year will be used for AMI alternatives.

4.8.2.3 Net Present Value

A NPV analysis of **Alternative No. 5** is performed taking into account its capital cost, projected O&M cost, and salvage value. The 2026 Office of Management and Budget (OMB) Federal Water Project discount rate of 3.25% is used in determining the present worth of the corresponding O&M costs and salvage value of the alternative. The salvage value includes the estimated costs for piping, valves, and hydrants. A 20-year analysis period is utilized.

(P/A, 3.25%, 20 yrs) = 14.54
(P/F, 3.25%, 20 yrs) = 0.528

Total Estimated Capital Cost = $4,528,000
Present Value = -$4,528,000

Annual O&M Cost = $641,462
Present Value = -($641,462)(14.54)=-$9,326,858

Salvage Value
Piping (50 years) = ($197,800)(0.528)(30 yr) / (50 yr) = $62,663
Valves & Hydrants (40 yrs) = ($26,400)(0.528)(20yr) / (40 yrs) = $6,970
Water Meters (20 yrs) = $0
Total Salvage Present Value = $69,633

TOTAL NET PRESENT VALUE
-$4,528,000 - $9,326,857 + $69,633 = -$13,785,224

4.8.3 Advantages and Disadvantages

TABLE 4-8 ADVANTAGES AND DISADVANTAGES FOR ALTERNATIVE NO. 5	
Advantages	**Disadvantages**
1. Addresses water system deficiencies.	1. Higher capital costs than AMR System alternatives.
2. Eliminates operation and maintenance costs required to collect meter readings.	2. More disturbance of existing infrastructure and more restoration required.
3. Reduces water loss, long-term O&M costs, and can leak detection capabilities and provide better diagnostics.	
4. Improves billing accuracy, efficiency, and customer/owner satisfaction	
5. Town already has ~750 Badger AMI meters and AMI Software implemented.	

4.9 Economic Evaluation

In summary, The estimated project costs are $3,768,000 for **Alternative No. 2**, $3,637,000 for **Alternative No. 3,** $4,659,000 for **Alternative No. 4**, and $4,528,000 for **Alternative No. 5**. **Alternative No.4** has the highest project cost, while **Alternative No. 3** is the least expensive, at approximately 28% lower than **Alternative No. 4.**

The difference in cost between the four alternatives is considered to be within the accuracy range of a planning-level estimate. Additionally, AMR systems may become obsolete during the system's lifespan as the cost gap narrows and customer expectations for enhanced service quality increase. This evolution in technology, demand, and existing AMI meters in the Town's service area suggests that AMI systems may ultimately become the more viable long-term solution.

4.10 Recommended Alternative

It is recommended that **Alternative No. 5**, the AMI metering upgrade with conventionally installed water main, be implemented. While the initial cost of the AMI system may be higher than the AMR system, the AMI system is expected to result in an a conservative annual labor savings of approximately $20,000 due to a 7-14 days

per month reduction in labor requirements. These values can be confirmed from Town staffing decisions and restructuring following implementation of the proposed project.

In addition to the labor savings, the AMI system offers an improved customer experience by reducing disputes and promoting water conservation through real-time monitoring of water usage . Furthermore, the AMI system helps to detect immediate issues such as leaks, continuous flow, high usage, and provides better diagnostics. A fully integrated AMI system enables the Town to identify potential issues in the water distribution system in order to reduce water losses and long-term operation and maintenance costs. Conventional installation will provide project simplicity, reduced cost, and quicker installation considering the size of the water main extension.

5.0 THE SELECTED PLAN

5.1 Description of Proposed Facilities

It is recommended the Town select **Alternative No. 5**, the AMI system with conventional installation alternative, which will address the water system deficiencies, improve fire protection capabilities and water system reliability. As described in **Section 5.0,** the selected alternative, **Alternative No. 5**, involves the implementation of an AMI system with a conventionally installed water main extension. The key components of the proposed water system include:

- Replacement of approximately 2,400 active and inactive analog and radio signal water meters with AMI meters resulting in a fully implemented AMI system.

- Utilization of the existing AMI metering software and associated billing system that enables real-time monitoring of water consumption. This will facilitate more accurate billing, reduce meter reading errors, and allow users to track their water usage on a more detailed level, promoting water conservation.

- Construction of approximately a 2,300 LF water main extension to create a hydraulic loop within the Town's water system, with associated hydrants and valves, using primarily conventional installation methods with minimal directional drilling.

5.2 Environmental Impacts of Proposed Facilities

The construction of this project may result in temporary impacts, including increased noise levels, elevated airborne particulate matter, maintenance of vehicular and pedestrian traffic flow, stormwater runoff, and occasional interruptions to water service. Appropriate control measures will be implemented to mitigate these temporary effects. The project's construction approach will prioritize minimizing community disruption and ensuring minimal downtime for the water system.

The proposed infrastructure improvements will be situated within developed neighborhoods and public rights-of-way throughout Orange Park. No significant adverse impacts are anticipated to the surrounding flora and fauna, threatened or endangered plant or animal species, prime agricultural lands, wetlands, or undisturbed natural areas. Additionally, the project is not expected to adversely affect the socio-economic characteristics of the affected areas.

In the long term, the project is expected to result in significant benefits, including an improved and more reliable potable water system that meets current drinking water quality standards, thereby enhancing the overall public health and water system efficiency for the community.

5.3 Cost to Construct Facilities

Alternative No. 5 has a total project cost of $4,528,000. The following tabulation includes a breakdown of total project cost into construction and non-construction costs.

COSTS	
Probable Construction Cost	$3,891,000
Non-Construction Cost	$637,000
TOTAL PROJECT COST =	**$4,528,000**

The project is expected to be funded by a combination of grants and loans as follows:

SOURCE	AMOUNT
SRF Loan (77%)	$3,486,560
SRF Grant (23%)	$1,041,440
TOTAL	**$4,528,000**

6.0 FINANCIAL FEASIBILITY

6.1 Revenues Required To Repaying The Loan

The Florida Department of Environmental Protection Drinking Water State Revolving Fund (DWSRF) is expected to be the primary funding source for the project. The Town has dedicated their Water and Sewer Fund Revenues for the repayment of the funding acquired for the construction of the proposed project. The complete State Revolving Loan Program Planning and Design Loan Application for this project is presented in **Appendix G**. This document provides a detailed review of the Town's existing and projected financial standing in terms of debt obligations, revenues, expenses, etc. to demonstrate the business plan of the Town's intention to repay the current and future funding amounts. The Town's 2026 projected Net Utilities Revenues are $1,354,042, with $1,354,042 available for this project for the year 2028. These values are projected to increase each coming year as the Town currently has no debt obligations outside of the Planning and Design Loan for this project.

The current planning and design SRF loan has a principal forgiveness of 50% of the total loan amount ($74,000/$148,000) and future funding will aim to secure as much grant funding and principal forgiveness as possible to aid the Town. Based on the current DWSRF rules and the Town's calculated principal forgiveness percentage for DWSRF construction loan, the Town may receive up to 23% of the total cost in grant/principal forgiveness, which would reduce the project's total cost to be amortized to $3,486,560. A DWSRF Business Plan for the Town is provided in **Appendix H**. The business plan provides updated historical and projected financial information since the time of the planning and design loan application submittal to demonstrate the financial capability of the Town for anticipated future construction loan repayment.

6.2 Existing/Proposed User Charge System

The Town of Orange Park has dedicated its Water and Sewer Fund Revenues for the repayment of their existing SRF loan for the Planning & Design Phase of this Water Meter Replacement Project (Agreement No. DW100110) and intends to dedicate its Water and Sewer Fund Revenues toward the repayment of its anticipated construction funding. The Town established its utility rate structure and has amended its utility rate ordinances or passed Resolutions periodically to adjust water and sewer rates, as needed. Both the water and sewer rates are structured to conserve water. The most recent residential water, sewer, and waste collection rates were adjusted in May 2026. The Town's current water and

sewer rates can be found on the Town's website (www.townoforangepark.com/p/residents/utility-services/utility-billing-information/water–sewer-rates). The current rates are based on the Town's 2018 Rate Study.

Since the Town qualifies for, and hopes to receive, grant/principal forgiveness, the Town does not anticipate the need to drastically modify its current annual water and sewer utility rate schedule to cover the annual costs associated with the project's required debt repayment at this time.

6.3 Water Utility Staffing and Operation

The planning, operation, and maintenance of the Town's water system are managed by a cooperation of various Town Departments. A complete list of the Town Departments can be found on the Town website. The major Departments responsible for the water system are the Public Works Department, Utility Billing Department, and Planning & Zoning Department that are overseen by the Town Manager along with the Mayor, Public Works Director, and Town Council**.** The water system is staffed with two class C operators and one lead/chief operator. A list of the operators can be found in the Town's Monthly Operating Reports.

The following projects are listed in the Town's capital improvements plan (CIP) from FY 25/26 through FY 29/30 for the Town**'**s water system.

Project Description	5-Year Estimate Cost
Fire hydrant replacement program	$97,500
Construction of equipment garage, shared with sewer	$375,000
Replace old water mains across the Town	$3,200,000
Replace old water meters	$110,000
Replacement of old water services not identified in larger projects	$320,000
Install valves on water mains	$400,000
Upgrades to SCADA - Data Flow Systems, valves, pumps, and sensors	$200,000
Install transmitter on water meters to allow meters to be read through drive-by technology	$1,050,000

Project Description	5-Year Estimate Cost
Installation of water main - Shaw to Miller to Fromhart	$300,000
Replace crane truck and purchase pulley system	$120,000
Replace pickup trucks	$94,000
Total	**$6,266,500**

Some components of the projects identified in the CIP are funded by outside funding sources or are being submitted to various funding sources, such as the FDEP SRF funding program**.** The Town adjusts its 5-year CIP as funding becomes awarded/available.

7.0 SCHEDULE AND PROJECT IMPLEMENTATION

7.1 Schedule For Implementing The Recommended Facilities

The following schedule is recommended in order to complete the critical replacement of the Town of Orange Park's water distribution system in a timely manner:

TABLE 7-1
PROJECT SCHEDULE

Implementation Steps	Schedule
a. Completion & Submittal of Planning and Design Documents	June 2026
b. Construction RFI Submittal	June 2026
c. FDEP SRF Environmental Review and State Clearinghouse Approval of Facilities Plan	July 2026
d. FDEP Priority List Hearing*	August 2026
e. Construction Loan Agreement	November 2026
f. Bidding	January 2027
f. Construction Notice to Proceed	March 2027
g. Construction Completion	September 2027

**Note: DWSRF Funding Hearings occur on a semi-annual basis (February & August). If project does not receive funding, scheduled dates will be delayed approximately 6 months.*

7.2 Project Implementation

We do not anticipate any proposed service agreements or local contracts will be required to implement the selected **Alternative No. 5**. The proposed water main extension will be within the Town's public right-of-way and an easement owned by the Town.

To implement the selected Alternative No. 5, the following permits will be required prior to construction commencement: (1) FDEP Water Distribution System Permit. These permits will be applied for and obtained in the design phase.

7.3 Regulatory Agency Review

To secure funding through a grant or subsidized loan from the SRF, the Town of Orange Park must ensure that the proposed solution to the water meter issues and proposed water main extension satisfies the requirements of relevant regulatory agencies. Upon adoption by the Town Commission, copies of the Facilities Plan will be submitted to the FDEP Water Facilities Funding Section for their review and approval. Additional meetings will occur as the project moves through the design, permitting, and construction phases.

8.0 PUBLIC PARTICIPATION PROCESS

8.1 Public Hearing Details

A public hearing/dedicated revenue hearing was held in the Town Hall at _____p.m. on _____ after advertising on the Town of Orange Park website. Records of the public notice and the hearing are available at the Town Hall.

8.2 Compliance With Local Requirements For Advertising To The Public

The Town of Orange Park does not have a specific local requirement for advertising or publicly noticing a Public Hearing for water or sewer utilities-related discussions. Therefore, the Town has met the SRF requirement of advertising a minimum of 14 days prior the Public Hearing by advertising the Hearing in the Clay Today on May 14, 2026. The Notice of Publication and copy of the advertisement is included in **Appendix I**.

9.0 PROJECT AUTHORIZATION

9.1 ADOPTING RESOLUTION

On _____ the Orange Park Town Council adopted the required Resolution to adopt this Facilities Plan, which is provided in **Appendix J**.

Appendix A

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

WATER SUPPLY FACILITIES WORK PLAN UPDATE

FOR

TOWN OF ORANGE PARK, FLORIDA

Prepared by:

MITTAUER & ASSOCIATES, INC.
CONSULTING ENGINEERS & PROJECT FUNDING SPECIALISTS
NOW A PART OF cph
THE SAME GREAT TEAM. NOW WITH EVEN MORE RESOURCES.

Orange Park, Florida
Project No. M240107.000
Client No. 2401-07-1
May 2025

WATER SUPPLY FACILITIES WORK PLAN UPDATE

FOR

TOWN OF ORANGE PARK, FLORIDA

Prepared by:



Orange Park, Florida
Project No. M240107.000
Client No. 2401-07-1
May 2025

EXECUTIVE SUMMARY

Pursuant to Chapter 163, Florida Statutes, the Town of Orange Park (Town), Florida is required to use the water management district's North Florida Regional Water Supply Plan (RWSP) as a basis for water supply planning within the Town limits. Water supply planning consists of identifying water supply sources and facilities needed to serve existing and new development within local jurisdictions, while incorporating water conservation through conventional methods, alternative water supply projects, and/or alternative water resource methods. A 10-year Water Supply Facilities Work Plan (WSFWP) is the required document the Town must produce within 18 months of District approval of its RWSP update. The Town previously produced a WSFWP in 2018 following a 2017 District RWSP update. The St. Johns River Water Management District's (SJRWMD) and Suwannee River Water Management District's (SRWMD) governing boards approved the last North Florida RWSP update on December 12, 2023, requiring an update to the Town's WSFWP within 18 months.

During completion of the 2018 WSFWP analysis, population growth projections along with per capita demand trends indicated anticipated potable water consumption rates could continue to correlate to groundwater withdrawals that would not exceed the Town's St. Johns Water Management District (SJRWMD) Consumptive Use Permit (#453) allocation by the year 2020, when the CUP expired. The Plan reviewed the 2018 RWSP regulations and recommendations, outlined various existing and planned conservation efforts, presented potential for existing and increased use of reclaimed water for non-essential water uses to lower withdrawals from the Floridan Aquifer, recommended Town potable water level of service standards consistent with the RWSP data, and recommended capital improvement projects to help support the regional and local water supply goals.

Following the Town 2018 WSFWP Update, the Town began an extensive application process for a SJRWMD CUP renewal in 2020, with subsequent approval issued in June 2022. Population growth and associated water use has resulted in the Town's water demands continuing to remain below the SJRWMD allocations. In 2024, the Town's average withdrawal rate from the Floridan Aquifer was 0.88 million gallons per day (MGD), while the Town's SJRWMD CUP allocation is 1.41 MGD, resulting in approximately 62.4% utilization of the authorized allocation.

This report updates the 2018 10-Year Water Supply Facilities Work Plan and primarily analyzes the five-year trending period between 2020 and 2024 with current development trends to consider future water resource needs until 2045, consistent with the Regional Plan. The Town's average water consumption has remained relatively constant since 2018

based on the 2023 RWSP data (Table B-5a). The Town's 2024 average per capita use is calculated as 96 gallons per capita per day (gpcd), which is consistent with the 2023 North Florida RWSP indicating an average 2014 - 2018 use of 97 gpcd. This demonstrates as Town population has marginally increased, the water use has also increased in correlation. Based on a regional average approach, compliance with the 2023 RWSP requires a potable water Level of Service (LOS) standard of 121 gpcd. This standard is lower than the current value stated in the Town Comprehensive Plan Infrastructure Element, but is shown to be attainable and closer to the Town's actual use based on current and projected Town water use data.

This Plan update also builds upon the 2018 review of the Town's reclaimed water supply capabilities and potential. There is potential for the Town to continue to increase the use of reclaimed water as an alternative water supply source to help promote Town and regional water conservation goals.

As a result of the analysis herein, the recommendations for future planning, development review, and utility coordination include the following:

- Continue current water conservation efforts to limit non-essential use of potable water supported by the Town rate system, Town Ordinances, Comprehensive Plan, and Town operations.

- Consider implementing a revision to the Town's Infrastructure Element of the Comprehensive Plan, and others elements as applicable, to include a Potable Water LOS standard equivalent to 121 gpcd with a 1.36 peak factor to remain consistent with the 2023 North Florida RWSP.

- Continue to plan to implement reclaimed water storage capabilities and associated WWTF modifications to assist with developing a Town reclaimed water system and readiness for conveyance to the CCUA reuse system.

- Maximize reclaimed water transfers to CCUA until such time that the Town can supplement CCUA demands with its own reuse system.

Recommended current/future Capital project considerations for the next 5-10 year planning horizon include the following:

- Continue to implement water main extensions and replacement projects to offset water loss and flushing needs while improving service reliability.

- Continue to incorporate the planned and FDEP funded water meter replacement program and monitoring system upgrades.

- Continue planning and funding efforts to implement reclaimed water storage capabilities. A 1.25 MG initial target is recommended, but additional storage may be needed in the future.

- Continue to identify potential Town non-potable reuse customers, such as the athletic association fields, to offset potable irrigation needs and create reuse distribution system extension projects.

- Continue to improve the Town WWTF process and collaborate with CCUA to improve readiness of reuse conveyance to the CCUA system.

- Monitor and adjust the Town 5-year CIP as potential project funding is awarded and becomes available.

Review of the Town's Comprehensive Plan Infrastructure Element, Capital Improvements Element, Conservation Element, and others demonstrates the Town's water supply goals align with the SJRWMD, SRWMD, and the 2023 North Florida RWSP.

TABLE OF CONTENTS

EXECUTIVE SUMMARY . . . . . ES 1

I. INTRODUCTION 1

II. WATER SYSTEM 4
A. Existing System Overview. 4
B. Water Treatment Plant Summary 5
1. Ash Street WTP 5
2. Milwaukee WTP 7
C. Existing Water Use Review. 9
1. WTP Well Review 9
2. Distribution System Metered Water Use 11
3. SJRWMD CUP Review 15
4. GPCD Review 15

III. RECLAIMED WATER SYSTEM 17
A. Existing System Overview. 17
B. Reclaimed Water Supply and Demand. 18

IV. WATER SUPPLY PROJECTIONS 20
A. Historic Growth Summary 20
B. Population and Demand Projection 20
C. Water Conservation Efforts. 22

V. 2045 WATER SUPPLY SUMMARY OF FINDINGS 24

VI. CAPITAL IMPROVEMENT PROJECTS 26

TABLES

II-1 Component Summary - Ash Street Water Treatment Plant 5
II-2 Component Summary - Milwaukee Water Treatment Plant 7
II-3 2020 Through 2024 Total Monthly Water Use 9
II-4 2020 Through 2024 Total Average Daily Water Use 10
II-5 2020 Through 2024 Monthly Water Use by Category 12
II-6 Annual GPCD 2020-2024 16
II-7 GPCD Planning Comparison 16
IV-1 Population Growth 2025 Through 2040 (Projected) 20
IV-2 2045 Water Use Projections 21
IV-3 2045 WWTF Flow Projections 21

FIGURES

I-1 Town Location and Planning Area Map 2

APPENDICES

A 2018 WSFWP
B 2024 WWTF Capacity Analysis Report

I. INTRODUCTION

The Town of Orange Park is located in northeast Clay County, **Figure I-1** provides a location map for the Town with Town limits, which provides a depiction of the areas served by the Town's potable water infrastructure (Water System). The Town water system is bounded on the east side by the St. Johns River, on the south and west by the Clay County Utility Authority (CCUA) service area, and on the north by the JEA utility service area. Due to the location of the adjacent utility service areas and land features, the Town is not anticipated to extend or expand its water system service area outside of the current limits.

The Town completed a Water Supply Facilities Work Plan in 2018 that provided a comprehensive review of the Town's water system and is provided as **Appendix A**. Potable water infrastructure is the backbone of ensuring a healthy community, and provision of safe drinking water allows for sustainable development and growth. Further, a central water distribution system allows for Town-wide fire protection capabilities. In some communities, the total water supply includes the combination of potable water and reclaimed water for non-essential water use, which is typically irrigation. Reclaimed water is an important offset to potable water use (specifically for irrigation), where feasible, and in concert with water conservation efforts can be integral tools to reduce potable water use. The Water Supply Facilities Work Plan Update (WSFWP) developed herein summarizes the existing and planned water and reclaimed water supply capabilities for the Town over a minimum 10-year planning period, generally targeting 2045, in compliance with the requirements and projections of the St. Johns River Water Management District's and Suwannee River Water Management District's 2023 North Florida Regional Water Supply Plan (RWSP). While the Town does not have a reclaimed water distribution system within its service area, the Town's Wastewater Treatment Facility (Ash Street WWTF) is permitted to discharge treated effluent to Clay County Utility Authority's (CCUA) reuse system via conveyance to the Miller Street WWTF for storage and further treatment, if needed. This interconnecting reuse water supply is accomplished via interlocal agreement between the Town and CCUA.

According to the State Legislature (ss.163.3177 and 163.3191), local governments are required to revise the Potable Water element (and others as applicable) of their Comprehensive Plans to include a Water Supply Facilities Work Plan analyzing at least a 10-year planning period within 18 months of an update of a corresponding Regional WSP.

The Work Plan's development must include:

- A projection of the local government's existing and projected water demands for at least a 10-year period (see **Section IV**); and

SCALE: 1" = 1500'

N

I-295
WELLS RD
WELLS RD
ASH ST
WTP
ASH ST
ST JOHNS RIVER
TOWN LIMITS
DEBARRY AVE
GANO AVE
BELLAIR BLVD
MILLER ST
CSX RAILROAD
PLAINFIELD AVE
HWY 17 / S.R. 15 / PARK AVE
KINGSLEY AVE
TOWN HALL
REED ST
ASTOR ST
MILWAUKEE AVE
WILWAUKEE WTP
DOCTORS LAKE DR
HOLLY POINT RD
DOCTORS LAKE

TOWN OF ORANGE PARK
WSFWP
Location & Service Area Map
Clay County, Florida

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FIGURE
I–1
May 5, 2025
Project No.
2401–07–1

J:\OrangePark\CAD Files\Orange Park\2401071 WSFWP\EXHIBIT - FIGURE I-1.dwg, 5/5/2025 4:37:48 PM

- Consideration of the capital projects identified as needed for the first five years in the 5-Year Schedule of Capital Improvements, including financially feasible revenue sources, and identification and prioritization of the water supply facilities and sources of water that will be required to meet those demands (see **Section V**).

In addition, local governments are required to revise their Comprehensive Plans to include the selected alternative water supply source projects, if any, and include conservation measures and reclaimed water supplies that can be used to offset demand for future potable water supply requirements.

The 2018 WSFWP sufficiently established an analysis and recommendations required for Town planning efforts based on 2014-2018 data and the 2017 North Florida RWSP.

The 2025 WSFWP update will build upon the 2018 WSFWP and review the following:

- Existing Water system supply components;
- Existing Reclaimed Water system supply capabilities;
- Water supply projections; and
- 2045 water supply summary of findings.

II. WATER SYSTEM

A. EXISTING SYSTEM OVERVIEW

The Town limits occupy an area of approximately 5.3 square miles, as shown in **Figure I-1**, and the municipal limits generally corresponds to the Town's water system service area limits. The existing water service area has historically been limited to two primary corridors located north/south along the St. Johns River (U.S. 17) and east/west (Kingsley Ave) connecting to the CCUA Service Area. The service area includes many commercial properties, as well as single-family and multi-family residential areas.

The Town currently owns and operates a water supply and distribution system (FDEP PWS ID 2101182) that consists of distribution piping and two water treatment plants (WTPs) containing four public water supply wells, two hydropneumatic tanks, two aerated ground storage tanks (GSTs), four high service pumps (HSPs), and associated appurtenances. These system components provide potable water and fire protection capabilities to the Town's developed areas. No external potable water interconnection is incorporated in the Town's system.

A general summary of the major WTP components are as follows:

Ash Street WTP:
- Ash St Well No. 1
- Ash St Well No. 2
- Aerated GST No. 1
- Hypochlorite Storage Tanks
- Chlorination Pump Nos. 1, 2 and 3
- High Service Pumps No. 1, 2, and 3
- Hydropneumatic Tank No. 1
- Generator

Milwaukee Ave WTP :
- Milwaukee Ave Well No. 1
- Milwaukee Ave Well No. 2
- Aerated GST No. 1
- Hypochlorite Storage Tanks

- Chlorination Pump Nos. 1, 2, and 3
- High Service Pumps No. 1, 2, and 3
- Hydropneumatic Tank No. 1
- Generator

The location of each WTP was presented in **Figure I-1**.

As of March 2025, the Town currently serves 2,373 residential water accounts; 472 commercial accounts; and 171 irrigation accounts. The March 2025 Average Daily Flow (ADF) for the entire water system was 803,400 gpd.

B. WATER TREATMENT PLANT SUMMARY

1. **Ash Street Water Treatment Plant (Ash St WTP):** Ash St WTP is located on Ash St adjacent to the Ash St WWTF within the main public works department compound. A detailed summary of the Ash St WTP facilities is presented in **Table II-1**:

TABLE II-1

COMPONENT SUMMARY
ASH STREET WATER TREATMENT PLANT

Quantity	Description
2	2,500 gallon Double Walled Sodium Hypochlorite Storage Tank
3	Chemical Feed Pumps
1	50-HP Vertical Turbine Pump (“Well No. 1”)
1	50-HP Vertical Turbine Pump (“Well No. 2”)
1	500,000-gallon Concrete GST with 2,700-gpm Cascade Aerator
1	15,000-gallon Steel Hydropneumatic Tank
3	75-HP 1,500-gpm High Service Pumps
1	400 kW Auxiliary Generator
1	16-inch Distribution Flow Meter
1	2,700 GPM Cascade Aerator
1	Chlorine Residual Analyzer
1	Chart Recorder

TABLE II-1 COMPONENT SUMMARY ASH STREET WATER TREATMENT PLANT	
Quantity	**Description**
	Well No. 1 Well Total Depth: 862' (bls) Well Casing Diameter: 18" Well Casing Depth: 309' (bls) Well Capacity: 2,300 gpm (3.31 MGD) Well Motor Size: 50 HP
	Well No. 2 Well Total Depth: 871' (bls) Well Casing Diameter: 18" Well Casing Depth: 309' (bls) Well Capacity: 2,300 gpm (3.31 MGD) Well Motor Size: 50 HP
	Plant Category & Class: 5C (The WTP is classified as a Category V Class C (0.25 MGD up to 3.0 MGD). Staffing is Class C or higher operator, 5 visits per week and one visit each weekend for a total of 0.60 hours per week. The lead/chief operator must be Class C or higher).
	FDEP Permitted Capacity: 2.90 MGD (Maximum Daily Flow - MDF)

The 18-inch wells and 2,200 gpm well pumps are located in isolated fenced areas. The chlorination system and high service pumps are housed in a separate building.

The Ash St WTP has an FDEP permitted maximum day capacity of 2.90 MG per day (2,014 gpm). From a design standpoint, the facility has a design maximum day firm design capacity of 3.30 MGD (2,300 gpm). The firm capacity considers one of the units within the limiting system process component being out of service, i.e. a well pump. Ash Street Well No.1 has a total depth of 862 feet, with an 18-inch diameter casing, and Ash Street Well No. 2 has a total depth of 871 feet with an 18-inch diameter casing. The well water is pumped by vertical turbine pumps, which are driven by a 50 horsepower (HP) electric motor. The pumps have a capacity of 2,300 gpm.

Due to the Floridan Aquifer's quality, the wells pump directly to an aerated ground water storage tank, and subsequently only require chlorination before being introduced to the distribution system at pressure via the high service pumps and hydro-tank. Provisions are included to be able to bypass the GST and hydro-tank if needed.

The chlorination equipment consists of two 2,500-gallon sodium hypochlorite tanks, which stores the disinfectant, and chemical metering pumps located in a separate room adjacent to the high service pumps. The water for each well is metered by a magnetic flow meter. A flow meter is also located downstream of the high service pumps to measure flow conveyed to the distribution system. All flow meters are continually calibrated and certified.

2. **Water Treatment Plant No. 2 (Milwaukee WTP):** The Milwaukee WTP has an FDEP permitted maximum day capacity of 2.90 MG per day (2,014 gpm). The WTP has a corresponding maximum day firm design capacity of 3.17 MGD with one well pump out of service. A detailed summary of the Ash St WTP facilities is presented in **Table II-2**:

TABLE II-2

COMPONENT SUMMARY
MILWAUKEE WATER TREATMENT PLANT

Quantity	Description
1	500,000-gallon Ground Storage Tank
1	Hypochlorite Storage Tank
1	400 kW Auxiliary Generator
1	16-inch Distribution Flow Meter
3	Chlorine Feed Pumps
3	75-HP 1,500-gpm High Service Pumps
1	Chlorine Residual Analyzer
1	Chart Recorder
1	15,000-gallon Steel Hydropneumatic Tank
1	2,700 gpm cascade aerator
	Well No. 3 Well Total Depth: 1000' (bls) Well Casing Diameter: 20" Well Casing Depth: 320' (bls) Well Capacity: 2,200 gpm (3.17 MGD) Well Motor Size: 75 hp
	Well No. 4 Well Total Depth: 1000' (bls) Well Casing Diameter: 20" Well Casing Depth: 320' (bls) Well Capacity: 2,200 gpm (3.17 MGD) Well Motor Size: 75 hp
	Plant Category & Class: 5C
	FDEP Permitted Capacity: 2.90 MGD (Maximum Daily Flow - MDF)

The Milwaukee facility is located in a fenced in and surveillanced area in the core part of the Town. The Town incorporated a painted mural on the outside of the GST to help blend in aesthetically.

Well Nos. 3 and 4 have a total depth of 1000 feet (bls) with an 20-inch casing to a depth of 320 feet (bls). These wells were constructed more recently in the year 2000, whereas the Ash St wells were constructed in 1971. The water is pumped from the well by a vertical turbine pump, which is driven by a 75 HP electric motor. The pumping capacity is 2,200 gpm at a TDH of 95 feet (42 psi).

Under normal operation, water is pumping from the wells to the aerator located above the GST, and subsequently pumped to a steel cylindrical hydropneumatic tank by the high service pumps prior to discharge to the system. The WTP operators have the option of isolating the ground storage tank and hydro tank and pumping the finished water directly into the distribution system. Unlike the Ash St WTP, chlorination occurs directly into the ground storage tank.

Like the Ash St WTP, the water for each well is metered by a magnetic flow meter. A flow meter is also located downstream of the high service pumps to measure flow conveyed to the distribution system. All flow meters are continually calibrated and certified.

C. EXISTING WATER USE REVIEW

The following section summarizes historical water use from the Town's wells for the period of 2020 through 2024.

1. **WTP Well Review: Table II-3** represents the Town's total monthly and yearly water use as pumped from the Town's well pumps compared with CUP allocations, and **Table II-4** represents annual average daily water use.

TABLE II-3
2020 THROUGH 2024 TOTAL MONTHLY WATER USE

Month	2020 (Gal/Mo)	2021 (Gal/Mo)	2022 (Gal/Mo)	2023 (Gal/Mo)	2024 (Gal/Mo)
January	24,490,000	25,445,000	20,888,000	27,027,000	25,776,000
February	28,732,000	23,884,000	23,614,000	26,725,000	27,454,000
March	27,736,000	23,155,000	25,154,000	25,483,000	26,289,000
April	25,361,000	23,124,000	24,274,000	24,461,000	24,821,000
May	21,363,000	25,983,000	24,388,000	27,013,000	27,213,000
June	30,408,000	26,876,000	27,940,000	30,117,000	29,316,000
July	26,903,000	29,958,000	31,360,000	26,274,000	30,177,000
August	26,915,000	24,534,000	30,237,000	25,034,000	32,778,000
September	26,917,000	29,427,000	30,020,000	28,392,000	28,425,000
October	25,348,000	25,913,000	28,353,000	31,726,000	32,474,000
November	23,487,000	25,613,000	26,788,000	28,446,000	24,242,000
December	24,612,000	32,040,000	25,397,000	27,946,000	28,277,000
ANNUAL AVERAGE (Gal/Mo)	**26,022,667**	**26,329,333**	**26,534,417**	**27,387,000**	**28,103,500**
TOTAL (Gal/Yr)	**312,272,000**	**315,952,000**	**318,413,000**	**328,644,000**	**337,242,000**
CUP ALLOCATION (Gal/Yr)	**513,000,000**	**513,000,000**	**513,000,000**	**513,000,000**	**513,000,000**
% CUP ALLOCATION	**60.9%**	**61.6%**	**62.1%**	**64.1%**	**65.7%**

TABLE II-4 2020 THROUGH 2024 TOTAL AVERAGE DAILY WATER USE					
Month	**2020 (Gal/Day)**	**2021 (Gal/Day)**	**2022 (Gal/Day)**	**2023 (Gal/Day)**	**2024 (Gal/Day)**
January	772,645	706,290	705,258	749,645	780,097
February	763,241	672,714	732,179	777,786	826,345
March	846,355	752,258	734,323	812,968	812,387
April	763,733	823,833	788,267	827,433	904,967
May	910,323	893,806	928,226	859,097	979,194
June	840,867	798,167	953,633	842,000	1,024,367
July	833,226	815,613	872,032	859,032	881,323
August	794,645	797,774	871,645	886,903	906,968
September	741,567	821,000	785,833	870,000	864,300
October	730,677	829,774	824,484	869,871	852,387
November	751,667	794,633	773,067	926,333	867,700
December	762,419	718,258	824,871	792,194	785,548
ANNUAL AVERAGE (Gal/Day)	**792,614**	**785,343**	**816,152**	**839,439**	**873,799**
CUP ALLOCATION (Gal/Day)	**1,405,000**	**1,405,000**	**1,405,000**	**1,405,000**	**1,405,000**

This data depicts the following over the 5-year period:

- Annual Average Total Use = 322,505,000 gpy
- Daily Average Use = 821,470 gpd
- Maximum Average Daily Use = 1,024,367 gpd
- Minimum Average Daily Use = 705,258 gpd
- CUP Utilization Average = 62.9%

Since 2020, the water use has increased as follows:

- 5-year Trend vs. 2020 ADF Increase = 3.6% (821,470 gpd/792,614 gpd)
- 2024 vs 2020 ADF Increase = 10.2% (873,799 gpd/792,614 gpd)

The 2023 RWSP states the 2014-2018 average daily water use was 878,000 gpd, which is greater than the 2020-2024 average daily use, and near equivalent to the 2024 average daily use. The 2014-2018 data fluctuated and did not present an increasing trend as witnessed in the current 2020-2024 trending period. The minimum 2014-2018 average daily value was reported in 2018 (830,000 gpd; RWSP Table B-5a). The 2014 - 2018 average flow value was compared against the 2018 population of 9,058 persons and resulted in an average gallons per capita per day (gpcd) value of 97 gpcd in the 2023 RWSP. The gpcd metric is a standard planning value for future development used in municipal planning documents such as the Town's 2040 Comprehensive Plan.

Review of the 2020-2024 water use data compared to yearly population figures and projections stated in the 2023 RWSP results in the following findings:

- The Bureau of Economic and Business Research (BEBR) reports an estimated Town of Orange Park 2024 population of 9,171 persons. Compared to the 2020-2024 Town average daily water use, the resultant average usage is 90 gpcd (821,470 gpd /9,171 persons).

- Comparing the 2024 population estimate to the 2024 average daily usage, the resultant average usage is 96 gpcd (873,799 gpd/9,171 persons).

- The 2023 RWSP stated 2020 and 2025 Town water use projections of 980,000 gpd associated with a build-out population of 10,076 persons and 97 gpcd (RWSP Table B-5).

2. **Distribution System Metered Water Use:** The Town organizes metered finished water use into the following categories:

- "Pumped Water" - Measured flow out of the wells.
- "Residential Potable" - Water used for residential consumption (may include irrigation).
- "Commercial Potable" - Water used for commercial consumption (either direct or via use in commercial process).
- "Irrigation" - Water used to irrigate commercial and residential facilities.

Unmetered quantities represent the total pumped gallons minus Residential Potable, Commercial Potable, and Irrigation. Pumped Water is generally evenly distributed between Ash Street WTP and Milwaukee WTP. **Table II-5** presents the Town's 2020-2024 water use breakdown by category.

