Erie County Department of Environment and Planning
Southtowns AWTF Expansion
Project Overview for Prospective Bidders

Project Overview (PO)

PO.1 Project History, Current Status, and Implementation Approach

History: The Southtowns Advanced Wastewater Treatment Facility (AWTF) is owned by Erie County, operated and maintained by the Erie County Department of Environment and Planning (ECDEP) Division of Sewerage Management (DSM), and became operational in December 1980.

In February 2020, the New York State Department of Environmental Conservation (DEC) issued an approval letter for the expansion of the Southtowns AWTF from a peak capacity of approximately 40 million gallons per day (MGD) maximum to a peak capacity of 55 MGD, along with other regulatory driven improvements. The expansion will be implemented in two phases (i.e., Phase 1 and Phase 2) that must be completed as a requirement of the existing State Pollutant Discharge Elimination System (SPDES) permit.

Status: The ECDEP selected Arcadis as the Project engineer, who has since developed Preliminary Engineering Reports (PER) for each Phase. Bidding Documents (Drawings and Specifications) are in production and will be submitted to DEC for approval on the timeline below.

Implementation Approach: The project delivery will be via a traditional design-bid-build method. A Project Labor Agreement (PLA) is under development and is anticipated to be included in the Bidding/Contract Documents. Should the PLA be implemented, each Phase will be bid as a single prime contract.

PO.2 Anticipated Project Schedule

Major Milestones	Phase 1	Phase 2
Submit Engineering Plans and Specifications to DEC for Approval	March 2023	April 2024
Advertise for Bids	Summer 2023	Spring 2024
Award Contract and Commence Construction	Late Summer / Early Fall 2023	Fall 2024
Complete Construction	Spring 2025*	Fall 2028*

*Actual Milestones and Contract Times will be specified in the Bidding Documents

PO.3 Existing Site and Facility Information

Figure 1 presents an aerial view of the Southtowns AWTF located at S3690 Lakeshore Road in the Town of Hamburg. The AWTF is bordered by Lake Shore Road (Route 5) to the east, Lake

Erie to the west, Woodlawn Beach State Park to the north, and Hoover Road with several industrial and commercial businesses as well as some residential properties to the south. The main entrance to the AWTF is from the north in the northeast area of the AWTF. There is another “construction entrance” from the southeast from Hoover Road.

Subsurface explorations consisting of 20 borings were completed between December 2021 and February 2022, and two additional borings completed in October 2022, to document geologic conditions at the AWTF. The geotechnical engineering investigation report, including boring logs and supplemental information, will be available as supplemental information to the Bidding Documents.

The vast majority of the site lies within “Zone X”, which represents an area of minimal flood hazard. A small drainage area on the northernmost portion of the site lies within “Zone AE” with a base flood elevation of 581.00’ (NAVD-1988). The facility does not have documented history of damage due to flooding.

Figure 1. Aerial view of the Southtowns AWTF

The AWTF is currently permitted to discharge up to 16 MGD on a monthly average basis and currently includes the following main treatment processes:

- Influent screening and pumping
- High-pure oxygen activated sludge system (UNOX)
- Clarifiers
- Monomedia filtration
- Sodium hypochlorite disinfection
- Effluent pumping

Treated effluent is conveyed through a 66-inch diameter outfall prestressed concrete cylinder pipe (PCCP) to Lake Erie and discharged via 35 diffuser tees (i.e., seventy 6-inch diameter diffuser ports) starting roughly 1,200 linear feet offshore.

The AWTF also has a 7-million-gallon Overflow Retention Facility (ORF) located to the southwest of the main AWTF building. The ORF is used to store and provide the equivalent of primary treatment and disinfection with sodium hypochlorite to flows received during wet-weather events in excess of the AWTF capacity. In 2017 a chlorine contact tank (CCT) was added to the ORF to provide a minimum of 15 minutes of contact time with sodium hypochlorite at peak ORF flows. Facilities to provide the ability for dechlorination using sodium bisulfite in the future were installed but are not currently used as it could adversely impact the ability to disinfect main AWTF discharges in the portion of the shared AWTF/ORF outfall.

Figure 2 depicts the major unit processes at the AWTF. In general, flows enter the AWTF from the northeast, travel south through the UNOX reactors, west through the clarifiers and monomedia filters, and then north to the effluent pump station where they are conveyed west through the outfall to Lake Erie. Since phosphorus removal is accomplished through the addition of ferrous or ferric chloride, the existing anaerobic phosphate stripper ("phostrip") tanks between the clarifiers and monomedia filters have been taken out of service and abandoned.

