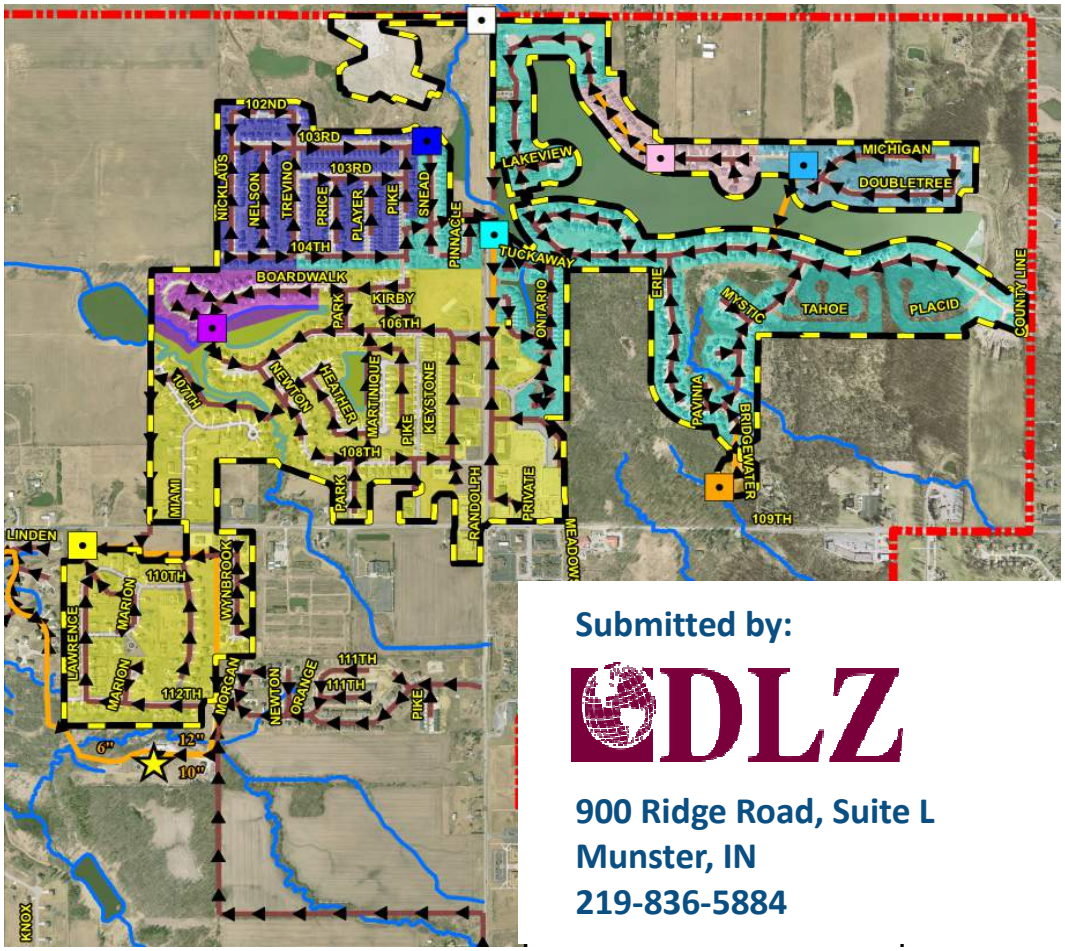
Town of Winfield, Indiana

Sanitary Master Plan

January 26, 2016



Submitted by:

