

DRAFT

**WASTEWATER TREATMENT PLAN
FOR
CLEAN WATERWAYS ACT
CITY OF HAWTHORNE, FLORIDA**

Wastewater Treatment Facility Identification No: FLA011291

FDEP Permit No. FLA011291

FDEP Permit Expires: November 17, 2025

Prepared by:

MITTAUER & ASSOCIATES, INC.
CONSULTING ENGINEERS
Orange Park, Florida
Project No. 9608-12-1
February 2024

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I. INTRODUCTION

The City of Hawthorne (City) is located within the Orange Creek Basin Management Action Plan (BMAP) area. The Florida legislature enacted legislation (Subparagraph 403.067(7)(a)9 of the Florida Statutes) requiring local governments (counties and municipalities) to develop a wastewater treatment plan and/or an onsite sewage treatment and disposal system (OSTDS) remediation plan for those identified entities within a specified BMAP. The Florida Department of Environmental Protection (FDEP) identified communities where the domestic wastewater treatment facilities and/or OSTDS were contributors of at least 20 percent of point source or non-point source nutrient pollution or where it was determined that remediation is necessary to achieve an identified total maximum daily load (TMDL). A final order was issued on June 12, 2023, identifying BMAP's where these requirements are applicable. The specified reviewing criteria within the remediation plans are summarized as follows:

A. WASTEWATER TREATMENT PLANT (WWTP) BMAP REMEDIATION PLAN CRITERIA

1. Identify the facility's permitted capacity in average annual gallons per day.
2. Identify the facility's permitted Total Nitrogen (TN) and Total Phosphorus (TP) effluent limits.
3. Summarize the annual TN and TP loading (showing both flow and concentrations) discharged from the facility over the past five years, estimated if necessary.
4. Summarize the facility's capacity analysis, considering future growth over the next 20 years.
5. List and rank facility expansion or upgrade items necessary to meet applicable nutrient water quality requirements (for example, to meet nutrient effluent limits in BMAPs and TMDLs, section 403.064(17), Florida Statutes, requirements, or other statutory or regulatory requirements), and the estimated costs of these facility improvements.
6. A projected timeline of the dates by which the construction of any facility improvements, including new/extended sewer lines, will begin and be completed and the date by which operations of the improved facility will begin.

B. OSTDS BMAP REMEDIATION PLAN CRITERIA

1. Provide an inventory of the OSTDS (including locations, such as GIS shape files, if available, or an Excel spreadsheet with addresses and/or longitude)

within the local government's jurisdiction or service area based on the best information available.

2. An estimate of future growth in new OSTDS over the next 20 years in the local government's jurisdiction or service area (including locational information, such as GIS shape files, if available, or an Excel spreadsheet with addresses and/or longitude).
3. An inventory of OSTDS that are expected to be eliminated over the next 20 years through connection to central sewer lines of a domestic wastewater facility or other distributed wastewater system, with additional nutrient reduction (including locational information, such as GIS shape files, if available, or an Excel spreadsheet with addresses and/or longitude).
4. Identification of deadlines and interim milestones for the planning, design, and construction of new/extended central sewer lines and replacement of OSTDS by connection to the new/extended lines (including locational information, such as GIS shape files, if available, or an Excel spreadsheet with addresses and/or longitude).
5. The estimated costs associated with the projects.
6. For OSTDS that are not expected to be eliminated over the new 20 years through connection to central sewer lines, an estimate of the number of these OSTDS that will require upgrading to enhanced nutrient-reducing OSTDS or participating in a distributed wastewater treatment system with additional nutrient reduction (including location information, such as GIS shape files, if available, or an Excel spreadsheet with addresses and/or latitude and longitude) within the local government's jurisdiction, in order to meet the water quality objectives of the BMAP.
7. The estimated cost to upgrade the identified existing OSTDS to enhanced nutrient reducing systems.
8. Any other cost effective and financially feasible project necessary to achieve the nutrient load reductions for OSTDS in order to meet the water quality objectives of the BMAP, along with estimated costs, timelines, and locational information.

This Wastewater Treatment Plan summarizes responses to the above Part A criteria. The City provided information to Alachua County representatives to be included in the County's OSTDS Plan in compliance with the above Part B criteria. The DRAFT County OSTDS Plan has been submitted to FDEP separately.