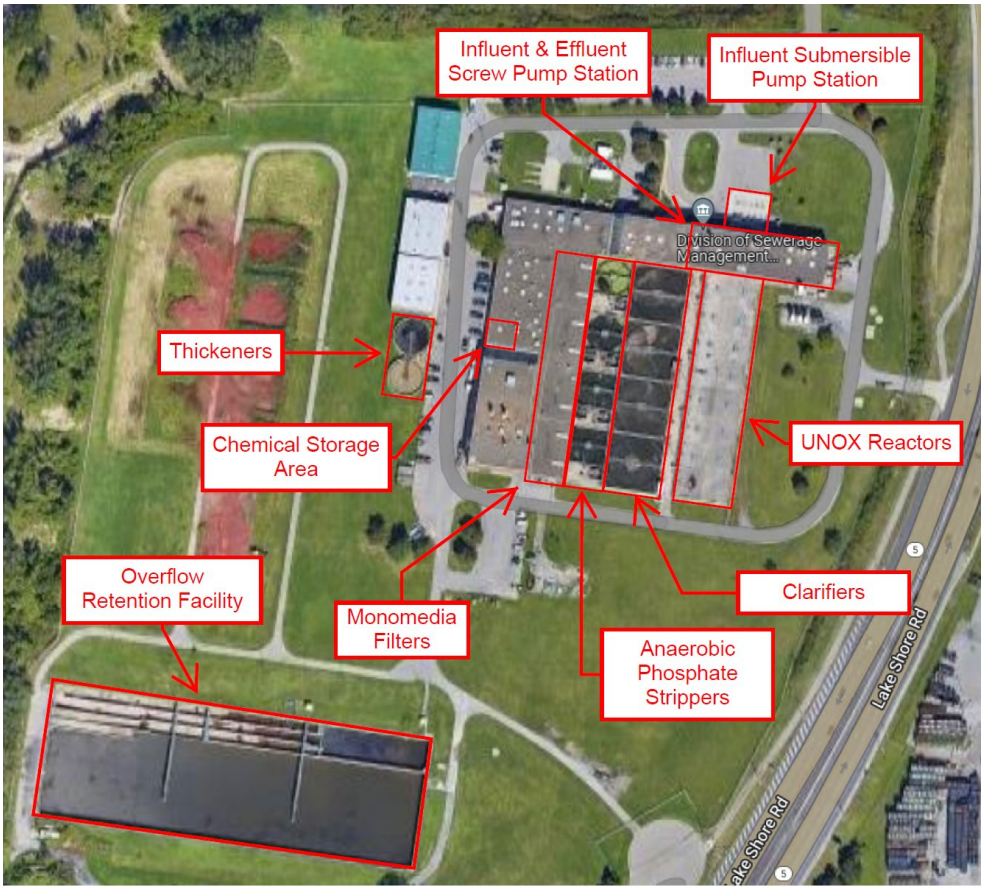


Figure 2. Aerial view of the major processes at the Southtowns AWTF

PO.4 Content of the Phases of Expansion

The process and physical elements of the capacity expansion are illustrated in Figure 3.

The two phases of the expansion are operationally independent, allowing construction to be completed on separate timelines. Phases 1 and 2 are connected from a capacity standpoint, in that the hydraulic capacity for Phase 1 must be aligned with the planned capacity for Phase 2, which is 55 MGD.

PO.4.1 Major Process and Physical Elements of Phase 1

The major elements of Phase 1 include:

- New effluent submersible pump station (ESPS).
  - Building area: Approximately 5,000 square feet.
  - Building height: Approximately 55 feet (~30 feet buried)
  - Five new ~150-horsepower (Hp) wet-pit submersible pumps with design capacity of 9,550 gallons per minute (gpm) each at 31.5 feet total dynamic head (TDH)
  - One “low flow” ~75-Hp wet-pit submersible pump with design capacity of 6,600 gpm at 25.2 feet TDH
- New chlorine contact tank (CCT).
  - Quantity of Trains: Two
  - Total Pass Length per Train: ~480 feet
  - Pass Width: 10 feet
  - Typical Side Water Depth: ~10 feet (varying with operating levels)
  - Train Volume (each): ~48,000 cubic feet
- New sodium bisulfite facilities for dechlorination.
  - New 2,100 gallon fiberglass-reinforced plastic (FRP) bulk storage tank
  - New pumping skid, including three 0.25-Hp peristaltic pumps
  - Existing fill station improvements
  - Existing containment area improvements to account for additional storage volume
- New parallel piping from the existing ORF to the existing outfall.
  - Pipe Diameter: 66-inch
  - Pipe Material of Construction: Fiberglass-Reinforced Polymer-Mortar
- Existing outfall diffusers improvements.
- New hydraulic relief point.
- New electrical substation and plant-wide generator furnished by the Owner via a Procurement Contract:
  - 15KV and 5 KV switchgear, two dry-type transformers, and unit substation
  - 2,500 KW generator, 5 KV switchgear, and load center