TABLE II-5

2020 THROUGH 2024 MONTHLY WATER USE BY CATEGORY

Month	Pumped (Gal/Mo)	Residential Potable (Gal/Mo)	Commercial Potable (Gal/Mo)	Irrigation (Gal/Mo)	Unmetered (Gal/Mo)
2020					
January	23,952,000	9,986,000	12,170,000	2,334,000	(538,000)
February	22,134,000	11,893,000	14,178,000	2,661,000	(6,598,000)
March	26,237,000	10,293,000	15,209,000	2,234,000	(1,499,000)
April	22,912,000	11,388,000	11,987,000	1,986,000	(2,449,000)
May	28,220,000	9,306,000	10,097,000	1,960,000	6,857,000
June	25,226,000	15,504,000	12,449,000	2,455,000	(5,182,000)
July	25,830,000	11,979,000	12,818,000	2,106,000	(1,073,000)
August	24,634,000	11,756,000	13,333,000	1,826,000	(2,281,000)
September	22,247,000	11,626,000	13,583,000	1,708,000	(4,670,000)
October	22,651,000	10,537,000	13,254,000	1,557,000	(2,697,000)
November	22,550,000	9,490,000	12,549,000	1,446,000	(935,000)
December	23,635,000	10,562,000	12,402,000	1,648,000	(1,590,000)
Average	**24,185,667**	**11,193,333**	**12,835,750**	**1,993,417**	**(1,887,917)**
Total	**290,228,000**	**134,320,000**	**154,029,000**	**23,921,000**	**(22,655,000)**
% Total Pumped		**46.3%**	**53.1%**	**8.2%**	**-7.8%**
2021					
January	21,895,000	10,006,000	13,594,000	1,845,000	(3,550,000)
February	18,836,000	10,110,000	12,681,000	1,093,000	(5,048,000)
March	23,320,000	10,102,000	12,076,000	977,000	165,000
April	24,715,000	8,796,000	13,170,000	1,158,000	1,591,000
May	27,708,000	11,144,000	13,233,000	1,606,000	1,725,000
June	23,945,000	12,156,000	12,868,000	1,852,000	(2,931,000)
July	25,284,000	13,579,000	13,803,000	2,576,000	(4,674,000)

TABLE II-5 2020 THROUGH 2024 MONTHLY WATER USE BY CATEGORY					
Month	**Pumped (Gal/Mo)**	**Residential Potable (Gal/Mo)**	**Commercial Potable (Gal/Mo)**	**Irrigation (Gal/Mo)**	**Unmetered (Gal/Mo)**
August	24,731,000	10,464,000	11,959,000	2,111,000	197,000
September	24,630,000	11,397,000	15,727,000	2,303,000	(4,797,000)
October	25,723,000	10,862,000	12,975,000	2,076,000	(190,000)
November	23,839,000	11,205,000	12,214,000	2,194,000	(1,774,000)
December	22,266,000	14,664,000	14,483,000	2,893,000	(9,774,000)
Average	**23,907,667**	**11,207,083**	**13,231,917**	**1,890,333**	**(2,421,667)**
Total	**286,892,000**	**134,485,000**	**158,783,000**	**22,684,000**	**(29,060,000)**
% Total Pumped		**46.9%**	**55.3%**	**7.9%**	**-10.1%**
2022					
January	21,863,000	7,526,000	11,389,000	1,973,000	975,000
February	20,501,000	10,183,000	11,536,000	1,895,000	(3,113,000)
March	22,764,000	10,102,000	13,263,000	1,789,000	(2,390,000)
April	23,648,000	9,526,000	13,083,000	1,666,000	(627,000)
May	28,775,000	10,288,000	12,545,000	1,555,000	4,387,000
June	28,609,000	14,019,000	11,611,000	2,310,000	669,000
July	27,033,000	13,613,000	13,756,000	3,991,000	(4,327,000)
August	27,021,000	13,339,000	13,485,000	3,413,000	(3,216,000)
September	23,575,000	12,797,000	13,846,000	3,377,000	(6,445,000)
October	25,559,000	9,657,000	15,540,000	3,156,000	(2,794,000)
November	23,192,000	10,537,000	13,610,000	2,641,000	(3,596,000)
December	25,571,000	11,195,000	12,286,000	1,916,000	174,000
Average	**2,254,417**	**10,570,750**	**6,806,083**	**1,833,333**	**2,087,167**
Total	**298,111,000**	**132,782,000**	**155,950,000**	**29,682,000**	**(20,303,000)**
% Total Pumped		**44.5%**	**52.3%**	**10.0%**	**-6.8%**
2023					
January	23,239,000	10,471,000	14,515,000	2,041,000	(3,788,000)
February	21,778,000	11,580,000	13,442,000	1,703,000	(4,947,000)
March	25,502,000	9,601,000	14,040,000	1,842,000	19,000
April	24,823,000	9,914,000	12,820,000	1,727,000	362,000

TABLE II-5 2020 THROUGH 2024 MONTHLY WATER USE BY CATEGORY					
Month	**Pumped (Gal/Mo)**	**Residential Potable (Gal/Mo)**	**Commercial Potable (Gal/Mo)**	**Irrigation (Gal/Mo)**	**Unmetered (Gal/Mo)**
May	26,632,000	11,579,000	13,435,000	1,999,000	(381,000)
June	25,260,000	12,971,000	14,011,000	3,135,000	(4,857,000)
July	26,630,000	10,929,000	12,738,000	2,607,000	356,000
August	27,494,000	10,265,000	11,969,000	2,800,000	2,460,000
September	26,100,000	11,823,000	13,297,000	3,272,000	(2,292,000)
October	26,966,000	13,723,000	13,924,000	4,079,000	(4,760,000)
November	27,790,000	10,447,000	14,382,000	3,617,000	(656,000)
December	24,558,000	11,486,000	13,165,000	3,295,000	(3,388,000)
Average	**25,564,333**	**11,232,417**	**13,478,167**	**2,676,417**	**(1,822,667)**
Total	**306,772,000**	**134,789,000**	**161,738,000**	**32,117,000**	**(21,872,000)**
% Total Pumped		**43.9%**	**52.7%**	**10.5%**	**-7.1%**
2024					
January	24,183,000	9,960,000	12,846,000	2,970,000	(1,593,000)
February	23,964,000	11,530,000	13,500,000	2,424,000	(3,490,000)
March	25,184,000	10,675,000	13,983,000	1,631,000	(1,105,000)
April	27,149,000	10,749,000	12,237,000	1,835,000	2,328,000
May	30,355,000	10,887,000	13,963,000	2,363,000	3,142,000
June	30,731,000	13,259,000	13,020,000	3,037,000	1,415,000
July	27,321,000	13,537,000	13,234,000	3,406,000	(2,856,000)
August	28,116,000	15,268,000	14,191,000	3,319,000	(4,662,000)
September	25,929,000	12,232,000	13,205,000	2,988,000	(2,496,000)
October	26,424,000	11,949,000	16,657,000	3,868,000	(6,050,000)
November	26,031,000	8,455,000	13,536,000	2,251,000	1,789,000
December	24,352,000	11,624,000	14,536,000	2,117,000	(3,925,000)
Average	**26,644,917**	**11,677,083**	**13,742,333**	**2,684,083**	**(1,458,583)**
Total	**319,739,000**	**140,125,000**	**164,908,000**	**32,209,000**	**(17,503,000)**
% Total Pumped		**43.8%**	**51.6%**	**10.1%**	**-5.5%**

As shown in **Table II-5** the majority of the pumped water is consumed for residential and commercial "potable purposes". The 'negative' unmetered months indicate Town service meters may be reporting inaccurate data. The well pump flow meters are regularly calibrated, so the pumped data is presumed to be the most accurate indication of Town water use. In light of this, the Town recently began pursuing a system-wide meter replacement program and Automatic Metering Infrastructure (AMI) monitoring system upgrade as part of an FDEP State Revolving Fund (SRF) project. The average use between the various meter types is summarized as follows:

- Residential = 45.1
- Commercial = 53.0%
- Irrigation = 9.3%
- Unmetered = -7.5%

3. **SJRWMD CUP Review:** The Town's water quantity allocations are governed by Consumptive Use Permit (CUP) #453 enforced through the SJRWMD. The SJRWMD has authorized the use of 513.0 million gallons per year (MGY) which corresponds to a daily annual average of 1.405 million gallons per day (MGD). This use limitation was assigned following the most recent CUP renewal process in June 2022. The 2018 WSFWP demonstrated the previous CUP had larger Town allocations. However, as demonstrated in **Table II-3** and the 2023 RWSP, the Town has remained well within CUP limitations.

4. **GPCD Review:** Planning documents typically utilize the metric of gallons per capita per day (gpcd) and gallons per day per equivalent residential unit (gpd/ERU) when establishing level of service standards used as the basis for determining the availability of facility capacity and future demand generated by growth. The gpcd value is connected with service area population, and the gpd/ERU value is connected to service area connections. Connection usage can be simply analyzed based on metered billing data. However, due to aforementioned meter accuracy concerns, the most accurate Town usage is based on the gpcd value comparing service area population and well production. The gpcd metric is also the basis used for water use planning in the Town's 2040 Comprehensive Plan, 2018 WSFWP, and 2023 RWSP. **Table II-6** compares well production to the BEBR reported annual population, and calculates the gallons per capita per day (gpcd) for comparison to the 2023 RWSP and 2040 Comprehensive Plan planning values.

TABLE II-6 ANNUAL GPCD 2020-2024			
Year	**Annual Average Daily Use (gpd)**	**BEBR Population Estimate (capita)**	**Calculated GPCD**
2020*	792,600	9,089	87
2021	785,400	9,126	86
2022	816,200	9,157	89
2023	839,500	9,165	92
2024	873,800	9,171	96
Average	**821,500**	**9,142**	**90**

** Based on 2020 US Census Data*

The calculated gpcd value in comparison to the various Town and regional planning values are presented in **Table II-7**.

TABLE II-7 GPCD PLANNING COMPARISON	
PLANNING SOURCE	**GPCD**
2018-2024 Average	90
2024 Average	96
2018 WSFWP Recommendation	131
2014-2018 RWSP Town Data	97
2023 RWSP Compliance*	121

** Compliance value is based on a regional average (RWSP Table B-17)*

The goals outlined in the North Florida RWSP indicated a regional potable water Level of Service (LOS) standard of 121 gpcd. Based on current and historic Town water use, this goal is attainable. Actual Town water use has remained between 90 - 97 gpcd for 10+ years. The 2018 WSFWP recommended the Town modify their Comprehensive Plan to incorporate a potable water LOS of 131 gpcd based on the previous 2017 RWSP.

Section IV presents population projections to estimate 2045 water use for comparison to the 2023 RWSP findings.

III. RECLAIMED WATER SYSTEM

Reclaimed/reuse water systems present the opportunity as an alternative water supply to offset potable water demands and associated groundwater withdrawals. A fundamental component of water supply planning and the 2023 RWSP is to identify water supply development projects that create alternative water supplies such as stormwater, surface water, or reclaimed water that can offset potable water uses, such as irrigation. Agricultural and landscape irrigation are the main users of reclaimed water to offset potable demand as non-potable water is sufficient for these applications. The 2023 RWSP estimates a potential 92.4 MGD benefit is available in the combined North Florida SJRWMD and SRWMD region from water supply projects. 52 projects are associated to this benefit, with 46 of the projects assigned to reclaimed water. While none of these projects are associated with the Town of Orange Park, the 2023 RWSP cites a 2045 potential reuse supply from the Town of 0.80 MGD (RWSP Table B-13). As aforementioned, the Town does not contain its own reclaimed distribution system due to lack of existing customer base and distribution system infrastructure. However, it is interconnected with CCUA's system to help provide reuse supply when needed. This section presents the Town's wastewater treatment system and reuse system supply capabilities to help analyze system needs to promote the 2023 RWSP goals for increased alternative water supply.

A. EXISTING SYSTEM OVERVIEW

The Town of Orange Park owns and operates a domestic Wastewater Treatment Facility (WWTF) that is a 2.50 MGD AADF advanced wastewater treatment (AWT) biological nutrient removal (BNR) facility employing the processes of screening, influent flow equalization, 5-stage BNR treatment (series of anaerobic, pre-anoxic, aerobic, post-anoxic & re-aeration basins), clarification/settling, filtration, and chlorination/disinfection. Treated effluent is discharged to a permitted outfall to the St. Johns River (Disposal Site D-001) and/or conveyed to Clay County Utility Authority's (CCUA) reuse system via an Interlocal Agreement (Reuse Site R-001). Waste sludge is stabilized via aerobic digestion, dewatered via contract centrifuge dewatering service or emergency onsite drying beds, and land applied at permitted disposal sites.

The WWTF was most recently expanded and upgraded to the existing 2.50 MGD AADF WWTF capable of meeting advanced treatment standards in 2011.

B. RECLAIMED WATER SUPPLY AND DEMAND

Both the St. Johns River surface water discharge (D-001) and CCUA reuse system (R-001) have permitted capacities of 2.50 MGD AADF. The Town monitors flow to both effluent sites individually to calculate total flow through the WWTF. Since initial operation of reuse system R-001 in 2011, a range of 5% - 15% of the WWTF's total annual flow has been conveyed to the reuse system. The use of R-001 is dependent on need from CCUA's system, which varies during dry and wet seasons. The Town's WWTF annual average daily flow has provided an average 5-year value of 0.94 MGD since 2020. This value has remained consistent with minor fluctuations between an annual average of approximately 0.93 - 0.97 MGD. Therefore, the reuse supply to the CCUA system has remained between 50,000 gpd (5%) and 140,000 gpd (15%) over this same period. Recent trends indicate the Town reuse demand to the CCUA system has decreased and is being required less frequently. Additional information and analysis related to the Town's WWTF flows is presented in the Town's 2024 WWTF Capacity Analysis Report presented in **Appendix B**. As presented in **Section II**, the annual average daily water use has presented an average 5-year value of 0.82 MGD which has also been relatively consistent. The discrepancy between water use and sewer flows can be mostly attributed to infiltration and inflow common in sewer collection systems.

The 2023 RWSP identifies the Town WWTF average flow as 0.99 MGD, which is in line with actual flows. Existing reuse utilization is indicated as 0.00 MGD. However, since the Town is connected to CCUA's system and can send flow as needed, the Town is tied to CCUA reuse system projects. CCUA's reuse system continues to grow due to development within Clay County and their associated service area. The Town is therefore also tied to CCUA's water supply development projects recognized by the RWSP, such as a 5-10 MGD Keystone Heights recharge project aimed to convey CCUA reuse to Keystone Heights in order to improve the minimum flow levels (MFLs) of surrounding lake systems. It is likely for these reasons, the 2023 RWSP projects 0.8 MGD of Town WWTF could potentially be used for beneficial reuse by 2045. The Town should continue to coordinate with CCUA, monitor Town policy, and promote treatment facility operations to maximize flows to the CCUA system. The Town has been proactive to try to improve its treatment plant efficiency and reuse supply capabilities to CCUA. Since 2024 the Town began to explore funding opportunities, such as the FDEP/SJRWMD Alternative Water Supply funding, to construct filtration improvements, incorporate reuse flow control valve improvements, and a 1.25

MG reuse ground storage tank. These items will greatly improvement the readiness for the Town to convey reuse to CCUA's system.

The Town has also began to explore increasing reuse supply and demand capabilities in its own service area. In-Town reuse customers would need to continue to be identified. Bulk users, such as large scale irrigation customers, present the best opportunity for reuse due to the cost of constructing the distribution infrastructure from the WWTF. The demand amount and frequency must justify the cost of conveying reuse. The Town has preliminarily identified local athletic association baseball and football fields as potential future reuse customers. 2024 water use data indicates existing irrigation customers use approximately 90,000 gallons per day. This presents an existing readily available customer demand base. However, additional bulk users would need to be established with proper funding to justify a Town distribution system. Before the Town can begin this venture, it first needs to complete the aforementioned planned construction of a 1.25 MG reuse ground storage tank and associated facility improvements which can help with both a Town reuse system and conveyance to CCUA's system to support the RWSP goals.

IV. WATER SUPPLY PROJECTIONS

A. HISTORIC GROWTH SUMMARY

The Bureau of Economic and Business Research (BEBR) of the University of Florida 2024 population estimates for Clay County and the Town were 236,365 and 9,171 persons, respectively. In comparison, the 2020 Census population estimates were 218,245 (+8.3% change or 2.1 % per year) and 9,089 (+0.9% change or 0.2% per year) persons, respectively. This demonstrates the Town has not experienced as much growth as other areas of Clay County, and is not anticipated to experience as much growth in the future.

B. POPULATION AND DEMAND PROJECTION

BEBR does not have population projections for the Town of Orange Park, but does provide population projections for Clay County as presented in **Appendix B**. To conservatively project future Town population from the County projections, the following criteria are used: (1) the Town service area will experience population growth equal to that of the "medium growth" projections published for Clay County as a whole; (2) population growth outside the existing service area will not be considered. **Table IV-1** represents the growth in the Town from 2025 through 2050 with a 2050 projection indicating a total population of 11,528 persons.

TABLE IV-1

POPULATION GROWTH 2025 THROUGH 2040 (PROJECTED)

Year	Town Population	Percent Change (Total)	Average Percent Change per Year
2025	9,461		
2030	10,096	6.7%	1.3%
2035	10,627	5.3%	1.1%
2040	10,984	3.4%	0.7%
2045	11,274	2.6%	0.5%
2050	11,528	2.3%	0.5%

* *Population calculated based upon 2024 BEBR Percentage of Change for Clay County Medium Growth Scenario*.

Despite the above conservative projections, the Town's service area is largely built out. This is exemplified by the observed stable water use data and WWTF flows. Future development and increase in Orange Park water use and WWTF flows will be dependent on in-fill development and redevelopment within the Town service area. For purposes of the North Florida RWSP, the Plan states a build-out population for the Town of 10,076 persons. The Plan further states this population will be realized by 2025 until the end of the planning period in 2045 with an associated build-out water use of 0.98 MGD (97 gpcd). A conservative build-out flow is also stated as 1.04 MGD for the Town (RWSP Table B-5). The 2023 RWSP also states a 2045 WWTF flow rate of 1.06 MGD. The below **Tables IV-2** and **IV-3** utilize BEBR projections to project 2045 water use and WWTF flow rates for comparison to the RWSP data.

TABLE IV-2
2045 WATER USE PROJECTIONS

Year	Town Population	Flow Projection (97 gpcd) (MGD)	Flow Projection (121 gpcd) (MGD)
2025	9,461	0.92	1.14
2030	10,096	0.98	1.22
2035	10,627	1.03	1.29
2040	10,984	1.07	1.33
2045	11,274	1.09	1.36

TABLE IV-3
2045 WWTF FLOW PROJECTIONS

Year	Town Population	WWTF FLOW (AADF) (MGD)
2025	9,461	1.00
2030	10,096	1.07
2035	10,627	1.13
2040	10,984	1.16
2045	11,274	1.19

As demonstrated, the BEBR population projections are more conservative since they do not consider the build-out scenario.

C. WATER CONSERVATION EFFORTS

From data presented in **Section II**, the Town's current residential water use does not indicate a significant potable water irrigation component with per capita consumption value ranging somewhere between 100 to 240 gpcd, which is relatively low compared to other communities. This is likely part of the Town's continued promotion of water conservation efforts, as well as older development areas.

For example, the Town of Orange Park, in accordance with the desire of the SJRWMD, implemented the following conservation techniques via Water Conservation Ordinance For Landscape Irrigation, Section 36-227, to advance the cause of water conservation efforts.

Landscape irrigation shall be subject to the following irrigation schedule exceptions:

1. Irrigation using a micro-irrigation is allowed anytime.

2. Irrigation of new landscape is allowed at any time of day on any day for the initial 30 days and every other day for the next 30 days for a total of one 60-day period, provided that the irrigation is limited to the minimum amount necessary for such landscape establishment.

3. Watering in of chemicals, including insecticides, pesticides, fertilizers, fungicides, and herbicides when required by law, the manufacturer, or best management practices is allowed anytime within 24 hours of application.

4. Irrigation systems may be operated any time for maintenance and repair purposes, not to exceed 10 minutes per hour per zone.

5. Irrigation using a hand-held hose equipped with an automatic shut-off nozzle is allowed anytime.

6. Discharge of water from a water-to-air air conditioning unit or other water-dependent cooling system is not limited.

7. The use of water from a reclaimed water system is allowed anytime. For the purpose of this paragraph, a reclaimed water system includes systems in

which the primary source is reclaimed water, which may or may not be supplemented from another source during peak demand periods.

8. The use of recycled water from wet detention treatment ponds for irrigation is allowed anytime provided the ponds are not augmented from any ground or off-site surface water, or public supply sources.

The Town also promotes water conservation through establishment of its tiered rate structure developed in 2011. The tiered rate structure assigns a larger rate to larger set increments of water use, effectively rewarding lesser use and promoting conservation. The Town also sends customers periodic mailing encouraging water conservation and individual customer water audits.

The Town 2040 Comprehensive Plan's Transportation Element and others also reserves the right for the Town and Town engineer to review proposed irrigation infrastructure; The Infrastructure Element and Conservation Element promote stormwater based irrigation systems and other innovative low-impact uses for new development; and the Conservation Element promotes reuse feasibility studies for existing and new development to offset potable water.

V. 2045 WATER SUPPLY SUMMARY OF FINDINGS

Current development activity and prevailing growth patterns experienced in the State of Florida and Clay County as a whole are not being experienced at the same rate in the Town of Orange Park. Based on build-out data compared to BEBR projections for the Town and 2023 RWSP data, we believe a 1% annual growth rate similar to what the Town has experienced for the past 5 years is a reasonable average projection for the next 10+ years to 2045. Actual values will fluctuate year to year. The Town should monitor this growth via building permit applications, as well as general planning activities such as, but not limited to, site plan applications, plat applications, zoning modifications, etc. Based on the current and projected growth pattern, the SJRWMD CUP data, water use and supply data, reclaimed water treatment and supply data, and 2023 RWSP information presented herein, the following Town notes and recommendations are provided:

- The Town's current and projected water use and associated CUP utilization rate indicate the CUP allocation will not be surpassed before expiration in the year 2042.

- Water use projections indicate water treatment plant capacity will not require expansion by 2045. The Town has the following groundwater pumping capacity:

  - Ash Street WTP (Well No. 1) = 2,300 gpm (3.31 MGD)
  - Ash Street WTP (Well No. 2) = 2,300 gpm (3.31 MGD)
  - Milwaukee Ave WTP (Well No. 3) = 2,200 gpm (3.17 MGD)
  - Milwaukee Ave WTP (Well No. 4) = 2,200 gpm (3.17 MGD)

  With the largest well out of service at each facility, the Town's firm capacity is 4,500 gpm (4.70 MGD).

- The Town has maintained a water use rate of 90 - 97 gpcd for over 10 years, and this value is anticipated to be associated with Town water use for the next 10+ years. The 2023 RWSP provides a regional average goal value of 121 gpcd, which is attainable by the Town. To comply with the 2023 RWSP, it is recommended the Town amend its Comprehensive Plan Infrastructure Element to state a potable water Level of Service of 121 gpcd.

- The Town should continue current water conservation efforts to limit non-essential use of potable water supported in its rate system, Town Ordinances, Comprehensive Plan and Town operations.

- WWTF flow rates indicate the Town WWTF will not exceed capacity in the next 10+ years or require expansion by 2045.

- The Town should continue to plan to implement reclaimed water storage capabilities and WWTF modifications to assist with developing a Town reclaimed water system and readiness for conveyance to the CCUA reuse system.

- The Town should maximize reclaimed water transfers to CCUA until such time that the Town can supplement CCUA demands with its own reuse system.

VI. CAPITAL IMPROVEMENT PROJECTS

The following projects are listed in the Town's 5-year capital improvement program (CIP) from FY 25/26 through FY 29/30 for the Town's water system.

Project Description	5-Year Estimated Cost
Fire hydrant replacement program	$97,500
Construction of equipment garage, shared with sewer	$375,000
Replace old water mains across Town	$3,200,000
Replace old water meters	$110,000
Replacement of old water services not identified in larger projects	$320,000
Install valves on water mains	$400,000
Upgrades to SCADA - Data Flow Systems, valves, pumps, and sensors	$200,000
Install transmitter on water meters to allow meters to be read through drive-by technology	$1,050,000
Installation of water main - Shaw to Miller to Fromhart	$300,000
Replace crane truck and purchase pulley system	$120,000
Replace pickup trucks	$94,000
Total	**$6,266,500**

As aforementioned, some components of the identified projects in the CIP are funded by outside funding sources or are being submitted to various funding sources, such as the FDEP SRF funding program. The Town can adjust the 5-year CIP as needed as funding becomes awarded/available.

The following projects are listed in the Town's 5-year capital improvement program (CIP) from FY 25/26 through FY 29/30 for the Town's sewer system.

Project Description	5-Year Estimated Cost
Construction of equipment garage, shared with water	$375,000
Replacement/rehabilitation/lining of aged manholes	$550,000
Inspection and replacement services for aged sewer lines	$745,000
Rehabilitate aging lift stations	$3,350,000
Lining of sewer lines	$1,500,000
Telemetry improvements for lift stations	$250,000
Purchase portable lift station emergency power generators	$300,000
General WWTF improvements	$340,000
Replace WWTF Disc Filters	$150,000
Sewer service extension	$180,000
Replace WWTF mixers	$60,000
Replace WWTF blower units	$500,000
Replace WWTF bar screen	$100,000
Purchase various sewer system equipment components (probes, cameras, samplers, etc.)	$111,000
Surge Tank Rehabilitation	$2,875,000
Purchase pickup trucks	$144,000
Total	**$11,530,000**

The above sewer system improvements are vital for the operation and efficiency of the sewer collection and treatment system. The identified WWTF improvements will also help the Town promote readiness to convey reuse to the CCUA system when needed. As aforementioned, The Town is also applying for various funding sources, such as the FDEP/SJRWMD Alternative Water Supply funding program, to help supplement the costs of some of the proposed improvements and implement a 1.25 MG prestressed concrete or glass-steel ground storage tank for reuse storage and supply. Therefore, for the next 5-10 year planning horizon, the Town should implement the following CIP considerations:

- Continue planning and funding efforts to Implement reclaimed water storage capabilities. A 1.25 MG initial target is recommended, but additional storage may be needed in the future.

- Continue to identify potential Town non-potable reuse customers, such as the athletic association fields, to offset potable irrigation needs and create reuse distribution system extension projects.

- Continue to improve the Town WWTF process and collaborate with CCUA to improve readiness of reuse conveyance to the CCUA system.

- Monitor and adjust the Town 5-year CIP as potential funding is awarded and becomes available.

APPENDIX A

2018 Water Supply Facilities Work Plan

2018 Work Plan

TOWN OF ORANGE PARK

CUP# 2-019-453-6

Adopted by:
The Town of Orange Park, Florida
December __, 2018

For information regarding this project, contact:

Legacy Civil Engineers, Inc.
630 Myrtle Avenue
Green Cove Springs, FL 32043

Project No.
Date: May 8, 2018

Table of Contents

1. INTRODUCTION 3
1.1 Statutory History 4
1.2 Statutory Requirements 4
2. BACKGROUND INFORMATION 7
2.1 Overview 7
2.2 Relevant Regional Issues 8
2.3 Current Water Supply 8
2.4 Conservation and Reuse 9
3. DATA AND ANALYSIS 10
3.1 Population Information 10
3.2 Current and Future Areas Served 10
3.3 Potable Water Level of Service Standard 12
3.4 Population and Potable Water Demand Projections 12
4. WORK PLAN: PROJECTS AND CAPITAL IMPROVEMENTS 14
5. GOALS, OBJECTIVES, POLICIES 16
Table 2 – OUTSIDE JURISDICTION SERVICE & BULK PURCHASES AGREEMENTS: TOWN WORK PLAN. **Error! Bookmark not defined.**

Section 1

INTRODUCTION

1. INTRODUCTION

The purpose of the TOWN Water Supply Facilities Work Plan (Work Plan) is to identify and plan for the water supply sources and facilities needed to serve existing and new development within the local government's jurisdiction. Chapter 163, Part II, Florida Statutes (F.S.), requires local governments to prepare and adopt Work Plans into their comprehensive plans within 18 months after St. Johns River Water Management District (District) approves a regional water supply plan or its update. The NORTH FLORIDA REGIONAL WATER SUPPLY PLAN (NFRWSP) was approved by the District's Governing Board on *January 17, 2017*. Therefore, the deadline for local governments within the St. Johns River Water Management District Region to amend their comprehensive plans to update the Work Plan is *July 12, 2018.*

Residents of the Town obtain their water from TOWN OF ORANGE PARK, which is responsible for ensuring enough capacity is available for existing and future customers. The Town is compliant with the conditions of its Consumptive Use Permit (CUP) issued by St. Johns Water River Management District (SJRWMD), which governs groundwater withdrawals from the Floridan Aquifer, which is the source of the Town's drinking water supply. Water treatment and distribution permit conditions are set through the Town's Public Water Supply Permit issued by Florida Department of Environmental Protection.

This Work Plan is based on initiatives already identified in the Town's Consumptive Use Permitting process to ensure adequate water supply for the Town. The Town permit renewal documents submitted and recorded in the Staff Report component of the current CUP provides detailed description of permit conditions articulated in the Final Permit related to conservations, reuse program, alternative water supply planning.

Through its Wastewater Operating Permit, and interlocal agreements and protocols, the Town has already constructed and operates its pipeline link to the only approved Alternative Water Supply Project in Clay County (ACES Project 12, which is a 10 mgd Aquifer Recharge project). The Town submits annual Reuse Reports through FDEP that quantifies the Town's contribution to re-use/groundwater augmentation of this network. Various O&M and Capital components of the Ash Street Wastewater Treatment Plant operate exclusively to the benefit of transfer of Treated/Filtered effluent to the CCUA reclaimed water system are routinely included in the Town's operating and capital budgets.

The Town's Work Plan bases future water consumption on population projections provided in the BEBR, Florida Populations Studies, Vol. 50, Bulletin 177 and proportions of Total Population (Office of Economic and Demographic Research, Oct. 17, 2016). The BEBR population projects a population of 11,682 in 2035, which is the planning threshold for the equipment service life of Town water supply and distribution equipment. The NFRWSP population projections for 2035 is 9,669 residents.

Water consumption in the Work Plan is assumed to be 131 gallons per day per capita pursuant to table B15 in the NFRWSP.

This Work Plan is divided into five sections:

Section 1 – Introduction
Section 2 – Background Information
Section 3 – Data and Analysis
Section 4 – Work Plan Projects/Capital Improvement Element/Schedule
Section 5 – Goals, Objectives, and Policies

1.1 Statutory History

The Florida Legislature enacted bills in the 2002, 2004, 2005, and 2011 sessions to address the state's water supply needs. These bills, in particular Senate Bills 360 and 444 (2005 legislative session), significantly changed Chapters 163 and 373, F.S. by strengthening the statutory links between the regional water supply plans prepared by the water management districts and the comprehensive plans prepared by local governments. In addition, these bills established the basis for improving coordination between local land use planning and water supply planning.

1.2 Statutory Requirements

The Orange Park has considered the following statutory provisions while updating the Water Supply Facilities Work Plan (Work Plan):

1. Coordinate appropriate aspects of its comprehensive plan with the North Florida Regional Water Supply Plan [163.3177(4) (a), F.S.]. ***Ongoing, Work Plan***
2. Ensure the future land use plan is based upon availability of adequate water supplies and public facilities and services [s.163.3177 (6) (a), F.S.]. Data and analysis demonstrating that adequate water supplies and associated public facilities will be available to meet projected growth demands must accompany all proposed Future Land Use Map amendments submitted for review. ***Ongoing, Work Plan, CUP.***
3. Ensure that adequate water supplies and potable water facilities are available to serve new development no later than the issuance by the local government

of a certificate of occupancy or its functional equivalent and consult with the applicable water supplier to determine whether adequate water supplies will be available to serve the development by the anticipated issuance date of the certificate of occupancy [s.163.3180 (2), F.S.]. ***Ongoing, Town Code, Work Plan***

4. Revise the General Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element (the "Infrastructure Element"), within 18 months after the water management district approves an updated regional water supply plan, to:
    a. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the North Florida Regional Water Supply Plan, or alternative project(s) proposed by the local government under s. 373.709(8)(b), F.S. [s. 163.3177(6)(c), F.S.];***Comp Plan Amendment, Work Plan***
    b. Identify the traditional and alternative water supply projects and the conservation and reuse programs necessary to meet water needs identified in the North Florida Regional Water Supply Plan [s. 163.3177(6)(c)3, F.S.]; ***Ongoing, CUP, Work Plan***
    c. Update the Work Plan for at least a 10-year planning period for constructing the public, private, and regional water supply facilities identified in the element as necessary to serve existing and new development [s. 163.3177(6)(c)3, F.S.]. ***Ongoing, CUP, Work Plan***
5. Revise the Five-Year Schedule of Capital Improvements to include water supply, reuse, and conservation projects and programs to be implemented during the five-year period [s. 163.3177(3)(a)4, F.S.].***Ongoing, Town CIP***

   To the extent necessary to maintain internal consistency after making changes described in Paragraph 1 through 5 above, revise the Conservation Element to assess projected water needs and sources for at least a 10-year planning period, considering the {Insert Name of applicable Regional Water Supply Plan} Water Supply Plan, as well as applicable consumptive use permit(s) [s.163.3177 (6) (d), F.S.]. The plan must address the water supply sources necessary to meet and achieve the existing and projected water use demand for the established planning period, considering the applicable regional water supply plan [s.163.3167(9), F.S.]. ***Ongoing, CUP, Work Plan***
6. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Intergovernmental Coordination Element to ensure coordination of the comprehensive plan with the

   North Florida Regional Water Supply Plan [s.163.3177 (6) (h) 1., F.S.]. ***Completed***
    a. While an Evaluation and Appraisal Report is not required, local governments are encouraged to comprehensively evaluate, and as necessary, update comprehensive plans to reflect changes in local

conditions. The evaluation could address the extent to which the local government has implemented the need to update their Work Plan, including the development of alternative water supplies, and determine whether the identified alternative water supply projects, traditional water supply projects, and conservation and reuse programs are meeting local water use demands [s.163.3191 (3), F.S.].***Comp Plan Amendment, Work Plan***

2. BACKGROUND INFORMATION

Included in this section is a brief overview of the Town of Orange Park, including information on land use and population.

2.1 Overview

Town of Orange Park was incorporated in 1877. The original boundaries encompassed an area approximately six square miles bounded by the St. Johns River to the east, Doctors Lake to the south, Clay County unincorporated areas to the west, and Duval County to the north.

The Town's Work Plan bases future water consumption on population projections provided in the BEBR, Florida Populations Studies, Vol. 50, Bulletin 177 and proportions of Total Population (Office of Economic and Demographic Research, Oct. 17, 2016). The BEBR population projects a population of 11,682 in 2035, which is the planning threshold for the equipment service life of Town water supply and distribution equipment. The NFRWSP population projections for 2035 is 9,669 residents.

Water consumption in the Work Plan is assumed to be 131 gallons per day per capita pursuant to table B15 in the NFRWSP.

Over 43.7% of the Town's water consumption is through meters to commercial customers, which tends to skew upwards the gallon per day/capita since transit populations in apartments and hotels (commercial meters) are generally not included in the census count in the 32073 zip code. This situation creates great uncertainty in the future water consumption projections, as transient populations can be very sensitive to the ebb and tide of local economic conditions. This uncertainty results in the need for higher-than-normal factors of safety in water supply planning.

In compliance with CUP permit requirements, the Town of Orange Park undertook a rate study in 2011 which resulted in approval of "Tiered Water Rates" in the Town Code. This tiered rate, intended as a water conservation measure, put downward pressure on water consumption during the height of the last economic recession.

In 2008 the Town of Orange Park constructed a force main between Clay County Utility Authority's (CCUA) Miller Street Plant and the Town's Ash Street WWTP for purposes of transferring treated and filtered wastewater from the Town to CCUA's reclaimed water system. In 2011 the Town of Orange Park Town Council and the CCUA Board of

Supervisors executed an interlocal agreement to facilitate the transfer. Since that time the Town has periodically pumped water to CCUA, which sells the water to its reclaimed water customers.

2.2 Relevant Regional Issues

The regional issues identified for the period of 2015 thru 2035 in the St. Johns River Water Management District Planning Region are:

i. Minimum Flows and Levels in the Etonia Creek network; the Lower Santa Fe River Basin; and the Ichnetucknee River basin.
ii. Water Conservation

2.3 Current Water Supply

The following section includes information pertaining to water provided by the TOWN. The information for any future water supply facilities needed is included in the discussion below and in the Capital Improvements section. No water is supplied to the Town from outside the Utility boundaries.

i) Consumptive Use Permit (CUP) Information:
(1) SJRWMD CUP # 453
(2) Renewal Date: December 31, 2020
(3) Current Maximum groundwater withdrawals:
(a) 567.94 million gallons/yr (1.556 mgd average) in 2018
(b) 584.73 million gallons/yr (1.602 mgd average) in 2019
(c) 600.79 million gallons/yr (1.646 mgd average) in 2020

ii) Treatment Facilities Permit: FDEP PWS ID 2101182, two (2) treatment facilities

iii) Groundwater Wells:

Well or Pump Number	Wellfield or Facility Name	Casing Dia. (in.)	Casing Depth (ft)	Total Depth (ft)	Pump Capacity (in gpm)	Date Drilled
1	Ash St WTP	24x18	309	862	2200	1971
2	Ash St WTP	24x18	310	871	2000	1971
3	Milwaukee WTP	20x16	320	1000	2200	2000
4	Milwaukee WTP	20x16	320	1000	2200	2000

iv) Storage Facilities
(1) Ash Street WTP: 500,000 Steel Ground Storage Tank
(2) Milwaukee WTP: 489,000 Concrete Ground Storage Tank

v) Interlocal Agreements and Bulk Sales (Potable): None

vi) Interconnects: None

vii) Outstanding Compliance Issues: None

2.4 Conservation and Reuse

In compliance with CUP permit requirements, the Town of Orange Park undertook a rate study in 2011 which resulted in approval of "Tiered Water Rates" in the Town Code. This tiered rate, intended as a water conservation measure, put downward pressure on water consumption during the height of the last economic recession.

The Town permit renewal documents submitted and recorded in the Staff Report component of the current CUP provides detailed description of permit conditions articulated in the Final Permit related to conservations, reuse program, alternative water supply planning. These measures include periodic mailing to customers encouraging water conservation and individual water audits of individual customers.

The Town of Orange Park has no reclaimed water distribution system in the Town limits. However, the Town Wastewater Treatment Plant (Ash Street WWTP) is designed and permitted to discharge treated and filtered effluent to Clay County Utility Authority's Miller Street WWTP for inclusion in the that utility's reclaimed water plant. Interlocal agreements have been signed between the two utilities to facilitate transfer of these water resources and operating protocols are included in the Plant's operating permit. The Town files annual Reuse Reports with FDEP that quantifies the transfer of effluent from Ash Street to CCUA. Based on the interlocal agreement with CCUA, the Town can transfer up to 0.9 mgd of treated and filtered effluent to CCUA, which is approximately 55.9% of the Town's current Consumptive Use capacity.

The Town's connection to the CCUA reclaimed water system also connects the Town to an approved Alternative Water Supply Project described in the North Florida Regional Water Supply Plan, the Keystone Area Rapid Infiltration Basin System (RIBS), which proposes to transfer reclaimed water (approximately 5 – 10 mgd) from the CCUA Mid-Clay Reservoir project (publicly-funded) to a RIBS in Keystone Heights through a publicly funded transmission line. The RIBS is intended to augment the Upper Floridan Aquifer, and thus constitutes an "alternative water supply" project.

The transmission of reclaimed water from CCUA's Miller Street WWTP to Mid-Clay WWTP is through pipes partially funded with public-funds. The Town's connection to the Mid-Clay plant was constructed USING ONLY Town Utility funds with no cost-share by any other agency of government.

As such, the Town of Orange Park has already expended great deals of money to develop its contribution to future alternative water supply projects.