II. WASTEWATER TREATMENT FACILITY

A. EXISTING FACILITY

The Hawthorne Wastewater Treatment Facility (WWTF) is designed to treat 0.200 million gallons per day (MGD) annual average daily flow (AADF) of domestic wastewater. It is a package steel WWTF. The WWTF utilizes an extended aeration biological treatment process. Reclaimed effluent is disposed of at a 0.200 MGD AADF permitted capacity, onsite rapid infiltration basin system. Disinfection is achieved through a hypochlorite solution fed through a chlorine contact chamber. The facility produces Class B biosolids through aerobic digestion and dewatering. The WWTF includes the following major components:

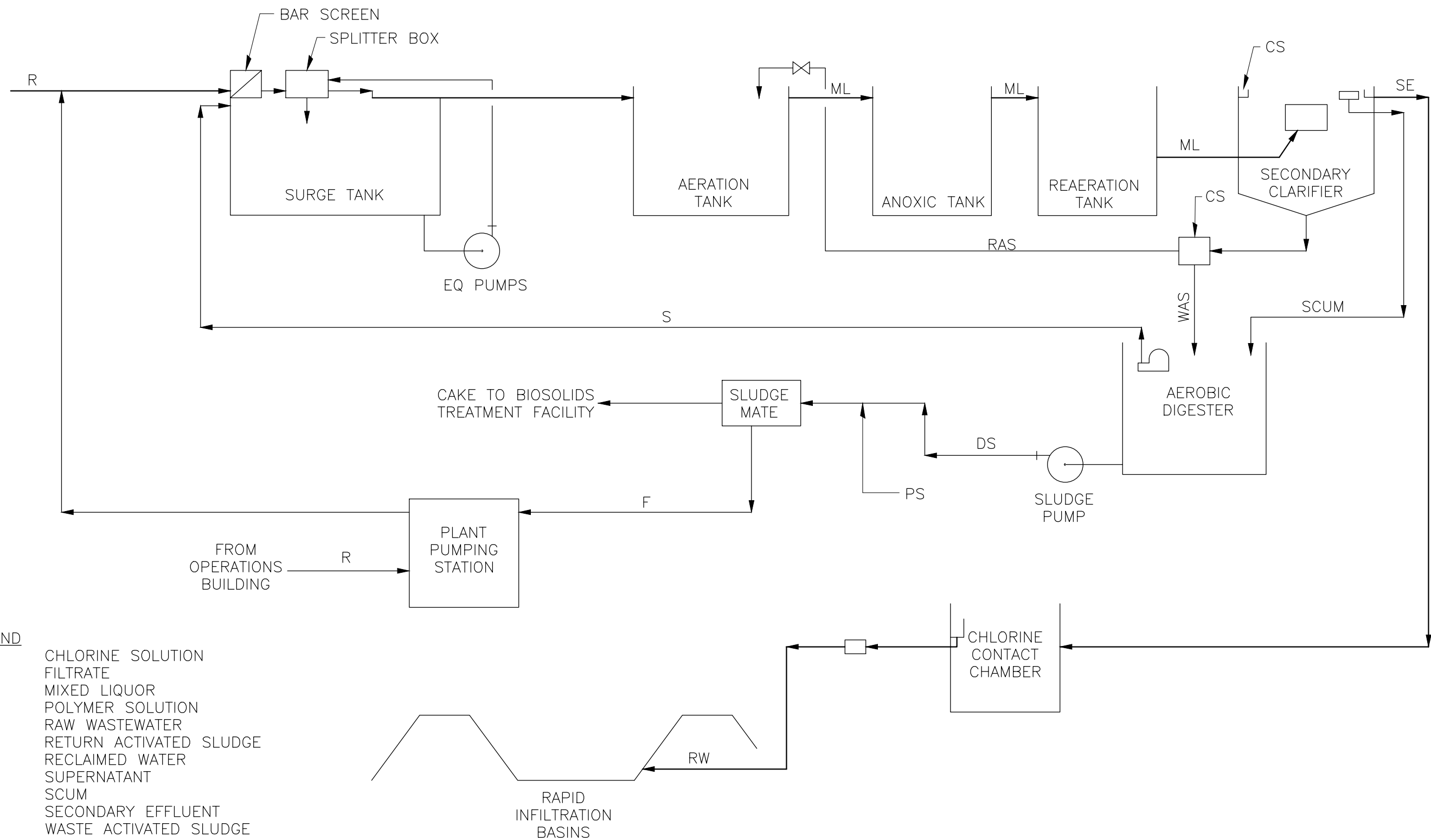
- One (1) manual bar screen;
- One (1) flow splitter box;
- One (1) circular biological treatment unit (BTU) consisting of one (1) flow equalization basin (34,306-gallons), one (1) aeration basin (138,594-gallons), one (1) anoxic basin (32,250-gallons), one (1) re-aeration basin (19,209-gallons), and one (1) aerobic digester (22,640-gallons);
- One (1) 30' diameter secondary clarifier (66,672-gallons) surrounded by the BTU basins;
- One (1) dual-compartment chlorine contact chamber (12,750-gallons);
- One (1) in-plant lift station; and
- One (1) polymer-assisted Flo Trend Sludge Mate dewatering system;