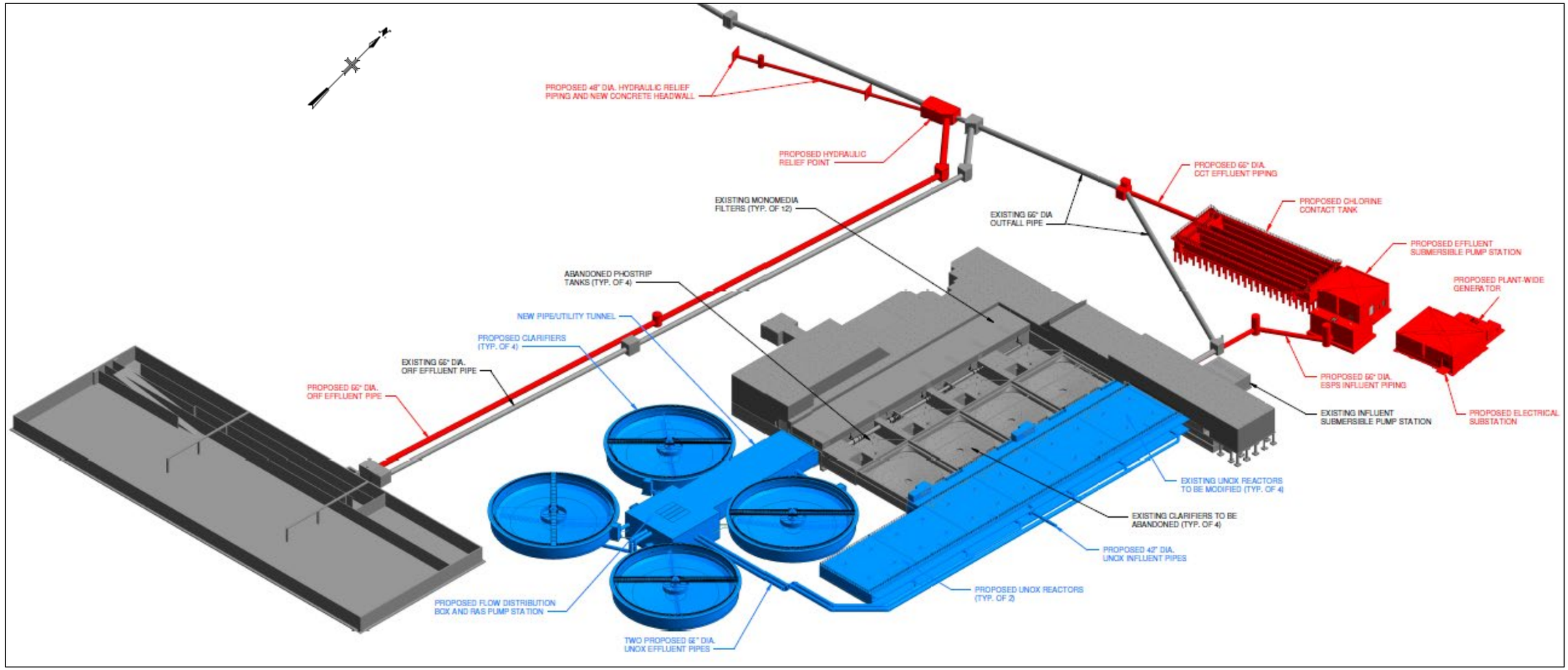


Figure 3. Image taken from Arcadis' 3D AutoCAD model showing Phase 1 improvements (in red), including the new CCT, ESPS, electrical substation, plant-wide generator, ORF effluent piping, and hydraulic relief point, and Phase 2 improvements (in blue), including four new circular clarifiers, new RAS pump station (between the clarifiers) and two new UNOX reactors. Outfall improvements in the lake and various site work features are not shown for clarity.

- New electrical support systems.
- New instrumentation and control (I&C) system and features.
- New heating, ventilating, and air conditioning (HVAC) systems for new buildings.

Phase 1 also contains numerous subcomponents and support systems (i.e., site/civil, security, architectural, structural, mechanical, electrical, I&C, and appurtenant improvements) for major project elements.

PO 4.2 Major Process and Physical Elements of Phase *2*

The major elements of Phase 2 include:

- Improvements to the four existing UNOX reactors, including structural and mechanical upgrades and changes to the flow circulation path as follows:
  - Structural: Increase effluent weir height by approximately 1.75 feet, relocate ports for UNOX reactor influent and replace support beams for new aerator
  - Mechanical: Replace surface aerators and provide new influent/effluent piping on east side of UNOX reactors
  - Flow Path: Reverse flow path to enter cell A and exit cell D over the modified effluent weirs
- Two new UNOX reactors.
  - Reactor Length: 82 feet
  - Reactor Width: 85.3 feet
  - Reactor Height: 13 feet
- New center-fed aerated flow distribution channel along the east side of the existing and new UNOX tanks.
- New piping to connect the existing and the new UNOX reactors to the new clarifier distribution box.
  - Dual 36-inch diameter headers, each conveying flow from three of the UNOX reactors
- Four new circular clarifiers with an integrated central flow distribution box and new effluent piping to convey flow from the new clarifiers to the existing monomedia filters.
  - Clarifier diameter: 145 feet
  - Clarifier Side Water depth: 14 feet
  - Spiral rakes, Stamford baffles, energy dissipating inlets (EDI), spray water in the center feed well, and full-radius scum removal
- New central return activated sludge (RAS) pump station responsible for the following:
  - Pumping RAS to just upstream of the UNOX reactors
    - Six new “large” capacity pumps with max. design flow of ~10 MGD (total)
    - Two “small” capacity pumps with max. design flow of ~1.5 MGD (total)

- Pumping WAS to the existing gravity thickener splitter box, including two new pumps to convey approximately 0.165 MGD each
- Collecting and pumping scum to the existing scum processing area, including two new scum transfer pumps and two new scum mixing pumps.