DLZ

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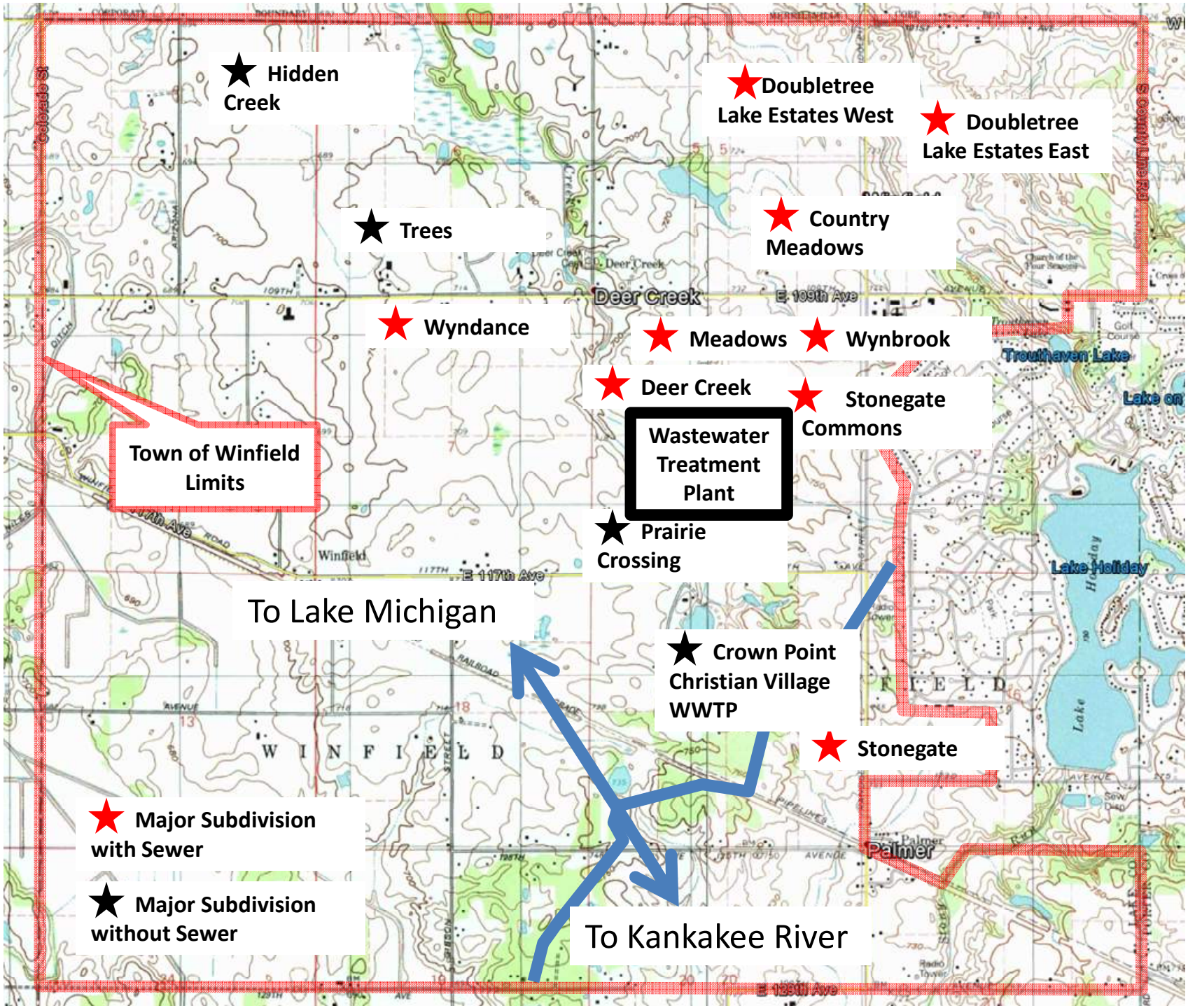
Hidden Creek
Doubletree Lake Estates West
Doubletree Lake Estates East
Trees
Country Meadows
Wyndance
Meadows
Wynbrook
Deer Creek
Stonegate Commons
Town of Winfield Limits
Wastewater Treatment Plant
Prairie Crossing
To Lake Michigan
Crown Point Christian Village WWTP
Stonegate
Major Subdivision with Sewer
Major Subdivision without Sewer
To Kankakee River
Deer Creek
E 109th Ave
Trouthaven Lake
Lake Holiday
Winfield
E 117th Ave
W I N F I E L D
F I E L D
Palmer
E 125th Ave