3. DATA AND ANALYSIS

The intent of the data and analysis section of the Work Plan is to describe information the Town of Orange Park uses to provide to state planning and regulatory agencies as part of their proposed comprehensive plan amendments, particularly those changing the Future Land Use Map (FLUM) to increase density and intensity.

3.1 Population Information

This section is a narrative summarizing population information describing coordination with the population projections from the Town of Orange Park's comprehensive plan and the North Florida Regional Water Supply Plan. With this amendment, the population projections used will be consistent throughout the comprehensive plan, including the tables in Section 3.4 which will contain more detailed population and demand projections.

3.2 Current and Future Areas Served

The map in Figure 1 depicts current and future TOWN boundaries served by the Town's water system.

The Town of Orange Park water system is bounded by the St. Johns River on the East, the Clay County Utility Authority (CCUA) Service Area on the South and the West, and the Jacksonville Electric Authority (JEA) Service Area on the North. The CCUA Service Area is defined in Chapter 94-491 Laws of Florida which grants CCUA the sole right to provide water service in the unincorporated areas of Clay County. The JEA service area was established in Chapter 67-1569 Laws of Florida which grants JEA the sole right to provide water services in Duval County, excluding the existing municipalities not annexed into the City of Jacksonville.

Because of the existence of adjoining utilities, the Town of Orange Park is not expected to expand its service area outside of the corporate limits.


Ortega Hills
Black Point
RIVER
R 25 E
R 26 E
Meadowbrook Terrace
Orange Park
Holly Point
Orange Point
Mandarin Point
Romeo Point
Macks Point
Doctors Inlet
Doctors Lake
Creighton Island
Geigers Point
Hog Point
Catfish Point
Neilhurst
Ragged Point
CLAY CO
DUVAL CO
ST JOHNS CO
N
0 0.5 1
Miles
Town of Orange Park
2-019-453-5
Location Map

Figure 1

3.3 Potable Water Level of Service Standard

The following summarizes the Town of Orange Park's existing and projected potable water level of service standard:

i) Existing Potable Water Level of Service Standard: **155 Gallons per day per capita** with 1.36 peak factor.
ii) Level of Service required for compliance with North Florida Regional Water Supply Plan (NFRWSP): **131 gallons per day per capita** based on regional average in the NFRWSP (Table B15).
iii) Current Gross Demand per Capita (2010-2014 per NFRWSP): **105 gallons per day per capita.**
iv) **Proposed Water Level of Service Standard: 131 gallons per day per capita** with 1.36 peak factor.

DISCUSSION:

i) Town of Orange Park is increasingly dominated by Commercial customers (43.7% currently). Commercial customers include hotels, long-term care facilities, and multi-family units.
ii) Hotels create commercial demand by persons not included in census of the Town.
iii) Hotel occupancy in the Town is dominated by commercial visitors (Tourist Development Council)
iv) During the 2010-2014 period, commercial meter demand in the Town hotel industry was depressed due to:
   (1) Slowdown in hotel occupancy by business/military customers due to economic recession.
   (2) Shut down of three large hotel complexes due to ownership changes, remodeling, or demolition.
v) Commercial meter water demand in multi-family or hotel units has not yet fully recovered to pre-recession levels, suggesting potential increase in water sales to existing units once vacancy rates decrease.
vi) The current proposed demand for Orange Park under the NFRWSP (105 gallons per day per capita) is the lowest in Clay County, which includes CCUA that has per capita demand for potable water reduced by large percentages of Clay County population that has no potable water service from CCUA.
vii) Based on the above, the Town should set Potable Water level of service standard at 131 gallons per day per capita, consistent with the regional average.

3.4 Population and Potable Water Demand Projections

The following summarizes the Town's existing and projected population:

i) Existing Population: **8,606** persons (Source: Medium Projections of University of Florida Bureau of Economic and Business Research, April 12, 2017).
ii) Proposed 2035 population projection for other parts of Comp Plan: **8,184**

persons (Source: Medium Projections of University of Florida Bureau of Economic and Business Research, April 12, 2017).

iii) Proposed 2035 population projection in NFRWSP: **9,669** persons (Source: Table B15, NFRWSP)

iv) **Proposed 2035 population projections for Potable Water components of Comprehensive Plan**: **11,682** persons (Source: Clay County Comprehensive Plan, BEBR, Florida Population Studies, Vol 50, with municipal projections based on proportions of County Population , 2016, Office of Economic and Demographic Research, October, 2016.) These population projections will be used for potable water planning in the Town of Orange Park:

(1) 2020: **9,364**
(2) 2025: **10,236**
(3) 2030: **10,986**
(4) 2035: **11,682**
(5) 2040: **12,327**

DISCUSSION:

i) Proposed BEBR municipal population projections do not take into account the transition of the Town of Orange Park from a pure "bedroom" community into a commerce center that hosts future long-term and short-term care facilities ancillary to nearby medical facilities; hotels that house future business customers that are included in other community's censuses; and multi-family units that are still filling with new residents after the last recession. Water sales through Commercial meters has risen to 43.7% of all water sales in the Town of Orange Park.

ii) The population projections used elsewhere in the Comprehensive Plan (decrease from current 8,606 to 8,184 in 2035) cannot be used for Potable Water elements of the Plan because this decrease does not account for unused water supply commitments for end-users that don't show up in the Town's census.

4. WORK PLAN: PROJECTS AND CAPITAL IMPROVEMENTS

The intent of this section of the Work Plan is to describe the projects and supporting capital improvements the Town of Orange Park will implement pursuant to its responsibilities under Paragraph 29 of the Town's Consumptive Use Permit #453-6 issued in January 2012 which prescribes:

> *The permittee's consumptive use shall not adversely impact wetlands, lakes, and spring flows or contribute to a violation of minimum flows and levels adopted in Chapter 40C-8, F.A.C., except as authorized by a District-approved minimum flow or level (MFL) recovery strategy. If unanticipated significant adverse impacts occur the District shall revoke the permit in whole or in part to curtail or abate the adverse impacts, unless the impacts are mitigated by the permittee pursuant to a District-approved plan.*

The Town has been in compliance with Paragraph 29 of Permit #453-6 before the date the permit was issued. Long before permit issuance, the Town developed in its Comprehensive Plan Objectives and Policies the water conservation plans that are now required in the North Florida Regional Water Supply Plan (NFRWSP).

Long before permit issuance the had already constructed the infrastructure necessary to link the Town's treated and filtered effluent to CCUA's reclaimed water system, which will become the water supply for the Keystone Area Rapid Infiltration Basin System, which is a "District-approved minimum flow or level (MFL) recovery strategy", pursuant to Paragraph 29. This project was constructed using ONLY Town utility capital improvement funds, and connects to CCUA's reclaimed water force main system which was constructed with large amounts of Public Grant. The Town has an interlocal agreement between the Town of Orange Park Town Council and the Clay County Utility Authority Board of Governors which commits both parties to send and receive, respectively, treated and filtered wastewater effluent from the Ash Street WWTP.

The Town's Work Plan should not compromise its own ability to serve existing water supply commitments to its current customers or any of their successors.

4.1 Work Plan Projects

The following summarizes the Town of Orange Park's existing and proposed projects and Capital Improvements that support compliance with Paragraph 29 of the Towns Consumptive Use Permit #453-6 and reinforce the Town's readiness to serve the water customers in the Town service area:

i) PROJECT: **Improve Readiness of Ash Street WWTP to deliver treated/filtered effluent to CCUA reclaimed water system.**
   (1) Promote and coordinate policy to maximize flows from Ash Street WWTP to Miller Street WWTP at the Governing Board level, Senior Staff level, and Treatment Plant Staff level.
   (2) Make treatment plant operational changes and equipment improvements necessary to ensure continuous, long-term compliance with the Operating Protocols between the Town and CCUA.
   (3) **Capital Improvements for this Project:**
      (a) Tertiary Filter Improvements
      (b) Modifications to "Reject" system to allow automatic or remote re-set of transfer valve.

ii) PROJECT: **Continue to promote water conservation in accordance with Objective 4.5 of the Comprehensive Plan**

iii) PROJECT: **Continue meter replacement program to ensure accurate measurement of water consumption.**
   (1) **Capital Improvements for this Project:**
      (a) Continue funding of small meter replacement

5. GOALS, OBJECTIVES, POLICIES

The intent of this section of the Work Plan is to describe modifications to the Town of Orange Park comprehensive plan:

5.1 Revised Goals, Objectives and Policies

The following summarizes revisions to the Goals, Objectives and Policies of the Town of Orange Park's Comprehensive Plan:

i) POLICY REVISION: **Revise Infrastructure Element, Objective 4.1, Policy 4.1.1 regarding Potable Water Level of Service**
(1) 131 gallons per day per capita with a 1.36 peaking factor

ii) NEW POLICY: **Objective 4.5, New Policy regarding CUP planning**
(1) Plan CUP allocation to include unused water supply commitments to existing under-utilized meters regardless of population projections used for other elements of the Comprehensive Plan.

APPENDIX B

2024 WWTF Capacity Analysis Report

CAPACITY ANALYSIS REPORT

FOR

WASTEWATER TREATMENT FACILITY PERMIT RENEWAL

TOWN OF ORANGE PARK
CLAY COUNTY, FLORIDA

Facility Identification No: FL0023922

FDEP Permit No. FL0023922

FDEP Permit Expires: 08/20/2024

Prepared by:

MITTAUER & ASSOCIATES, INC.
CONSULTING ENGINEERS
Orange Park, Florida
Project No. 2401-02-1
July 2024

CAPACITY ANALYSIS REPORT

FOR

WASTEWATER TREATMENT FACILITY PERMIT RENEWAL

TOWN OF ORANGE PARK
CLAY COUNTY, FLORIDA

Facility Identification No: FL0023922

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FDEP Permit No. FL0023922

FDEP Permit Expires: 08/20/2024

Prepared by:

MITTAUER & ASSOCIATES, INC.
CONSULTING ENGINEERS
Orange Park, Florida
Project No. 2401-02-1
July 2024

CERTIFICATIONS

Sarah Campbell, ICMA-CM, Town Manager
Town of Orange Park
2042 Park Avenue
Orange Park, Florida 32073

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sarah Campbell, ICMA-CM, Town Manager

CERTIFICATIONS

Jarrod P. Petrohovich, P.E.
Mittauer & Associates, Inc.
580-1 Wells Road
Orange Park, Florida 32073
(904) 278-0030

I certify that the information contained in this report is true and correct to the best of my knowledge, the report was prepared in accordance with sound engineering principles, and I discussed the recommendations and schedules with the permittee or the permittee's delegated representative.



J. P. Petrohovich 7/25/2024
Jarrod P. Petrohovich, P.E.
FL P.E. #95584

TABLE OF CONTENTS

CERTIFICATIONS . . . . . i, ii

I. INTRODUCTION 1

II. EXISTING CONDITIONS 4
A. Permitted Capacities 4
B. Monthly Average Daily Flows, Three-Month Average Daily Flows, and Annual Average Daily Flows 4
C. Seasonal Variations and Inflow/Infiltration 8
D. Updated Flow and Loading Information 9

III. FUTURE CONDITIONS 13

IV. SUMMARY AND CONCLUSIONS 17
A. Time Required for the Three-Month Average Daily Flow to Reach Permitted Capacity 17
B. Recommendations for Expansion 17
C. Expansion Schedules 17

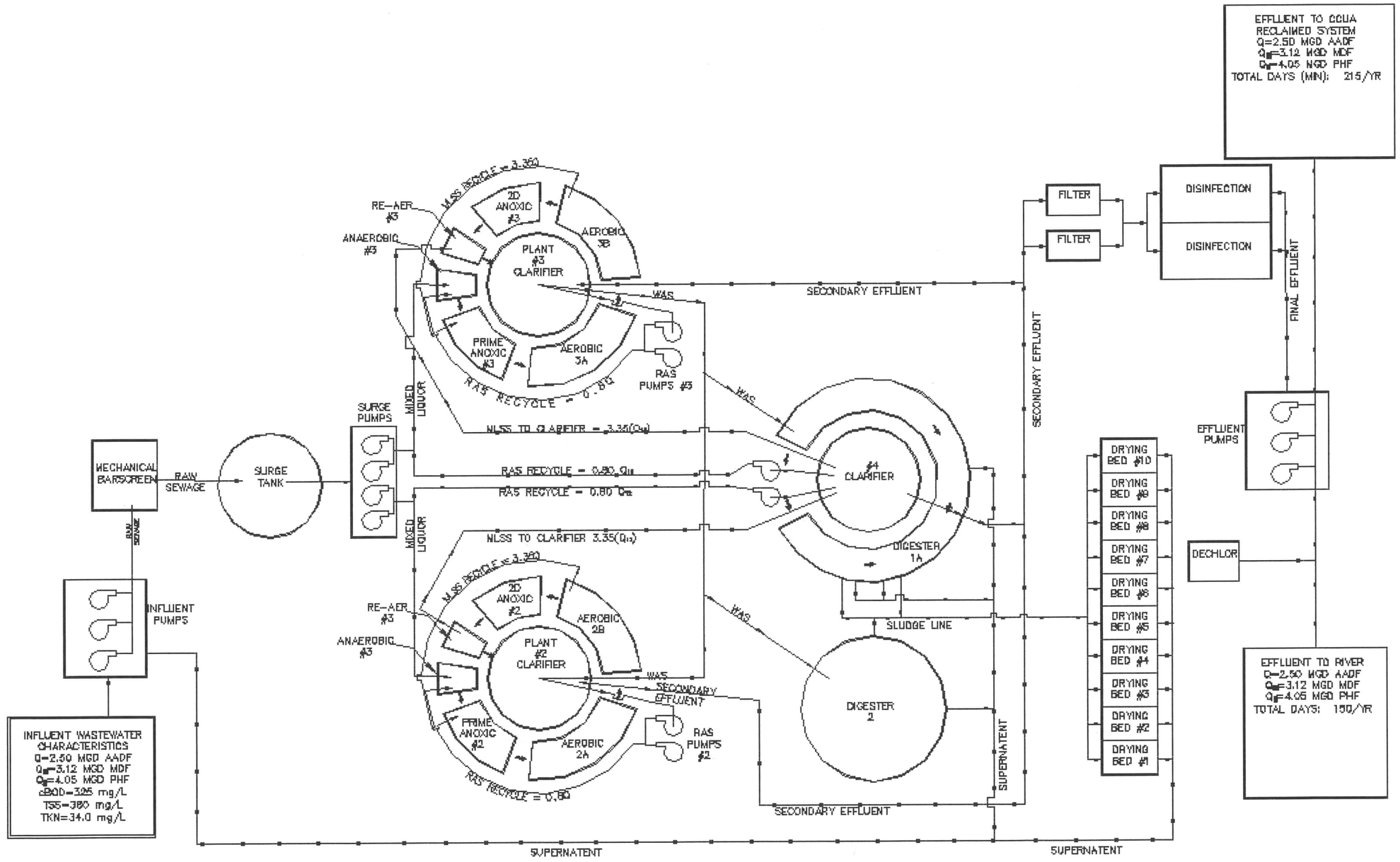
TABLES
II-1 2019 Through 2023 Orange Park WWTF MADF, TMADF, and Percent Capacity 4
II-2 2019 Through 2023 Maximum ADF Review 8
II-3 Design Influent Loadings 9
II-4 Average Influent $CBOD_5$ and TSS Values for 2022 and 2023 11
III-1 Population Projections 2025 Through 2050 13
III-2 Projected Population for 2025 Through 2050 14
III-3 Projected Flows for 2025 Through 2050 14

FIGURES
I-1 Schematic Flow Diagram 2
I-2 Site Plan 3
II-1 Facility MADF, TMADF, and AADF 7
II-2 Rainfall vs MADF Correlation 10
III-1 Population Based Flow Projection for 2025 Through 2050 15
III-2 TMADF Flow Projection 16

I. INTRODUCTION

The Town of Orange Park owns and operates a domestic Wastewater Treatment Facility (WWTF) that is a 2.50 MGD AADF advanced wastewater treatment (AWT) biological nutrient removal (BNR) facility employing the processes of screening, influent flow equalization, 5-stage BNR treatment (series of anaerobic, pre-anoxic, aerobic, post-anoxic & re-aeration basins), clarification/settling, filtration, and chlorination/disinfection. Treated effluent is discharged to a permitted outfall to the St. Johns River (Disposal Site D-001) and/or conveyed to Clay County Utility Authority's (CCUA) reuse system via an Interlocal Agreement (Reuse Site R-001). Waste sludge is stabilized via aerobic digestion, dewatered via contract centrifuge dewatering service or emergency onsite drying beds, and land applied at permitted disposal sites.

The WWTF was most recently expanded and upgraded to the existing 2.50 MGD AADF WWTF capable of meeting advanced treatment standards in 2011. A Flow Diagram and Site Plan of the WWTF provided by the Town and included in the accompanying Operation & Maintenance Performance Report by Legacy Civil Engineers, Inc is shown in **Figure I-1** and **Figure I-2,** respectively.



FLOW DIAGRAM

NTS

MITTAUER & ASSOCIATES, INC.
CONSULTING ENGINEERS
580-1 Wells Road, Orange Park, Florida 32073
Tel. (904) 278-0030 Fax. (904) 278-0840 Florida RY No. 6569

TOWN OF ORANGE PARK
WWTF Permit Renewal 2024
Flow Diagram
Clay County, Florida

FIGURE
I–1
July 23, 2024
Project N
2401–02-

SCALE: 1" = 40'

PLANT FILTERS

PLT #2 BLOWERS

BNR PLANT #3 & CLARIFIER #3

CHLORINE CONTACT TANK #2

CHLORINE CONTACT TANK #1

BLOWER BLDG

FUEL TANK

GENERATOR

Sanitary Cleanout Top 9.40 Inv 6.70

6" PVC @ 0.50%

Sanitary M/H Top 10.29 Inv 5.25

Catch Basin Top 9.25 Inv 4.42 S

42"-18"RCP 0.32%

Catch Basin Top 9.31 Inv 6.25 S Inv 6.25 W Inv 6.23 N

EFFLUENT PUMPS

DIGESTER #1

CLARIFIER #4

PLANT #2

RAS PUMP #2

PAPER SCREEN

CLARIFIER #1

EXTENDED AIR/ SURGE TANK

OPERATIONS BLDG

SURGE PUMPS

Return Pkg Valve w/ Handle

To Old gravity Drain

Sanitary Manhole Top 9.86 Inv 4.26 S Inv 4.27 E

MH 4 TOP 10.05 INV N 4.77 INV W 4.97 INV E 4.86

MH 3 TOP 10.82 INV N 4.92 INV W 4.87

ASPHALT PAVEMENT

DECHLOR BLDG

DIRT SLUDGE LOADING RAMP

Catch Basin Top 10.14 Inv 4.20 S Inv 4.26 N

DRYING BED

DRYING BED

DRYING BED

DRYING BED

DRYING BED

DRYING BED

DRYING BED

DRYING BED

DRYING BED

DRYING BED

Sanitary Manhole Top 9.28 Inv 3.85 N Inv 3.80 E

Catch Basin Top 9.28 Inv 6.17 W

85'-8"@0.50%

0.18%

0.37%

0.43%

MITTAUER & ASSOCIATES, INC.
CONSULTING ENGINEERS
580-1 WELLS ROAD, ORANGE PARK, FLORIDA 32073
TEL. (904) 278-0030 FAX. (904) 278-0840 FLORIDA RY NO. 6569

TOWN OF ORANGE PARK
WWTF Permit Renewal 2024
Site Plan
Clay County, Florida

FIGURE
I–2
July 23, 2024
Project N
2401-02-

II. EXISTING CONDITIONS

A. PERMITTED CAPACITIES

The Orange Park WWTF is permitted to treat and dispose of 2.50 MGD on an annual average daily flow ("AADF") basis. The Town reported the residuals handling facilities are designed to handle a design waste sludge flow of 250,000 gallons per day.

Both the St. Johns River surface water discharge (D-001) and CCUA reuse system (R-001) have permitted capacities of 2.50 MGD AADF. The Town monitors flow to both effluent sites individually to calculate total flow through the WWTF. Since initial operation of reuse system R-001 in 2011, a range of 5% - 15% of the WWTF's total annual flow has been conveyed to the reuse system. The use of R-001 is dependent on need from CCUA's system, which varies during dry and wet seasons.

B. MONTHLY AVERAGE DAILY FLOWS, THREE-MONTH AVERAGE DAILY FLOWS, AND ANNUAL AVERAGE DAILY FLOWS

A summary of the WWTF monthly average daily flows and corresponding three-month average daily flows ("TMADF") since January 2019 is provided in **Table II-1**. The capacity percentage, per the current permit, is based on the TMADF flow divided by the Orange Park WWTF permitted capacity.

TABLE II-1
2019 THROUGH 2023 ORANGE PARK WWTF
MADF, TMADF, AND PERCENT CAPACITY

Month-Year	MADF (MGD)	TMADF (MGD)	Capacity (%)
January 2019	0.975	0.975	39.0
February 2019	0.940	0.957	38.3
March 2019	0.930	0.948	37.9
April 2019	0.883	0.918	36.7
May 2019	0.884	0.899	36.0
June 2019	0.865	0.877	35.1
July 2019	0.940	0.897	35.9
August 2019	0.996	0.934	37.3
September 2019	0.948	0.961	38.5
October 2019	0.947	0.964	38.5

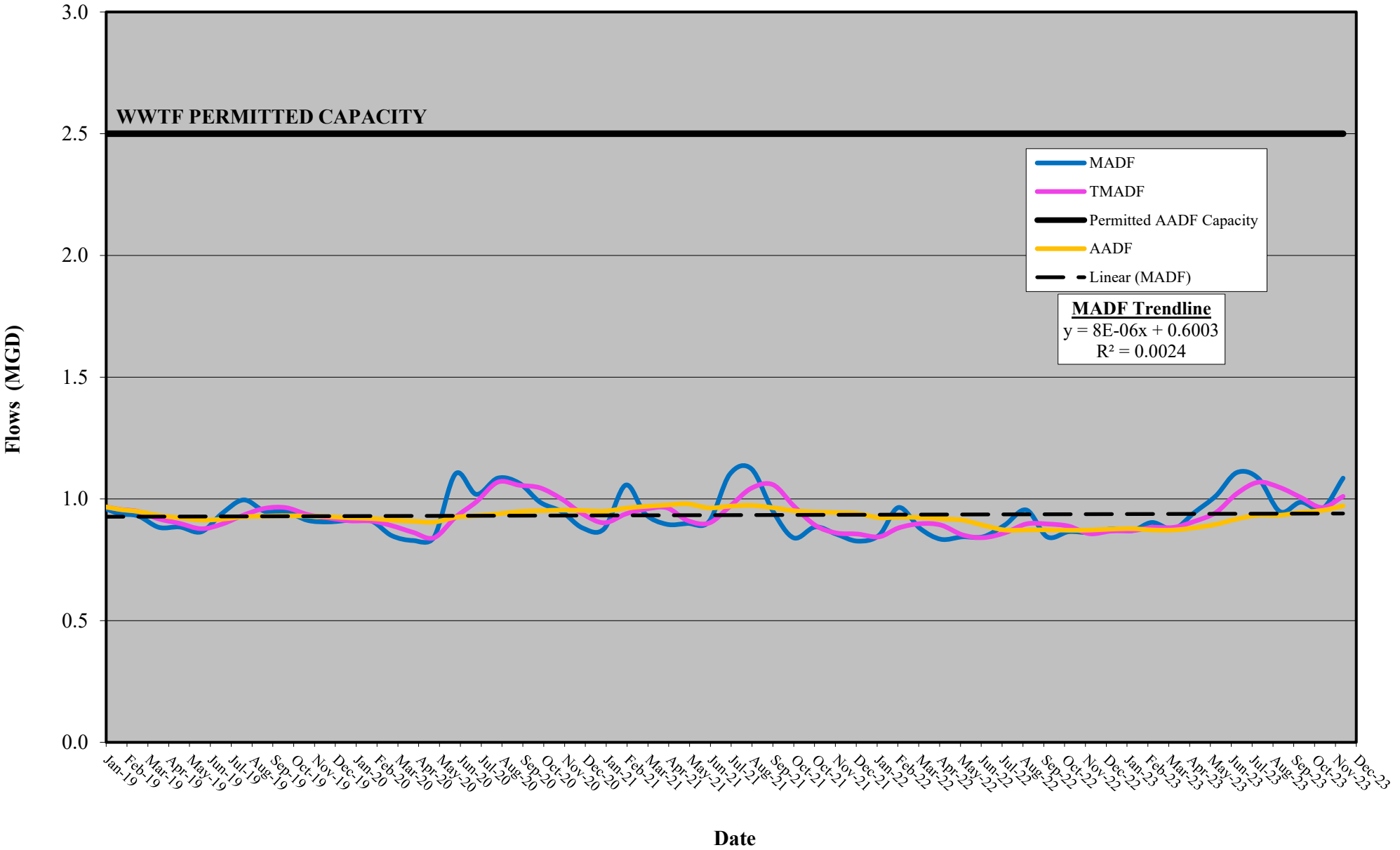
TABLE II-1 2019 THROUGH 2023 ORANGE PARK WWTF MADF, TMADF, AND PERCENT CAPACITY			
Month-Year	**MADF (MGD)**	**TMADF (MGD)**	**Capacity (%)**
November 2019	0.912	0.936	37.4
December 2019	0.905	0.922	36.9
January 2020	0.912	0.910	36.4
February 2020	0.909	0.909	36.4
March 2020	0.849	0.890	35.6
April 2020	0.829	0.862	34.5
May 2020	0.842	0.840	33.6
June 2020	1.103	0.925	37.0
July 2020	1.019	0.988	39.5
August 2020	1.085	1.069	42.8
September 2020	1.064	1.056	42.2
October 2020	0.986	1.045	41.8
November 2020	0.948	0.999	40.0
December 2020	0.880	0.938	37.5
January 2021	0.887	0.902	36.1
February 2021	1.057	0.938	37.5
March 2021	0.939	0.957	38.3
April 2021	0.896	0.964	38.5
May 2021	0.899	0.911	36.4
June 2021	0.907	0.900	36.0
July 2021	1.102	0.969	38.8
August 2021	1.124	1.044	41.8
September 2021	0.950	1.058	42.3
October 2021	0.840	0.971	38.8
November 2021	0.885	0.891	35.7
December 2021	0.856	0.860	34.4
January 2022	0.826	0.856	34.2
February 2022	0.851	0.844	33.8
March 2022	0.965	0.881	35.2
April 2022	0.878	0.898	35.9

TABLE II-1 2019 THROUGH 2023 ORANGE PARK WWTF MADF, TMADF, AND PERCENT CAPACITY			
Month-Year	**MADF (MGD)**	**TMADF (MGD)**	**Capacity (%)**
May 2022	0.834	0.892	35.7
June 2022	0.844	0.852	34.1
July 2022	0.844	0.841	33.6
August 2022	0.893	0.86	34.4
September 2022	0.954	0.897	35.9
October 2022	0.844	0.897	35.9
November 2022	0.865	0.888	35.5
December 2022	0.862	0.857	34.3
January 2023	0.876	0.868	34.7
February 2023	0.87	0.869	34.8
March 2023	0.903	0.883	35.3
April 2023	0.876	0.883	35.3
May 2023	0.944	0.908	36.3
June 2023	1.013	0.944	37.8
July 2023	1.108	1.022	40.9
August 2023	1.084	1.068	42.7
September 2023	0.948	1.047	41.9
October 2023	0.987	1.006	40.2
November 2023	0.959	0.964	38.6
December 2023	1.085	1.01	40.4

Flows to R-001 and D-001 are measured via magnetic flow meter with totalizer recording effluent flow pumped from the effluent pump station.

Based on the aforementioned tabulation, the Orange Park WWTF annual average daily flow ("AADF") was 0.927 MGD in 2019, 0.952 MGD in 2020, 0.944 MGD in 2021, 0.872 MGD in 2022, and 0.971 MGD in 2023. A review of the TMADF, MADF, and AADF from January 2019 through December 2023 are provided within **Figure II-1**. The trend line for this data period is flat, indicating flows have been generally stabilized.

Town of Orange Park:
WWTF Permit Renewal 2024
Figure II-1: MADF, TMADF, and AADF



C. SEASONAL VARIATIONS AND INFLOW/INFILTRATION

The annual total precipitation within Clay County and Orange Park typically ranges between 43 and 53 inches according to information obtained from the St. Johns River Water Management District's (SJRWMD) Monthly Hydrologic Conditions Report. Summer months tend to be wetter than winter months. Orange Park's wettest month of the year is July, with a 5-year average rainfall of 7.1 inches since 2019. Discussion with operating staff and examination of the influent flows received at the Orange Park WWTF gives some indication of inflows entering the collection system. **Table II-2** displays the maximum daily flow versus the annual average daily flow for that given year.

TABLE II-2
2019 THROUGH 2023 MAXIMUM ADF REVIEW

Year	Maximum ADF (MGD)	Maximum ADF/AADF (MGD/MGD)
2019	1.590	1.590/0.927 = 1.72
2020	1.667	1.667/0.952 = 1.75
2021	1.635	1.635/0.944 = 1.73
2022	1.472	1.472/0.872 = 1.69
2023	2.290	2.290/0.971 = 2.36

A more detailed analysis of actual monthly rainfall versus flow into the Orange Park WWTF was reviewed to determine any contribution of infiltration and inflow into the system. Using information gathered from the facility and SJRWMD, a review of driest and wettest months of the previous 5-years were reviewed and resulted in the following data points:

1. March 2020 - 0.63"
2. June 2021 - 10.75"

A review of the respective WWTF monthly records for the listed months resulted in the following recorded flows:

1. March 2020 - 0.849 MGD
2. June 2021 - 0.907 MGD

As shown on this comparative basis, an approximate 10-inch increase in rainfall resulted in a 0.058 MGD increase in average daily flows at the Orange Park WWTF, which corresponds to approximately 5,800 gpd per inch of rainfall. Further, **Figure II-2** displays WWTF monthly average daily flow values plotted as a function of monthly rainfall totals since January 2019. The trendline provides a weak correlation between monthly rainfall and MADF, but does show an impact with an increasing trend.

In summary and based on available information, the Town does not currently have an I/I issue as defined in the FDEP Guidelines for Preparation of Operation and Maintenance Performance Reports. The estimated total daily flow during the historic wettest month of June 2021 resulted in a daily flow per capita of 99 gpcd (907,000 gpd/9,165 capita), which is less than the 275 gpcd value considered excessive by FDEP. The maximum daily flows recorded at the facility are also lesser than planning/design values (1.72 - 2.36 Peaking Factor, **Table II-2**), which typically range between 2.0 to 4.0 times the annual average daily flow value. I/I conditions have not appeared to affect operations or treatment performance at the Orange Park WWTF at this time. However, given the size of the WWTF, the spike in influent flows has the potential to affect operations and should continue to be monitored.

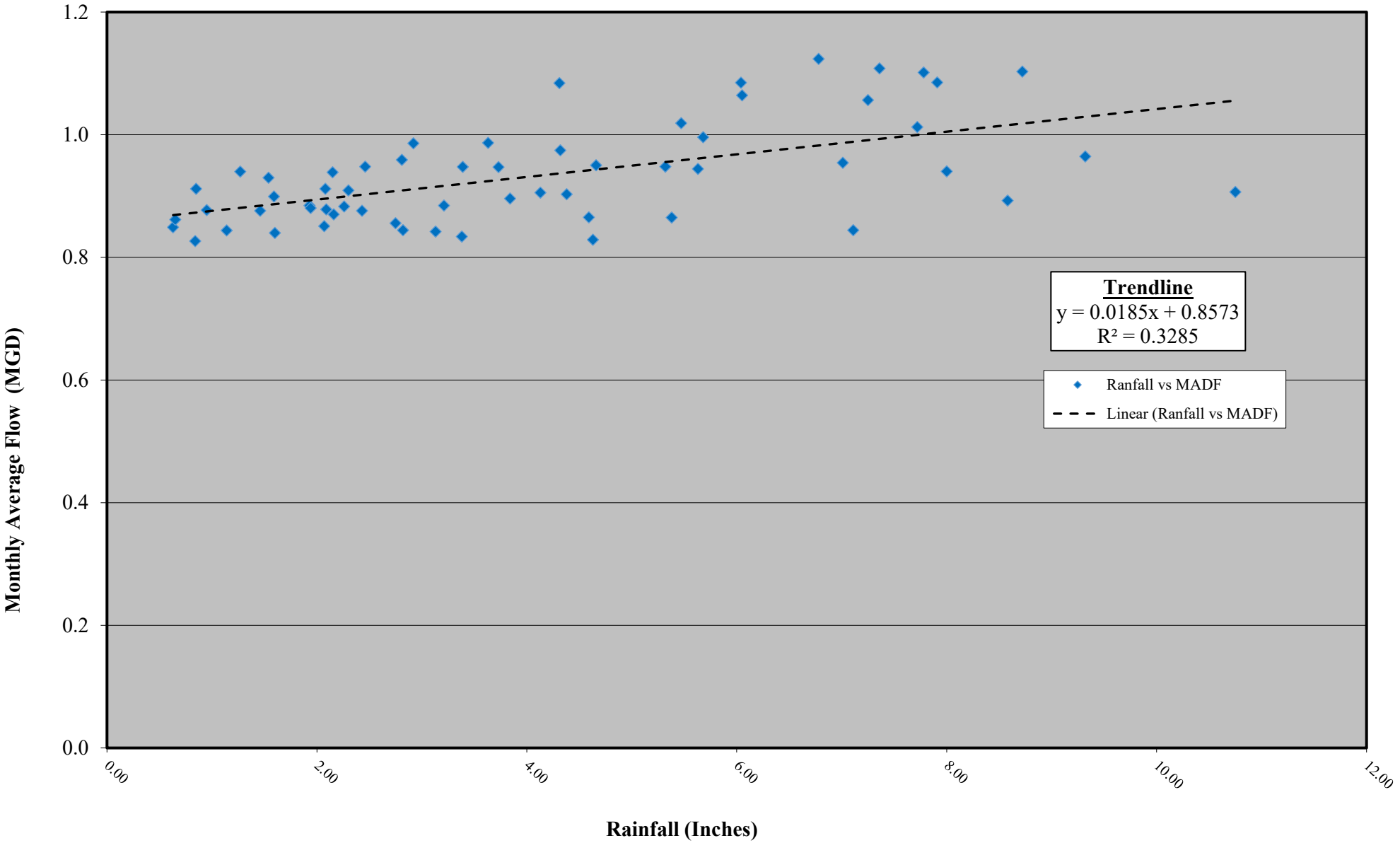
D. UPDATED FLOW AND LOADING INFORMATION

The influent loadings used as the basis of design for the facility per the O&M Performance Report are provided in the following **Table II-3**. The design $CBOD_5$ and TSS loadings are higher than anticipated while the TKN and TP loadings are comparable to similar wastewater treatment facilities with comparable capacities.

TABLE II-3
DESIGN INFLUENT LOADINGS

Flow	2.50 MGD, MADF
$CBOD_5$	360 mg/l
TSS	300 mg/l
TKN as N	40 mg/l
TP as P	8 mg/l

Town of Orange Park:
WWTF Permit Renewal 2024
Figure II-2: Rainfall vs MADF Correlation Plot



Average influent $CBOD_5$ and TSS concentrations at the WWTF for the past two years have been as tabulated in **Table II-4**.

TABLE II-4
AVERAGE INFLUENT $CBOD_5$ AND TSS VALUES FOR 2022 AND 2023

Month/Year	$CBOD_5$, mg/l (Mo. Max)	TSS, mg/l (Mo. Max)
January 2022	158	236
February 2022	135	218
March 2022	140	236
April 2022	115	177
May 2022	104	213
June 2022	132	250
July 2022	113	197
August 2022	132	259
September 2022	162	213
October 2022	173	198
November 2022	184	184
December 2022	196	190
2022 Average	**145.3**	**214**
January 2023	177	243
February 2023	260	314
March 2023	242	302
April 2023	233	251
May 2023	235	211
June 2023	220	160
July 2023	164	130
August 2023	165	125
September 2023	205	172
October 2023	128	122
November 2023	204	114
December 2023	177	96
2023 Average	**201**	**187**

As shown within **Table II-4**, the concentrations vary significantly with average ranges of 104 to 260 mg/l for $CBOD_5$ and 96 to 314 mg/l for TSS. The Orange Park WWTF operators are aware of these wide variations at the facility and make process modifications within the facility operations to accommodate the fluctuating wastewater strength. Average loadings for $CBOD_5$ and TSS are below the design loadings and more inline with average design values of 200 mg/l $CBOD_5$ and 200 mg/l TSS. The O&M Performance report notes the loading values have continued to decrease over the past 10 years.

III. FUTURE CONDITIONS

The Bureau of Economic and Business Research (BEBR) of the University of Florida does not have population projections for the Town of Orange Park; however, the 2023 BEBR Florida Statistical Abstract has published projections for Clay County as follows:

TABLE III-1
POPULATION PROJECTIONS 2025 THROUGH 2050

Year	Population (in Thousands) with Percent Change (%)		
	Low Growth	Medium Growth	High Growth
2025[a]	224.2 (-3.0%)	238.5(+3.2%)	252.8 (+9.4%)
2030	229.1 (+2.2%)	254.5 (+6.7%)	280.0 (+10.8%)
2035	231.0 (+0.8%)	267.9 (+5.3%)	304.7 (+8.8%)
2040	229.2 (-0.8%)	276.9 (+3.4%)	324.7 (+6.6%)
2045	225.9 (-1.4%)	284.2 (+2.6%)	342.4 (+5.5%)
2050	222.3 (-1.6%)	290.6 (+2.3%)	358.9 (+4.8%)

a: Percentage change for 2025 was calculated from the Year 2023 BEBR Results

The year 2023 BEBR population estimate counts for Orange Park and Clay County were 9,165 and 231,042 persons, respectively. This population estimate for Orange Park is up 76 (+0.8%) from the 2020 U.S. Census count of 9,089 persons, and up 753 (+9.0%) from the previous 2010 U.S. Census count that recorded 8,412 persons.

The Town is not anticipated to experience as much growth as other areas of Clay County. The Town's service area is largely built out. This is exemplified by the observed stable WWTF flows. Future development and increase in Orange Park WWTF flows will be dependent on in-fill development and redevelopment within the Town service area.