PO.5 Applicable Permits

The following permits are being obtained by the Owner. All other permits will be the responsibility of the prime contractor(s).

Joint Permit for Outfall Work in the Lake	

PO.6 Engineer's Estimate of Probable Construction Cost

The total cost of Phase 1 and Phase 2 are expected to be in excess of $100 million.

PO.7 Supplemental Information

- Engineer contact information:

  Jason Williams, PE
  Direct: 716 667 6603
  E-mail: Jason.Williams@arcadis.com

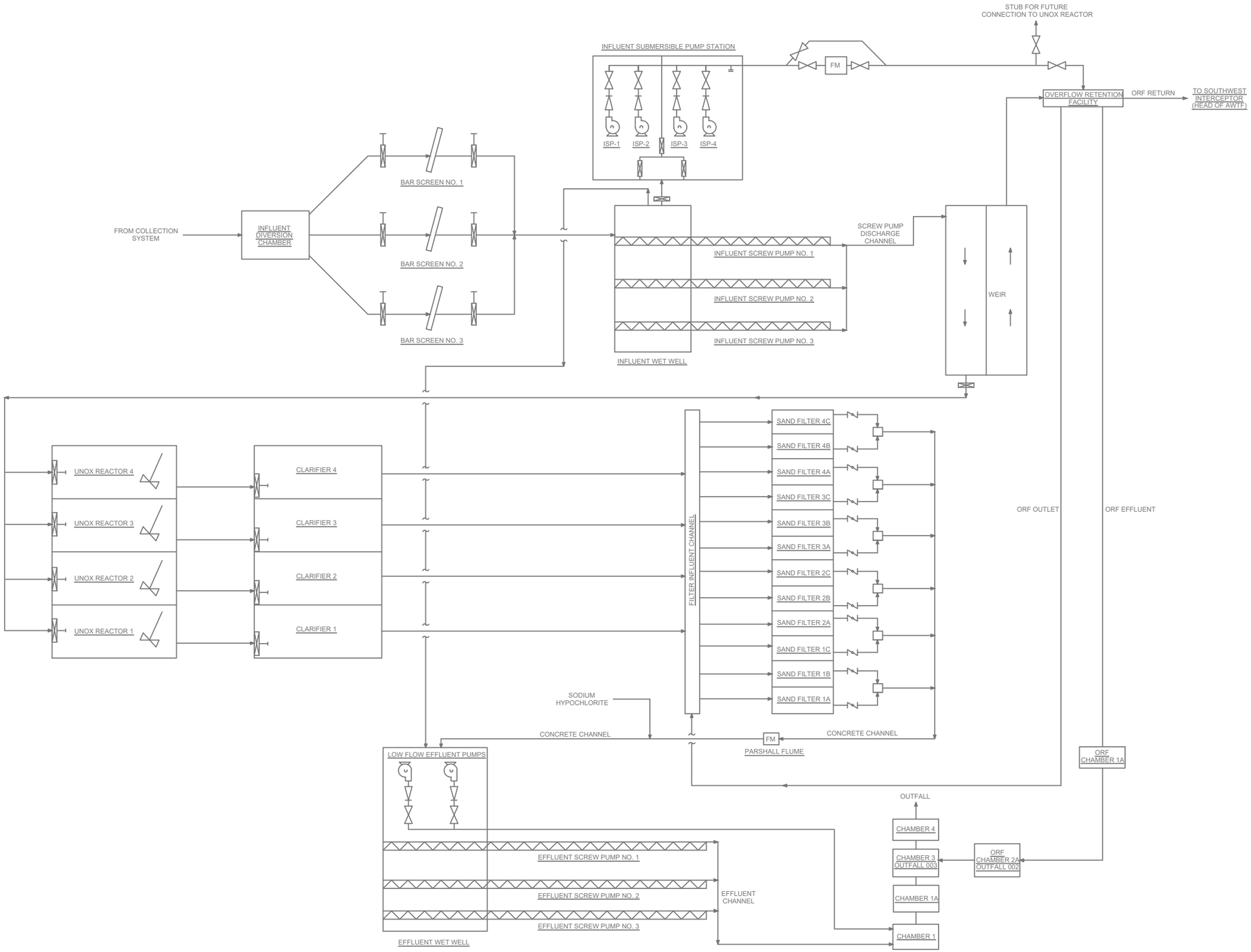
- Draft Supplemental Drawings/Sketches – Attached

PO.8 Tours and Meetings with the Owner and Engineer

An in-person open house, followed by a tour of the AWTF Work areas, hosted by the Owner and Engineer is scheduled for May 31, 2023 at the AWTF. An option to join the open house (only) portion of the meeting via Microsoft Teams will also be available. Please contact Jason Williams at the e-mail indicated above in section "PO.7" if you would like to be included on the open house invite.