January 26, 2016

Town of Winfield
Sanitary Board
10645 Randolph Street
Winfield, Indiana 46307

RE: Town of Winfield, Indiana Sanitary Master Plan

Dear Distinguished Board Members:

DLZ Indiana, LLC (DLZ) is pleased to present this Sanitary Master Plan (Plan) for the Town of Winfield. This Plan was developed at the direction of the Town Council and the Sanitary Sewer Board of the Town of Winfield and is intended to provide an overview of the wastewater collection and treatment system, its current capabilities, a plan to guide the Town in future growth decisions, and a capital improvements plan for identifying costs required to maintain and upgrade the Town's current wastewater infrastructure.

The Town of Winfield is located on the "Continental Divide" which separates the Lake Michigan watershed and the Kankakee River watershed. The wastewater treatment plant was also located on relatively high ground. Development throughout the Town began in several "seed" areas scattered throughout the Town. These characteristics resulted in a relatively large number of lift stations and subdivisions not served by sanitary sewer systems throughout the Town.

The Town of Winfield is relatively young, established in 1993. While many of the challenges facing the Town's wastewater infrastructure are not unique, Winfield is in a special position to plan for these challenges at an early stage. This Plan should be considered a "living" document that should be updated every few years as dictated by infrastructure and/or development changes.

DLZ appreciates the opportunity to provide this report and welcomes further discussion of the contents. Should you have any questions, please contact us at your earliest convenience at 574-236-4400 or 219-836-5884.

Respectfully submitted,

DLZ Indiana, LLC

Mark H. Nye, PE
Division Manager

Michael P. Duffy Jr., PE, PS
Project Manager

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SECTION 1 - PROJECT LOCATION