To develop a conservative future population estimate, two basic criteria are used:

1. The wastewater service area will experience population growth equal to that of the "medium growth" projections published for Clay County as a whole.

2. Population growth outside the existing service area will not be considered.

Applying the above criteria results in population estimates as follows:

TABLE III-2 PROJECTED POPULATION FOR 2025 THROUGH 2050	
Year	**Population[a]**
2025	9,461
2030	10,096
2035	10,627
2040	10,984
2045	11,274
2050	11,528

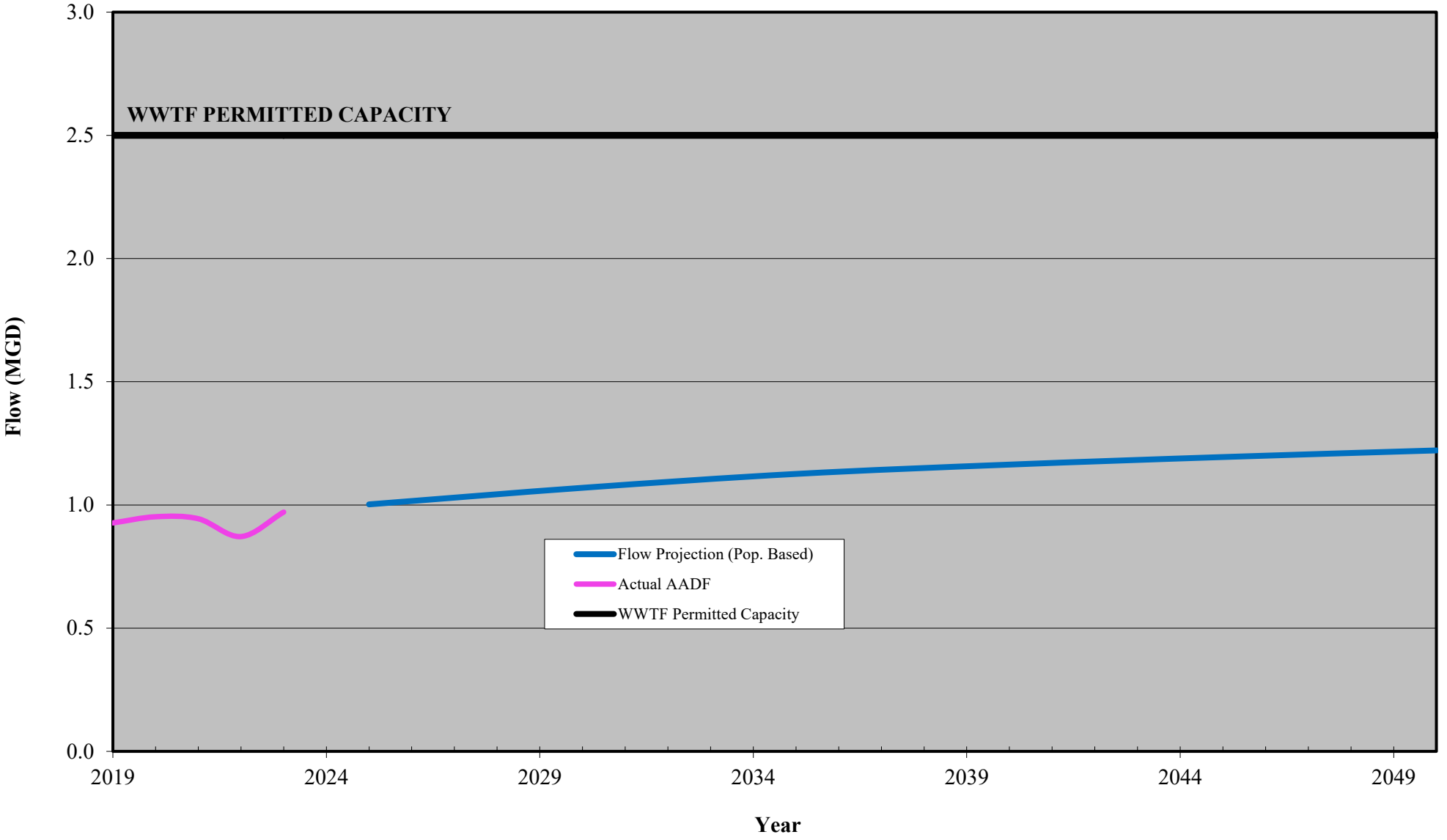
a: Population base change calculated from the Year 2023 BEBR Results

Using the 2023 AADF value of 0.971 MGD, the 2023 per capita wastewater flow would be calculated as 106 gpcd (971,000 gpd-AADF/9,165 persons 2023 BEBR result), and utilizing the 5-year maximum TMADF/AADF ratio of 1.15, the wastewater flow projections are as follows:

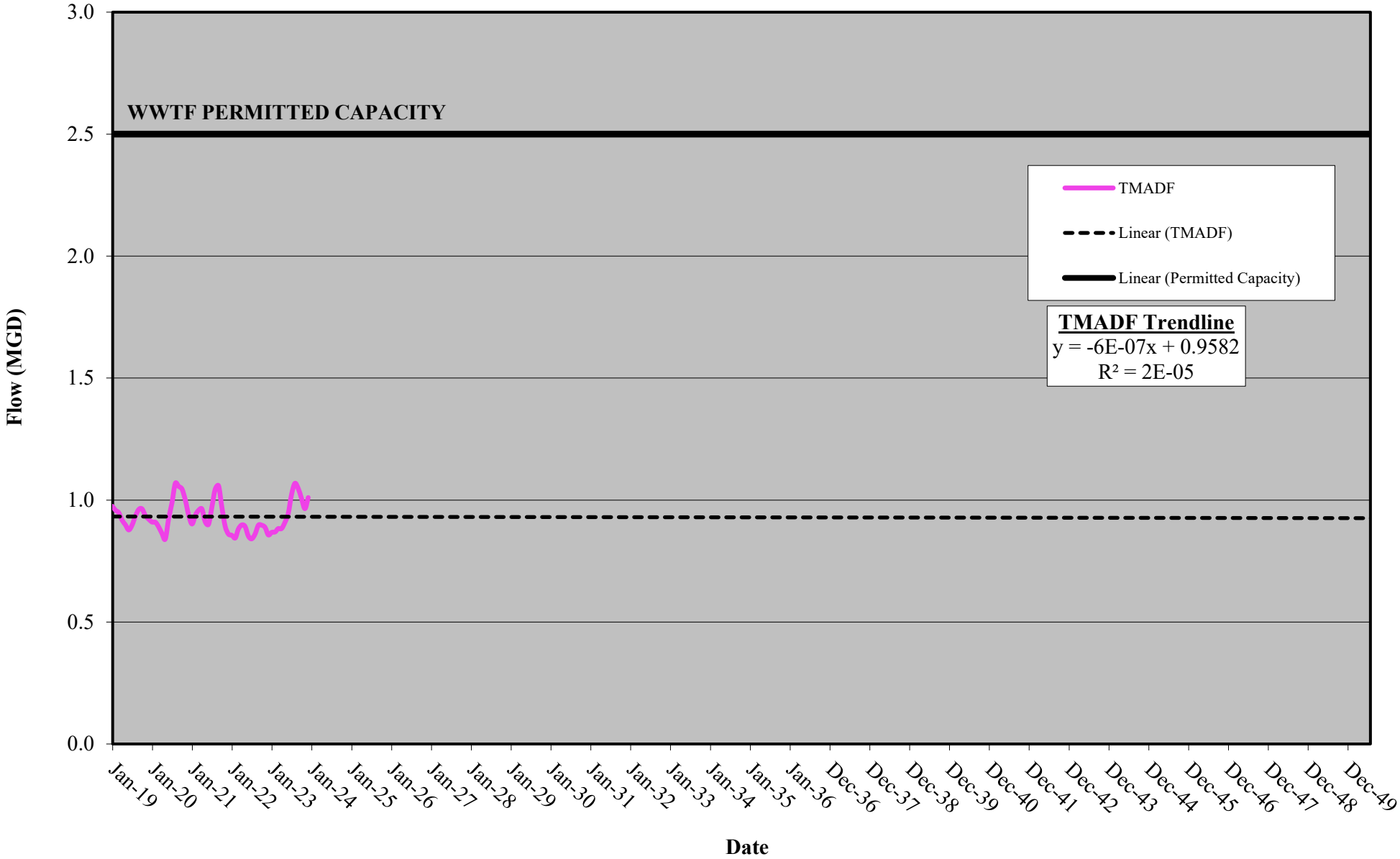
TABLE III-3 PROJECTED FLOWS FOR 2025 THROUGH 2050		
Year	**AADF (Projected)**	**Max TMADF (Projected)**
2025	1.002	1.156
2030	1.070	1.233
2035	1.126	1.298
2040	1.164	1.342
2045	1.194	1.377
2050	1.221	1.408

Figure III-1 depicts this data graphically. The capacity of the Town's facility is not projected to be exceeded within the next 25 years. The projected annual average daily flow in 2050 is estimated at 1.221 MGD, or 48.8% of the WWTF's AADF permitted and design capacity. As another analysis, the recorded TMADF values were plotted from 2019 through December 2023 and a regression line was calculated. This regression line was projected up to the year 2050 and the anticipated TMADF flow is not projected to surpass the facility's permitted capacity by 2050. The regression line is flat and shows stable flows. This information is depicted on **Figure III-2**. The population driven projection is more likely indicative of future flows.

Town of Orange Park
WWTF Permit Renewal 2024
Figure III-1: Population Based Flow Projection



Town of Orange Park
WWTF Permit Renewal 2024
Figure III-2: TMADF Flow Projection



IV. SUMMARY AND CONCLUSIONS

A. TIME REQUIRED FOR THE THREE-MONTH AVERAGE DAILY FLOW TO REACH PERMITTED CAPACITY

Based on current population projections and three-month average daily flow projections, the Orange Park WWTF will not reach 50% of the rated capacity beyond 2050. Therefore, an updated Capacity Analysis Report should not be required until the next permit renewal.

B. RECOMMENDATIONS FOR EXPANSION

Expansion is not required at this time. Based on the current demographics and trends, an expansion of the Orange Park WWTF will not be required for a number of years extending beyond 2050.

C. EXPANSION SCHEDULES

No expansion schedule needed at this time per rule.

Appendix B

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

USGS Quadrangle Map

USGS
science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

ORANGE PARK QUADRANGLE
FLORIDA-DUVAL CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)

81°45′ 30°15′ 81°37′30″ 30°07′30″

137 500 METERS
655 000 METERS
642 500 METERS
130 000 METERS

Oak Hill
Wesconnett
Venetia
Venetia Terrace
JACKSONVILLE NAVAL AIR STATION
Yukon
Dewey Park
Golf Course
Sewage Disposal
JOHN TOWERS FIELD
Piney Point
Christopher Point
San Jose
Bolles Sch
Dupont High Sch
Drive-in Theatre
Zion Grove Ch
Timucuan Sch
Freewill Ch
Assembly Ch
Venetia Terrace Ch
L. C. Ringhaver Park
Morse Ave Sch
Golf Course
Bluff Landing
Ortega Hills
Athletic Field
Casa Linda Lake
Mulberry Cove
Boat Ramp
Black Point
NAS Chapel
Water Tanks
Air Station Hospital
Mulberry 3
Towers
Filtration Plant
Collins Rd Ch
Argyle Forest
Jacksonville Memory Gardens
North Meadowbrook Terrace
Meadowbrook Terrace
Bryan Jennings Sch
Fire Sta
Bellair
Cherry Sch
Orange Park
Orange Park Sch
Grove Park Sch
Park
Substation
Sew Disp
Humana Hosp
Magnolia Cem
City Park
Orange Park Landing
Montclair Sch
Laurel Grove
Holly Point
Orange Point
Lakeside Sch
Lakeside Ch
Camp Echockotee
St Johns Sch
Macks Point
Romeo Point
Creighton Island
Geigers Point
Radio Tower
Moccasin Slough
Johnson Slough
Mill Cove
DOCTORS INLET
DOCTORS LAKE
ST JOHNS RIVER
Plummers Cove
Beauclerc Bluff
Beauclerc Gardens
Pickwick Park
Plummers
Guardian Ch
Plummers Point
Deep Bottom Cr
Mandarin
Ch of Our Savior
Mandarin Cem
Mandarin Point
Alberts Park
Flynn Park
Mt Zion Ch
Colonial Ch
First Christian Ch
First Ch
Lofton Cem
Julington Creek
Huntington
Old Bull Bay
Julington

DUVAL CO
CLAY CO
ST JOHNS CO
JACKSONVILLE CORP BDY
ORANGE PARK CORP BDY
JULINGTON CORP BDY

Produced by the United States Geological Survey

Topography compiled 1951. Planimetry derived from imagery taken 1994 and other sources. Public Land Survey System and survey control current as of 1989

North American Datum of 1983 (NAD 83). Projection and 1 000-meter grid: Universal Transverse Mercator, zone 17
2 500-meter ticks: Florida Coordinate System of 1983 (east zone)

North American Datum of 1927 (NAD 27) is shown by dashed corner ticks. The values of the shift between NAD 83 and NAD 27 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

There may be private inholdings within the boundaries of the National or State reservations shown on this map

Landmark buildings verified 1989

MN GN
5° 89 MILS
0° 21′ 6 MILS
UTM GRID AND 2001 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

20% TOTAL RECOVERED FIBER

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25286, DENVER, COLORADO 80225
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

FLORIDA
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Marietta
2 Jacksonville
3 Arlington
4 Jacksonville Heights
5 Bayard
6 Middleburg
7 Fleming Island
8 Orangedale

ADJOINING 7.5′ QUADRANGLES

INTERIOR - GEOLOGICAL SURVEY, RESTON, VIRGINIA - 2002

ROAD CLASSIFICATION

Primary highway hard surface
Secondary highway hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U.S. Route
State Route

ORANGE PARK, FL

1994

NIMA 4644 II NW-SERIES V847

ISBN 0-607-88921-7

Appendix C

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

NRCS Soil Survey Map

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Clay County, Florida, and Duval County, Florida

Soil Survey Report - Town of Orange Park



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map.....9
Legend.....10
Map Unit Legend.....12
Map Unit Descriptions.....13
Clay County, Florida.....15
1—Albany fine sand, 0 to 5 percent slopes.....15
2—Blanton fine sand, 0 to 5 percent slopes.....17
3—Hurricane fine sand, 0 to 5 percent slopes.....19
5—Penney fine sand, 0 to 5 percent slopes.....21
6—Mandarin fine sand, 0 to 2 percent slopes.....23
8—Sapelo fine sand.....25
9—Leon fine sand, 0 to 2 percent slopes.....28
10—Ortega fine sand, 0 to 5 percent slopes.....29
12—Surrency fine sand, depressional.....32
13—Meggett fine sandy loam.....34
14—Ortega-Urban land complex, 0 to 5 percent slopes.....36
16—Hurricane-Urban land complex, 0 to 5 percent slopes.....38
18—Ridgewood fine sand, 0 to 5 percent slopes.....40
19—Osier fine sand.....42
20—Scranton fine sand.....45
22—Pelham fine sand, 0 to 2 percent slopes.....48
23—Sapelo-Urban land complex.....50
24—Urban land.....53
25—Maurepas muck, frequently flooded.....55
99—Water.....57
Duval County, Florida.....58
2—Albany fine sand, 0 to 5 percent slopes.....58
63—Sapelo fine sand, 0 to 2 percent slopes.....60
69—Urban land.....62
99—Water.....63
References.....65
Glossary.....67

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

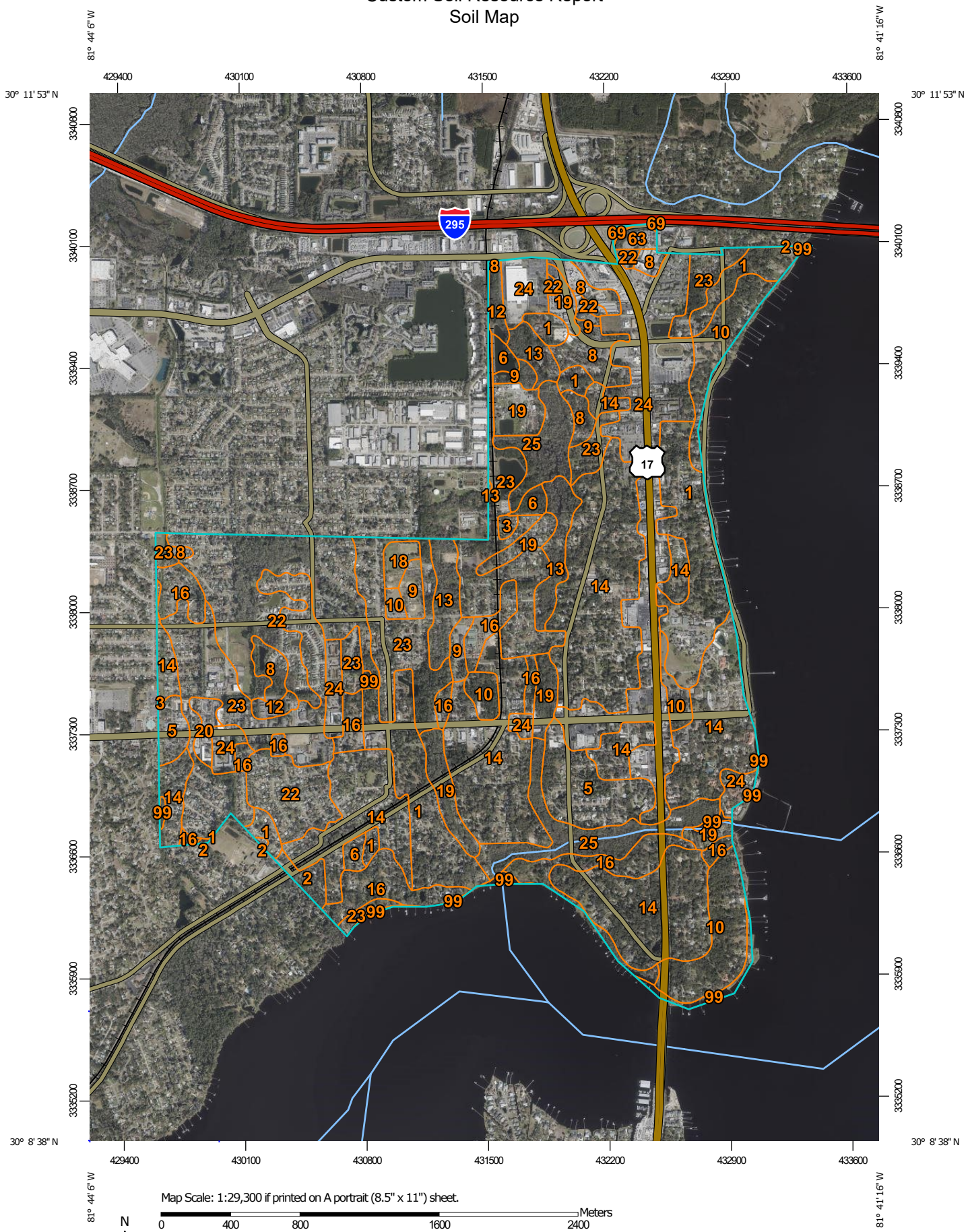
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


81° 44' 6" W
81° 41' 16" W
429400
430100
430800
431500
432200
432900
433600
30° 11' 53" N
30° 8' 38" N
3340800
3340100
3339400
3338700
3338000
3337300
3336600
3335900
3335200
295
17
Map Scale: 1:29,300 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 400 800 1600 2400
Feet
0 1000 2000 4000 6000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clay County, Florida
Survey Area Data: Version 21, Aug 20, 2024

Soil Survey Area: Duval County, Florida
Survey Area Data: Version 19, Aug 21, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Albany fine sand, 0 to 5 percent slopes	213.9	9.1%
2	Blanton fine sand, 0 to 5 percent slopes	11.2	0.5%
3	Hurricane fine sand, 0 to 5 percent slopes	3.3	0.1%
5	Penney fine sand, 0 to 5 percent slopes	69.1	3.0%
6	Mandarin fine sand, 0 to 2 percent slopes	17.1	0.7%
8	Sapelo fine sand	63.6	2.7%
9	Leon fine sand, 0 to 2 percent slopes	24.9	1.1%
10	Ortega fine sand, 0 to 5 percent slopes	117.9	5.0%
12	Surrency fine sand, depressional	15.3	0.7%
13	Meggett fine sandy loam	64.6	2.8%
14	Ortega-Urban land complex, 0 to 5 percent slopes	572.5	24.4%
16	Hurricane-Urban land complex, 0 to 5 percent slopes	131.3	5.6%
18	Ridgewood fine sand, 0 to 5 percent slopes	9.8	0.4%
19	Osier fine sand	81.2	3.5%
20	Scranton fine sand	10.2	0.4%
22	Pelham fine sand, 0 to 2 percent slopes	203.2	8.7%
23	Sapelo-Urban land complex	343.0	14.6%
24	Urban land	271.7	11.6%
25	Maurepas muck, frequently flooded	92.1	3.9%
99	Water	17.0	0.7%
Subtotals for Soil Survey Area		**2,332.9**	**99.6%**
Totals for Area of Interest		**2,341.9**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Albany fine sand, 0 to 5 percent slopes	0.6	0.0%
63	Sapelo fine sand, 0 to 2 percent slopes	7.1	0.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
69	Urban land	1.2	0.1%
99	Water	0.1	0.0%
Subtotals for Soil Survey Area		**9.0**	**0.4%**
Totals for Area of Interest		**2,341.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clay County, Florida

1—Albany fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4g5v
Elevation: 10 to 400 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Albany and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Albany

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 47 inches: fine sand
Bt - 47 to 60 inches: fine sandy loam
Btg - 60 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A/D
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Other vegetative classification: North Florida Flatwoods (R154XY004FL), Sandy soils on rises and knolls of mesic uplands (G153AA131FL)

Hydric soil rating: No

Minor Components

Blanton

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY030NC - Dry Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Meadowbrook, non-hydric

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Hurricane

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Ocilla

Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy over loamy soils on rises and knolls of mesic uplands (G153AA231FL)
Hydric soil rating: No

Ridgewood

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)

Hydric soil rating: No

2—Blanton fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4g66
Elevation: 10 to 400 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Blanton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blanton

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 58 inches: fine sand
Bt - 58 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F153AY040NC - Moist Loamy Rises and Flats

Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Minor Components

Penney
Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY010NC - Dry Sands
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G153AA111FL)
Hydric soil rating: No

Albany
Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Ortega
Percent of map unit: 5 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Ocilla
Percent of map unit: 5 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy over loamy soils on rises and knolls of mesic uplands (G153AA231FL)
Hydric soil rating: No

3—Hurricane fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4g6j
Elevation: 0 to 350 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Hurricane and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hurricane

Setting

Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 56 inches: fine sand
Bh - 56 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: About 12 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)

Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Minor Components

Blanton
Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY030NC - Dry Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Albany
Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Centenary
Percent of map unit: 3 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Leon, non-hydric
Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Mandarin
Percent of map unit: 2 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Ortega

Percent of map unit: 2 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

5—Penney fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4g72
Elevation: 0 to 350 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Penney and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Penney

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 3 inches: fine sand
E - 3 to 57 inches: fine sand
E and Bt - 57 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F153AY010NC - Dry Sands
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G153AA111FL)
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on ridges and dunes of xeric uplands (G153AA111FL)
Hydric soil rating: No

Minor Components

Blanton

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY030NC - Dry Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Albany

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Centenary

Percent of map unit: 4 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Ortega

Percent of map unit: 3 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve

Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

6—Mandarin fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sxql
Elevation: 0 to 250 feet
Mean annual precipitation: 39 to 62 inches
Mean annual air temperature: 53 to 81 degrees F
Frost-free period: 209 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Mandarin and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mandarin

Setting

Landform: Rises
Landform position (three-dimensional): Rise, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 7 inches: fine sand
E - 7 to 13 inches: fine sand
Bh - 13 to 18 inches: fine sand
E' - 18 to 62 inches: fine sand
B'h - 62 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.28 to 19.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Minor Components

Leon

Percent of map unit: 5 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: Yes

Centenary

Percent of map unit: 1 percent
Landform: Rises
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Rutlege

Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)
Hydric soil rating: Yes

Ortega

Percent of map unit: 1 percent
Landform: Marine terraces, ridges
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

8—Sapelo fine sand

Map Unit Setting

National map unit symbol: 4g7l
Elevation: 0 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Sapelo, non-hydric, and similar soils: 60 percent
Sapelo, hydric, and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sapelo, Non-hydric

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 16 inches: fine sand
Bh - 16 to 29 inches: fine sand
E' - 29 to 49 inches: fine sand
Btg - 49 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D

Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: North Florida Flatwoods (R154XY004FL), Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Description of Sapelo, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 16 inches: fine sand
Bh - 16 to 29 inches: fine sand
E' - 29 to 49 inches: fine sand
Btg - 49 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: North Florida Flatwoods (R154XY004FL), Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: Yes

Minor Components

Leon, non-hydric

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Albany

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Meadowbrook, non-hydric

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Plummer, non-hydric

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Newnan

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Rutlege

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)

Hydric soil rating: Yes

9—Leon fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sxqv
Elevation: 0 to 250 feet
Mean annual precipitation: 47 to 61 inches
Mean annual air temperature: 55 to 81 degrees F
Frost-free period: 267 to 347 days
Farmland classification: Not prime farmland

Map Unit Composition

Leon, non-hydric, and similar soils: 89 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leon, Non-hydric

Setting

Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 18 inches: fine sand
Bh - 18 to 37 inches: fine sand
E' - 37 to 45 inches: fine sand
B'h - 45 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Minor Components

Leon, hydric
Percent of map unit: 5 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Mascotte
Percent of map unit: 3 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Mandarin
Percent of map unit: 3 percent
Landform: Rises
Landform position (three-dimensional): Rise, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

10—Ortega fine sand, 0 to 5 percent slopes

Map Unit Setting
National map unit symbol: 4g5w
Elevation: 0 to 350 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition
Ortega and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ortega

Setting

Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 3 inches: fine sand
C - 3 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F153AY020NC - Moist Sands
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Minor Components

Blanton

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY030NC - Dry Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Albany

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex

Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Centenary

Percent of map unit: 3 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Ridgewood

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Penney

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY010NC - Dry Sands
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G153AA111FL)
Hydric soil rating: No

Hurricane

Percent of map unit: 2 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

12—Surrency fine sand, depressional

Map Unit Setting

National map unit symbol: 4g5y
Elevation: 0 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Surrency and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Surrency

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 12 inches: fine sand
Eg - 12 to 34 inches: fine sand
Btg - 34 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Forage suitability group: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G153AA245FL)

Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G153AA245FL)
Hydric soil rating: Yes

Minor Components

Leon, hydric
Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: Yes

Meggett
Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G153AA341FL)
Hydric soil rating: Yes

Pelham, non-hydric
Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: No

Plummer, non-hydric
Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Sapelo, non-hydric
Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Rutlege

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)
Hydric soil rating: Yes

Santee

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G153AA345FL)
Hydric soil rating: Yes

13—Meggett fine sandy loam

Map Unit Setting

National map unit symbol: 4g5z
Elevation: 10 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Meggett and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meggett

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey fluviomarine deposits

Typical profile

A - 0 to 6 inches: fine sandy loam
Eg - 6 to 11 inches: fine sandy loam
Btg1 - 11 to 23 inches: clay loam
Btg2 - 23 to 80 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Forage suitability group: Loamy and clayey soils on flats of hydric or mesic lowlands (G153AA341FL)
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G153AA341FL)
Hydric soil rating: Yes

Minor Components

Goldhead, non-hydric

Percent of map unit: 8 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: No

Pelham, non-hydric

Percent of map unit: 7 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: No

14—Ortega-Urban land complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4g60
Elevation: 0 to 250 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Ortega and similar soils: 50 percent
Urban land: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ortega

Setting

Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
C - 5 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F153AY020NC - Moist Sands
Forage suitability group: Forage suitability group not assigned (G153AA999FL)

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Unranked

Minor Components

Blanton

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY030NC - Dry Loamy Rises and Flats
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Centenary

Percent of map unit: 3 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Penney

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY010NC - Dry Sands
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Hurricane

Percent of map unit: 2 percent

Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

16—Hurricane-Urban land complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4g62
Elevation: 0 to 350 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Hurricane and similar soils: 60 percent
Urban land: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hurricane

Setting

Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 7 inches: fine sand
E - 7 to 52 inches: fine sand
Bh - 52 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Unranked

Minor Components

Leon, non-hydric

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Albany

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Centenary

Percent of map unit: 2 percent
Landform: Rises on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Ortega

Percent of map unit: 2 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Mandarin

Percent of map unit: 2 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

18—Ridgewood fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4g64
Elevation: 0 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgewood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgewood

Setting

Landform: Ridges on marine terraces, knolls on marine terraces

Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
C - 5 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 12 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F153AY020NC - Moist Sands
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Minor Components

Albany

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Plummer, non-hydric

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Osier, non-hydric

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Hurricane

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Ortega

Percent of map unit: 3 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

19—Osier fine sand

Map Unit Setting

National map unit symbol: 4g65
Elevation: 0 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Osier, non-hydric, and similar soils: 70 percent
Osier, hydric, and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Osier, Non-hydric

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

A - 0 to 5 inches: fine sand
Cg - 5 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Description of Osier, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

A - 0 to 5 inches: fine sand
Cg - 5 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: Yes

Minor Components

Leon, non-hydric
Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Albany
Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Hurricane
Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Plummer, non-hydric
Percent of map unit: 2 percent

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Rutlege

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)
Hydric soil rating: Yes

Ridgewood

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

20—Scranton fine sand

Map Unit Setting

National map unit symbol: 4g67
Elevation: 0 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Scranton, non-hydric, and similar soils: 70 percent
Scranton, hydric, and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scranton, Non-hydric

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
Cg - 9 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Description of Scranton, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
Cg - 9 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: Yes

Minor Components

Leon, hydric
Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: Yes

Ona, non-hydric
Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Plummer, non-hydric
Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Sapelo, non-hydric
Percent of map unit: 2 percent

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Rutlege

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)
Hydric soil rating: Yes

Ridgewood

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY020NC - Moist Sands
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Osier, non-hydric

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

22—Pelham fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tg56
Elevation: 0 to 190 feet
Mean annual precipitation: 48 to 63 inches
Mean annual air temperature: 57 to 79 degrees F

Frost-free period: 251 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Pelham and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pelham

Setting

Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
Eg - 6 to 26 inches: fine sand
Btg1 - 26 to 42 inches: sandy clay loam
Btg2 - 42 to 83 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 13 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: Yes

Albany
Percent of map unit: 6 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Microfeatures of landform position: Rises
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Meggett
Percent of map unit: 3 percent
Landform: Flatwoods
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G153AA341FL)
Hydric soil rating: Yes

Surrency
Percent of map unit: 3 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, convex
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G153AA245FL)
Hydric soil rating: Yes

23—Sapelo-Urban land complex

Map Unit Setting
National map unit symbol: 4g6b
Elevation: 10 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition
Sapelo, non-hydric, and similar soils: 50 percent

Urban land: 30 percent
Sapelo, hydric, and similar soils: 10 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sapelo, Non-hydric

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 19 inches: fine sand
Bh - 19 to 32 inches: fine sand
E' - 32 to 49 inches: fine sand
Btg - 49 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)

Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Unranked

Description of Sapelo, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 19 inches: fine sand
Bh - 19 to 32 inches: fine sand
E' - 32 to 49 inches: fine sand
Btg - 49 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Yes

Minor Components

Albany

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Hurricane

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Leon, non-hydric

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Meadowbrook, non-hydric

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

24—Urban land

Map Unit Setting

National map unit symbol: 4g6c
Elevation: 10 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Unranked

Minor Components

Ortega

Percent of map unit: 3 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Hurricane

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Centenary

Percent of map unit: 3 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Penney

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: No

Sapelo, non-hydric

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Ridgewood

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

25—Maurepas muck, frequently flooded

Map Unit Setting

National map unit symbol: 4g6d
Elevation: 0 to 300 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 253 to 283 days
Farmland classification: Not prime farmland

Map Unit Composition

Maurepas and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maurepas

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Woody organic material

Typical profile

Oa - 0 to 66 inches: muck
Cg - 66 to 75 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very high (about 20.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A/D
Ecological site: F153AY100NC - Flooded Organic Soil Flood Plains and Terraces
Forage suitability group: Organic soils in depressions and on flood plains (G153AA645FL)
Other vegetative classification: Organic soils in depressions and on flood plains (G153AA645FL)
Hydric soil rating: Yes

Minor Components

Rutlege

Percent of map unit: 5 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F153AY090NC - Flooded Mineral Soil Flood Plains and Terraces
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G153AA145FL)
Hydric soil rating: Yes

Surrency

Percent of map unit: 5 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G153AA245FL)
Hydric soil rating: Yes

Pamlico

Percent of map unit: 5 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F153AY100NC - Flooded Organic Soil Flood Plains and Terraces

Other vegetative classification: Organic soils in depressions and on flood plains (G153AA645FL)
Hydric soil rating: Yes

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Unranked

Duval County, Florida

2—Albany fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: sssq
Elevation: 10 to 190 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 263 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Albany and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Albany

Setting

Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 3 inches: fine sand
E - 3 to 50 inches: fine sand
Bt - 50 to 63 inches: fine sandy loam
Btg - 63 to 88 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A/D
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)

Hydric soil rating: No

Minor Components

Blanton

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY030NC - Dry Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G153AA121FL)
Hydric soil rating: No

Mascotte

Percent of map unit: 4 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: Yes

Sapelo

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY050NC - Moist Spodosol Rises and Flats
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Pelham, hydric

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: Yes

63—Sapelo fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: ssvp
Elevation: 0 to 190 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 263 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Sapelo and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sapelo

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 23 inches: fine sand
Bh - 23 to 32 inches: fine sand
E' - 32 to 56 inches: fine sand
Btg - 56 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F153AY070NC - Wet Spodosol Flats and Depressions

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G153AA141FL)
Hydric soil rating: No

Minor Components

Yonges
Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G153AA341FL)
Hydric soil rating: Yes

Albany
Percent of map unit: 2 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY040NC - Moist Loamy Rises and Flats
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G153AA131FL)
Hydric soil rating: No

Pelham, hydric
Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: Yes

Pelham, non-hydric
Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G153AA241FL)
Hydric soil rating: No

Surrency
Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave

Across-slope shape: Concave
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G153AA245FL)
Hydric soil rating: Yes

69—Urban land

Map Unit Setting

National map unit symbol: ssvw
Elevation: 0 to 190 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 263 to 293 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Unranked

Minor Components

Albany

Percent of map unit: 1 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Pelham, hydric

Percent of map unit: 1 percent

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: Yes

Leon

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Ortega

Percent of map unit: 1 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

Hurricane

Percent of map unit: 1 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)
Hydric soil rating: No

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G153AA999FL)
Other vegetative classification: Forage suitability group not assigned (G153AA999FL)

Hydric soil rating: Unranked

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the following National Soil Survey Handbook link: “National Soil Survey Handbook.”

ABC soil

A soil having an A, a B, and a C horizon.

Ablation till

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

AC soil

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low: 0 to 3
Low: 3 to 6
Moderate: 6 to 9
High: 9 to 12
Very high: More than 12

Backslope

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Bajada

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

Basal area

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology)

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology)

from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout (map symbol)

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Borrow pit (map symbol)

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

Bottom land

An informal term loosely applied to various portions of a flood plain.

Boulders

Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR)

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy

The leafy crown of trees or shrubs. (See Crown.)

Canyon

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena

A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps

See Terracettes.

Cement rock

Shaly limestone used in the manufacture of cement.

Channery soil material

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment

Control of unwanted vegetation through the use of chemicals.

Chiseling

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clay

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions

See Redoximorphic features.

Clay film

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay spot (map symbol)

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

Claypan

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil

Sand or loamy sand.

Cobble (or cobblestone)

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility)

See Linear extensibility.

Colluvium

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions

See Redoximorphic features.

Conglomerate

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat)

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology)

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations)

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system

Growing crops according to a planned system of rotation and management practices.

Cross-slope farming

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown

The upper part of a tree or shrub, including the living branches and their foliage.

Cryoturbate

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

Cuesta

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

Culmination of the mean annual increment (CMAI)

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave

The walls of excavations tend to cave in or slough.

Decreasers

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing

Postponing grazing or resting grazing land for a prescribed period.

Delta

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression, closed (map symbol)

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

Depth, soil

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diatomaceous earth

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace)

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural)

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface

Runoff, or surface flow of water, from an area.

Drainageway

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill

See Mine spoil.

Ecological site

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated)

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic)

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface

A land surface shaped by the action of erosion, especially by running water.

Escarpment

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Escarpment, bedrock (map symbol)

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, nonbedrock (map symbol)

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

Esker

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left

behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat)

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity

The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil

Sandy clay, silty clay, or clay.

Firebreak

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Forest cover

All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glaciofluvial deposits

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping

Growing crops in strips that grade toward a protected waterway.

Grassed waterway

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit (map symbol)

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

Gravelly soil material

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol)

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

Green manure crop (agronomy)

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water

Water filling all the unblocked pores of the material below the water table.

Gully (map symbol)

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology)

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat)

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon: An organic layer of fresh and decaying plant residue.

L horizon: A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon: The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon: The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon: The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon: The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon: Soft, consolidated bedrock beneath the soil.

R layer: Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

M layer: A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

W layer: A layer of water within or beneath the soil.

Humus

The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Very low: Less than 0.2
Low: 0.2 to 0.4
Moderately low: 0.4 to 0.75
Moderate: 0.75 to 1.25
Moderately high: 1.25 to 1.75
High: 1.75 to 2.5
Very high: More than 2.5

Interfluve

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology)

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions

See Redoximorphic features.

Irrigation

Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin: Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border: Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding: Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation: Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle): Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow: Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler: Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation: Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding: Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography)

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll

A small, low, rounded hill rising above adjacent landforms.

Ksat

See Saturated hydraulic conductivity.

Lacustrine deposit

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landfill (map symbol)

An area of accumulated waste products of human habitation, either above or below natural ground level.

Landslide

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lava flow (map symbol)

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

Leaching

The removal of soluble material from soil or other material by percolating water.