Intent and Use

This information is provided solely for the convenience of the contracting community and with the sole intent of providing an overview of the project and its phases. This information should not be used for bidding or construction purposes and the Owner and Engineer accept no responsibility for any Contractor's interpretation or use of these materials. Any cost associated with the review or use of these materials or the attendance at any open house or meeting is solely the responsibility of the Contractor(s).



ERIE COUNTY DEPARTMENT OF ENVIRONMENT AND PLANNING
DIVISION OF SEWERAGE MANAGMENT

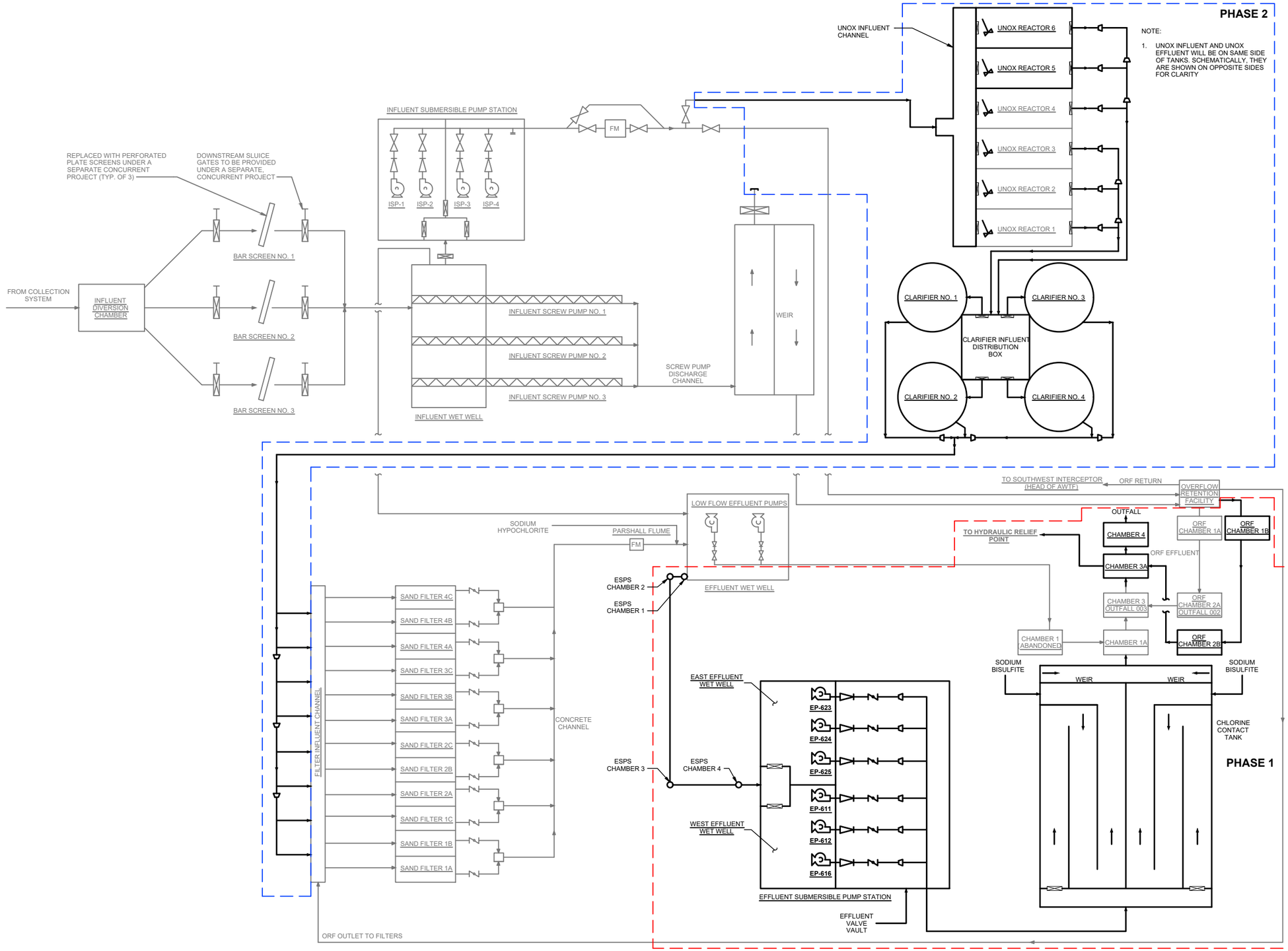
SOUTHTOWNS AWTF PHASE 1 AND 2 EXPANSION

EXISTING PROCESS FLOW DIAGRAM

NOT TO SCALE

MARCH 2023

ATTACHMENT NO. 1



ERIE COUNTY DEPARTMENT OF ENVIRONMENT AND PLANNING
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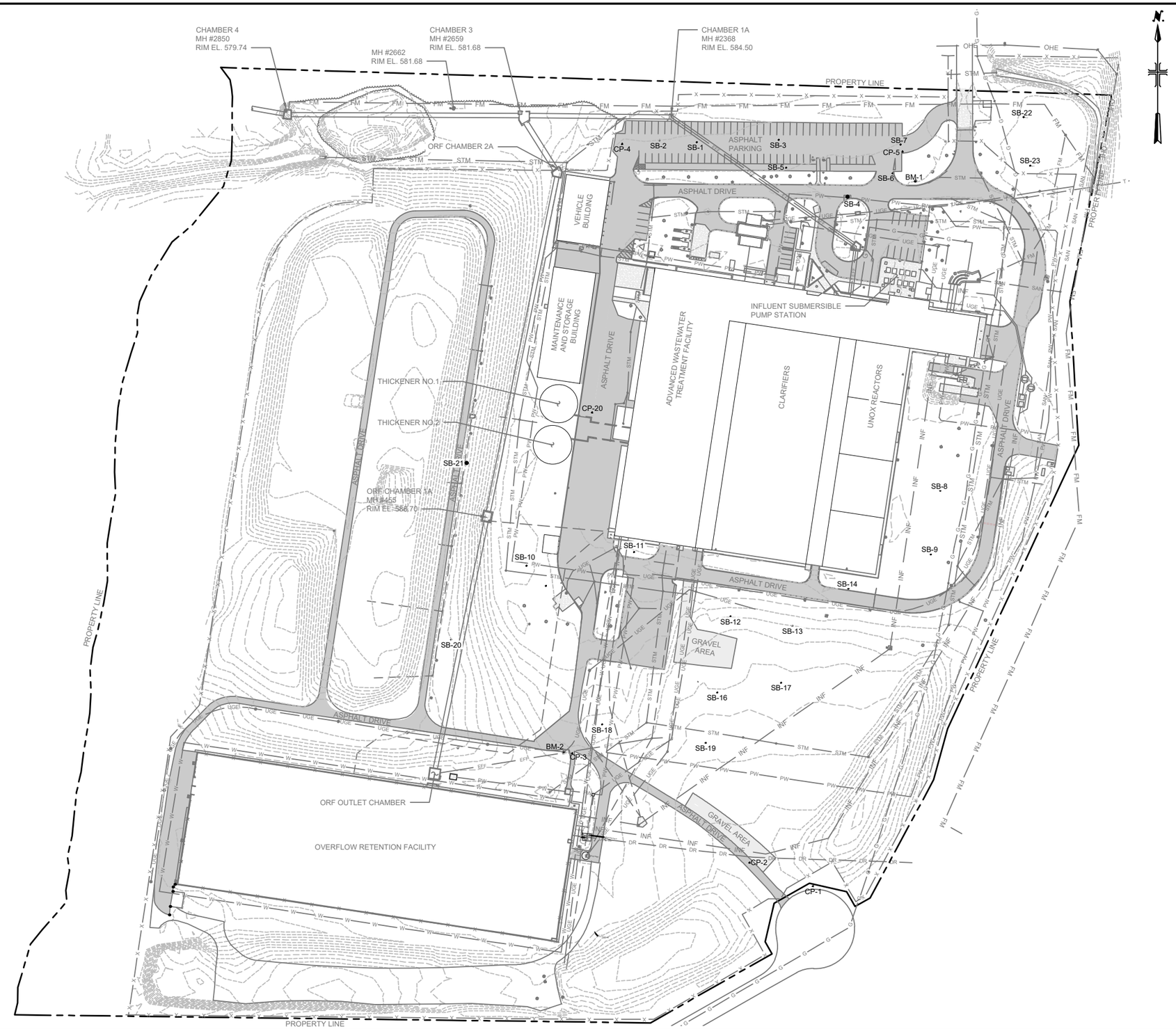
SOUTHTOWNS AWTF PHASE 1 AND 2 EXPANSION

PROPOSED PROCESS FLOW DIAGRAM

NOT TO SCALE