A flow schematic and site plan of the WWTF are shown in **Figures 1** and **2**, respectively.

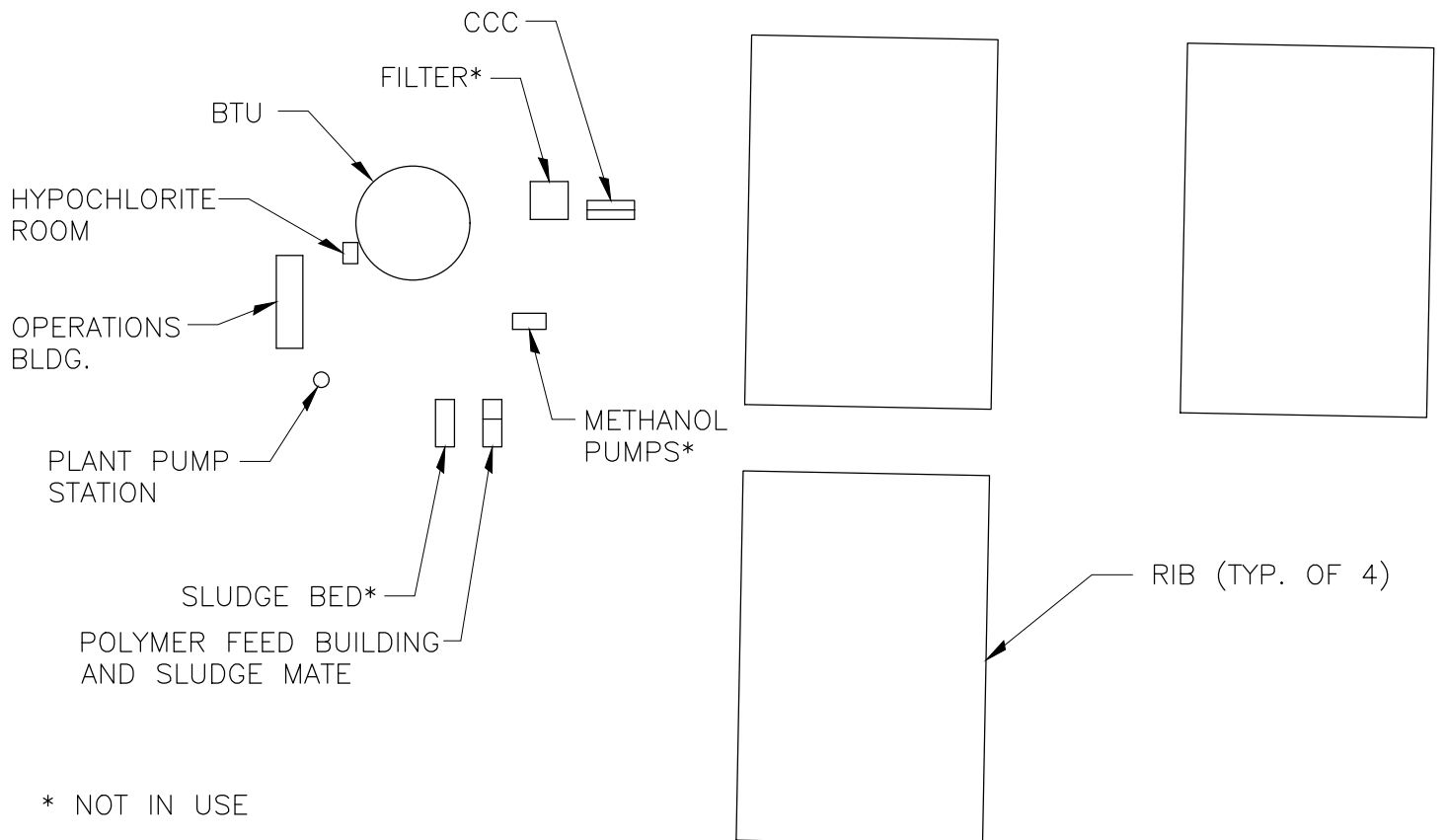
B. BMAP PLAN REQUIREMENTS

The BMAP Wastewater Treatment Plan requirements are addressed as follows:

1. **WWTF Permitted Capacity:** The facility's permitted capacity is 200,000 gallons per day (0.200 MGD) on annual average daily flow ("AADF") basis. The current flow is approximately 95,000 gallons per day (0.095 MGD) average daily flow ("ADF").
2. **Permitted Total Nitrogen and Total Phosphorus Effluent Limits:** The City is required to report maximum Nitrite plus Nitrate, Total Nitrogen, and Total Phosphorus effluent concentrations on a monthly basis based on a monthly 8-hr composite sample. TN and TP effluent limitations are not present in the current operating permit.



SCALE: 1" = 100'



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CITY OF HAWTHORNE
Site Plan
Alachua County, Florida

FIGURE
2

3. **Annual Total Nitrogen and Total Phosphorus Effluent Concentrations (AADF):** The effluent concentration for TN and TP concentrations at the WWTF are as follows:

Effluent TN (5-year Average): 18 mg/l @ 90,000 gpd

Effluent TP (5-year Average): 5.5 mg/l @ 90,000 gpd

4. **Capacity Analysis Considering Future Growth:** The Bureau of Economic and Business Research (BEBR) of the University of Florida does not have population projections for the City of Hawthorne; however, the 2023 BEBR Florida Statistical Abstract has published projections for Alachua County as shown in **Table II-1**.