Levee (map symbol)

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit

The moisture content at which the soil passes from a plastic to a liquid state.

Loam

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength

The soil is not strong enough to support loads.

Low-residue crops

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Marsh or swamp (map symbol)

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

Mass movement

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses

See Redoximorphic features.

Meander belt

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment

Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil

Very fine sandy loam, loam, silt loam, or silt.

Mesa

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Metamorphic rock

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth’s crust. Nearly all such rocks are crystalline.

Mine or quarry (map symbol)

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

Mine spoil

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage

Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area

A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol)

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil

Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil

Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can

occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Muck

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat

See Hemic soil material.

Mudstone

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules

See Redoximorphic features.

Nose slope (geomorphology)

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low: Less than 0.5 percent
Low: 0.5 to 1.0 percent
Moderately low: 1.0 to 2.0 percent
Moderate: 2.0 to 4.0 percent
High: 4.0 to 8.0 percent
Very high: More than 8.0 percent

Outwash

Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material

The unconsolidated organic and mineral material in which soil forms.

Peat

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped

An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon

The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation

The movement of water through the soil.

Perennial water (map symbol)

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

Permafrost

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

pH value

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting

Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit

The moisture content at which a soil changes from semisolid to plastic.

Plasticity index

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology)

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Plinthite

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan

A compacted layer formed in the soil directly below the plowed layer.

Ponding

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings

See Redoximorphic features.

Potential native plant community

See Climax plant community.

Potential rooting depth (effective rooting depth)

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil

The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil

A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and

promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid: Less than 3.5
Extremely acid: 3.5 to 4.4
Very strongly acid: 4.5 to 5.0
Strongly acid: 5.1 to 5.5
Moderately acid: 5.6 to 6.0
Slightly acid: 6.1 to 6.5
Neutral: 6.6 to 7.3
Slightly alkaline: 7.4 to 7.8
Moderately alkaline: 7.9 to 8.4
Strongly alkaline: 8.5 to 9.0
Very strongly alkaline: 9.1 and higher

Red beds

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations

See Redoximorphic features.

Redoximorphic depletions

See Redoximorphic features.

Redoximorphic features

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix

See Redoximorphic features.

Regolith

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material)

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol)

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

Sapric soil material (muck)

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat)

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

Very high: 100 or more micrometers per second (14.17 or more inches per hour)

High: 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)

Moderately high: 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)

Moderately low: 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)

Low: 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)

Very low: Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (map symbol)

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic)

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slide or slip (map symbol)

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

Slope

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill

The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Sodic (alkali) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodic spot (map symbol)

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

Sodicity

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight: Less than 13:1
Moderate: 13-30:1
Strong: More than 30:1

Sodium adsorption ratio (SAR)

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand: 2.0 to 1.0
Coarse sand: 1.0 to 0.5
Medium sand: 0.5 to 0.25
Fine sand: 0.25 to 0.10
Very fine sand: 0.10 to 0.05
Silt: 0.05 to 0.002
Clay: Less than 0.002

Solum

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol)

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

Stone line

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot (map symbol)

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

Strath terrace

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

Platy: Flat and laminated

Prismatic: Vertically elongated and having flat tops

Columnar: Vertically elongated and having rounded tops

Angular blocky: Having faces that intersect at sharp angles (planes)

Subangular blocky: Having subrounded and planar faces (no sharp angles)

Granular: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

Single grained: Entirely noncoherent (each grain by itself), as in loose sand

Massive: Occurring as a coherent mass

Stubble mulch

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil

Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum

The part of the soil below the solum.

Subsurface layer

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation)

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field

generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology)

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer

Otherwise suitable soil material that is too thin for the specified use.

Till

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Tuff

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

Upland

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variegation

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Very stony spot (map symbol)

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

Water bars

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol)

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point)

The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow

The uprooting and tipping over of trees by the wind.

Appendix D

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

Federally Listed Species In Clay County

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Florida Ecological Services Field Office
777 37th St
Suite D-101
Vero Beach, FL 32960-3559
Phone: (352) 448-9151 Fax: (772) 562-4288
Email Address: fw4flesregs@fws.gov
https://www.fws.gov/office/florida-ecological-services

In Reply Refer To: 05/30/2025 21:04:16 UTC
Project Code: 2025-0103807
Project Name: DWSRF Water System Improvements

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. **Please include your Project Code, listed at the top of this letter, in all subsequent correspondence regarding this project.** Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Marine Mammals
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Florida Ecological Services Field Office
777 37th St
Suite D-101
Vero Beach, FL 32960-3559
(352) 448-9151

PROJECT SUMMARY

Project Code: 2025-0103807
Project Name: DWSRF Water System Improvements
Project Type: Water Supply Pipeline - Maintenance/Modification - Below Ground
Project Description: The Town of Orange Park, Florida, owns and operates the Public Water System (PWS ID 2101182), serving approximately 2,982 service connections. The Town seeks funding to upgrade its water infrastructure, including:

• Replacing all existing meters with an Advanced Metering Infrastructure (AMI) system.
• Addressing distribution system extension/looping and/or replacement needs to increase water pressure, eliminate dead ends, and enhance fire flow/fire suppression capabilities.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@30.171361349999998,-81.7135824571748,14z



Counties: Clay and Duval counties, Florida

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered
West Indian Manatee *Trichechus manatus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/4469 General project design guidelines: https://ipac.ecosphere.fws.gov/project/RQZ7XATLNZDJXKV5OWS6VFK2LY/documents/generated/7281.pdf	Threatened

BIRDS

NAME	STATUS
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Red-cockaded Woodpecker *Dryobates borealis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	Threatened
Whooping Crane *Grus americana* Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential

REPTILES

NAME	STATUS
Eastern Indigo Snake *Drymarchon couperi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/646	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

BALD & GOLDEN EAGLES INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

MIGRATORY BIRD INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

MARINE MAMMALS

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

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1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME

West Indian Manatee *Trichechus manatus*
Species profile: https://ecos.fws.gov/ecp/species/4469

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE
- R4SBC
- R2UBFx
- R4SBCx

ESTUARINE AND MARINE DEEPWATER
- E1UBL

ESTUARINE AND MARINE WETLAND
- E2SS3P
- E2EM1N

FRESHWATER FORESTED/SHRUB WETLAND
- PFO1/2F
- PFO4C
- PFO1C
- PFO1/3C
- PFO1R
- PFO4/1C
- PFO1/4C
- PFO1F

FRESHWATER EMERGENT WETLAND
- PEM1F
- PEM1Fx
- PEM1C
- PEM1Cx

FRESHWATER POND
- PUBHx
- PUSCx

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: John Petrohovich
Address: 580-1 Wells Road
City: Orange Park
State: FL
Zip: 32073
Email john.petrohovich@mittauer.com
Phone: 9046440647

Appendix E

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

FDEP Sanitary Survey Report

FLORIDA DEPARTMENT OF Environmental Protection

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

Ron DeSantis
Governor

Alexis A. Lambert
Secretary

August 7, 2025

Mr. William Whitson
Town of Orange Park
2042 Park Ave.
Orange Park, FL, 32073
wwhitson@townop.com

Re: Compliance Assistance Offer
Town of Orange Park
PWS ID No. 2101182
Clay County – Drinking Water

Dear Mr. Whitson:

A sanitary survey inspection was conducted at your system on June 4, 2025. During this inspection, potential non-compliance was noted. The purpose of this letter is to offer compliance assistance as a means of resolving these matters.

Specifically, potential non-compliance with the requirements under Chapter 403, Florida Statutes (Fla. Stat.), Chapter 62-555, Florida Administrative Code (Fla. Admin. Code) was observed. Please see the attached inspection report for a full account of Department observations and recommendations.

We request you review the items of concern noted and respond in writing within **15 days** of receipt of this Compliance Assistance Offer. Your written response should include one of the following:

1. Describe what has been done to resolve the non-compliance issue or provide a schedule describing how/when the issue will be addressed (see "Recommendations for Corrective Action" section of the report).
2. Provide the requested information, or information that mitigates the concerns or demonstrates them to be invalid, or
3. Arrange for the case manager to visit your system to discuss the item(s) of concern.

It is the Department's desire that you are able to adequately address the aforementioned issues so that this matter can be closed. Your failure to respond promptly may result in the initiation of formal enforcement proceedings.

During the inspection, it was noted that this system has a finished water storage tank(s) requiring an inspection by a professional engineer licensed in Florida, in accordance with Rule 62-555.350(2), Fla. Admin. Code. The previous tank inspection and next inspection due date are noted in the Tanks section on Page 3 of the attached report.

Please address your response and any questions to Christopher Williams of the Northeast District Office at (904) 256-1521, or via e-mail at Christopher.Williams@FloridaDEP.gov. We look forward to your cooperation with this matter.

Sincerely,

Shane Tierney
Environmental Manager
Compliance Assurance Program

Enclosures: Sanitary Survey Inspection Report
Compliance Assistance Offer, issued September 6, 2024

ec: FDEP: Chris Azcuy, Madison White, Shane Tierney, Christopher Williams
c: Brandon Hoffman, bhoffman@townop.com

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

Water system: Town of Orange Park – Ash Street	**System PWS #: 2101182-01**	**Survey date: 06/04/2025**
Facility type class: **Community** - (5C)	Source type: Ground	4-Log approved: No
Facility address: 700 Ash St, Orange Park		
Facility phone(s): 904-252-4027	Facility email/fax: wwhitson@townop.com	
Facility contact: Brandon Hoffman	Facility contact phone(s): 904-426-5862	
Facility contact email/fax: Bhoffman@townop.com		
Owner name: William Whitson	Company name: Town of Orange Park	
Owner/Corp address: 2042 Park Ave.	City: Orange Park / State: FL / Zip: 32073	
Owner/Corp phone(s): 904-278-3011	Owner e-contact(s): wwhitson@townop.com	
Operator name: Brandon Hoffman	Certification: A-21357	
Operator phone(s): 904-426-5862	Operator email/fax: bhoffman@townop.com	
On-site Rep: Mr. Hoffman, Mr. McGriff	**Immediate Action Required?**: No	Inspection recap given? Yes

SERVICE AREA CHARACTERISTICS
Municipality

Food Service: ☐ Yes ☐ No ☒ N/A

GENERAL INFORMATION
Number of Service Connections 2982
Population Served 8668 Basis Town records
Plant Design Capacity 2.9 MGD
Basis P0080234-007-WC Dated 11/24/1999
Average Day (from MORs) 474,458 gpd
Max. Day (from MORs) 1,211,000 gpd
Total Storage Capacity 507,500 gallons
Comments storage = GST + 1/2 H
Population and Service Connection count are for both WTPs.

LOCATION
Latitude 30° 10' 58.4908" North
Longitude 81° 42' 37.5233" West
GPS: No Date: DPHO, 09/14/2004
Directions I-95 S to 295 N towards Orange Park. Exit Hwy 17, head South (left). Make right on Milwaukee Ave. Plant is directly on the right.

OPERATION & MAINTENANCE
Certified Operator: ☒ Yes ☐ No ☐ Not required
Plant visits conducted by: Mr. Brandon Hoffman
O&M Log: ☒Yes ☐No O&M Manual: ☒Yes ☐No
Visitation Frequency
Hrs/day: *Required* 6 min *Actual* 7
Hrs/wk: *Required* 0.6 *Actual* 41
Days/wk: *Required* 55+1 *Actual* 5+2
Non-consecutive Days? ☐ Yes ☐ No ☒ N/A
MORs submitted regularly? ☒ Yes ☐ No ☐ N/A
Data missing from MORs? ☐ No ☐ Yes ☐ N/A
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 Caterpillar Diesel Generator
Capacity of Standby (kW) 400
Switchover: ☒ Automatic ☐ Manual
Standby Plan: ☐ Yes ☐ No
Hrs Operated Under Load 4 hrs/mo.
What equipment does it operate?
☒ Well pumps 2
☒ High Service Pumps 3
☒ Treatment Equipment Chlorinator, CLX Ana.
Satisfy 1/2 max-day demand? ☒Yes ☐No ☐Unk
Comments N/A

TREATMENT PROCESSES IN USE
Hypochlorination for disinfection
Aeration for H2S removal
Is additional treatment needed? ☐ Yes ☒ No
If so, for control of what deficiencies?
N/A

DISTRIBUTION SYSTEM
Flow Measuring Device Flow Meter
Meter Size & Type Water Specialties ML 03 16'
Meter tested w/i 5 yrs? ☒ Yes ☐ No ☐ Unk ☐ N/A
Backflow Prevention :☒ Yes ☐ No
Cross-connections HBVB installed - 4 RPZ
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 RPZs tested 6/2/2025
Flow meter calibrated 10/4/2024

Town of Orange Park – Ash Street

PWS ID # 2101182-01
Survey Date 06/04/2025

GROUND WATER SOURCE

Well Number (PWS Identification)		1	2	
Well Name (System Identification)		Ash Street Well 1	Ash Street Well 2	
Year Drilled		1969	1978	
Depth Drilled		580	580	
Latitude		30° 10’ 58.0998” N	30° 10’ 57.2829” N	
Longitude		81° 42’ 38.5999” W	81° 42’ 38.7323” W	
GPS (Y or N) / Date (if applicable)		N	N	
Florida Well ID		AAC2414	AAC2415	
Static Water Level		Unk	40’	
Normal Yield (if different than rated capacity)		Unk	Unk	
Strainer		Unk	Yes	
Length (outside casing)		309’	309’	
Diameter (outside casing)		18”	18”	
Material (outside casing)		Black Steel	Black Steel	
Well Contamination History		None	None	
Is inundation of well possible?		Not likely	Not likely	
6’ X 6’ X 4” Concrete Pad		Ok	OK	
SET BACKS	Septic Tank	N/A	N/A	
	Reuse Water	>500’	>500’	
	WW Plumbing	>200’	>200’	
	Other Sanitary Hazard	Adj. wastewater plant	Adj. wastewater plant	
PUMP	Type	Vertical Turbine	Vertical Turbine	
	Manufacturer Name	Peerless	Peerless	
	Model Number	14HXB	14HXB	
	Rated Capacity (gpm)	2200	2200	
	Motor Horsepower	75	75	
Well casing 12” above grade?		Ok*	Ok*	
Well Casing Sanitary Seal		Ok	Ok	
Raw Water Sampling Tap		Ok	Ok	
Above Ground Check Valve		Ok	Ok	
Fence/Housing		Ok	Ok	
Well Vent Protection		OK	Ok	

COMMENTS Well casing < 12" - OK until bacti issues arise or permitted well construction occurs

Town of Orange Park – Ash Street

PWS ID # 2101182-01
Survey Date 06/04/2025

CHLORINATION (Disinfection)
Type: Hypo-Chlorination
Make Stenner S3V5G (x3) Capacity 31.5 gpd (each)
Chlorine Feed Rate Set at 62/100
Avg. Amount of Cl_2 gas used N/A
Chlorine Residuals: Plant 0.75 Remote 0.54
Remote tap location Quinten St main
DPD Test Kit: ☐ On-site ☒ With operator
☐ None ☐ Not Used Daily
Injection Points pre H tank (at the aerator)
Booster Pump Info N/A
Comments N/A

AERATION (Gases, Fe, & Mn Removal)
Type Cascade Capacity 2700 GPM each
Aerator Condition Good
Bloodworm Presence None
Visible Algae Growth None
Protective Screen Condition Good
Comments N/A

HIGH SERVICE PUMPS

Pump Number	1	2	3
Type	Centrifugal	Centrifugal	Centrifugal
Make	Peerless	Peerless	Peerless
Model	6AE14	6AE14	6AE14
Capacity (gpm)	1500	1500	1500
Motor HP	75	75	75
Date Installed	2004	2004	2004
Maintenance	Good	Good	Good

Comments N/A

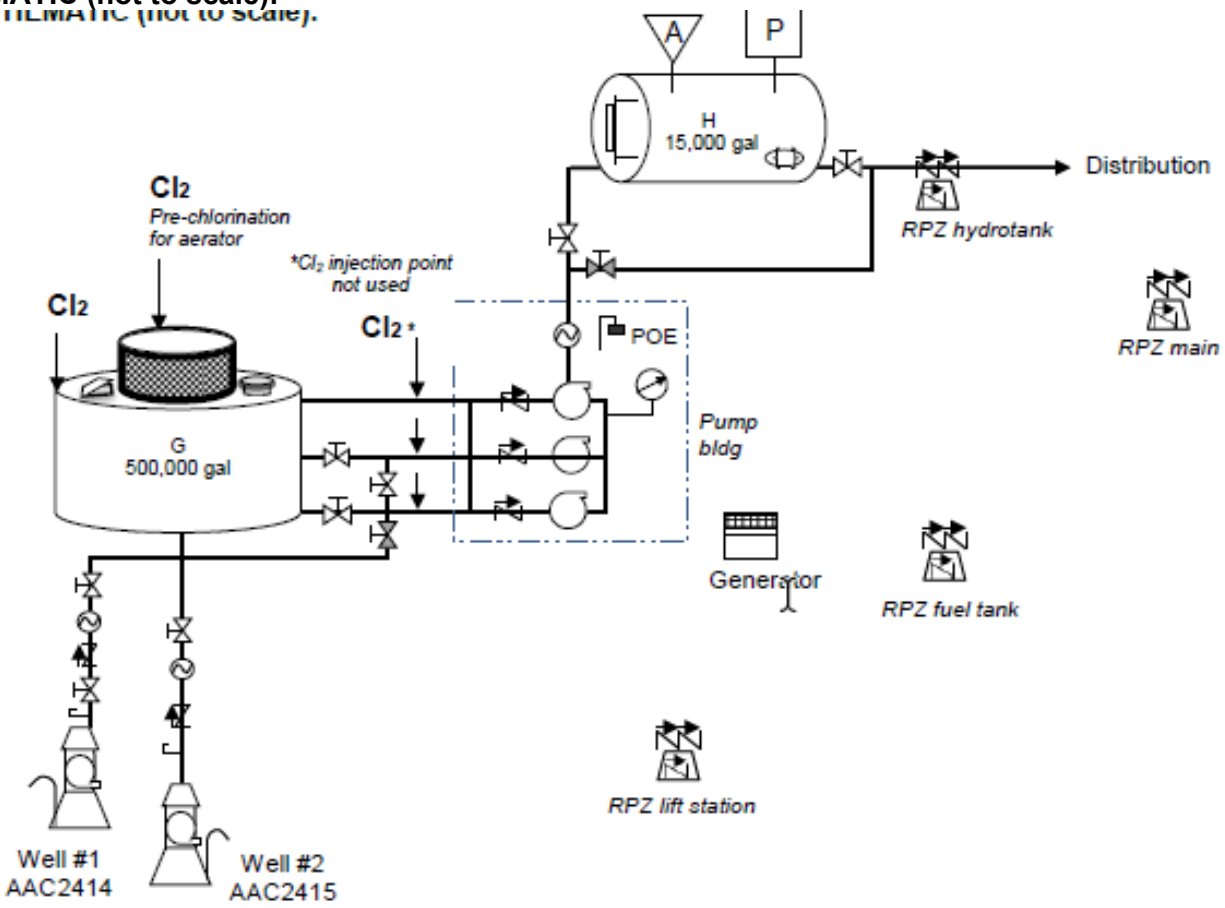
STORAGE FACILITIES
(B) Bladder (CW) Clearwell (C) Contact (E) Elevated
(G) Ground (H) Hydropneumatic (S.C.) See Comments

Tank Type/Number	**G**	**H**	
Capacity (gal)	500,000	15,000	
Material	Concrete	Steel	
By-pass Piping	Yes	Yes	
Gravity Drain	Yes	Yes	
PRV/ARV	N/A	Both	
Protected Openings	Yes	No	
Access Padlocked	Yes	Yes	
Pressure Gauge	N/A	Yes	
On/Off Pressure	N/A	49/64	
Sight Glass or Level Indicator	L.I.	S.G.	
Fittings for Sight Glass	N/A	Yes	
Height to Bottom of Elevated Tank	N/A	NA	
Height to Max. Water Level	N/A	N/A	
Last Insp Done*	2020/02	2020/02	
Next Insp Due*	2025/02*	2025/02*	

Comments Both tanks are overdue for their 5-year inspection

**FL PE 5-yr inspection of finished water storage tank with 11"x15" access manhole.*

SCHEMATIC (not to scale):



SCHEMATIC KEY	
well head and casing well w/Turbine pump	chlorine injection point Cl2
check valve w/ reduced pressure zone	air volume control pressure relief valve A P
threadless (smoothbore) tap	pressure gauge
threaded tap w/ HBVB point of entry tap POE	gate valve - open, closed
well vent	flow meter

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

Water system: Town of Orange Park – Milwaukee Ave.	**System PWS #: 2101182-02**	**Survey date: 06/04/2025**
Facility type class: **Community** - (5C)	Source type: Ground	4-Log approved: N/A
Facility address: Milwaukee Ave and Smith St, Orange Park FL 32073		
Facility phone(s): 904-252-4027	Facility email/fax: wwhitson@townop.com	
Facility contact: Brandon Hoffman	Facility contact phone(s): 904-426-5862	
Facility contact email/fax: wwhitson@townop.com		
Owner name: William Whitson	Company name: Town of Orange Park	
Owner/Corp address: 2042 Park Ave.	City: Orange Park	State: FL / Zip: 32073
Owner/Corp phone(s): 904-278-3011	Owner e-contact(s): wwhitson@townop.com	
Operator name: Brandon Hoffman	Certification: A-21357	
Operator phone(s): 904-426-5862	Operator email/fax: bhoffman@townop.com	
On-site Rep: Mr. Hoffman	**Immediate Action Required?**: No	Inspection recap given? Yes

SERVICE AREA CHARACTERISTICS
Municipality

Food Service: ☐ Yes ☐ No ☒ N/A

GENERAL INFORMATION
Number of Service Connections 2982
Population Served 8668 Basis Town Records
Plant Design Capacity 2.9 MGD
Basis permit issued 11/24/99 - WTP Upgrades P0080234-008-WC
Average Day (from MORs) 350,603 gpd
Max. Day (from MORs) 1,238,000 gpd
Total Storage Capacity 507,500 gallons
Comments storage = GST + 1/2 H
Population and Service Connection count are for both WTPs.

LOCATION
Latitude 30° 09' 47.1864" North
Longitude 81° 42' 09.1444" West
GPS: No Date: DPHO, 09/14/2004
Directions I-95S to 295N towards Orange Park. Exit Hwy 17 head South (left). Make right on Milwaukee Ave. Plant is directly on the right.

OPERATION & MAINTENANCE
Certified Operator: ☒ Yes ☐ No ☐ Not required
Plant visits conducted by: Brandon Hoffman
O&M Log: ☒Yes ☐No O&M Manual: ☒Yes ☐No
Visitation Frequency
Hrs/day: *Required* 6 min *Actual* 6
Hrs/wk: *Required* 0.6 *Actual* 41
Days/wk: *Required* 5+1 *Actual* 5+2
Non-consecutive Days? ☐ Yes ☐ No ☒ N/A
MORs submitted regularly? ☒ Yes ☐ No ☐ N/A
Data missing from MORs? ☒ No ☐ Yes ☐ N/A
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 Caterpillar Diesel Generator
Capacity of Standby (kW) 400
Switchover: ☒ Automatic ☐ Manual
Standby Plan: ☒ Yes ☐ No
Hrs Operated Under Load 4 hrs/mo.
What equipment does it operate?
☒ Well pumps 2
☒ High Service Pumps 3
☒ Treatment Equipment Chlorinator, CLX ana.
Satisfy 1/2 max-day demand? ☒Yes ☐No ☐Unk
Comments 1 hr. every Thursday

TREATMENT PROCESSES IN USE
Disinfect/ Hypochlorine
Aeration for H2S Removal
Is additional treatment needed? ☐ Yes ☒ No
If so, for control of what deficiencies?
N/A

DISTRIBUTION SYSTEM
Flow Measuring Device Flow Meter
Meter Size & Type Water Specialities 16"
Meter tested w/i 5 yrs? ☒ Yes ☐ No ☐ Unk ☐ N/A
Backflow Prevention :☒ Yes ☐ No
Cross-connections HBVB installed
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 Flow meter calibrated 10/4/2024

Town of Orange Park – Milwaukee Ave.

PWS ID # 2101182-02
Survey Date 06/04/2025

GROUND WATER SOURCE

Well Number (PWS Identification)		1 (Offline)	2	
Well Name (System Identification)		Milwaukee Well 1	Milwaukee Well 2	
Year Drilled		2001	2001	
Depth Drilled		800’	800’	
Latitude		30° 09’ 46.6969” N	30° 09’ 47.6858” N	
Longitude		81° 42’ 09.5262” W	81° 42’ 09.1138” W	
GPS (Y or N) / Date (if applicable)		N	N	
Florida Well ID		AAF1894	AAF1893	
Static Water Level		3’	3’	
Normal Yield (if different than rated capacity)		Unk	Unk	
Strainer		Yes	Yes	
Length (outside casing)		165’	165’	
Diameter (outside casing)		20”	20”	
Material (outside casing)		Galvanized	Galvanized	
Well Contamination History		None	None	
Is inundation of well possible?		Not likely	Not likely	
6’ X 6’ X 4” Concrete Pad		Ok	Ok	
SET BACKS	Septic Tank	N/A	N/A	
	Reuse Water	N/A	N/A	
	WW Plumbing	>200’	>200’	
	Other Sanitary Hazard	N/A	N/A	
PUMP	Type	Vertical Turbine	Vertical Turbine	
	Manufacturer Name	Peerless	Peerless	
	Model Number	14HXB	14HXB	
	Rated Capacity (gpm)	2200	2200	
	Motor Horsepower	75	75	
Well casing 12” above grade?		Ok	Ok	
Well Casing Sanitary Seal		Ok	Ok	
Raw Water Sampling Tap		Ok	Ok	
Above Ground Check Valve		Ok	Ok	
Fence/Housing		Good	Good	
Well Vent Protection		Ok	Ok	

COMMENTS Well 1 Inactive for maintenance.

Town of Orange Park – Milwaukee Ave.

PWS ID # 2101182-02
Survey Date 06/04/2025

CHLORINATION (Disinfection)
Type: Hypo-Chlorination
Make Tacmina (x2) Capacity 3.5 gph (each)
Chlorine Feed Rate set at 38/100
Avg. Amount of Cl_2 gas used N/A
Chlorine Residuals: Plant 1.65 Remote 2.2+
Remote tap location Smith St
DPD Test Kit: ☐ On-site ☒ With operator
☐ None ☐ Not Used Daily
Injection Points pre H-tank
Booster Pump Info N/A
Comments N/A

AERATION (Gases, Fe, & Mn Removal)
Type Cascade Capacity 2700 GPM each
Aerator Condition Good
Bloodworm Presence None
Visible Algae Growth None
Protective Screen Condition Good
Comments N/A

HIGH SERVICE PUMPS

Pump Number	1	2	3
Type	Centrifugal	Centrifugal	Centrifugal
Make	Peerless	Peerless	Peerless
Model	6AE16	6AE16	6AE16
Capacity (gpm)	1500	1500	1500
Motor HP	75	75	75
Date Installed	2004	2004	2004
Maintenance	Good	Good	Good

Comments N/A

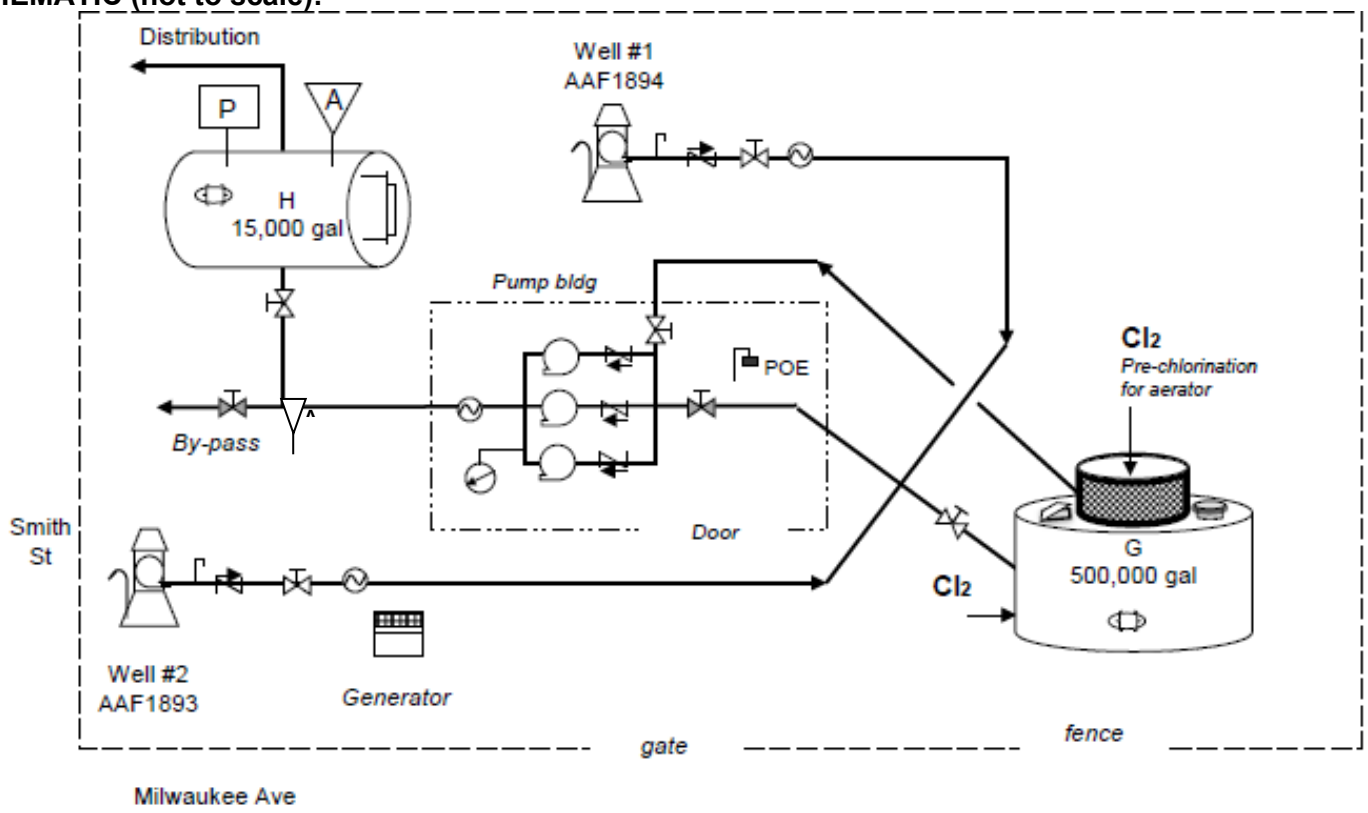
STORAGE FACILITIES
(B) Bladder (CW) Clearwell (C) Contact (E) Elevated
(G) Ground (H) Hydropneumatic (S.C.) See Comments

Tank Type/Number	G	H	
Capacity (gal)	500,000	15,000	
Material	Concrete	Steel	
By-pass Piping	Yes	Yes	
Gravity Drain	Yes	Yes	
PRV/ARV	N/A	Both	
Protected Openings	Yes	N/A	
Access Padlocked	Yes	Yes	
Pressure Gauge	N/A	Yes	
On/Off Pressure	N/A	49/64	
Sight Glass or Level Indicator	L.I.	S.G.	
Fittings for Sight Glass	N/A	Yes	
Height to Bottom of Elevated Tank	N/A	N/A	
Height to Max. Water Level	N/A	N/A	
Last Insp Done*	2021/07	2021/07	
Next Insp Due*	2026/07	2026/07	

Comments N/A

**FL PE 5-yr inspection of finished water storage tank with 11"x15" access manhole.*

SCHEMATIC (not to scale):



SCHEMATIC KEY	
well head and casing well w/Turbine pump	chlorine injection point Cl2
check valve	air volume control pressure relief valve A P
threadless (smoothbore) tap	pressure gauge
threaded tap w/ HBVB point of entry tap POE	gate valve - open, closed
well vent	flow meter

Monitoring Schedule					
Chemical	**Next Due**	**Comments**	**Chemical**	**Next Due**	**Comments**
Bacteriologicals	2025 July	Monthly	VOCs	2026	Triennially
Disinfectant Levels	2025 July	with Bactis	SOCs	2026	Triennially
Nitrate & Nitrite	2025	Annually	Rads	2026	9-Year
Inorganics	2026	Triennially	DBPs	2025	Annually July
Asbestos	2029	9-Year	Pb-Cu	2026	Triennially, June-Sept
Secondaries	2026	Triennially	WQPs	N/A	

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

MONITORING VIOLATIONS	MCL VIOLATIONS
2024 DBPs – req'd to sample in July; sampled in August. Still needs Public Noticed.	N/A
2023 SOCs – 2nd set of SOCs was not submitted. Public Noticed in 2023 CCR.	

MONITORING COMMENTS:

N/A

DEFICIENCIES:

#	Deficiency	Rule Reference	Corrective Action	Category	Severity	Corrected
1	Tank inspection was not performed by personnel under the responsible charge of a licensed engineer or there is no signed & sealed report documenting such a tank inspection (Hydro tank & GST at Ash St. WTP)	62-555.350(2)	Have the tank inspected by personnel under the responsible charge of a professional engineer licensed in Florida and/or submit a signed and sealed report.	Finished Water Storage	Minor	No

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

ADDITIONAL COMMENTS:

A Compliance Assistance Offer was issued to your facility on Sept. 6, 2024 to address the missed Stage 2 Disinfection Byproduct monitoring during July 2024—sampling resumed August 29, 2024. A response was not received. The system is still required to notify the public of the missed S2 DBP sampling. Failure to complete these requirements, and provide a response regarding the tank inspection scheduling, within 15 days of receipt of this letter may result in enforcement.

Inspector: _____ (904) 256-1521
Christopher Williams, Environmental Specialist II Christopher.Williams@FloridaDEP.gov

Approved by: _____
Madison White, Environmental Consultant

FLORIDA DEPARTMENT OF Environmental Protection

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

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

August 7, 2025

Mr. William Whitson
Town of Orange Park
700 Ash Street
Orange Park, FL, 32073
wwhitson@townop.com

Re: Compliance Assistance Offer
Town of Orange Park
PWS ID No. 2101182
Clay County – Drinking Water

Dear Ms. Campbell:

Department personnel have noted a monitoring deficiency for the Town of Orange Park Water System, owned and operated by Town of Orange Park. The purpose of this letter is to offer compliance assistance as a means of resolving the current matter and to maintain compliance in the future.

Specifically, Department records indicate the drinking water system did not submit analytical results for Stage 2 Disinfection Byproducts (S2 DBPs), including Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s), which were required to be performed annually under Rule 62-550.514, Florida Administrative Code (Fla. Admin. Code). The samples were required to be taken during the July 2024 monitoring period with a dual sample set at one site identified in the systems approved monitoring plan.

We request you review the above noted item of concern and respond within **15 days** of receipt of this offer. Your written response should:

1. Provide information that either mitigates the concern or demonstrates them to be invalid,

2. Complete DBP sampling at the the site(s) in your approved monitoring plan within **60 days** of this letter.

3. Describe what you have done to resolve the issue.

a. Pursuant to Rule 62-560.410, Fla. Admin. Code, you are required to notify the public, served by this system and submit documentation within **90 days** from the date of this letter. The template for Public Notice and the DEP Certification of Delivery form are attached for your use.
b. Provide documentation of the steps that have been taken to prevent future missed monitoring, as applicable.

4. If desired, arrange for one of our specialists to meet at our office or visit your facility to offer suggested actions to return to compliance.

It is the Department's desire that you will be able to document compliance or corrective actions concerning the missed monitoring identified above. Your failure to respond promptly in writing (or by e-mail) may result in the initiation of formal enforcement proceedings.

Please address your response and any questions to Christopher Williams of the Northeast District Office at (904) 256-1521, or via e-mail at Christopher.Williams@FloridaDEP.gov. We look forward to your cooperation with this matter.

Sincerely,

Shane Tierney
Environmental Manager
Compliance Assurance Program

Enclosures: Public Notice Instructions
Public Notice Template
DEP Certification of Delivery Form

ec: FDEP: Chris Azcuy, Shane Tierney, Madison White, Christopher Williams, Monique Jordan
Brandon Hoffman, bhoffman@townop.com, Kyle Croce, kcroce@townop.com

PUBLIC NOTIFICATION INSTRUCTIONS

This water system is required to issue public notice to the consumers of its water. Public notification must be issued within **90 days** of this notice.

Either method 1 or 2 must be used to issue public notice, in addition to method 3 for community water systems with a population greater than 3300:

1. US Mail. Submit a copy of the actual notice mailed to serve as proof of distribution.
2. Hand Delivery and Continuous Posting. Submit a copy of the actual notice posted to serve as proof of distribution. Posting must continue until the contaminants are sampled for, but in no case less than 7 days even if samples are taken.
3. Publication in a newspaper of general circulation in the affected area. A copy of the published notice will serve as proof of distribution.

Please note that the public notice must be reissued at least once every 3 months by mail delivery or by hand delivery until samples are taken.

The attached public notice is appropriate for hand delivery or mail. However, you may wish to modify it before using it. If you do, you must still include all the required elements and leave the health effects language in *italics* unchanged. This language is mandatory. Also, each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar problems, which would frustrate the purpose of the notice.

In your notice, please indicate the reason for not conducting sampling and the corrective actions you are taking to prevent future missed sampling. Listed below are some steps commonly taken by water systems. Use one or both of the following actions, if appropriate, or develop your own:

- We are sampling immediately for the above parameters.
- We will inform you when samples are satisfactorily completed.

Within 10 days after issuing/posting the public notice, you must submit a copy of the attached *PWS Certification of Delivery of Public Notice* form, along with a copy of the notice (as explained above) to this office:

Department of Environmental Protection
Attn: Potable Water Section
8800 Baymeadows Way West, Suite 100
Jacksonville, FL 32256
Electronic Submittals: DEP_NED@dep.state.fl.us

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
Town of Orange Park Chemical Monitoring Public Notice

What happened?

Our water system did not meet the requirements of a drinking water rule. Although this is not an emergency, as our customers, you have a right to know what happened, what you should do, and what we are doing to correct this situation.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During the July 2024 monitoring period, we did not monitor or test for Stage 2 Disinfection Byproducts (S2 DBPs), including Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s), and therefore cannot be sure of the quality of your drinking water at that time.