MARCH 2023

ATTACHMENT NO. 2



BORE HOLE LOCATIONS
VERTICAL DATUM = NAVD88 (GEOID 18)
HORIZONTAL DATUM = NAD83 (2011)

Northing	Easting	Elevation	Description
1015735.33	1077035.16	584.07	SB-7
1015691.73	1077022.92	584.38	SB-6
1015700.48	1076861.61	584.09	SB-5
1015657.38	1076954.64	583.79	SB-4
1015742.60	1076850.23	583.29	SB-3
1015741.86	1076669.53	582.99	SB-2
1015739.17	1076725.97	583.15	SB-1
1014984.18	1076353.22	594.34	SB-20
1015096.43	1076467.63	582.90	SB-10
1015065.77	1076497.01	583.37	SB-11
1014855.51	1076582.33	586.50	SB-18
1014827.59	1076739.44	590.83	SB-19
1014903.76	1076757.06	589.01	SB-16
980653.20	1076777.18	587.07	SB-12
1015005.08	1076871.15	587.18	SB-13
1014918.68	1076853.91	589.50	SB-17
1015061.52	1076955.98	584.54	SB-14
1015133.64	1077080.92	585.07	SB-9
1015210.10	1077095.66	584.52	SB-8
1015117.18	1076630.94	583.68	SB-11
1015451.11	1076411.82	596.00	SB-21
1015777.23	1077221.90	548.35	SB-22
1015703.40	1077231.74	584.51	SB-23
NOTE: SOIL BORING SB-15 DOES NOT EXIST			