TABLE II-1 POPULATION PROJECTIONS 2025 THROUGH 2045			
Year	Population (in Thousands) with Percent Change (%)		
	Low Growth	Medium Growth	High Growth
2023	293.04	293.04	293.04
2025 ^a	282.7 (-3.5%)	300.8 (+2.7%)	318.8 (+8.8%)
2030	285.3 (+0.9%)	317.0 (+5.4)	348.7 (+9.4%)
2035	284.0 (-0.5%)	329.3 (+3.9%)	374.6 (+7.4%)
2040	280.0 (-1.4%)	338.4 (+2.8%)	396.8 (+5.9%)
2045	274.8 (-1.9%)	345.6 (+2.1%)	416.5 (+5.0%)

a: Percentage change for 2025 was calculated from the Year 2023 BEBR County Estimate.

The year 2023 BEBR estimate for the City of Hawthorne and Alachua County were 1,462 and 293,040 persons, respectively.

Further increases to the WWTF flow will be dependent on development as the City's existing collection system expands the majority of the City's utility service area. The following discussion will review potential population growth trends to determine potential influences on flows. In developing the population estimate, two basic criteria will be used/assumed:

1. The wastewater service area will experience population growth equal to that of the "medium growth" projections published for Alachua 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 shown in **Table II-2**.

TABLE II-2	
PROJECTED POPULATION FOR 2025 THROUGH 2045	
Year	Population^a
2025	1,502
2030	1,583
2035	1,645
2040	1,690
2045	1,726

a: Population base change calculated from the Year 2017 BEBR Results.