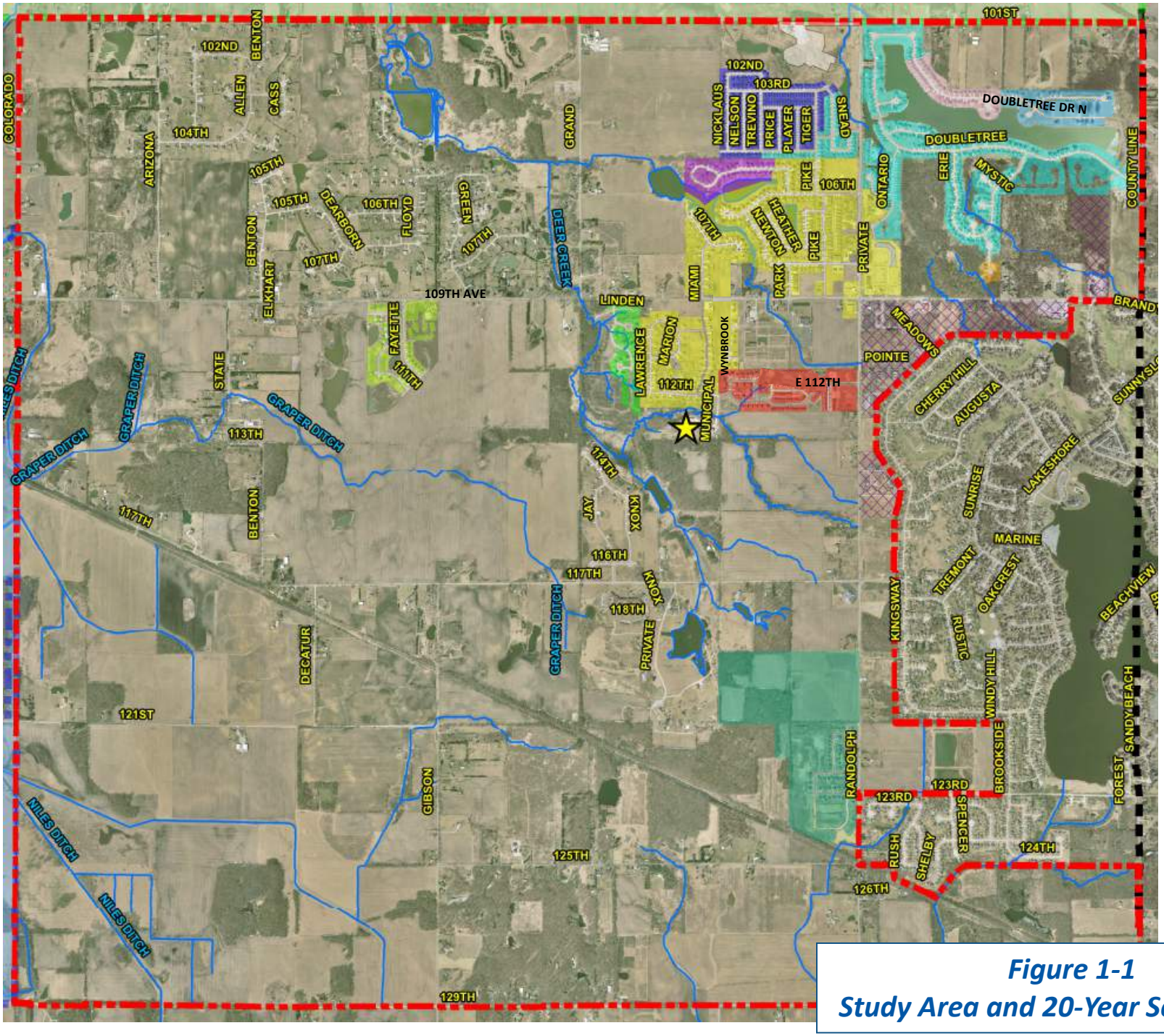


Figure 1-1
Study Area and 20-Year Service Area

SECTION 1 - PROJECT LOCATION

1.1 Study Area

The study area encompasses areas bounded by the current corporate limits of the Town of Winfield, Indiana. The area is shown in **Figure 1-1**. A discussion on the study area is found in Section 1.4 on this page.

1.2 20-Year Service Area

The 20-year service area is the same as the study area and encompasses the areas bounded by the current corporate limits of the Town of Winfield, Indiana. The area is shown in **Figure 1-1**.

1.3 Quadrangle Map, Section, Township, Range

The Town of Winfield and the study area is located in Winfield Township, Lake County, Indiana. It is located in Township 34 North, Ranges 7 and 8 West. The Town is located in Sections 1, 12, 13, and 24 in Range 8 West; and in Sections 4, 5, 6, 7, 8, 9, 16, 17, 18, 19, 20, and 21 in Range 7 West.

1.4 Project Area Description

The project area is the Town of Winfield corporate limits as shown by the thick dashed red line on **Figure 1-1**. The detailed focus of this study included the existing infrastructure and future infrastructure needs along the 109th Avenue, Randolph Street, 117th Avenue, and Grand Boulevard corridors. These corridors were defined during a public meeting with representatives from various Town Boards on April 2, 2015. It was also determined that areas in the southwest quadrant of the Town will generally remain rural in nature and that planning of wastewater infrastructure in that area is premature and shall be left for future updates to this plan, if required.

1.5 Statement of Ownership

The Town of Winfield owns the existing Wastewater Treatment Plant and the collection system including gravity sewers, lift stations, and force mains within the right-of-ways and easements dedicated to the Town. At present, the only systems not owned by the Town of Winfield are the Crown Point Christian Village wastewater treatment plant along with the associated collection system and the Picasso's Lift Station. The Picasso Lift Station's connection point to the Town's infrastructure and its intended service area is also unknown as it was put in place by a developer without the knowledge of the Town. This lift station was discovered during the preparation of this report. Recommendations for additional investigations into this lift station are discussed in later sections of this report.

Up until 2006, the Town of Winfield was served by a private sanitary sewer service administered by Utilities Inc.. In 2005 the Town purchased the treatment plant and associated infrastructure. The Town's view of ownership and maintenance of wastewater infrastructure in Doubletree East and Doubletree West have been inconsistent since 2005. Records obtained from IDEM show the majority of the IDEM permits issued for wastewater infrastructure indicate Doubletree Lake Estates as the owner, inspector, and maintenance provider. While the Town ultimately treats the effluent from these systems, it provided limited oversight, inspection, and maintenance of these systems throughout the years. Some of the wastewater infrastructure was also bonded while other infrastructure was not, depending upon the opinions of various Town personnel and legal staff at that time.