SURVEY CONTROL POINTS
VERTICAL DATUM = NAVD88 (GEOID 18)
HORIZONTAL DATUM = NAD83 (2011)

CP	Northing	Easting	Elevation	Description
1	1014610.25	1076902.42	593.48	REBAR & CAP
2	1014645.82	1076806.06	592.74	MAGNAIL
3	1014811.85	1076537.20	587.20	MAGNAIL
4	1015736.43	1076613.02	583.14	MAGNAIL
5	1015725.12	1077038.44	584.24	MAGNAIL
20	1015329.09	1076567.43	583.57	MAGNAIL

SURVEY BENCHMARKS
VERTICAL DATUM = NAVD88 (GEOID 18)
HORIZONTAL DATUM = NAD83 (2011)

BM	Northing	Easting	Elevation	Description
1	1015679.58	1077057.56	584.55	SW BOLT OF LIGHT POLE
2	1014813.94	1076524.39	587.89	NE BOLT OF LIGHT POLE

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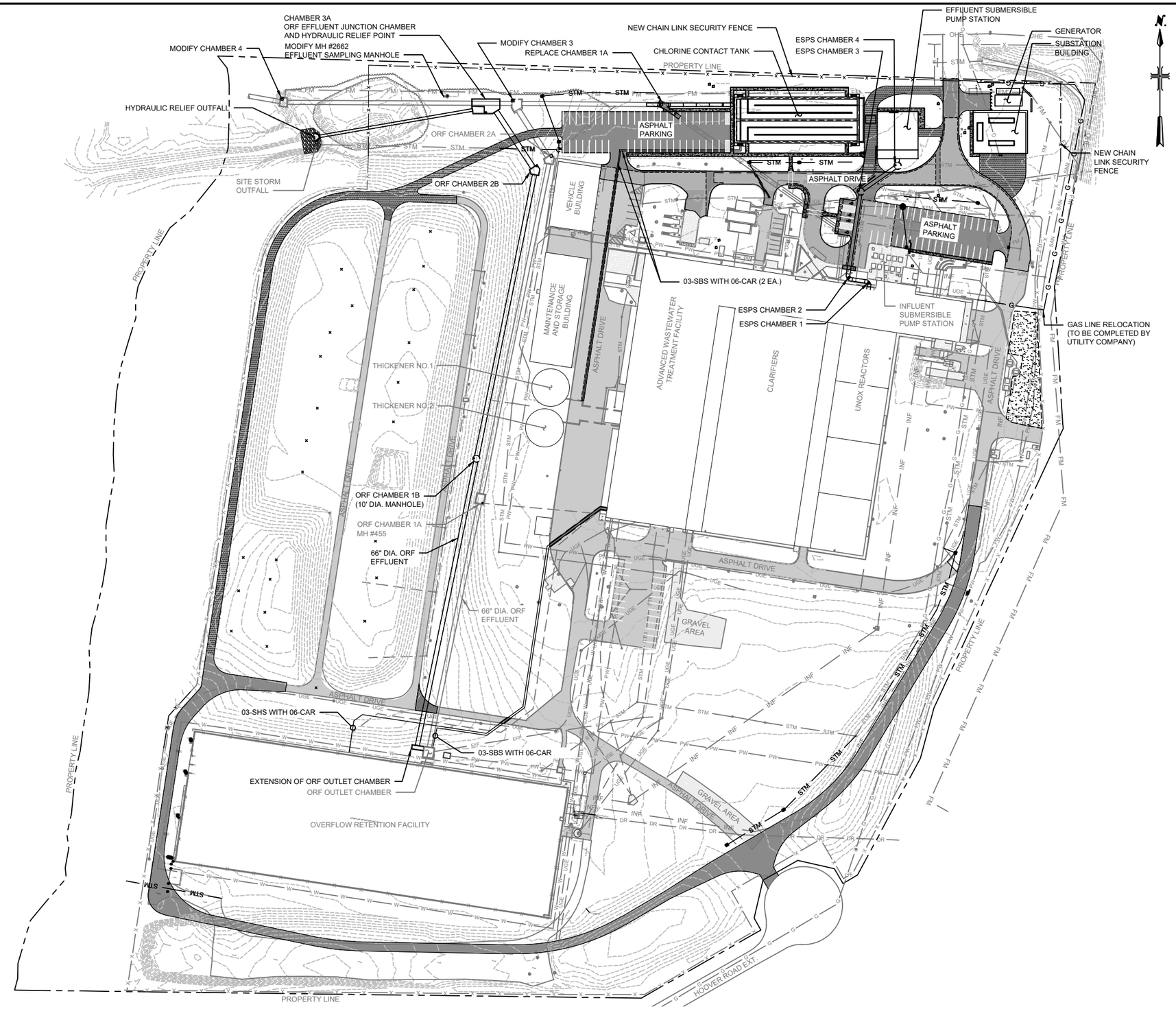
SOUTHTOWNS AWTF PHASE 1 AND 2 EXPANSION