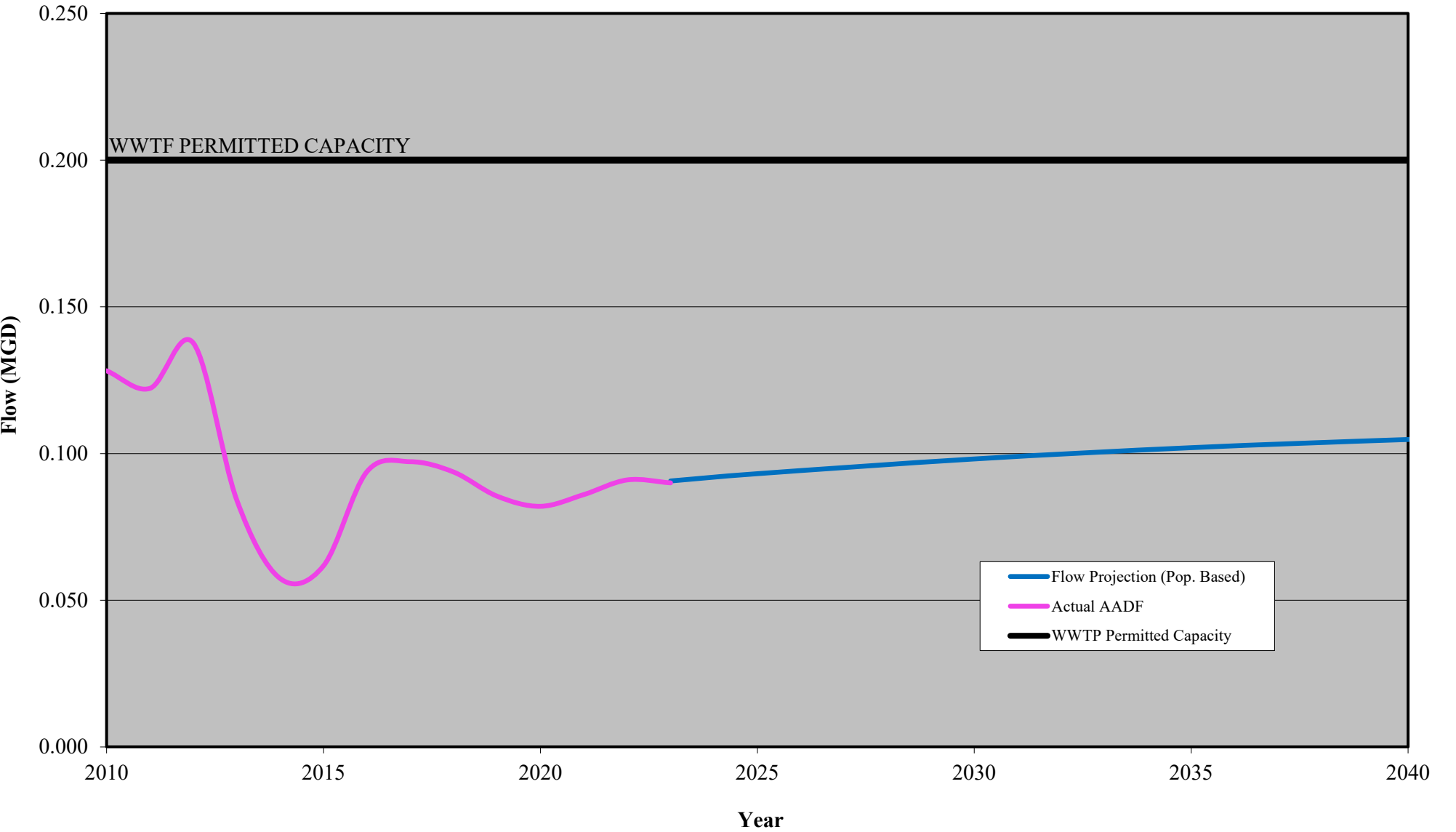
Table II-3 presents a potential flow projection. The 2023 through 2045 values are increased on a percentage basis based on the population growth shown for the medium growth projections in Alachua County. The projections will be largely influenced based on further expansion of the Town's sewer collection system since a number of existing residential connections are currently served via on-site disposal systems.