What should I do?

Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

Any customers who are concerned about their exposure to HAA5s/ TTHMs can choose alternative sources of water for ingestion.

What does this mean?

This is not an immediate risk. If it had been, you would have been notified immediately.

What is being done?

_____
_____
_____
_____

For more information, please contact _____ at _____ or contact the Department of Environmental Protection, Potable Water Section at 904-256-1700.

> *Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by our water system: **Town of Orange Park**
Potable Water System ID: **2101182**
Date distributed: ____

Appendix F

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

Water System Analysis Results and CCR

2025 Annual Drinking Water Quality Report

Town of Orange Park

PWS # 2101182

We are pleased to present to you this year's Annual Drinking Water Quality Report. This report is designed to inform you about the excellent water and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water.

The Town of Orange Park has four wells that draw from the Upper Floridan Aquifer. Due to the excellent quality of this groundwater source, disinfection through chlorination and aeration are the primary treatment processes required to produce a safe and aesthetically pleasing product for our community. During 2025, the Town also completed rehabilitation work on one of its primary drinking water wells to improve operational reliability and help ensure continued delivery of high-quality drinking water to our residents and businesses.

2025 Source Water Assessment

In 2025, the Florida Department of Environmental Protection (DEP) continued oversight of the Town of Orange Park water system through the Source Water Assessment and Protection Program (SWAPP). The assessment provides information regarding potential sources of contamination in the vicinity of our wells. There are six identified potential sources of contamination for this system with susceptibility levels ranging from low to moderate. The assessment results are available on the DEP Source Water Assessment and Protection Program (SWAPP) website at https://prodapps.dep.state.fl.us/swapp/.

Contact Information

If you have any questions about this report or concerning your water utility, please contact Kyle Croce, Public Works Director, at 904-264-7411 or kcroce@townop.com. We encourage you to be informed about your water utility.

Water Quality Test Results

This report shows our water quality results and what they mean.

Town of Orange Park routinely monitors for contaminants in your drinking water according to federal and state laws, rules, and regulations. Except where indicated otherwise, this report is based on the results of our monitoring for the period of January 1, 2025 through December 31, 2025. Data obtained before January 1, 2025 and presented in this report are from the most recent testing done in accordance with applicable laws, rules, and regulations.

In the table below, you may find unfamiliar terms and abbreviations. To help you better understand these terms, we have provided the following definitions:

- **Maximum Contaminant Level** or **MCL**: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- **Maximum Contaminant Level Goal** or **MCLG**: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- **Action Level** or **AL**: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- **Maximum Residual Disinfection Level** or **MRDL**: The level of drinking water disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **Maximum Residual Disinfection Level Goal** or **MRDLG**: The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

- **Parts per million** (**ppm**) or **milligrams per liter** (**mg/L**): one part by weight of analyte to 1 million parts by weight of the water sample.

- **Parts per billion** (**ppb**) or **micrograms per liter** (**µg/L**): one part by weight of analyte to 1 billion parts by weight of the water sample.

Inorganic Contaminants

Contaminant and Unit of Measurement	Date of sampling (mo/yr)	MCL Violation Y/N	Level Detected	Range of Results	MCLG	MCL	Likely Source of Contamination
Barium (ppm)	03/2023	N	0.019	0.017 - 0.019	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Fluoride (ppm)	03/2023	N	0.61	0.56 - 0.61	4	4	Erosion of natural deposits; discharge from fertilizer and aluminum factories. Water additive which promotes strong teeth when at the optimum level of 0.7 ppm
Sodium (ppm)	03/2023	N	13.00	11.00 - 13.00	N/A	160	Saltwater intrusion, leaching from soil
For Inorganic Contaminants, "Level Detected" is the highest level detected at any sampling point. "Range of Results" is the range of all individual samples collected.							

Our water system did not meet all requirements of certain drinking water rules during the 2025 monitoring period. Although these situations were not emergencies, as our customers, you have a right to know what happened, what you should do, and what we are doing to correct these situations.

During July 2025, the Town of Orange Park was late completing required Disinfection By-Product (DBP) monitoring. In addition, during December 2025, the Town missed required bacteriological sampling within the required compliance timeframe. Because these monitoring and reporting requirements were not completed as scheduled, we cannot be certain of the water quality during those specific monitoring periods.

Required follow-up and make-up sampling was completed after the issues were identified. All subsequent bacteriological monitoring results returned compliant, and there was no evidence of contamination detected in the drinking water system. Follow-up DBP monitoring results also remained within allowable regulatory limits.

During 2025, the Town also completed rehabilitation work on one of its primary drinking water wells to improve operational reliability and help ensure continued delivery of safe, high-quality drinking water to the community.

Required Health Effects Statement: Some people who drink water containing disinfection by-products in excess of the Maximum Contaminant Level (MCL) over many years may experience problems with their liver, kidneys, or central nervous systems and may have an increased risk of getting cancer. Some people who drink water containing harmful bacteria or other microbial contaminants could become seriously ill. However, follow-up monitoring confirmed compliance with applicable drinking water standards.

We do not believe these monitoring and reporting issues had any adverse effect on public health. Nevertheless, our system has reviewed internal procedures, updated compliance tracking practices, and will continue striving to meet all future sampling and reporting requirements.

Stage 1 Disinfectants

Disinfectant and Unit of Measurement	Date of sampling (mo/yr)	MCL Violation Y/N	Level Detected	Range of Results	MRDLG	MRDL	Likely Source of Contamination
Chlorine (ppm)	09/2025	N	2.53	1.0-4.93	4	4	Water additive used to control microbes
For Chlorine, "Level Detected" is the highest running annual average (RAA) that occurred in 2025, computed quarterly, of monthly averages of all samples collected. "Range of Results" is the range of monthly averages of all individual samples collected in 2025.							

Stage 2 Disinfection By-Products

Contaminant and Unit of Measurement	Date of sampling (mo/yr)	MCL Violation Y/N	Level Detected	Range of Results	MCLG	MCL	Likely Source of Contamination
Haloacetic Acids (HAA5s) (ppb)	08/2025	N	4.59	N/A	N/A	60	By-product of drinking water disinfection
Total Trihalomethanes (TTHMs) (ppb)	08/2025	N	28.22	N/A	N/A	80	By-product of drinking water disinfection

Lead and Copper (Tap Water)

Contaminant and Unit of Measurement	Date of sampling (mo/yr)	AL Exceeded Y/N	90th Percentile Result	No. of sampling sites exceeding the AL	MCLG	AL (Action Level)	Likely Source of Contamination
Copper (tap water) (ppm)	09/2023	N	0.14	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead (tap water) (ppb)	09/2023	N	2.3	0	0	15	Corrosion of household plumbing systems; erosion of natural deposits

Lead in Drinking Water

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Town of Orange Park is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead. The Town completed a lead service line inventory in 2024/2025 per EPA's Lead and Copper Rule Revision (LCCR). All Town water services installed prior to 1989 were inspected at and around the immediate areas of each meter assembly. No lead water service materials were reported and the Town satisfied EPA rule requirements. The lead service line inventory did not complete a review of plumbing components on private property and was limited to Town right-of-way.

Sources of Drinking Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Possible Contaminants

Contaminants that may be present in source water include:

(A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

(B) Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or/arming.

(C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

(D) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by

products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

(E) Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

Vulnerable Population Statement

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. U.S. Environmental Protection Agency/Center for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Closing Statement

The Town of Orange Park would like you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water. If you have any questions or concerns about the information provided, please feel free to call any of the numbers listed.

RECEIVED
By Kaitlyn N Williams at 5:00 pm, Sep 15, 2025

Florida Department of Environmental Protection
Safe Drinking Water Program Laboratory Reporting Format

PUBLIC WATER SYSTEM INFORMATION (to be completed by sampler – please type or print legibly)

System Name: Town of Orange Park PWS I.D. #: 2101182

System Type (check one): [X] Community [ ] Nontransient Noncommunity [ ] Transient Noncommunity

Address: 700 Ash st

City: Orange Park ZIP Code: 32043

Phone #: 904-264-7411 Fax #: E-Mail Address: BHoffman@TownOP.com

SAMPLE INFORMATION (to be completed by sampler)

Sample Number: J2512717001 Sample Date: 08/20/2025 Sample Time: 08:00 [AM] PM (Circle One)

Sample Location (be specific): ST Francis #1 Location Code:

Disinfectant Residual (Required when reporting results for trihalomethanes and haloacetic acids 1.2 mg/L Field pH: 7.6

Sample Type (Check Only One)

- [X] Distribution
- [X] Entry Point (to Distribution) BT
- [ ] Plant Tap (not for compliance with 62-550
- [ ] Raw (at well or intake)
- [ ] Max Residence Time
- [ ] Ave Residence Time
- [ ] Near First Customer

Reason(s) for Sample (Check all that apply)

- [ ] Routine Compliance with 62-550
- [ ] Confirmation of MCL Exceedance*
- [ ] Composite of Multiple Sites*
- [ ] Replacement (of Invalidated Sample)
- [ ] Special (not for compliance with 62-550)
- [ ] Clearance (permitting)
- [ ] Other:

Sampling Procedure Used or Other Comments:

*See 62-550(6) for requirements and restrictions. And 62-550.512(3) for nitrate or nitrite exceedances.

*See 62-550.550(4) for requirements and attach a results page for each site.

SAMPLER CERTIFICATION

I Brandon Hoffman (Print Name), Lead Operator (Print Title), do HEREBY CERTIFY that the above public water system and sample collection information is complete and correct.

Signature: Date: 9-15-25

Certified Operator # A21357 Phone # 9044265862 Sampler's Fax #:

Sampler's E-mail: BHoffman@TownOP.com

*Results must be reported with appropraite qualifers in accordance with Florida Administration Code Rule 62-160, Table1. Results qualified with A, F, H, N, O, T, Z, ?, *, are unacceptable for compliance with 62-550. Results qualified with a J, Q, R, or Y must be accompanied by written justification and will be evaluated on a case by case basis. To avoid a monitoring violation, unacceptable results must be replaced with acceptable results from samples collected during the same monitoring period.

Florida Department of Environmental Protection
Safe Drinking Water Program Laboratory Reporting Format

LABORATORY CERTIFICATION INFORMATION (to be completed by lab – please type or print legibly)

Lab Name: Advanced Environmental Laboratories, Inc. Florida DOH Certification #: E82574 Certification Expiration Date: 06/30/2026

ATTACH CURRENT DOH ANALYTE SHEET*

Address: 6681 Southpoint Pkwy, Jacksonville, FL 32216 Phone #: (904) 363-9350

Were any analyses subcontracted ☐ Yes ☑ No If yes, please provide DOH certification number(s): _____

ATTACH DOH ANALYTE SHEET FOR EACH SUBCONTRACTED LAB

ANALYSIS INFORMATION (to be completed by lab) Date Sample(s) Received: 08/20/2025

PWS ID: (From Page 1): 2101182 Sample Number (From Page 1): J2512717001 Lab Assigned Report # Or Job ID: J2512717

Group(s) Analyzed & Results attached for compliance with Chapter 62-550, F.A.C. (Check all that apply):

Inorganics	Synthetic Organics	Volatile Organics	Disinfection Byproducts	Radionuclides	Secondaries
☐ All except Asbestos	☐ All 30	☐ All 21	☑ Trihalomethanes	☐ Single Sample	☐ All 14
☐ Partial	☐ All Except Dioxin	☐ Partial	☑ Haloacetic Acids	☐ Qtrly Composite*	☐ Partial
☐ Nitrate	☐ Partial		☐ Chlorite		
☐ Nitrite	☐ Dioxin Only		☐ Bromate		
☐ Asbestos					

LAB CERTIFICATION

I, Dani Lutzic (Print Name), Project Manager (Print Title), do HEREBY CERTIFY that all attached analytical data are correct and unless noted meet all requirements of the National Environmental Laboratory Accreditation Conference (NELAC).

Signature: Dani Lutzic Date: 08/28/2025

* Failure to provide a valid and current Florida DOH lab certification number and a current Analyte Sheet for the attached analysis results will result in rejection of the report, possible enforcement against the public water system for failure to sample, and may result in notification of the DOH Bureau of Laboratory Services.

** Please provide radiological sample dates & locations for each quarter.

CONFIRMATION & NOTIFICATION IS REQUIRED WITHIN 24 HRS FOR NITRATE OR NITRITE MCL EXCEEDANCES

NON-DETECTS ARE TO BE REPORTED AS THE MDL WITH "U" QUALIFIER. (Non-detects reported as "BDL" or with a "<" are not acceptable.)

COMPLIANCE DETERMINATION (to be completed by DEP or DOH -- attach notes as necessary)

Sample Collection & Analysis Satisfactory: ☐ Yes ☐ No _____ Replacement Sample or Report Requested (circle or highlight group(s) above)

Person Notified: _____ Date Notified: _____ DEP/DOH Reviewing Official: _____

*Results must be reported with appropraite qualifers in accordance with Florida Administration Code Rule 62-160, Table1. Results qualified with A, F, H, N, O, T, Z, ?, *, are unacceptable for compliance with 62-550. Results qualified with a J, Q, R, or Y must be accompanied by written justification and will be evaluated on a case by case basis. To avoid a monitoring violation, unacceptable results must be replaced with acceptable results from samples collected during the same monitoring period.

Florida Department of Environmental Protection
Safe Drinking Water Program Laboratory Reporting Format

DISINFECTION BYPRODUCTS
62-550.310(3)

Report Number / Job ID: J2512717001

Disinfectant Residual (mg/L):

PWS ID (From Page 1): 2101182

Contam ID	Contam Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Regulatory MRL**	Analysis Date	Analysis Time	DOH Lab Certification #
2450	Monochloroacetic Acid	N/A	ug/L	0.89	U	EPA 552.2	0.89	2	08/26/2025	13:12	E82574
2451	Dichloroacetic Acid	N/A	ug/L	0.89	U	EPA 552.2	0.89	1	08/26/2025	13:12	E82574
2452	Trichloroacetic Acid	N/A	ug/L	0.67	U	EPA 552.2	0.67	1	08/26/2025	13:12	E82574
2453	Monobromoacetic Acid	N/A	ug/L	0.52	U	EPA 552.2	0.52	1	08/26/2025	13:12	E82574
2454	Dibromoacetic Acid	N/A	ug/L	0.73	U	EPA 552.2	0.73	1	08/26/2025	13:12	E82574
2456	Total Haloacetic Acids (HAA5)	60	ug/L	0.89	U	EPA 552.2	0.89	---	08/26/2025	13:12	E82574

Contam ID	Contam Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Regulatory MRL**	Analysis Date	Analysis Time	DOH Lab Certification #
2941	Chloroform	N/A	ug/L	14.31		EPA 524.2	0.53	1	08/21/2025	19:40	E82574
2942	Bromoform	N/A	ug/L	0.50	U	EPA 524.2	0.50	1	08/21/2025	19:40	E82574
2943	Bromodichloromethane	N/A	ug/L	9.23		EPA 524.2	0.54	1	08/21/2025	19:40	E82574
2944	Dibromochloromethane	N/A	ug/L	4.46		EPA 524.2	0.44	1	08/21/2025	19:40	E82574
2950	Total Trihalomethanes (TTHM)	80	ug/L	28.00		EPA 524.2	1.0	---	08/21/2025	19:40	E82574

** Laboratories are required to adhere to the minimum reporting level (MRL) requirements of 40 CFR 141.131(b)(2)(iv).

*** Applicable to monitoring as prescribed in 40 CFR 141.132.(b)(2)(i)(B) and (b)(2)(ii).

**** Laboratories that use EPA Methods 317.0 Revision 2.0, 326.0 or 321.8 must meet a 1.0 µg/L MRL for bromate.

Note: Do not round values. Report results to the accuracy, precision, and sensitivity of the analytical method used.

REVIEWED
By Kaitlyn N Williams at 10:49 am, Sep 24, 2025

*Results must be reported with appropraite qualifers in accordance with Florida Administration Code Rule 62-160, Table1. Results qualified with A, F, H, N, O, T, Z, ?, *, are unacceptable for compliance with 62-550. Results qualified with a J, Q, R, or Y must be accompanied by written justification and will be evaluated on a case by case basis. To avoid a monitoring violation, unacceptable results must be replaced with acceptable results from samples collected during the same monitoring period.

Florida Department of Environmental Protection
Safe Drinking Water Program Laboratory Reporting Format

PUBLIC WATER SYSTEM INFORMATION (to be completed by sampler – please type or print legibly)

System Name: Town of Orange Park PWS I.D. #: 2101182

System Type (check one): [X] Community [ ] Nontransient Noncommunity [ ] Transient Noncommunity

Address: 700 Ash St

City: Orange Park ZIP Code: 32043

Phone #: 904-264-7411 Fax #: E-Mail Address: BHoffman@TownOP.com

SAMPLE INFORMATION (to be completed by sampler)

Sample Number: J2512717002 Sample Date: 08/20/2025 Sample Time: 08:00 [AM] PM (Circle One)

Sample Location (be specific): ST Francis #2 Location Code:

Disinfectant Residual (Required when reporting results for trihalomethanes and haloacetic acids 1.1 mg/L Field pH: 7.6

Sample Type (Check Only One)

- [X] Distribution
- [ ] Entry Point (to Distribution)
- [ ] Plant Tap (not for compliance with 62-550
- [ ] Raw (at well or intake)
- [ ] Max Residence Time
- [ ] Ave Residence Time
- [ ] Near First Customer

Reason(s) for Sample (Check all that apply)

- [ ] Routine Compliance with 62-550
- [ ] Confirmation of MCL Exceedance*
- [ ] Composite of Multiple Sites*
- [ ] Other:
- [ ] Replacement (of Invalidated Sample)
- [ ] Special (not for compliance with 62-550)
- [ ] Clearance (permitting)

Sampling Procedure Used or Other Comments:

*See 62-550(6) for requirements and restrictions. And 62-550.512(3) for nitrate or nitrite exceedances.

*See 62-550.550(4) for requirements and attach a results page for each site.

SAMPLER CERTIFICATION

I Brandon Hoffman (Print Name), Lead operator (Print Title), do HEREBY CERTIFY that the above public water system and sample collection information is complete and correct.

Signature: Date: 9-15-25

Certified Operator # A.21357 Phone # 904-426-5861 Sampler's Fax #:

Sampler's E-mail: BHoffman@TownOP.com

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Florida Department of Environmental Protection
Safe Drinking Water Program Laboratory Reporting Format

LABORATORY CERTIFICATION INFORMATION (to be completed by lab – please type or print legibly)

Lab Name: Advanced Environmental Laboratories, Inc. Florida DOH Certification #: E82574 Certification Expiration Date: 06/30/2026

ATTACH CURRENT DOH ANALYTE SHEET*

Address: 6681 Southpoint Pkwy, Jacksonville, FL 32216 Phone #: (904) 363-9350

Were any analyses subcontracted ☐ Yes ☑ No If yes, please provide DOH certification number(s): _____

ATTACH DOH ANALYTE SHEET FOR EACH SUBCONTRACTED LAB

ANALYSIS INFORMATION (to be completed by lab) Date Sample(s) Received: 08/20/2025

PWS ID: (From Page 1): 2101182 Sample Number (From Page 1): J2512717002 Lab Assigned Report # Or Job ID: J2512717

Group(s) Analyzed & Results attached for compliance with Chapter 62-550, F.A.C. (Check all that apply):

Inorganics	Synthetic Organics	Volatile Organics	Disinfection Byproducts	Radionuclides	Secondaries
☐ All except Asbestos	☐ All 30	☐ All 21	☑ Trihalomethanes	☐ Single Sample	☐ All 14
☐ Partial	☐ All Except Dioxin	☐ Partial	☑ Haloacetic Acids	☐ Qtrly Composite*	☐ Partial
☐ Nitrate	☐ Partial		☐ Chlorite		
☐ Nitrite	☐ Dioxin Only		☐ Bromate		
☐ Asbestos					

LAB CERTIFICATION

I, Dani Lutzic (Print Name), Project Manager (Print Title), do HEREBY CERTIFY that all attached analytical data are correct and unless noted meet all requirements of the National Environmental Laboratory Accreditation Conference (NELAC).

Signature: Dani Lutzic Date: 08/28/2025

* Failure to provide a valid and current Florida DOH lab certification number and a current Analyte Sheet for the attached analysis results will result in rejection of the report, possible enforcement against the public water system for failure to sample, and may result in notification of the DOH Bureau of Laboratory Services.

** Please provide radiological sample dates & locations for each quarter.

CONFIRMATION & NOTIFICATION IS REQUIRED WITHIN 24 HRS FOR NITRATE OR NITRITE MCL EXCEEDANCES

NON-DETECTS ARE TO BE REPORTED AS THE MDL WITH "U" QUALIFIER. (Non-detects reported as "BDL" or with a "<" are not acceptable.)

COMPLIANCE DETERMINATION (to be completed by DEP or DOH -- attach notes as necessary)

Sample Collection & Analysis Satisfactory: ☐ Yes ☐ No _____ Replacement Sample or Report Requested (circle or highlight group(s) above)

Person Notified: _____ Date Notified: _____ DEP/DOH Reviewing Official: _____

*Results must be reported with appropraite qualifers in accordance with Florida Administration Code Rule 62-160, Table1. Results qualified with A, F, H, N, O, T, Z, ?, *, are unacceptable for compliance with 62-550. Results qualified with a J, Q, R, or Y must be accompanied by written justification and will be evaluated on a case by case basis. To avoid a monitoring violation, unacceptable results must be replaced with acceptable results from samples collected during the same monitoring period.

Florida Department of Environmental Protection
Safe Drinking Water Program Laboratory Reporting Format

DISINFECTION BYPRODUCTS
62-550.310(3)

Report Number / Job ID: J2512717002

Disinfectant Residual (mg/L):

PWS ID (From Page 1): 2101182

Contam ID	Contam Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Regulatory MRL**	Analysis Date	Analysis Time	DOH Lab Certification #
2450	Monochloroacetic Acid	N/A	ug/L	0.89	U	EPA 552.2	0.89	2	08/26/2025	13:45	E82574
2451	Dichloroacetic Acid	N/A	ug/L	2.34		EPA 552.2	0.89	1	08/26/2025	13:45	E82574
2452	Trichloroacetic Acid	N/A	ug/L	2.25		EPA 552.2	0.67	1	08/26/2025	13:45	E82574
2453	Monobromoacetic Acid	N/A	ug/L	0.52	U	EPA 552.2	0.52	1	08/26/2025	13:45	E82574
2454	Dibromoacetic Acid	N/A	ug/L	0.73	U	EPA 552.2	0.73	1	08/26/2025	13:45	E82574
2456	Total Haloacetic Acids (HAA5)	60	ug/L	4.59		EPA 552.2	0.89	---	08/26/2025	13:45	E82574

Contam ID	Contam Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Regulatory MRL**	Analysis Date	Analysis Time	DOH Lab Certification #
2941	Chloroform	N/A	ug/L	14.13		EPA 524.2	0.53	1	08/21/2025	20:10	E82574
2942	Bromoform	N/A	ug/L	0.50	U	EPA 524.2	0.50	1	08/21/2025	20:10	E82574
2943	Bromodichloromethane	N/A	ug/L	9.12		EPA 524.2	0.54	1	08/21/2025	20:10	E82574
2944	Dibromochloromethane	N/A	ug/L	4.97		EPA 524.2	0.44	1	08/21/2025	20:10	E82574
2950	Total Trihalomethanes (TTHM)	80	ug/L	28.22		EPA 524.2	1.0	---	08/21/2025	20:10	E82574

** Laboratories are required to adhere to the minimum reporting level (MRL) requirements of 40 CFR 141.131(b)(2)(iv).

*** Applicable to monitoring as prescribed in 40 CFR 141.132.(b)(2)(i)(B) and (b)(2)(ii).

**** Laboratories that use EPA Methods 317.0 Revision 2.0, 326.0 or 321.8 must meet a 1.0 µg/L MRL for bromate.

Note: Do not round values. Report results to the accuracy, precision, and sensitivity of the analytical method used.

REVIEWED
By Kaitlyn N Williams at 10:50 am, Sep 24, 2025

*Results must be reported with appropraite qualifers in accordance with Florida Administration Code Rule 62-160, Table1. Results qualified with A, F, H, N, O, T, Z, ?, *, are unacceptable for compliance with 62-550. Results qualified with a J, Q, R, or Y must be accompanied by written justification and will be evaluated on a case by case basis. To avoid a monitoring violation, unacceptable results must be replaced with acceptable results from samples collected during the same monitoring period.

Advanced Environmental Laboratories, Inc.

- ☐ Altamonte Springs: 380 Northlake Blvd., Ste. 1048, FL 32701 • 407.937.1594 • Lab ID: E53078
- ☐ Fort Myers: 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Lab ID: E84462
- ☑ Jacksonville: 6881 Southpoint Pkwy., FL 32216 • 904.363.9350 • Lab ID: E82574
- ☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.210.8274 • Lab ID: E811006

* J 2 5 1 2 7 1 7 *

Client Name:	Town of Orange Park
Address:	700 Ash St
	Orange Park, FL 32073
Phone:	904-426-5862
FAX:	
Contact:	Brandon Hoffman
Sampled By:	BLH
Turn Around Time:	Standard x Rush
AEL Profile #:	16573 (1)

Project Name:	THM/HAA
Project Number:	
PO Number:	
FDEP Facility No:	
FDEP Facility Addr:	
Special Instructions:	
ADaPT	EQuIS Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED (3) 40 mL Vials THM	ANALYSIS REQUIRED (3) 40 mL Amber HAA	LABORATORY I.D. NUMBER
							Preservation	NaThio	NH4Cl	
							Field-Filtered?			
001	St Francis #1	Grab	8-20-25	0820	DW	6		X	X	001
002	St Francis #2	Grab	08-20-25	0820	DW	6		X	X	002

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = Ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice: ☒ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked

Temp. when received (observed) 2.0 °C Temp. when received (corrected) 2.0 °C

DCN: AD-D051web Form last revised 08/07/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	[illegible] Jacquis	8/20/25	1021	[signature]	8/20/25	1022
2						
3						
4						

FOR DRINKING WATER USE:

(When PWS information not otherwise supplied) PWS ID: _____

Contact Person: _____

Supplier of Water: _____

Site-Address: _____

Advanced Environmental Laboratories, Inc
6681 Southpoint Pkwy Jacksonville, FL 32216
Payments: P.O. Box 551580 Jacksonville, FL 32255-1580
Phone: (904) 363-9350
Fax: (904) 363-9354

FINAL

Workorder: THM/HAA (J2512717)

August 28, 2025

Brandon Hoffman

RE: Workorder: J2512717 THM/HAA

Dear Brandon Hoffman:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday August 20, 2025. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dani Lutzic, Project Manager
DLutzic@aellab.com

Certificate of Analysis

This report shall not be reproduced, except in full,
without the written consent of Advanced Environmental Laboratories, Inc.

Laboratories Certified Under NELAP by the Florida Department of Health
Listing of Organization FOAs Query Results
Database Version: 02/04/2017 08:30:00
Laboratory Name Advanced Environmental Laboratories, Inc.
DOH ID: E82574

Matrix	Category	Analyte	AnalyteCode	Method	MethodCode	Certification Date
Drinking Water	Group I Unregulated Contaminants	Aldrin	7025	EPA 508	10085004	5/10/2011
Drinking Water	Group I Unregulated Contaminants	Dieldrin	7470	EPA 508	10085004	5/10/2011
Drinking Water	Group I Unregulated Contaminants	Aldicarb (Temik)	7010	EPA 531.1	10090809	5/10/2011
Drinking Water	Group I Unregulated Contaminants	Aldicarb sulfone	7015	EPA 531.1	10090809	7/26/2012
Drinking Water	Group I Unregulated Contaminants	Aldicarb sulfoxide	7020	EPA 531.1	10090809	5/10/2011
Drinking Water	Group I Unregulated Contaminants	Bromoacetic acid	9312	EPA 552.2	10095600	1/21/2005
Drinking Water	Group I Unregulated Contaminants	Bromochloroacetic acid	9315	EPA 552.2	10095600	1/21/2005
Drinking Water	Group I Unregulated Contaminants	Chloroacetic acid	9336	EPA 552.2	10095600	1/21/2005
Drinking Water	Group I Unregulated Contaminants	Dibromoacetic acid	9357	EPA 552.2	10095600	1/21/2005
Drinking Water	Group I Unregulated Contaminants	Dichloroacetic acid	9360	EPA 552.2	10095600	3/24/2005
Drinking Water	Group I Unregulated Contaminants	Trichloroacetic acid	9642	EPA 552.2	10095600	1/21/2005
Drinking Water	Group II Unregulated Contaminants	1,2,3-Trichloropropane	5180	EPA 504.1	10082607	5/10/2011
Drinking Water	Group II Unregulated Contaminants	1,1,1,2-Tetrachloroethane	5105	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,1,2,2-Tetrachloroethane	5110	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,1-Dichloroethane	4630	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,1-Dichloropropene	4670	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,2,3-Trichlorobenzene	5150	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,2,3-Trichloropropane	5180	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,2,4-Trichlorobenzene	5155	EPA 524.2	10088605	1/21/2005
Drinking Water	Group II Unregulated Contaminants	1,2,4-Trimethylbenzene	5210	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,3,5-Trimethylbenzene	5215	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,3-Dichlorobenzene	4615	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	1,3-Dichloropropane	4660	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	2,2-Dichloropropane	4665	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	2-Chlorotoluene	4535	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	4-Chlorotoluene	4540	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	4-Isopropyltoluene	4915	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Acetone	4315	EPA 524.2	10088605	8/3/2012
Drinking Water	Group II Unregulated Contaminants	Bromobenzene	4385	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Bromochloromethane	4390	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Bromodichloromethane	4395	EPA 524.2	10088605	1/21/2005
Drinking Water	Group II Unregulated Contaminants	Bromoform	4400	EPA 524.2	10088605	1/21/2005
Drinking Water	Group II Unregulated Contaminants	Chloroethane	4485	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Chloroform	4505	EPA 524.2	10088605	1/21/2005
Drinking Water	Group II Unregulated Contaminants	Dibromochloromethane	4575	EPA 524.2	10088605	1/21/2005
Drinking Water	Group II Unregulated Contaminants	Dibromomethane	4595	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Dichlorodifluoromethane	4625	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Hexachlorobutadiene	4835	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Isopropylbenzene	4900	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Methyl bromide (Bromomethane)	4950	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Methyl chloride (Chloromethane)	4960	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Methyl tert-butyl ether (MTBE)	5000	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Naphthalene	5005	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	Trichlorofluoromethane	5175	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	cis-1,3-Dichloropropene	4680	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	n-Butylbenzene	4435	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	n-Propylbenzene	5090	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	sec-Butylbenzene	4440	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	tert-Butylbenzene	4445	EPA 524.2	10088605	10/26/2009
Drinking Water	Group II Unregulated Contaminants	trans-1,3-Dichloropropene	4685	EPA 524.2	10088605	10/26/2009
Drinking Water	Microbiology	Heterotrophic plate count	2555	SM 9215 B	20035205	1/21/2005
Drinking Water	Microbiology	Escherichia coli	2525	SM 9221 F	1087	8/3/2012
Drinking Water	Microbiology	Total coliforms	2500	SM 9222 B	20036800	4/4/2002
Drinking Water	Microbiology	Escherichia coli	2525	SM 9223 B	725	9/5/2002
Drinking Water	Microbiology	Total coliforms	2500	SM 9223 B	725	9/5/2002
Drinking Water	Other Regulated Contaminants	1,1,1-Trichloroethane	5160	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	1,1,2-Trichloroethane	5165	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	1,1-Dichloroethylene	4640	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	1,2-Dichlorobenzene	4610	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	1,2-Dichloroethane	4635	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	1,2-Dichloropropane	4655	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	1,4-Dichlorobenzene	4620	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Benzene	4375	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Carbon tetrachloride	4455	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Chlorobenzene	4475	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Dichloromethane (DCM, Methylene chloride)	4650	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Ethylbenzene	4765	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Styrene	5100	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Tetrachloroethylene (Perchloroethylene)	5115	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Toluene	5140	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Total trihalomethanes	5205	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Trichloroethene (Trichloroethylene)	5170	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Vinyl chloride	5235	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	Xylene (total)	5260	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	cis-1,2-Dichloroethylene	4645	EPA 524.2	10088605	1/21/2005
Drinking Water	Other Regulated Contaminants	trans-1,2-Dichloroethylene	4700	EPA 524.2	10088605	1/21/2005
Drinking Water	Primary Inorganic Contaminants	Conductivity	1610	EPA 120.1	10006209	4/30/2008
Drinking Water	Primary Inorganic Contaminants	Mercury	1095	EPA 1631	10122802	2/18/2016
Drinking Water	Primary Inorganic Contaminants	Barium	1015	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Beryllium	1020	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Cadmium	1030	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Calcium	1035	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Chromium	1040	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Magnesium	1085	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Nickel	1105	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Silica as SiO2	1990	EPA 200.7	10013408	1/21/2005
Drinking Water	Primary Inorganic Contaminants	Sodium	1155	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Antimony	1005	EPA 200.8	10014401	12/8/2006

Drinking Water	Primary Inorganic Contaminants	Arsenic	1010	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Barium	1015	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Beryllium	1020	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Cadmium	1030	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Chromium	1040	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Lead	1075	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Nickel	1105	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Selenium	1140	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Thallium	1165	EPA 200.8	10014401	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Mercury	1095	EPA 245.1	10036201	4/4/2002
Drinking Water	Primary Inorganic Contaminants	Fluoride	1730	EPA 300.0	10053006	9/21/2011
Drinking Water	Primary Inorganic Contaminants	Nitrate	1805	EPA 300.0	10053006	5/10/2011
Drinking Water	Primary Inorganic Contaminants	Nitrite	1835	EPA 300.0	10053006	5/10/2011
Drinking Water	Primary Inorganic Contaminants	Orthophosphate as P	1870	EPA 300.0	10053006	5/10/2011
Drinking Water	Primary Inorganic Contaminants	Sulfate	2000	EPA 300.0	10053006	5/10/2011
Drinking Water	Primary Inorganic Contaminants	Total nitrate-nitrite	1825	EPA 300.0	10053006	5/10/2011
Drinking Water	Primary Inorganic Contaminants	Alkalinity as CaCO3	1505	EPA 310.1	10054601	12/8/2006
Drinking Water	Primary Inorganic Contaminants	Alkalinity as CaCO3	1505	SM 2320 B	20003003	1/21/2005
Drinking Water	Primary Inorganic Contaminants	Conductivity	1610	SM 2510 B	20003809	4/30/2008
Drinking Water	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	pH	1900	EPA 150.1	10008205	4/4/2002
Drinking Water	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	Copper	1055	EPA 200.7	10013408	4/4/2002
Drinking Water	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	Copper	1055	EPA 200.8	10014401	3/25/2015
Drinking Water	Radiochemistry	Uranium	3035	EPA 200.8	10014401	7/1/2007
Drinking Water	Secondary Inorganic Contaminants	Color	1605	EPA 110.2	10005400	2/13/2003
Drinking Water	Secondary Inorganic Contaminants	Residue-filterable (TDS)	1955	EPA 160.1	10009004	4/4/2002
Drinking Water	Secondary Inorganic Contaminants	Turbidity	2055	EPA 180.1	10011402	7/17/2002
Drinking Water	Secondary Inorganic Contaminants	Aluminum	1000	EPA 200.7	10013408	4/4/2002
Drinking Water	Secondary Inorganic Contaminants	Boron	1025	EPA 200.7	10013408	12/8/2006
Drinking Water	Secondary Inorganic Contaminants	Iron	1070	EPA 200.7	10013408	4/4/2002
Drinking Water	Secondary Inorganic Contaminants	Manganese	1090	EPA 200.7	10013408	4/4/2002
Drinking Water	Secondary Inorganic Contaminants	Molybdenum	1100	EPA 200.7	10013408	12/8/2006
Drinking Water	Secondary Inorganic Contaminants	Potassium	1125	EPA 200.7	10013408	1/21/2005
Drinking Water	Secondary Inorganic Contaminants	Silver	1150	EPA 200.7	10013408	4/4/2002
Drinking Water	Secondary Inorganic Contaminants	Zinc	1190	EPA 200.7	10013408	4/4/2002
Drinking Water	Secondary Inorganic Contaminants	Manganese	1090	EPA 200.8	10014401	12/8/2006
Drinking Water	Secondary Inorganic Contaminants	Molybdenum	1100	EPA 200.8	10014401	4/27/2007
Drinking Water	Secondary Inorganic Contaminants	Silver	1150	EPA 200.8	10014401	12/8/2006
Drinking Water	Secondary Inorganic Contaminants	Thorium	1170	EPA 200.8	10014401	12/8/2006
Drinking Water	Secondary Inorganic Contaminants	Zinc	1190	EPA 200.8	10014401	12/8/2006
Drinking Water	Secondary Inorganic Contaminants	Chloride	1575	EPA 300.0	10053006	5/10/2011
Drinking Water	Secondary Inorganic Contaminants	Color	1605	SM 2120 B	20001803	4/27/2007
Drinking Water	Secondary Inorganic Contaminants	Odor	1855	SM 2150 B	20002602	2/13/2003
Drinking Water	Secondary Inorganic Contaminants	Hardness	1750	SM 2340 B	20003401	12/8/2006
Drinking Water	Secondary Inorganic Contaminants	Salinity	1975	SM 2520 B	20004006	8/3/2012
Drinking Water	Secondary Inorganic Contaminants	Residue-filterable (TDS)	1955	SM 2540 C	20004404	10/26/2009
Drinking Water	Secondary Inorganic Contaminants	Total dissolved solids	1705	SM 2540 C	20004404	2/28/2008
Drinking Water	Secondary Inorganic Contaminants	pH	1900	SM 4500-H+-B	20016404	2/28/2008
Drinking Water	Synthetic Organic Contaminants	1,2-Dibromo-3-chloropropane (DBCP)	4570	EPA 504.1	10082607	4/4/2002
Drinking Water	Synthetic Organic Contaminants	1,2-Dibromoethane (EDB, Ethylene dibromide)	4585	EPA 504.1	10082607	4/4/2002
Drinking Water	Synthetic Organic Contaminants	Chlordane (tech.)	7250	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Endrin	7540	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Heptachlor	7685	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Heptachlor epoxide	7690	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Hexachlorobenzene	6275	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Hexachlorocyclopentadiene	6285	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Methoxychlor	7810	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	PCBs	8870	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Toxaphene (Chlorinated camphene)	8250	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	7120	EPA 508	10085004	3/24/2005
Drinking Water	Synthetic Organic Contaminants	2,4-D	8545	EPA 515.3	10088207	3/29/2006
Drinking Water	Synthetic Organic Contaminants	Dalapon	8555	EPA 515.3	10088207	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	8620	EPA 515.3	10088207	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Pentachlorophenol	6605	EPA 515.3	10088207	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Picloram	8645	EPA 515.3	10088207	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Silvex (2,4,5-TP)	8650	EPA 515.3	10088207	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Alachlor	7005	EPA 525.2	10089608	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Atrazine	7065	EPA 525.2	10089608	3/24/2005
Drinking Water	Synthetic Organic Contaminants	Benzo(a)pyrene	5580	EPA 525.2	10089608	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Di(2-ethylhexyl)adipate	6062	EPA 525.2	10089608	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Simazine	8125	EPA 525.2	10089608	3/24/2005
Drinking Water	Synthetic Organic Contaminants	bis(2-Ethylhexyl) phthalate (DEHP)	6255	EPA 525.2	10089608	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Carbofuran (Furadan)	7205	EPA 531.1	10090809	4/19/2005
Drinking Water	Synthetic Organic Contaminants	Oxamyl	7940	EPA 531.1	10090809	2/25/2015
Drinking Water	Synthetic Organic Contaminants	Glyphosate	9411	EPA 547	10091802	4/30/2008
Drinking Water	Synthetic Organic Contaminants	Endothall	7525	EPA 548.1	10092601	1/21/2005
Drinking Water	Synthetic Organic Contaminants	Diquat	9390	EPA 549.2	10093206	4/19/2005
Drinking Water	Synthetic Organic Contaminants	Total haloacetic acids (HAA5)	9414	EPA 552.2	10095600	1/21/2005

Appendix G

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

DWSRF Planning and Design Loan Application

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

STATE REVOLVING LOAN PROGRAM FOR DRINKING WATER FACILITIES

LOAN APPLICATION

TOWN OF ORANGE PARK | DW10011

Florida Department of Environmental Protection
State Revolving Fund Program
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399-3000

TABLE OF CONTENTS

	Page Number
LOAN APPLICATION	
(1) SUBMITTAL	1
(2) COMPLETING THE APPLICATION	1
(3) ASSISTANCE	1
PART I - ADMINISTRATIVE INFORMATION	
(1) PROJECT SPONSOR	1
(2) AUTHORIZED REPRESENTATIVE	1
(3) PRIMARY CONTACT	1
(4) ADDITIONAL CONTACTS	1
(5) PROJECT NUMBER	1
(6) INTERIM FINANCING	1
PART II - PROJECT INFORMATION	
A. PRECONSTRUCTION PROJECT	
(1) ACTIVITIES	2
(2) SCHEDULE	2
(3) COST	2
B. CONSTRUCTION PROJECT	
(1) ACTIVITIES	2
(2) SCHEDULE	3
(3) COST	3
PART III - FINANCIAL INFORMATION	
(1) PRINCIPAL	3
(2) TERMS AND REPAYMENT	3
(3) ANNUAL FUNDING LIMIT	3
(4) INFORMATION ON LIENS	3
(5) ACTUAL AND PROJECTED REVENUES	4
(6) AVAILABILITY OF PLEDGED REVENUES	4
(7) LOAN SERVICE FEE	4
PART IV - AUTHORIZATION AND ASSURANCES	
(1) AUTHORIZATION	4
(2) ASSURANCES	4
PART V - SUPPLEMENTARY INFORMATION	
SCHEDULE OF PRIOR AND PARITY LIENS	7
SCHEDULE OF ACTUAL REVENUES AND DEBT COVERAGE	8
SCHEDULE OF PROJECTED REVENUES AND DEBT COVERAGE	9
LIST OF ATTACHMENTS	10

LOAN APPLICATION

(1) SUBMITTAL. Submit the application and attachments to the Department of Environmental Protection, MS 3505, State Revolving Fund Program, Marjorie Stoneman Douglas Building, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000. The application (and supporting documentation) may be submitted electronically to the Department's Project Manager.