EXISTING SITE PLAN

NOT TO SCALE

MARCH 2023

ATTACHMENT NO. 3



PAVEMENT SURFACE LEGEND:

- EXISTING PAVEMENT TO REMAIN
- NEW STANDARD DUTY ASPHALT PAVEMENT SECTION
- NEW HEAVY DUTY ASPHALT PAVEMENT SECTION
- PAVEMENT MILL AND OVERLAY
- NEW CONCRETE SIDEWALK SECTION

ERIE COUNTY DEPARTMENT OF ENVIRONMENT AND PLANNING
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ARCADIS

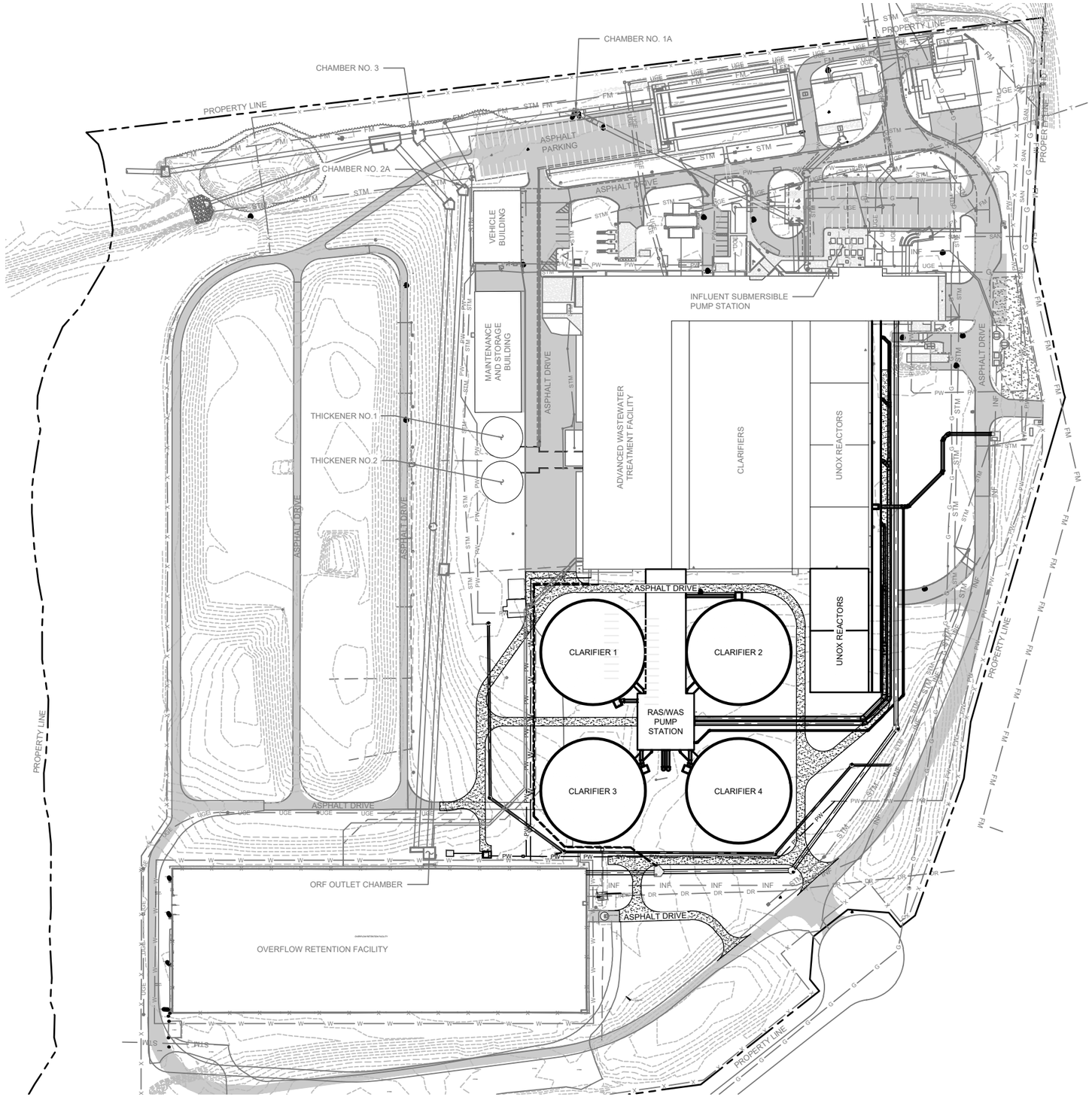
SOUTHTOWNS AWTF PHASE 1 AND 2 EXPANSION

PROPOSED PHASE 1 SITE PLAN

NOT TO SCALE

MARCH 2023

ATTACHMENT NO. 4



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SOUTHTOWNS AWTF PHASE 1 AND 2 EXPANSION

PROPOSED PHASE 2 SITE PLAN

NOT TO SCALE

MARCH 2023

ATTACHMENT NO. 5