TABLE II-3		
PROJECTED FLOWS FOR 2025 THROUGH 2045		
Year	AADF (Projected)	Max TMADF (Projected)
2025	0.093	0.112
2030	0.098	0.118
2035	0.102	0.123
2040	0.105	0.126
2045	0.107	0.129

a: Max TMADF/AADF ratio of 1.2 utilized based on facility flow records.

Figure 3 depicts the AADF data graphically. With these flow projections, the capacity of the City's WWTF is not projected to be exceeded within the next 20 years pending large-scale development. It is noted the City has been contacted by developers over the previous 3 years with projected flow contributions that would trigger a WWTF expansion. The WWTF capacity was noted as the City's most limiting infrastructure component.

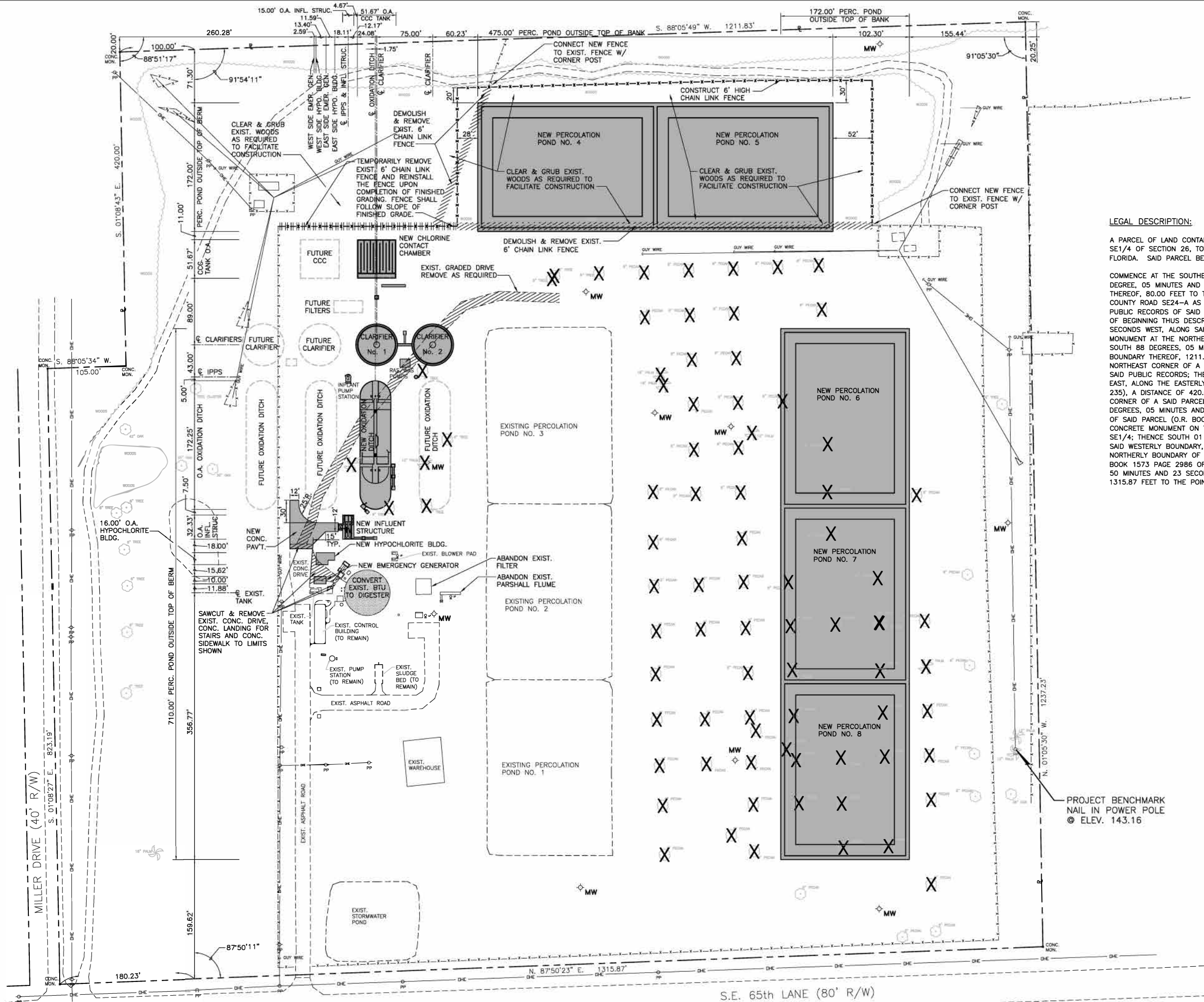
City of Hawthorne
Figure 3: Population Based Flow Projection