(2) COMPLETING THE APPLICATION.

(a) This application consists of five parts: (I) ADMINISTRATIVE INFORMATION; (II) PROJECT INFORMATION; (III) FINANCIAL INFORMATION; (IV) AUTHORIZATION AND ASSURANCES; and (V) SUPPLEMENTARY INFORMATION.

(b) All information provided on this application must be printed. Monetary amounts may be rounded.

(c) Forms and attachments to be submitted are denoted with italic print.

(3) ASSISTANCE. Completing this application may require information that can be obtained from the Drinking Water State Revolving Fund Program staff. Please email SRF_Reporting@dep.state.fl.us for assistance in completing this application.

PART I - ADMINISTRATIVE INFORMATION

(1) PROJECT SPONSOR: Town of Orange Park

Federal Employer Identification Number: 59-6000395

DUNS Number: FAKUJBW6TVX5

(2) AUTHORIZED REPRESENTATIVE (person authorized to sign or attest loan documents).

Name: Randy Anderson Title: Mayor

Telephone: (904) 477-7341 Email: randerson@townop.com

Mailing Address: 2042 Park Avenue, Orange Park, FL 32073

(3) PRIMARY CONTACT (person to answer questions regarding this application).

Name: Jarrod P. Petrohovich, P.E. Title: Project Manager

Telephone: (904) 644-0646 Email: JPetrohovich@mittauer.com

Employer: Mittauer & Associates, Inc.

Mailing Address: 580-1 Wells Road, Orange Park, FL 32073

(4) ADDITIONAL CONTACTS. If more than one additional person is to receive copies of Department correspondence, attach the information (*Attachment #* 1).

Name: Kyle Croce Title: Public Works Director

Telephone: (772) 332-6942 Email: kcroce@townop.com

Employer: Town of Orange Park

Mailing Address: 700 Ash Street, Orange Park, FL 32073

(5) PROJECT NUMBER (listed on the Department's priority list). DW10011

(6) INTERIM FINANCING. A local government project sponsor that has interim financing may be subject to certain conditions regarding such financing.

Is the project currently being funded with interim financing? ☐ Yes ☒ No

PART II – PROJECT INFORMATION

If you are applying for a planning or design loan for a project that will involve construction, complete only Subpart A below. If you are applying for a loan to construct a project that is already planned and designed, complete only Subpart B below.

A. PLANNING OR DESIGN PROJECT

Information should be provided for each separate facility to be planned and designed as appropriate. For design/build projects (not eligible for design loans) or those where multiple facilities, segments, or phases are involved, please attach information for activities, schedule, and cost for each. (*Attachment #*_____)

(1) ACTIVITIES. Attach a brief description of the scope of planning and design activities to be financed by this loan. Include a list of any engineering services to be performed. (*Attachment #*2_____) Are these activities the same as those scheduled on the *Request for Inclusion Form*? ■ Yes ☐ No. If "No", please explain. (*Attachment #*_____)

(2) SCHEDULE.

(a) Provide proposed completion dates for the items. (Please call Department staff to discuss time frames needed to complete required tasks.)

Planning documentation	06/01/205
Engineering design	08/01/2025
Certification of site availability	06/01/2025
Permitting	08/01/2025

(b) Do you anticipate that an interlocal agreement with another party will be necessary to implement the project? If "Yes", please explain. (*Attachment #*_____) ☐ Yes ☒ No

(c) Is this a design/build project? ☐ Yes ☒ No

(3) COST. Is the cost information submitted for the planning or design loan priority list current? If "No", please explain and submit revised cost information using the appropriate page of the *Request for Inclusion Form*. (Attachment #_____) Note that the disbursable amount will be limited to the priority list amount. ■ Yes ☐ No

PLANNING OR DESIGN APPLICANTS PROCEED TO PART III.

B. CONSTRUCTION PROJECT

(1) ACTIVITIES.

(a) Attach a brief description of construction activities to be financed by this loan. Include a list of the contracts (by title) corresponding to the plans and specifications accepted by the Department (*Attachment #*_____).

Are these contracts the same as those scheduled on the *Request for Inclusion Form*? ☐ Yes ☐ No

If "No", please explain. (*Attachment #*_____)

(b) Have any of the contracts been bid? ☐ Yes ☐ No

If "Yes", indicate which contracts have been bid. (*Attachment #*_____)

(c) Was planning or design for this project financed in another SRF loan? ☐ Yes ☐ No

If "Yes", give the SRF loan number. _____

(d) Does this project involve an interlocal agreement with other local governments or other entities? ☐ Yes ☐ No

If "Yes", attach a copy of the interlocal agreement. (*Attachment #*_____)

Is the interlocal agreement fully executed and enforceable? ☐ Yes ☐ No

If "No", please explain (*Attachment #*_____).

(2) SCHEDULE. (month and year)

(a) Anticipated notice to proceed for first construction contract. _____

(b) Anticipated completion of all construction contracts. _____

(3) COST. Is the cost information submitted for the priority list current? ☐ Yes ☐ No

If "No", please explain and submit revised cost information using the appropriate page of the *Request for Inclusion Form.* (*Attachment #*_____) Note that the disbursable amount will be limited to the priority list amount.

PART III - FINANCIAL INFORMATION

Estimates of the capitalized interest, interest rate, pledged revenue coverage, limitations on annual loan amounts for large projects, applicability and amount of repayment reserves, amount of the loan service fee and any other information may be obtained by contacting staff in the State Revolving Fund Management Section.

(1) PRINCIPAL. The requested amount of the loan which does not include capitalized interest is $ 148,000

Note that the disbursable amount will be limited to the priority list amount and must be consistent with the project information provided under **PART II** of this application. Also note that the capitalized interest is an inexact estimate, and it is subject to adjustment by the Department to reflect actual disbursement timing. The principal amount of the loan does not include the loan service fee.

(2) TERMS AND REPAYMENT.

(a) Loans for planning and design shall be amortized over 10 years. Construction loans to local government project sponsors are amortized over the lesser of useful life of the project or 20 years unless the project is to serve a small community qualifying as financially disadvantaged. Construction loans to financially disadvantaged small communities may be amortized over the lesser of useful life of the project or 30 years. Construction loans to non-governmental project sponsors are amortized over the lesser of the useful life of the project or 20 years. Interest charges and principal are paid semiannually.
What is the useful life of the project? 50 (years)
Over how many years would you like to amortize the loan? 10 (years)

(b) List all revenues that are to be pledged for repayment of this loan. Water and Sewer Fund

(c) Pledged revenue receipts or collections by the project sponsor must exceed the amount of the repayments due to the Department unless there are other collateral provisions. The excess revenue, or coverage, generally is 15% of each repayment.
What coverage is proposed for the loan? 15 % (coverage percentage)

(d) Is any other financial assistance being applied to this project? ☐ Yes ☒ No

If "Yes", please list. (*Attachment #*_____)

(3) ANNUAL FUNDING LIMIT. Large project funding (generally, loans in excess of $10 million) may be provided in increments pursuant to the initial loan agreement and subsequent amendments.

(4) INFORMATION ON LIENS.

(a) Describe, if applicable, all debt obligations having a prior or parity lien on the revenues pledged to repay this loan. (*Attachment #*3_____) For example: City Name, Florida, Water and Sewer System Revenue Bonds, Series 1996, issued in the amount of $10,000,000, pursuant to Ordinance No. 93-104, as amended and supplemented by Ordinance No. 96-156.

(b) Using the Part V, *Schedule of Prior and Parity Liens*, provide debt service information, if applicable, on each prior and parity obligation.

(c) For the listed obligations, provide a copy of the ordinance(s), resolution(s), official statement(s), or pages thereof, setting forth the definitions, use of proceeds, debt service schedule, pledged revenues, rate covenants, provisions for issuing additional debt, provisions for bond insurance, and debt rating. (*Attachment #*_____).

(d) Describe any other notes and loans payable from the revenues pledged to repay this loan. (*Attachment #*_____).

(5) ACTUAL AND PROJECTED REVENUES.

(a) Complete the Part V, *Schedule of Actual Revenues and Debt Coverage* for the past two fiscal years.

(b) Complete the Part V, *Schedule of Projected Revenues and Debt Coverage*, demonstrating the availability of pledged revenues for loan repayment.

(6) AVAILABILITY OF PLEDGED REVENUES. All sources must be supported by a written legal opinion. (*Attachment #*4_____) The opinion must address the following:

(a) Availability of the revenues to repay the loan.

(b) Right to increase rates at which revenues shall be collected to repay the loan.

(c) Subordination of the pledge if pledged revenues are subject to a prior or parity lien.

(7) LOAN SERVICE FEE. A loan service fee is assessed on each loan. The fee is not part of the loan. The fee along with interest thereon will be deducted from the first available repayments after the final amendment to the loan agreement.

PART IV – AUTHORIZATION AND ASSURANCES

(1) AUTHORIZATION. Provide an authorizing resolution of the Applicant's governing body or other evidence of authorization (*Attachment #*5_____) for the following:

(a) Pledging revenues to repay the loan.

(b) Designation of the Authorized Representative(s) to file this application, provide assurances, execute the loan agreement, and represent the Applicant in carrying out responsibilities (including that of requesting loan disbursements) under the loan agreement.

(2) ASSURANCES. The Applicant agrees to comply with the laws, rules, regulations, policies and conditions relating to the loan for this project. Applicants should seek further information from the Drinking Water State Revolving Fund Program staff as to the applicability of the requirements if the necessity for the assurances is of concern. Specifically, the Applicant certifies that it has complied, as appropriate, and will comply with the following requirements, as appropriate, in undertaking the Project:

(a) Assurances for capitalization grant projects.

1. Complete all facilities for which funding has been provided.

2. The Applicant is advised, pursuant to 40 CFR 35 Section 35.3575, that a number of Federal law, executive orders, and government-wide policies can apply to your project or activity that is receiving Federal financial assistance. The Applicant agrees to read those provisions regarding the application of Federal cross-cutting authorities (cross-cutters) to determine their applicability to your specific project or activity.

(b) Assurances for other projects. Please note that Florida Statutes are available at http://www.leg.state.fl.us. They are also available at the following physical address: Florida Department of State Division of Library and Information Services R.A. Gray Building 500 South Bronough Street Tallahassee, Florida 32399-0250.

1. Chapter 161, Part I, F.S., "Beach and Shore Preservation Act" and Part III, "Coastal Zone Protection Act of 1985" which regulate coastal zone construction and all activities likely to affect the condition of the beaches or shore.

2. Chapter 163, Part II, F.S., the "Local Government Comprehensive Planning and Land Development Regulation Act" which requires units of local government to establish and implement comprehensive planning programs to control future development.

3. Chapter 186, F.S., State and Regional Planning, which requires conformance of projects with Regional Plans and the State Comprehensive Plan.

4. Chapter 253, F.S., "Emergency Archaeological Property Acquisition Act of 1988" which requires protection of archaeological properties of major statewide significance discovered during construction activities.

5. Chapter 258, Part III, F.S., which requires protection of components or potential components of the national wild and scenic rivers system.

6. Chapter 267, F.S., the "Florida Historical Resources Act" which requires identification, protection, and preservation of historic properties, archaeological and anthropological sites.

7. Chapter 287, Part I, F.S., which prohibits parties convicted of public entity crimes or discrimination from participating in State-assisted projects and which requires consideration of the utilization of Minority Business Enterprises in State-assisted projects.

8. Chapter 372, F.S., the Florida Endangered and Threatened Species Act which prohibits the killing or wounding of an endangered, threatened, or special concern species or intentionally destroying their eggs or nest.

9. Chapter 373, Part IV, F.S., Florida Water Resources Act of 1972, which requires that activities on surface waters or wetlands avoid adversely affecting: public health, safety, welfare, or property; conservation of fish and wildlife, including endangered or threatened species or their habitats; navigation or the flow of water; the fishing or recreational values or marine productivity; and significant historical and archaeological resources.

10. Chapter 380, Part I, F.S., Florida Environmental Land and Water Management Act of 1972 as it pertains to regulation of developments and implementation of land and water management policies.

11. Chapter 381, F.S., Public Health, as it pertains to regulation of onsite wastewater systems.

12. Chapter 403, Part I, F.S., Florida Air and Water Pollution Control which requires protection of all waters of the state.

13. Chapter 582, F.S., Soil and Water Conservation Act which requires conformance with Water Management District's regulations governing the use of land and water resources.

14. Governor's Executive Order 95-359, which requires State Clearinghouse review of project planning documentation and intergovernmental coordination.

(c) Assurances for all projects. The loan recipient certifies that it is not listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension."

I, the undersigned Authorized Representative of the Applicant, hereby certify that all information contained herein and in the attached is true, correct, and complete to the best of my knowledge and belief. I further certify that I have been duly authorized to file the application and to provide these assurances.

Signed this 10th Day of December, 20 24

Authorized Representative _____ Randy Anderson, Mayor

(signature) *(name typed or printed)*

Attachments

PART V – SUPPLEMENTARY INFORMATION

SCHEDULE OF PRIOR AND PARITY LIENS
(EXCLUDING SRF LOANS)

List annual debt service beginning two years before the anticipated loan agreement date and continue at least three additional fiscal years. Use additional pages as necessary.

	#1	#2	#3
Identify Each Obligation	_____	_____	_____
Coverage	_____ %	_____ %	_____ %
Insured?	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No

Fiscal Year	**Annual Debt Service (Principal Plus Interest)** #1	#2	#3	**Total Debt Service**	**Total Debt Service Incl. Coverage**
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
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20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$
20	$	$	$	$	$

PART V – SUPPLEMENTARY INFORMATION

SCHEDULE OF ACTUAL REVENUES AND DEBT COVERAGE

(Provide information for the two fiscal years preceding the anticipated date of the SRF loan agreement.)

		Year 2022	Year 2023
(a)	Operating Revenues (Source)		
	Charges for Services	$4,695,885	$4,714,629
(b)	Interest Income		
(c)	Other Income or Revenue (Identify)		
(d)	Total Revenues	$4,695,885	$4,714,629
(e)	Operating Expenses (excluding interest on debt, depreciation, and other non-cash items)	$2,377,316	$2,699,554
(f)	Net Revenues [(f) = (d) – (e)]	$2,318,569	$2,015,075
(g)	Debt Service (including any required coverage)		

(h) Attach audited annual financial report(s), or pages thereof, or 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 #* 6)

(i) Attach worksheets reconciling this page with the appropriate financial statements (for example, backing out depreciation and interest payments from operating expenses). (*Attachment #* 7)

(j) If the net revenues were not sufficient to satisfy the debt service and coverage requirement, please explain what corrective action was taken. (*Attachment #*_____)

PART V – SUPPLEMENTARY INFORMATION

SCHEDULE OF PROJECTED REVENUES AND DEBT COVERAGE

Begin with the fiscal year preceding first anticipated semiannual loan payment and continue for at least three additional years. Attach a separate page for previous State Revolving Fund loans.

		Year 2024	Year 2025	Year 2026	Year 2027	Year 2028
(a)	Operating Revenue	$4,808,922	$4,905,100	$5,003,202	$5,103,266	$5,205,331
(b)	Interest Income					
(c)	Other Income or Revenue (identify)					
(d)	Total Revenues	$4,808,922	$4,905,100	$5,003,202	$5,103,266	$5,205,331
(e)	Operating Expenses (excluding interest on debt, depreciation, and other non-cash items)	$2,753,545	$2,808,616	$2,864,788	$2,922,084	$2,980,526
(f)	Net Revenues (f = d - e)	$2,055,377	$2,096,484	$2,138,414	$2,181,182	$2,224,806
(g)	Revenue (including coverage) pledged to debt service, excluding SRF loans					
(h)	Revenue (including coverage) pledged to outstanding SRF loans					
(i)	Revenue Available for this SRF Loan [(i) = (f) – (g) – (h)]	$2,055,377	$2,096,484	$2,138,414	$2,181,182	$2,224,806

(j) Identify the source of the above information and explain methods used to develop the projections (*Attachment #*8). 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.

(k) For construction loans, are the above projections consistent with the accepted financial feasibility information in the planning documents? ☐ Yes ☐ No

If "No", please explain. (*Attachment #*_____)

PART V – SUPPLEMENTARY INFORMATION

LIST OF ATTACHMENTS

LIST OF ATTACHMENTS. This application requires the submittal of *Attachments* to provide supplemental information. The application is not complete without the completed *List of Attachments*. Please list all attachments that you are including with this application form.

Attachment	Number
Additional Contacts	1
Project Description	2
Debt Obligations Section 4a	3
Written Legal Opinion	4
Authorizing Resolution	5
Financial Report Documentation	6
Reconciling Worksheet	7
Financial Projections: Methodology Overview	8

ATTACHMENT 1 - ADDITIONAL CONTACTS
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

ATTACHMENT 1 - ADDITIONAL CONTACTS
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

1)

Name: John A. Petrohovich II

Title: Project & Funding Specialist

Telephone: (904) 644-0647

Email: john.petrohovich@mittauer.com

Employer: Mittauer & Associates, Inc.

Mailing Address: 580-1 Wells Road, Orange Park, FL 32073

ATTACHMENT 2 - PROJECT DESCRIPTION
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

ATTACHMENT 2 - PROJECT DESCRIPTION
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OR ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

The Town of Orange Park, Florida, owns and operates the Public Water System (PWS ID 2101182), serving approximately 2,982 service connections. The Town seeks funding to upgrade its water infrastructure, including:

- Replacing all existing meters with an Advanced Metering Infrastructure (AMI) system.
- Addressing distribution system extension/looping and/or replacement needs to increase water pressure, eliminate dead ends, and enhance fire flow/fire suppression capabilities.

Location

- **Latitude:** 30°09'46.58"N
- **Longitude:** 81°42'09.32"W

Project Need

The current challenges include:

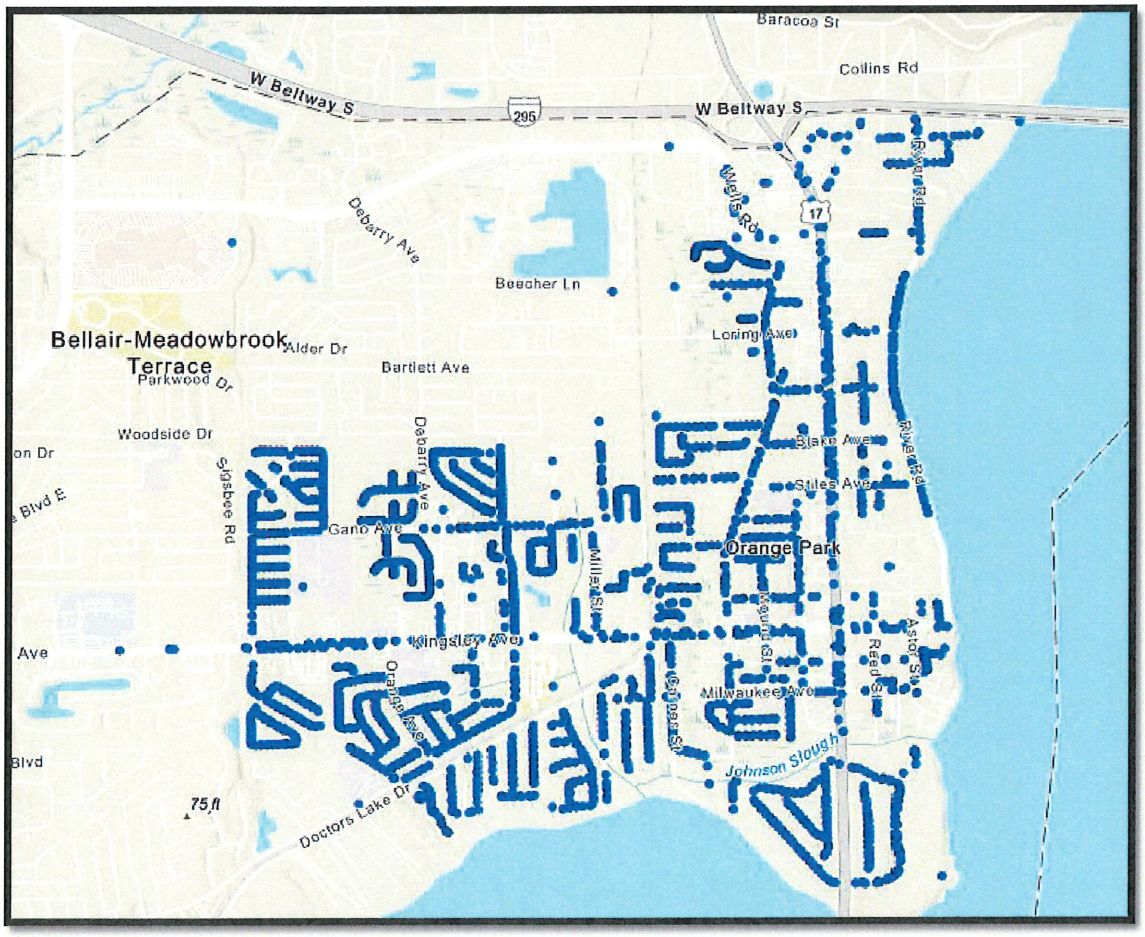
- Existing meters leading to inefficiencies and inaccuracies.
- Insufficient water pressure in certain areas.
- Presence of dead ends in the distribution system compromising water quality.

Benefits

1. **Operational Efficiency:**
    - **Hydrant Flushing:** With improved distribution system design, the need for hydrant flushing will be reduced, resulting in cost savings associated with labor and water usage.
    - **Meter Reading:** Transitioning to an AMI system will significantly reduce operational costs and improve billing accuracy.
2. **Enhanced Fire Flow and Suppression:**
    - Upgrading the distribution system will increase water pressure and flow rates, improving fire flow capabilities for enhanced fire suppression efforts and public safety.
3. **Water Quality/Quantity Improvements:**
    - Addressing dead ends and improving system looping will enhance water circulation, reducing the risk of stagnation and improving overall water quality.
    - Water loss from unmetered usage and/or faulty meters will be detected and eliminated with AMI incorporation.
4. **Community and Environmental Benefits:**

- Ensuring reliable water pressure and quality supports public health and safety, benefiting residents, businesses, and the environment.
- Sustainable infrastructure upgrades will support future growth and development in Orange Park, promoting economic stability and community resilience.
- The upgraded/replaced metering system will allow for water conservation.

The proposed upgrades aim to enhance operational efficiency, improve fire protection capabilities, ensure water quality, and support the long-term sustainability of Orange Park's water system while achieving significant cost savings and environmental benefits.



ATTACHMENT 3 - DEBT OBLIGATIONS
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

The Town of Orange Park, Florida does not currently have any outstanding debt obligations with prior or parity liens on the revenues pledged to repay this loan. As of the submission date of this loan application, there are no outstanding bonds or loans encumbering the revenue streams of the Town of Orange Park's Water and Sewer Fund.

ATTACHMENT 4 - WRITTEN LEGAL OPINION
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

TOWN of ORANGE PARK
Closer To What Matters

December 10, 2024

Ms. Angela Knecht
Program Administrator
State Revolving Fund Management
3900 Commonwealth Blvd., Mail Station 3505
Tallahassee, Florida 32399-3000

Re: DW10011 – Town of Orange Park
DWSRF Water Meter & Distribution System Improvements (Planning & Design Phase)

Dear Ms. Knecht:

I am the duly appointed Town Attorney for the Town of Orange Park, Florida (the "Town"). The Town proposes to borrow $148,000 from the State Revolving Fund to finance the preparation of a Facilities Plan and the design of a town-wide initiative to replace all existing water meters with an Advanced Metering Infrastructure (AMI) system. The project also includes improvements to the water distribution system through extensions, looping, and/or replacements to increase water pressure, eliminate dead ends, and enhance fire flow and fire suppression capabilities. The loan will be secured by the net revenues of the Town's Water and Sewer Fund, and the pledged revenues are legally available for this purpose. The Town has the legal authority to increase rates to ensure repayment of the loan.

As of the effective date of this letter and as certified by the Town's Director of Finance, there are no current pledges on the Water and Sewer Fund revenues and such revenues are not encumbered by any prior liens or outstanding debt service obligations.

Sincerely,

Lawsikia Hodges
Attorney for the Town of Orange Park

ATTACHMENT 5 - AUTHORIZING RESOLUTION
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

RESOLUTION 11-24

A RESOLUTION OF THE TOWN OF ORANGE PARK, FLORIDA, RELATING TO THE STATE REVOLVING FUND LOAN PROGRAM; MAKING FINDINGS; AUTHORIZING THE LOAN APPLICATION; AUTHORIZING THE LOAN AGREEMENT; ESTABLISHING PLEDGED REVENUES; DESIGNATING AUTHORIZED REPRESENTATIVES AND PROVIDING ASSURANCES; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; AUTHORIZING TECHNICAL AMENDMENTS; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Florida Statutes provide for loans to local government agencies to finance the planning, design, and construction of municipal potable water distribution systems; and

WHEREAS, Florida Administrative Code rules require authorization to apply for loans, to establish pledged revenues, to designate an authorized representative; to provide assurances of compliance with loan program requirements; and to enter into a loan agreement; and

WHEREAS, the State Revolving Fund loan priority list designates Project No. DW10011 as eligible for available planning and design phase funding; and

WHEREAS, the Town of Orange Park, Florida, intends to enter into a loan agreement with the Department of Environmental Protection (the "Department") under the State Revolving Fund for planning and design phase project financing;

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF ORANGE PARK, FLORIDA, AS FOLLOWS:

SECTION I. Findings. The foregoing findings are incorporated herein by reference and made a part hereof.

SECTION II. **Authorization to apply for loan**. The Town of Orange Park, Florida, is authorized to apply for a loan to finance the Planning & Design Phase of the Project. The loan application in the principal amount of $148,000.00 from the Department, which includes the project description, is attached hereto as **Exhibit 1** (the "Loan Application"). The loan is expressly subject to the terms and conditions of the Loan Application and the Department's final approval of the loan.

SECTION III. **Revenues to be pledged**. The revenues pledged for the repayment of the loan are net Water and Sewer Fund revenues.

SECTION IV. **Authorized representative**. The Mayor is hereby designated as the authorized representative to provide the assurances and commitments required by the loan application.

SECTION V. **Execution of Loan Agreement**. The Mayor is hereby designated as the authorized representative to execute the loan agreement which will become a binding obligation in accordance with its terms when signed by both parties. The Mayor is authorized to represent the Town in carrying out the Town's responsibilities under the loan agreement. The Mayor is authorized to delegate responsibility to appropriate Town staff to carry out technical, financial, and administrative activities associated with the loan agreement.

SECTION VI. **Legal Authority**. The legal authority for borrowing moneys to plan and design this Project is Florida Statutes §166.111.

SECTION VII. **Conflicts**. All Resolutions or part of Resolutions in conflict with any of the provisions of this Resolution are hereby repealed.

SECTION VIII. **Severability**. If any Section or portion of a Section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other Section or part of this Resolution.

SECTION IX. **Technical amendments**. The Mayor, as authorized representative, in consultation with the Town staff and Town Attorney, is authorized to make such technical or clerical amendments to the Loan Application as may be necessary to effectuate the purposes of this resolution. Any such technical or clerical amendments shall not increase the obligations of the Town under the Loan Application.

SECTION X. **Effective Date**. This Resolution shall become effective immediately upon its passage and adoption.

PASSED and **ADOPTED** this 10th day of December, A.D. 2024.

ATTEST

Town Clerk, Courtney Russo

Randy Anderson, Mayor

APPROVED AS TO FORM AND LEGALITY

Lawsikia Hodges, Town Attorney

ATTACHMENT 6 - FINANCIAL REPORT DOCUMENTATION
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

2022

Town of Orange Park, Florida

Financial Statements and Independent Auditor's Report

September 30, 2022

PURVIS GRAY
CERTIFIED PUBLIC ACCOUNTANTS

Additional information on the Town's capital assets can be found in Note 5 of the notes to the financial statements.

Long-term debt. At the end of fiscal year 2022, the Town had no outstanding debt. The Town's long-term debt of bonds and the Florida Department of Environmental Protection loans were paid in full in October 2015.

Under *Florida Statutes*, no debt limit margin is placed on local governments.

Additional information on the Town's long-term debt can be found in Note 6 of the notes to the financial statements of this report.

Economic Factors and Future Budgets and Rates

The State of Florida, by Constitution, does not have a state personal income tax and, therefore, the state operates primarily using sales tax revenue, gasoline tax revenue, and corporate income taxes. Local governments (cities and counties) primarily rely on property assessments combined with a limited array of authorized other taxes (sales, gasoline, utilities services, etc.) and fees (franchise, occupational license, etc.) to support their governmental activities. There are a limited number of state shared revenues and recurring and non-recurring (one time) grants from both state and federal government agencies.

- The unemployment rate as of September 30, 2022, for the municipal service area was 2.6%. This compared favorably with the state's average unemployment rate of 2.7% and with the national average unemployment rate of 3.7%.

- Since the Town is effectively built out, new construction is not expected to produce significant annual increases in property assessments. Currently, about thirty-one percent (31.0%) of the General Fund's annual revenues are from property taxes. The Town implemented a utility service tax on electricity which went into effect on April 1, 2015, and generated $863,000 in revenue in fiscal year 2022. Other current revenues are not expected to increase significantly, and many of these are beyond the Town's control. Continued diversification of revenues where possible could help to alleviate pressure on property tax rates.

- Although the Town is constantly being challenged by increasing costs for employee benefits, it does not face demand to add personnel in order to extend current levels of services to new areas.

- Public Safety-related activities, such as Police and Fire Services, make up 52.8% of the General Fund Expenditures, down from the prior year at 55.9%.

Requests for Information

This financial report is designed to provide a general overview for those with an interest in the Town's finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the Town of Orange Park, Finance Director, 2042 Park Avenue, Orange Park, Florida 32073.

TOWN OF ORANGE PARK, FLORIDA
STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN FUND NET POSITION
PROPRIETARY FUNDS
FOR THE YEAR ENDED SEPTEMBER 30, 2022

	Business-Type Activities - Enterprise Funds		
	Major Fund		
	Water and Sewer	Stormwater	Total
Operating Revenues			
Charges for Services	$ 4,695,885	$ 399,888	$ 5,095,773
Other Income	100	-	100
Total Operating Revenues	4,695,985	399,888	5,095,873
Operating Expenses			
Personnel Services	808,363	138,562	946,925
Utilities	323,306	-	323,306
Supplies, Materials, and Other	199,742	31,882	231,624
Professional and Contractual Services	64,585	60,095	124,680
General and Administrative	457,678	-	457,678
Depreciation and Amortization	1,578,103	35,949	1,614,052
Repairs and Maintenance	465,880	35,241	501,121
Insurance	57,762	-	57,762
(Total Operating Expenses)	(3,955,419)	(301,729)	(4,257,148)
Operating Income (Loss)	740,566	98,159	838,725
Non-Operating Revenues (Expenses)			
Intergovernmental	-	735,169	735,169
Investment Revenue	(57,936)	(14,675)	(72,611)
Total Non-Operating Revenues (Expenses)	(57,936)	720,494	662,558
Income Before Capital Contributions and Transfers	682,630	818,653	1,501,283
Transfers (out)	(453,000)	-	(453,000)
Change in Net Position	229,630	818,653	1,048,283
Net Position, Beginning of Year	29,287,737	1,590,852	30,878,589
Net Position, End of Year	$ 29,517,367	$ 2,409,505	$ 31,926,872

See accompanying notes.

2023

Town of Orange Park, Florida

Financial Statements and Independent Auditor's Report

September 30, 2023

PURVIS GRAY

CERTIFIED PUBLIC ACCOUNTANTS

Additional information on the Town's capital assets can be found in Note 5 of the notes to the financial statements.

Long-term debt. At the end of fiscal year 2023, the Town had no outstanding debt. The Town's long-term debt of bonds and the Florida Department of Environmental Protection loans were paid in full in October 2015.

Under *Florida Statutes*, no debt limit margin is placed on local governments.

Additional information on the Town's long-term debt can be found in Note 6 of the notes to the financial statements of this report.

Economic Factors and Future Budgets and Rates

The State of Florida, by Constitution, does not have a state personal income tax and therefore the State operates primarily using sales tax revenue, gasoline tax revenue, and corporate income taxes. Local governments (cities and counties) primarily rely on property assessments combined with a limited array of authorized other taxes (sales, gasoline, utilities services, etc.) and fees (franchise, occupational license, etc.) to support their governmental activities. There are a limited number of state shared revenues and recurring and non-recurring (one time) grants from both state and Federal government agencies.

- The unemployment rate as of September 30, 2023, for the municipal service area was 3.1%. This compared favorably with the state's average unemployment rate of 2.8% and with the national average unemployment rate of 3.8%.

- Since the Town is effectively built out, new construction is not expected to produce significant annual increases in property assessments. Currently, about thirty-one percent (33.0%) of the General Fund's annual revenues are from property taxes. The Town implemented a utility service tax on electricity which went into effect on April 1, 2015, and generated $839,000 in revenue in fiscal year 2023. Other current revenues are not expected to increase significantly, and many of these are beyond the Town's control. Continued diversification of revenues where possible could help to alleviate pressure on property tax rates.

- Although the Town is constantly being challenged by increasing costs for employee benefits, it does not face demand to add personnel in order to extend current levels of services to new areas.

- Public Safety-related activities, such as Police and Fire Services, make up 54.2% of the General Fund Expenditures, up from the prior year at 52.8%.

Requests for Information

This financial report is designed to provide a general overview for those with an interest in the Town's finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the Town of Orange Park, Finance Director, 2042 Park Avenue, Orange Park, Florida 32073.