5. **List of Construction, Expansion, and Upgrades Required:** The existing WWTF was constructed approximately 30 years ago and contains many components nearing or exceeding their useful life expectancy. The WWTF is located in an FDEP designated Basin Management Action Plan (BMAP) area (Waterbody ID: 2713: Little Orange Creek) which has been identified for impairment by Total Nitrogen (TN) and Total Phosphorus (TP). The aged Hawthorne WWTF does not have the capability to produce an effluent quality suitable for its discharge location according to the BMAP/FDEP standards. Also, the limited WWTF capacity does not allow room for much anticipated growth.

The existing WWTF is not designed to be capable of producing Advanced Wastewater Treatment (AWT) standard effluent (3.0 mg/l TN and 1.0 mg/l TP). The City previously funded the design of a WWTF Expansion project in 2008 to expand the facility and provide the capability to produce AWT quality effluent (see proposed Site Plan in **Figure 4**). The design and permitting for this project were completed, but sufficient funding could not be secured. The City is a rural community with financial limitations. The City has continuously applied for funding of the project through various funding opportunities but has not been successful. The WWTF expansion project would provide a 0.500 MGD AADF treatment and discharge capacity and is anticipated to allow the facility to produce an average effluent TN concentration of 3 mg/l and average TP concentration of 1 mg/l. The resulting reduction in loads to the surrounding water bodies are approximately 950 lbs TP/yr and 3,000 lbs TN/yr. The project would also provide an increase to aquifer recharge through percolation ponds with an increase in capacity and flows. A current cost estimate for the construction of this project is presented in **Figure 5**.

The St. Johns River Water Management District more recently funded a rehabilitation effort of existing Hawthorne WWTF components as a temporary solution to help lower annual average TN and TP effluent concentrations towards the original facility design values (10 mg/l TN and 3 mg/l TP) and help the facility remain operational. This project includes improvements to existing screening, aeration supply, tank coating system, tank mixing capability, and clarification components. The funding amount for this project is \$1,000,000. Design and Permitting are anticipated to be complete in March 2024, with Construction estimated for Completion in December 2024 - January 2025.



LEGAL DESCRIPTION:

A PARCEL OF LAND CONTAINING 36.46 ACRES AND LYING IN THE SE1/4 OF THE SE1/4 OF SECTION 26, TOWNSHIP 10 SOUTH, RANGE 22 EAST, ALACHUA COUNTY, FLORIDA. SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE SOUTHEAST CORNER OF SAID SECTION 26 AND RUN NORTH 01 DEGREE, 05 MINUTES AND 30 SECONDS WEST, ALONG THE EASTERLY BOUNDARY THEREOF, 80.00 FEET TO THE NORTHERLY BOUNDARY OF THE RIGHT-OF-WAY OF COUNTY ROAD SE24-A AS DESCRIBED IN O.R. BOOK 1573 PAGE 2986 OF THE PUBLIC RECORDS OF SAID COUNTY FOR THE POINT OF BEGINNING. FROM POINT OF BEGINNING THUS DESCRIBED CONTINUE NORTH 01 DEGREE, 05 MINUTES AND 30 SECONDS WEST, ALONG SAID EASTERLY BOUNDARY, 1237.23 FEET TO A CONCRETE MONUMENT AT THE NORTHEAST CORNER OF SAID SE1/4 OF THE SE1/4; THENCE SOUTH 88 DEGREES, 05 MINUTES AND 49 SECONDS WEST, ALONG THE NORTHERLY BOUNDARY THEREOF, 1211.83 FEET TO A CONCRETE MONUMENT LOCATED AT THE NORTHEAST CORNER OF A PARCEL DESCRIBED IN O.R. BOOK 1129 PAGE 235 OF SAID PUBLIC RECORDS; THENCE SOUTH 01 DEGREE, 08 MINUTES AND 27 SECONDS EAST, ALONG THE EASTERLY BOUNDARY OF SAID PARCEL (O.R. BOOK 1129 PAGE 235), A DISTANCE OF 420.00 FEET TO A CONCRETE MONUMENT AT THE SOUTHEAST CORNER OF A SAID PARCEL (O.R. BOOK 1129 PAGE 235); THENCE SOUTH 88 DEGREES, 05 MINUTES AND 34 SECONDS WEST, ALONG THE SOUTHERLY BOUNDARY OF SAID PARCEL (O.R. BOOK 1129 PAGE 235), A DISTANCE OF 105.00 FEET TO A CONCRETE MONUMENT ON THE WESTERLY BOUNDARY OF SAID SE1/4 OF THE SE1/4; THENCE SOUTH 01 DEGREE, 08 MINUTES AND 27 SECONDS EAST, ALONG SAID WESTERLY BOUNDARY, 823.19 FEET TO A CONCRETE MONUMENT ON THE NORTHERLY BOUNDARY OF SAID COUNTY ROAD SE24-A AS DESCRIBED IN O.R. BOOK 1573 PAGE 2986 OF SAID PUBLIC RECORDS; THENCE NORTH 87 DEGREES, 50 MINUTES AND 23 SECONDS EAST, ALONG LAST SAID NORTHERLY BOUNDARY, 1315.87 FEET TO THE POINT OF BEGINNING.