TOWN OF ORANGE PARK, FLORIDA
STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN FUND NET POSITION
PROPRIETARY FUNDS
FOR THE YEAR ENDED SEPTEMBER 30, 2023

	Business-Type Activities - Enterprise Funds		
	Major Fund		
	Water and Sewer	Stormwater	Total
Operating Revenues			
Charges for Services	$ 4,714,629	$ 399,794	$ 5,114,423
Other Income	123	375	498
Total Operating Revenues	4,714,752	400,169	5,114,921
Operating Expenses			
Personnel Services	1,000,197	198,841	1,199,038
Utilities	307,924	-	307,924
Supplies, Materials, and Other	172,680	32,463	205,143
Professional and Contractual Services	62,980	17,249	80,229
General and Administrative	553,703	-	553,703
Depreciation and Amortization	1,618,671	47,839	1,666,510
Repairs and Maintenance	534,435	53,005	587,440
Insurance	67,635	-	67,635
(Total Operating Expenses)	(4,318,225)	(349,397)	(4,667,622)
Operating Income (Loss)	396,527	50,772	447,299
Non-Operating Revenues (Expenses)			
Intergovernmental	-	29,314	29,314
Investment Revenue	28,206	(101)	28,105
Total Non-Operating Revenues (Expenses)	28,206	29,213	57,419
Income Before Capital Contributions and Transfers	424,733	79,985	504,718
Transfers (out)	(456,400)	-	(456,400)
Change in Net Position	(31,667)	79,985	48,318
Net Position, Beginning of Year	29,517,367	2,409,505	31,926,872
Net Position, End of Year	$ 29,485,700	$ 2,489,490	$ 31,975,190

See accompanying notes.

ATTACHMENT 7 - RECONCILING WORKSHEET
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

The Town of Orange Park's Schedule of Actual Revenues and Debt Coverage is based on the Town's FY 2022 and 2023 Audits and associated Financial Statements. Attachment No. 6 includes the pertinent information from each Audit describing where the revenues and expenses were derived from. All items listed on this Schedule were pulled directly from each FY's Statement of Revenues, Expenses, and Changes in Fund Net Position for the Proprietary Fund. The Operating Expenses line item was adjusted to back out depreciation.

ATTACHMENT 8 - FINANCIAL PROJECTIONS: METHODOLOGY OVERVIEW
DWSRF WATER METER & DISTRIBUTION SYSTEM IMPROVEMENTS
(PLANNING & DESIGN PHASE)
TOWN OF ORANGE PARK, FLORIDA
MITTAUER & ASSOCIATES, INC. PROJECT NO. 2401-04-1
November 2024

The Town of Orange Park Financial Projections are based on an average of the historical revenues and expenses from previous years' audits. As this phase of the project focuses on Planning and Design efforts, the Town does not expect any significant changes in revenues or expenses. Accordingly, a nominal 2% increase is projected for both revenues and expenses. The Operating Expenses in previous years were determined by subtracting Depreciation from the overall Operating Expenses value.

Appendix H

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

FDEP SRF Business Plan

DRINKING WATER STATE REVOLVING FUND BUSINESS PLAN

Sponsor Name: Town of Orange Park System Population:

DWSRF Project #: DW10011 PWS ID#: 2101182

Contact Person and Title: Kyle Croce Telephone: 904-264-9565

Mailing Address: 2042 Park Avenue City: Orange Park State: FL Zip: 32040

Contact for Finance Plan (if different): Telephone:

Mailing Address: City: State: Zip:

e-mail: kcroce@townop.com Fax:

Source Type: ☒ 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
What is the frequency of water system billing?	Monthly
How often are system rates reviewed for adequacy?	Periodically
When was the last time rates were reviewed?	2018
What resources and guidance does the water system use for setting water user rates, fees or charges?	Annual audit of revenues versus expenses and reviews of current and future assets.
What is your water system 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?	$77,106

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

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

Does the water system employ the services of a professional engineer?	Yes ☒	No ☐
Are there procedures for billing and collection?	Yes ☒	No ☐
Does the system have audited financial statements?	Yes ☒	No ☐
Are there standard purchasing procedures that provide controls over expenditures?	Yes ☒	No ☐
What year will construction be completed and repayments begin (for the first project)?	2028	
What is the estimated cost of your SRF project?	$4,528,000	

Please attach a copy of the user charge ordinance.

Table 1
WATER RATE REVENUE SUMMARY

		LAST YR. (2023)	YEAR 1 (Current Year) (2024)	YEAR 2	YEAR 3		SRF Project
1.	Number of Residential Customers	2366	2364	2370	2,374		2,379
2.	Number of New Residential Service Connections	0	6	4	5		5
3.	Annual Residential Water Sales (Gallons)	144,245,000	141,979,000	143,398,224	143,685,020		143,972,390
4.	Avg Daily Residential Usage (Gal/day) (Line 3 divided by line 1 divided by 365)	167	165	166	166		166
5.	Annual Residential Water Sales ($)	932,061	907,846	933,753	947,759		961,975
6.	Average Annual Residential Bill (line 5 divided by line 1)	394	384	394	399		404
7.	Annual Residential Bill Amount Uncollected	0	0	0	0		0
8.	Total Residential Rates Collected (Line 5 minus line 7)	932,061	907,846	933,753	947,759		961,975
9.	Impact and Connection Fees per Residential Service	N/A	N/A	N/A	N/A		N/A
10.	Total Residential Impact and Connection Fees (Line 2 times line 9)	0	0	0	0		0
11.	Number of Commercial Customers	469	470	470	471		472
12.	Number of New Commercial Service Connections	1	0	1	1		1
13.	Annual Commercial Water Sales (Gallons)	175,627,000	164,383,000	170,345,010	170,685,700		171,027,071
14.	Annual Commercial Water Sales ($)	1,117,918	1,039,827	1,095,056	1,111,481		1,128,154
15.	Annual Commercial Bill Amount Uncollected	0	0	0	0		0
16.	Total Commercial/Industrial Bills Collected (Line 14 minus line 15)	1,117,918	1,039,827	1,095,056	1,111,481		1,128,154
17.	Impact and Connection Fees for Commercial Service	N/A	N/A	N/A	N/A		N/A
18.	Total Commercial Impact and Connection Fees (Line 12 times line 17)	0	0	0	0		0
19.	Bulk Water Sales	0	0	0	0		0
20.	Total Projected Water Revenue (Line 8+10+16+18+19)	2,049,979	1,947,673	2,028,808	2,059,241		2,090,129

* 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* # B-D). 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.	Year 1	Year 2 2	Year 3		SRF Project
	OPERATING REVENUES						
1	Water Rates	2,049,979	1,947,673	2,028,808	2,059,241		2,090,129
2	Fire Protection	-	-	-	-		
3	Fees and Services						
4	Interest Income						
5a	Other –						
5b	Other –						
6	**Total (Lines 1 - 5)**	2,049,979	1,947,673	2,028,808	2,059,241		2,090,129
	NON-OPERATING REVENUES						
7	Interest Income						
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 -						
15	**Total (Lines 7 - 14)**						
	OPERATING EXPENSES						
	OPERATION AND MAINTENANCE						
16	Salaries (Operators)	211,248	183,153	200,159	203,161		206,208
17	Benefits	51,033	62,751	57,745	58,612		59,491
18	Utilities	159,635	131,870	147,939	150,158		152,410
19	Chemicals & Treatment	39,714	42,400	41,673	42,298		42,932
20	Repairs and Maintenance	40,613	73,413	57,868	58,736		59,617
21	Materials, Supplies & Parts	40,964	82,032	62,420	63,357		64,307
22	Transportation	1,231	2,915	2,104	2,136		2,168
23	Purchased Water Costs						
24	Outside Services						
25	Other – Communication, Contingencies, and current charges	37,842	47,694	43,410	44,061		44,722

26	**Total (Lines 16 – 25)**	582,280	626,228	613,318	622,518		631,855
	ADMINISTRATIVE						
27	Salaries and Benefits						
28	Building Overhead						
29	Office Supplies & Postage	3,823	4,791	4,372	4,437		4,504
30	Insurance	64,396	64,563	65,447	66,428		67,425
31	Customer Billing & Collection						
32	Accounting and Legal						
33	A/E & Professional Services	3,689	19,336	11,685	11,860		12,038
34	Other - Training	1,922	4,122	3,067	3,113		3,160
35	**TOTAL (Lines27 – 34)**	73,830	92,812	72,886	73,979		75,089
36	**Net Operating Income (Line 6 minus 26 minus 35)**	1,393,869	1,228,633	1,342,605	1,362,744		1,383,185
	NON-OPERATING EXPENSES						
37	Debt-Repayment – Principal and Interest						
38	Capital Improvements Acquisition of Plant Equipment						
39	Interfund Transfers						
40	To General Fund						
41	To Replacement Fund						
42	To Emergency Fund						
43	Depreciation Expenses (If money is set aside)						
44	Other -						
45	**TOTAL (Lines 37 + 44)**						
46	**Net Non-Operating Income (Line 15 minus Line 45)**						
47	**Net Income Before Taxes (Lines 36 + 46)**	1,393,869	1,228,633	1,342,605	1,362,744		1,383,185
	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)**	1,393,869	1,228,633	1,342,605	1,362,744		1,383,185

Instructions for Completing Table 2

Identify the source of the above information and explain methods used to develop the projections (*Attachment* # B-D). 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			Insured?
#1	FDEP SRF Planning & Design Loan		No
#2	FDEP SRF Construction Loan		No
#3			
#4			
#5			

Annual Debt Service (Principal Plus Interest)

Fiscal Year	#1	#2	#3	Total Debt Service	Total Debt Service Incl. Coverage
2025	$8,702			$8,702	
2026	$8,702			$8,702	
2027	$8,702			$8,702	
2028	$8,702	$231,000		$239,702	
2029	$8,702	$231,000		$239,702	
2030	$8,702	$231,000		$239,702	
2031	$8,702	$231,000		$239,702	
2032	$8,702	$231,000		$239,702	
2033	$8,702	$231,000		$239,702	
2034	$8,702	$231,000		$239,702	
2035	$8,702	$231,000		$239,702	
2036	$8,702	$231,000		$239,702	
2037	$8,702	$231,000		$239,702	
2038		$231,000		$231,000	
2039		$231,000		$231,000	
2040		$231,000		$231,000	
2041		$231,000		$231,000	
2042		$231,000		$231,000	
2043		$231,000		$231,000	
2044		$231,000		$231,000	
2045		$231,000		$231,000	
2046		$231,000		$231,000	
2047		$231,000		$231,000	

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.)

		FY 23	FY 24	FY 25	FY 26	FY 27
(a)	Net Operating Revenues. (Table 2 line 36)	1,393,869	1,228,633	1,342,605	1,362,744	1,383,185
(b)	Debt Service (including required coverage) pledged to all prior, parity, or projected projects (last column of Table 3).	0	0	0	0	8,702
(c)	Net Revenue (= a – b)	1,393,869	1,228,633	1,333,903	1,354,042	1,374,483

(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* # C)

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

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

(k) Identify the source of the above information and explain methods used to develop the projections (Attachment # D). 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
Utility Rate Schedule	A
Financial Source Worksheets: Budgets and Utility Sales Report	B
FY ’23 and FY ’24 Financial Audits	C
Business Plan Narrative	D

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 ☒ No ☐
- System's capacity exceeds peak demand by more than 20% (Percentage - 97 %) — Yes ☒ No ☐
- System can meet peak demand without pumping at peak capacity for extended periods. — Yes ☒ No ☐
- System has an emergency plan in place to meet system demand during a shortage (natural disaster or largest pump/well out, etc.) — Yes ☒ No ☐
- System has accurate records indicating types and percentage of customers use: — Yes ☒ No ☐
Residential 43% Commercial 52% Industrial _____% Dedicated Irrigation Meter 5%
- 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 10%) — Yes ☒ No ☐

Purchase Water Systems **NA** ☒

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** ☒

- 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 ☒ No ☐
- Source water protection area provides a minimum 500 foot radius around each drinking water well — Yes ☒ 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 ☒ 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 10 minutes following disinfection and before the first user in the distribution system Yes ☒ No ☐
- Disinfection equipment is regularly inspected and maintained Yes ☒ 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 ☒ 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 ☒ 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)_____, repairs identified leaks quickly, and keeps water loss in the distribution system below 20%. Average number of leak repairs per year is 5-10 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 _____ 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: _____.

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 _____ 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 1,030,000 gals
- System's Ground 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 <u>3</u> 4 5
• Storage tanks are covered and the surrounding areas are fenced	1 2 <u>3</u> 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 <u>3</u> 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 C plant operating 0.6 hours per day.

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

Brandon Hoffman, Lead/Chief Operator, License Class: A, License Number: 0021357
George Mcriff, Operator, License Class: C, License Number: 23577

- 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	☒ connection policies	☐ main extension policies
☒ bacteriological sampling plan	☐ emergency operation plan	☒ Lead & Copper sample plan
☐ cross connection control plan	☒ record management plan	☐ TTHM
☒ general rules	☒ disconnection policy	☒ public education & outreach
☐ disaster response plan	☐ personnel policy	☐ 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

☒ System name	☒ System ID#	☒ location
☒ design flow capacity	☒ type of treatment	☒ 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

☒ a flow schematic (source to distribution)
☒ pumping capabilities (source, chemicals, and high service)
☒ storage (raw, finished water, and chemicals)
☒ system map showing location of all wells, intake structures, pumping stations, storage tanks, and the defined service area

System Operation and Control

☒ 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
☒ 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

- ☒ identification of samples and tests needed for compliance as well as for process control.
- ☒ 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)
- ☒ 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
- ☒ daily logs, maintenance records, laboratory records, monthly reports, monitoring reports, sanitary surveys, annual reports, operating cost reports, and accident reports.
- ☒ historical records (permits, standards, pumping capacity, consumption, and drawdown)
- ☒ list of equipment warranties and provisions
- ☒ specific area for filing records
- ☒ 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
- ☒ 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
- ☒ a record of data plate information on each piece of equipment maintained, this should include manufacturers' maintenance schedule for routine adjustments
- ☒ 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
- ☐ list of outside contract maintenance tasks
- ☒ 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
- ☒ stocks of spare parts, supplies, chemicals and other items vital to system operation
- ☒ a system of requisitions and/or work orders used to distribute parts, supplies, chemicals, etc. for reorder purposes

Emergency Response Program

- ☒ 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.
- ☒ safety procedures for all personnel involved in the response

☒ 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
☒ procedures for putting standby and emergency sources into active service
☒ procedures for notifying customers, the local health jurisdiction, and EPA of water quality problems
☒ 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.

☐ Detailed design criteria	☐ User Charge System	☐ Approved shop drawings
☒ Schematics	☐ Piping color codes	☐ Valve indices or schedule
☒ As-built drawings	☐ Drinking water rules/Ordinance	☒ 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: ☒ Yes ☐ No
Aquifer is: Floridan Aquifer ☐ 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) Kyle Croce

Title Public Works Director

Address 2042 Park Avenue

City Orange Park State FL Zip 32073

Phone 904-264-9565 Fax

Attachment A

Business Plan
DWSRF Water Meter Replacements
Town of Orange Park, Florida
Client No. 2401-04-1

Utility Rate Schedule

Water & Sewer Rates

The Town uses a tiered structure for determining rates. Your monthly bill will vary depending on how much water you use. The more water you use, the more you will pay. The less water you use, the less you will pay.

The water and sewage rates below are effective **November 1, 2018.**

Base Residential Rates

For homes, the base charge for water will be $16.96 per month and the base fee for sewer service will be $21.32.

Water….$16.96
Sewer….$21.32
Refuse…$32.00
Total……$70.28

W[illegible]r Usage Charges

Y[illegible]ge charges for water will be as follows:

0-4,000 gallons per month =	$2.12 per 1,000 gallons
4,001 – 8,000 gallons per month =	$2.65 per 1,000 gallons
8,001 – 12,000 gallons per month =	$3.98 per 1,000 gallons
12,001 – 20,000 gallons per month =	$5.56 per 1,000 gallons
20,000 + per month =	$7.23 per 1,000 gallons

(The cost is not cumulative, so if you use 10,000 gallons in one month, the first 4,000 gallons would be billed at $2.12, the second 4,000 gallons would be billed at $2.65 and the last 2,000 gallons would be billed at $3.98.

Sewer Usage Charges

Your usage charges for sewer will be $4.16 for every 1,000 gallons. Sewer usage charges will still be capped at 12,000 gallons per month. Maximum sewer charges will not exceed $71.25.

How Can You Save Money?

- Fix leaky toilets, sinks & faucets
- Water lawns based on minimum recommendations
- Invest in an irrigation meter
- Take a shower instead of a bath
- Run washer & dishwasher only when full
- Visit our Indoor Water Conservation page to learn great ways to conserve water and save money!
- Go to www.sjrwmd.com for even more water-saving tips.

Deposit & Fees

All residential customers starting new service will be charged a $50.00 administrative fee and a $275.00 deposit ($87.50 for water, $87.50 for sewer and $100.00 for refuse).

I will be refunded after 24 months to customers who established a "Good Credit History*." Refunds will be applied as a credit to customers account.

*"Good Credit History" means that during the preceding twenty-four (24) consecutive months, a customer: (a) never had service discontinued for delinquent payment; (b) never had a check returned for non-payment; and (c) had no more than one instance of a delinquent payment of a bill.

Commercial Rate Information

Most commercial accounts use a meter size of 3/4-inch. For this meter size, the following rates apply:

Water base charge: $16.96 per month

Water usage: $2.65 per 1,000 gallons

Sewer base charge: $21.32 per month

Sewer usage: $4.16 per 1,000 gallons

If you have a larger meter size, or need information related to installation or irrigation, please contact the Utility Billing Department at 264-9565, Option 2.

How to Start Service

To receive information on starting service for a commercial account please contact the Utility Billing Department at (904) 278-3016.

Download application here: TOWN OF ORANGE PARK UTILITY APPLICATION

Attachment B

Business Plan
DWSRF Water Meter Replacements
Town of Orange Park, Florida
Client No. 2401-04-1

Financial Source Worksheets: Budgets and Utility Sales Report

		Actual 2021-2022	Actual 2022-2023	Budget 2023-2024	Adopted Budget 2024-2025
Department: 60 - PUBLIC WORKS					
Activity: 53300 - WATER UTILITY					
Object: 10 - PERSONNEL SERVICES					
402-60-53300-12000	REGULAR SALARIES & WAGES	190,607.85	211,248.05	225,200.00	**217,100.00**
402-60-53300-12100	REG SAL/WAGES - LEAVE PAYOUT	327.27	0.00	750.00	**0.00**
402-60-53300-14000	OVERTIME	21,724.45	30,767.87	29,000.00	**29,000.00**
402-60-53300-15000	SPECIAL PAY	2,350.00	2,350.00	2,400.00	**2,400.00**
402-60-53300-21000	FICA TAXES	16,125.30	18,153.27	19,700.00	**19,025.00**
402-60-53300-22000	RETIREMENT CONTRIBUTIONS	11,129.17	11,896.56	14,100.00	**17,400.00**
402-60-53300-22100	PENSION EXPENSE	(34,857.68)	(11,337.29)	0.00	**0.00**
402-60-53300-23000	LIFE & HEALTH INSURANCE	26,216.99	28,998.42	32,400.00	**31,400.00**
402-60-53300-24000	WORKERS COMPENSATION INS	4,137.74	6,134.08	6,200.00	**8,000.00**
402-60-53300-26000	OTHER POSTEMPLOYMENT BENEFITS (OPEB)	852.23	(797.40)	0.00	**0.00**
	Object: 10 - PERSONNEL SERVICES Total:	**238,613.32**	**297,413.56**	**329,750.00**	**324,325.00**
Object: 30 - OPERATING EXPENDITURES					
402-60-53300-31000	PROF SVCS	4,446.07	2,318.52	10,990.00	**11,424.00**
402-60-53300-31005	PROF SVCS-ENGINEERING	3,690.00	0.00	1,430.00	**6,000.00**
402-60-53300-31060	PROF SVCS-COMPUTER	3,750.00	1,104.18	10,445.00	**3,750.00**
402-60-53300-31070	PROF SVCS-MEDICAL	298.00	266.00	540.00	**540.00**
402-60-53300-34010	OTHER SERVICES-LAB ANALYSES	12,867.27	15,000.00	12,500.00	**25,000.00**
402-60-53300-34040	OTHER SERVICES-UTILITY LOCATION	271.41	388.52	600.00	**701.00**
402-60-53300-40000	TRAVEL & PER DIEM	0.00	1,231.07	1,582.00	**2,500.00**
402-60-53300-41000	COMMUNICATION SERVICES	2,378.58	2,302.13	2,728.00	**5,410.00**
402-60-53300-42000	FREIGHT & POSTAGE SERVICES	571.86	749.96	850.00	**800.00**
402-60-53300-43000	UTILITY SERVICES	169,396.59	159,635.36	171,000.00	**132,000.00**
402-60-53300-44000	RENTALS & LEASES	372.33	391.38	468.00	**468.00**
402-60-53300-45010	INSURANCE-PROP/CASUALTY/AUTO/LIAB	24,915.36	29,263.35	33,700.00	**40,000.00**
402-60-53300-46010	R & M - AUTOMOTIVE	2,951.53	3,503.47	350.00	**3,000.00**
402-60-53300-46020	R & M - BUILDINGS & EQUIPMENT	15,305.95	7,097.04	20,500.00	**26,722.13**
402-60-53300-46040	R & M - OFFICE EQUIPMENT	6,446.20	6,718.93	6,800.00	**6,800.00**
402-60-53300-46080	R & M - WATER TREATMENT PLANT	7,716.64	7,187.60	15,000.00	**18,000.00**
402-60-53300-46090	R & M - WATER DIST SYSTEM	26,361.55	14,920.13	38,500.00	**36,000.00**

		Actual 2021-2022	Actual 2022-2023	Budget 2023-2024	Adopted Budget 2024-2025
402-60-53300-46150	R & M - FIRE HYDRANT	1,458.19	1,185.85	1,500.00	**3,000.00**
402-60-53300-47000	PRINTING & BINDING	1,247.84	1,650.76	1,700.00	**1,900.00**
402-60-53300-49000	OTHER CURRENT CHARGES	465.00	153.38	250.00	**280.00**
402-60-53300-49020	OTH CUR CHGS - CONV FEE	16,535.39	17,113.69	16,500.00	**20,300.00**
402-60-53300-49030	OTH CUR CHGS - SAFETY PROGRAM	305.33	759.98	1,200.00	**1,200.00**
402-60-53300-49040	CONTINGENCIES	1,477.01	1,733.40	20,000.00	**20,000.00**
402-60-53300-51000	OFFICE SUPPLIES	1,298.86	1,173.72	1,800.00	**1,800.00**
402-60-53300-52000	OPERATING SUPPLIES	3,510.46	(2,352.67)	11,425.00	**18,000.00**
402-60-53300-52010	OPER SUPPLIES - AUTOMOTIVE	500.00	653.83	700.00	**700.00**
402-60-53300-52020	OPER SUPPLIES - UNIFORMS	2,168.40	1,686.76	1,880.00	**2,160.00**
402-60-53300-52110	OPER SUPPLIES - GASOLINE	11,377.52	6,770.47	9,600.00	**7,500.00**
402-60-53300-52120	OPER SUPPLIES - DIESEL	14,283.49	4,094.55	3,700.00	**3,600.00**
402-60-53300-52150	OPER SUPPLIES-EQUIPMENT	5,845.09	4,098.49	6,000.00	**6,000.00**
402-60-53300-52560	OPER SUPPLIES - LAB SUPPLIES	2,951.25	4,267.66	7,000.00	**7,000.00**
402-60-53300-52570	OPER SUPPLIES - METER SUPPLIES	0.00	21,745.15	22,000.00	**25,000.00**
402-60-53300-52580	OPER SUPPLIES - METER REPLACEMENT	0.00	0.00	16,000.00	**20,000.00**
402-60-53300-52600	OPER SUPPLIES - CHLORINE	23,003.57	39,713.62	42,400.00	**55,260.00**
402-60-53300-54000	BOOKS, PUBLICATIONS, SUBSCRIPTIONS & MEMBERSHIPS	830.00	248.41	1,958.00	**1,308.00**
402-60-53300-55000	TRAINING	1,626.58	1,921.74	4,000.00	**5,000.00**
402-60-53300-56410	PUBLIC ASST SVCS-COMMUNITY CANOPY	0.00	0.00	1,000.00	**200.00**
402-60-53300-59000	DEPRECIATION	1,577,565.85	1,618,132.97	0.00	**0.00**
	Object: 30 - OPERATING EXPENDITURES Total:	**1,948,189.17**	**1,976,829.40**	**498,596.00**	**519,323.13**
Object: 60 - CAPITAL OUTLAY					
402-60-53300-62000	BUILDINGS	0.00	3,700.00	0.00	**0.00**
402-60-53300-62010	IMPROVEMENTS	0.00	0.00	13,000.00	**10,000.00**
402-60-53300-64000	MACHINERY & EQUIPMENT	**2,356.22**	17,146.53	9,000.00	**0.00**
	Object: 60 - CAPITAL OUTLAY Total:	**2,356.22**	**20,846.53**	**22,000.00**	**10,000.00**
Object: 90 - OTHER USES					
402-60-53300-91000	TRANSFERS-ADMINISTRATIVE CHARGE	228,838.00	247,047.00	234,095.00	**255,833.00**

		Actual 2021-2022	Actual 2022-2023	Budget 2023-2024	Adopted Budget 2024-2025
402-60-53300-93000	INTEREST - CUSTOMER DEPOSITS	26.85	33.71	30.00	**20.00**
	Object: 90 - OTHER USES Total:	**228,864.85**	**247,080.71**	**234,125.00**	**255,853.00**
	Activity: 53300 - WATER UTILITY Total:	**2,418,023.56**	**2,542,170.20**	**1,084,471.00**	**1,109,501.13**

		Actual 2022-2023	Actual 2023-2024	Budget 2024-2025	Budget 2025-2026
Department: 60 - PUBLIC WORKS					
Activity: 53300 - WATER UTILITY					
Object: 10 - PERSONNEL SERVICES					
402-60-53300-12000	REGULAR SALARIES & WAGES	211,248.05	183,152.86	217,100.00	235,300.00
402-60-53300-12100	REG SAL/WAGES - LEAVE PAYOUT	0.00	0.00	0.00	0.00
402-60-53300-14000	OVERTIME	30,767.87	32,552.20	29,000.00	36,000.00
402-60-53300-15000	SPECIAL PAY	2,350.00	1,950.00	2,400.00	2,400.00
402-60-53300-21000	FICA TAXES	18,153.27	15,655.97	19,025.00	22,600.00
402-60-53300-22000	RETIREMENT CONTRIBUTIONS	11,896.56	12,281.80	17,231.80	12,700.00
402-60-53300-22100	PENSION EXPENSE	(11,337.29)	1,717.57	0.00	0.00
402-60-53300-23000	LIFE & HEALTH INSURANCE	28,998.42	26,054.86	31,400.00	41,200.00
402-60-53300-24000	WORKERS COMPENSATION INS	6,134.08	6,595.84	8,168.20	14,200.00
402-60-53300-26000	OTHER POSTEMPLOYMENT BENEFITS (OPEB)	(797.40)	(1,406.67)	0.00	0.00
	Object: 10 - PERSONNEL SERVICES Total:	**297,413.56**	**278,554.43**	**324,325.00**	**364,400.00**
Object: 30 - OPERATING EXPENDITURES					
402-60-53300-31000	PROF SVCS	2,318.52	10,263.74	11,424.00	11,366.00
402-60-53300-31005	PROF SVCS-ENGINEERING	0.00	0.00	6,000.00	14,000.00
402-60-53300-31060	PROF SVCS-COMPUTER	1,104.18	8,314.46	24,343.25	23,647.78
402-60-53300-31070	PROF SVCS-MEDICAL	266.00	758.00	540.00	500.00
402-60-53300-34010	OTHER SERVICES-LAB ANALYSES	15,000.00	10,904.10	18,361.17	28,000.00
402-60-53300-34040	OTHER SERVICES-UTILITY LOCATION	388.52	690.01	701.00	720.00
402-60-53300-40000	TRAVEL & PER DIEM	1,231.07	2,915.18	2,500.00	2,000.00
402-60-53300-41000	COMMUNICATION SERVICES	2,302.13	3,256.19	8,268.83	8,236.00
402-60-53300-42000	FREIGHT & POSTAGE SERVICES	749.96	470.93	800.00	600.00
402-60-53300-43000	UTILITY SERVICES	159,635.36	131,869.94	132,000.00	152,000.00
402-60-53300-44000	RENTALS & LEASES	391.38	458.11	468.00	548.00
402-60-53300-45010	INSURANCE-PROP/CASUALTY/AUTO/LIAB	29,263.35	31,911.89	40,000.00	46,000.00
402-60-53300-46010	R & M - AUTOMOTIVE	3,503.47	(76.57)	6,600.00	4,000.00
402-60-53300-46020	R & M - BUILDINGS & EQUIPMENT	7,097.04	18,017.59	17,301.13	22,446.81
402-60-53300-46040	R & M - OFFICE EQUIPMENT	6,718.93	6,800.00	6,800.00	6,800.00
402-60-53300-46080	R & M - WATER TREATMENT PLANT	7,187.60	10,979.95	13,014.00	16,000.00
402-60-53300-46090	R & M - WATER DIST SYSTEM	14,920.13	37,283.09	39,265.00	40,000.00

		Actual 2022-2023	Actual 2023-2024	Budget 2024-2025	Budget 2025-2026
402-60-53300-46150	R & M - FIRE HYDRANT	1,185.85	408.71	3,000.00	2,000.00
402-60-53300-47000	PRINTING & BINDING	1,650.76	1,609.83	3,600.00	1,800.00
402-60-53300-49000	OTHER CURRENT CHARGES	153.38	201.86	280.00	280.00
402-60-53300-49020	OTH CUR CHGS - CONV FEE	17,113.69	20,741.50	20,300.00	20,300.00
402-60-53300-49030	OTH CUR CHGS - SAFETY PROGRAM	759.98	949.57	1,200.00	800.00
402-60-53300-49040	CONTINGENCIES	1,733.40	10,493.00	20,000.00	25,000.00
402-60-53300-51000	OFFICE SUPPLIES	1,173.72	1,396.33	1,800.00	1,800.00
402-60-53300-52000	OPERATING SUPPLIES	(2,352.67)	16,048.84	13,232.75	16,000.00
402-60-53300-52010	OPER SUPPLIES - AUTOMOTIVE	653.83	561.36	700.00	800.00
402-60-53300-52020	OPER SUPPLIES - UNIFORMS	1,686.76	1,735.11	2,160.00	2,700.00
402-60-53300-52110	OPER SUPPLIES - GASOLINE	6,770.47	6,530.00	7,500.00	8,000.00
402-60-53300-52120	OPER SUPPLIES - DIESEL	4,094.55	4,318.80	3,600.00	6,000.00
402-60-53300-52150	OPER SUPPLIES-EQUIPMENT	4,098.49	5,999.60	4,535.00	5,200.00
402-60-53300-52560	OPER SUPPLIES - LAB SUPPLIES	4,267.66	2,890.03	7,000.00	7,000.00
402-60-53300-52570	OPER SUPPLIES - METER SUPPLIES	21,745.15	30,210.43	24,790.00	33,000.00
402-60-53300-52580	OPER SUPPLIES - METER REPLACEMENT	0.00	13,738.24	15,400.00	10,000.00
402-60-53300-52600	OPER SUPPLIES - CHLORINE	39,713.62	42,400.00	55,260.00	52,000.00
402-60-53300-54000	BOOKS, PUBLICATIONS, SUBSCRIPTIONS & MEMBERSHI	248.41	1,314.37	1,379.00	1,323.63
402-60-53300-55000	TRAINING	1,921.74	4,122.04	5,000.00	4,000.00
402-60-53300-56410	PUBLIC ASST SVCS-COMMUNITY CANOPY	0.00	0.00	200.00	500.00
402-60-53300-59000	DEPRECIATION	1,618,132.97	1,767,212.92	0.00	0.00
	Object: 30 - OPERATING EXPENDITURES Total:	**1,976,829.40**	**2,207,699.15**	**519,323.13**	**575,368.22**
Object: 60 - CAPITAL OUTLAY					
402-60-53300-62000	BUILDINGS	3,700.00	0.00	0.00	0.00
402-60-53300-62010	IMPROVEMENTS	0.00	0.00	17,000.00	0.00
402-60-53300-64000	MACHINERY & EQUIPMENT	17,146.53	0.00	0.00	0.00
	Object: 60 - CAPITAL OUTLAY Total:	**20,846.53**	**0.00**	**17,000.00**	**0.00**
Object: 90 - OTHER USES					
402-60-53300-91000	TRANSFERS-ADMINISTRATIVE CHARGE	247,047.00	234,095.00	255,833.00	264,697.00
402-60-53300-93000	INTEREST - CUSTOMER DEPOSITS	33.71	22.74	20.00	20.00

		Actual 2022-2023	Actual 2023-2024	Budget 2024-2025	Budget 2025-2026
402-60-53300-99010	OTHER USES-BAD DEBT EXPENSE	0.00	17,798.38	0.00	0.00
	Object: 90 - OTHER USES Total:	**247,080.71**	**251,916.12**	**255,853.00**	**264,717.00**
	Activity: 53300 - WATER UTILITY Total:	**2,542,170.20**	**2,738,169.70**	**1,116,501.13**	**1,204,485.22**

Attachment C

Business Plan
DWSRF Water Meter Replacements
Town of Orange Park, Florida
Client No. 2401-04-1

FY ‘23 & ‘24 Financial Audits

Attachment D

Business Plan
DWSRF Water Meter Replacements
Town of Orange Park, Florida
Client No. 2401-04-1

Business Plan Narrative

Drinking Water SRF Business Plan
SRF Water Meter Replacements
Town of Orange Park, Florida
Client No. 2401-04-1

BUSINESS PLAN NARRATIVE DISCUSSION

The Town of Orange Park (Town) combines their water and wastewater utilities into one enterprise funds and a separate enterprise fund for stormwater utilities. This division is utilized for more accurate accounting purposes, but also to address future funding needs associated with each system. This is especially true for groundwater source water systems where the production well is also the system's high service pump and only chlorination is required for treatment. This is true for the Town's system.

The enclosed Business Plan was created based on the previous two fiscal year's budgets, actual reported values, and proposed current year's budget. Information from previous financial audits and financial records are incorporated into the evaluation as well.

The following notes are provided for the enclosed Business Plan:

- **TABLE 1 NOTES**

  - Line 1, 2, 11, 12: New water service residential and commercial connections are approximated around 0.2% per year to be conservative with past annual service connections for the Town.

  - Line 5 & 14: The Town last updated their water and sewer rates in 2018, see Attachment A. Future increases are dependent on funding requirements. Future revenue increases are based on the Town's limited population growth as it approaches buildout, and the current year's proposed budget.

- **TABLE 2 NOTES**

  - General: 'Year 2" projected values are based on the average of the previous two years values incorporating a 1.5% inflation increase. The 'Year 3' and 'SRF Project' year projections are held constant incorporating a 1.5% inflation increase depending on the revenue/expense category.

- **TABLE 3 NOTES**

  - The Debt Service for the construction loan is based on a calculated maximum principal forgiveness eligibility for the Town of 23%. The following table shows the debt service basis for obligation #1-#2:

Project Component	Total Cost	FDEP SRF Grant/Loan	Loan Terms	Semi-Annual Payment
Planning & Design	$148,000	$74,000/$74,000	10 Yr/ 2.22%	$4,351
Construction #1	$4,528,000	$1,041,440/$3,486,560	20 Yr/ 2.87%	$115,500

- The anticipated annual debt service and related impact on water system net revenues are listed on page 12. These values demonstrate the importance of grant funding to the Town for implementation of the water meter replacements project.

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

- As stated herein, the Town plans to pledge its Net Utility Revenues to current and future debt service. As shown in Table 3 and Page 11, the Town's Water & Sewer Net Revenues are sufficient to repay the project's required debt service at this time.

Appendix I

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

Public Hearing Summary and Ad Affidavit

CLAY TODAY

PUBLISHER AFFIDAVIT

PUBLISHER AFFIDAVIT
CLAY TODAY
Published Weekly
Fleming Island, Florida

STATE OF FLORIDA
COUNTY OF CLAY:

Before the undersigned authority personally appeared Hugh Osteen, who on oath says that he is the publisher of the "Clay Today" a newspaper published weekly at Fleming Island in Clay County, Florida; that the attached copy of advertisement
Being a Notice of Public Hearing

In the matter of June 2, 2026

LEGAL: 199727

Was published in said newspaper in the issues:

5/14/2026

Affiant Further says that said "Clay Today" is a newspaper published at Fleming Island, in said Clay County, Florida, and that the said newspaper Has heretofore been continuously published in said Clay County, Florida, Weekly, and has been entered as Periodical material matter at the post Office in Orange Park, in said Clay County, Florida, for period of one year next proceeding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Hugh Osteen III

Sworn to me and subscribed before me 05/14/2026

Christie Lou Wayne

CHRISTIE LOU WAYNE
MY COMMISSION # HH591294
EXPIRES: September 30, 2026

NOTARY PUBLIC, STATE OF FLORIDA

3513 US HWY 17 Fleming Island FL 32003
Telephone (904) 264-3200
FAX (904) 264-3285
E-Mail: legal@claytodayonline.com
Christie Wayne christie@osteenmediagroup.com

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the Town Council of the Town of Orange Park will hold a public hearing on Tuesday, June 2, 2026, at 7:00 PM at Town of Orange Park Meeting Council Chambers, located at 2042 Park Avenue, Orange Park, FL 32073.
The purpose of the hearing is to consider the approval of the proposed Drinking Water State Revolving Fund (DWSRF) Facilities Planning Document for the Town's Water Meter Replacement Project, funded through the Florida Department of Environmental Protection (FDEP) DWSRF program. The hearing will include a discussion of the Facilities Plan, the need for the project, proposed improvements, project alternatives, cost estimates, and the financial impact of the selected alternative.
Any member of the public interested in the proposed project is encouraged to attend. Project funding details are available from the FDEP DWSRF Loan Program at (850) 245-2118 or online at http://floridadep.gov/wra/srf/content/dwsrf-program. For local project or meeting information, please contact Orange Park Town Hall at (904) 264-9565 or visit 2042 Park Avenue, Orange Park, FL 32073.
Persons with disabilities requiring accommodations to participate in this meeting should contact Town Hall at least 24 hours in advance to request assistance.
Legal 199727 Published 5/14/2026 in Clay County's Clay Today newspaper

Appendix J

DWSRF Water Main Replacements
Town of Orange Park, Florida
2401-04-1

Adopting Resolution No. 14-26