- LEGEND
- EXISTING STRUCTURE OR BUILDING
 - NEW STRUCTURE OR PERCOLATION POND
 - FUTURE STRUCTURE
 - DEMOLISH & REMOVE EXISTING TREE

CITY OF HAWTHORNE
WWTP Expansion - Phase I
Overall Site & Horizontal Control Plan
Alachua County, Florida

JOB NO.
9608-2-1
SHEET NO.

MITTALTAUER
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DESIGNER
DRAWN
PROJECT
DATE
1 INCH

NO
DATE
BY

REVISION DESCRIPTION

CITY OF HAWTHORNE, FLORIDA
WWTP EXPANSION - PHASE I
ENGINEER'S OPINION OF PROBABLE PROJECT COST
Mittauer & Associates, Inc. Project No. 9608-12-1
08/29/23

A. CONSTRUCTION

ITEM NO.	DESCRIPTION	ESTIMATED COST
1	Mobilization & General Conditions	\$3,000,000
2	Influent Structure	\$3,000,000
3	Oxidation Ditch	\$9,000,000
4	Clarifiers (2)	\$4,000,000
5	RAS/WAS Pump Station	\$400,000
6	Chlorine Contact Chamber	\$1,500,000
7	Hypochlorite Feed System	\$250,000
8	In-Plant Pump Station	\$350,000
9	Modifications to Existing BTU	\$500,000
10	Percolation Ponds	\$1,000,000
11	Electrical & Emergency Generator	\$2,500,000
12	Sitework	\$1,000,000
13	Yard Piping	\$1,500,000
14	Miscellaneous	\$500,000
TOTAL ESTIMATED CONSTRUCTION		\$28,500,000
CONSTRUCTION CONTINGENCY (10%)		\$2,850,000
TOTAL ESTIMATED CONSTRUCTION COST		\$31,350,000

B. ENGINEERING SERVICES DURING CONSTRUCTION

ITEM NO.	DESCRIPTION	ESTIMATED COST
1	Re-permitting and Plan/Specification Updates	\$60,000
2	Bidding & Award	\$6,000
3	Project Management (\$31,350,000 x 3.0%)	\$940,500
4	Resident Observation (78 weeks x \$3,400/wk)	\$265,200
5	Start-up Services	\$15,000
6	O&M Manual	\$25,000
7	Record Drawings	\$12,700
TOTAL ESTIMATED CONSTRUCTION		\$1,324,400

TOTAL ESTIMATED PROJECT COST =	\$32,674,400
---------------------------------------	---------------------

6. **Projected Timeline for Construction:** As noted previously, the City has limited financial capabilities. Therefore, the WWTF Expansion and AWT improvements are dependent on grant funding, so a specific timeline is not available at this time.