Only the wastewater treatment plant, Meadows Lift Station, Boardwalk Lift Station and the associated gravity sewer system to each were consistently maintained and operated by the Town. The position of the Town as of the writing of this report is that the Town owns and operates all of the wastewater infrastructure except for Crown Point Christian Village. At this time, Crown Point Christian Village is privately owned and operated system and is not connected to the Town's wastewater treatment plant. The Town's position on the Picasso's Lift Station has not been discussed as of the writing of this report; however it appears as if it is a private service with a force main that runs through Town right-of-way.

The Wyndance lift station was recently taken over by the Town. It is currently under a maintenance bond. During recent years, the developers of Stonegate and Stonegate Commons have also come forward and turned over their infrastructure to the Town. Wyndance, Stonegate Commons and Stonegate Lift Stations, required repairs and were completed prior to the Town's final acceptance of the infrastructure.

SECTION 2 - EXISTING INFRASTRUCTURE

SECTION 2 - EXISTING INFRASTRUCTURE

2.0 Overview

The existing wastewater collection system in the Town of Winfield is comprised of: approximately 92,000 lineal feet of gravity sanitary sewer ranging in size from 8-inches in diameter to 24-inches in diameter; 12 lift stations (including the Picasso Lift Station); and 23,000 lineal feet of 6-inch to 12-inch force main.

The existing wastewater treatment plant (WWTP) is located immediately south of the Meadows Subdivision and is currently rated at 0.4 million gallons per day (MGD) average day capacity and 1.44MGD peak capacity. In 2007, it underwent its fourth expansion, but it was the first expansion while under the ownership of the Town of Winfield. The previous expansions were apparently conducted while under ownership by Utilities, Inc.

The 12 lift stations include:

- ✓ Stonegate Lift Station
- ✓ Stonegate Commons Lift Station
- ✓ Doubletree East Phase 10 Lift Station (Bridgewater)
- ✓ Doubletree East Lift Station #1
- ✓ Doubletree East Phase 8 Lift Station (Pebbles)
- ✓ Doubletree West Lift Station #1
- ✓ Picasso Lift Station
- ✓ Randolph Street Lift Station
- ✓ Boardwalk Lift Station
- ✓ Meadows Lift Station
- ✓ Wyndance Lift Station
- ✓ Deer Creek Lift Station

Locations of these lift stations and a flow schematic are shown in **Figure 2-1**. The current situation for each lift station, gravity sewers, and wastewater treatment plant is provided in this section.

Several major subdivisions within the Town are on septic systems. These subdivisions include:

- ✓ Trees
- ✓ Hidden Creek
- ✓ Prairie Crossing

Trees and Hidden Creek were developed under the County's rules and requirements. There was a recommendation that Prairie Crossing connect to the Wastewater Treatment Plant during its development; however, this recommendation was not required by the Town. In general, there are no known complaints regarding the performance of the septic systems with the exception of several lots on the east side of the Prairie Crossing Subdivision. It is understood, but not verified, that alternative septic systems were installed at the problematic locations to rectify the issues.

2.1 Existing Pump Stations and Force Mains

Each of the pump stations were visited by DLZ and Utility Services, Inc. (Operator) representatives on April 16, 2015. A brief review of the components at each lift station and the apparent condition of each lift station was conducted. Some of the photographs are shown on the pages that follow.

Interviews with Operator personnel were conducted to identify maintenance concerns and maintenance history. In general, many of the lift stations appear to be operating adequately and no serious maintenance issues were identified by the Operator with the exception of the Boardwalk Lift Station and Wyndance Lift Station. A summary of the condition of and issues identified at each lift station is provided on the following pages. It should be noted that since the April 16, 2015 assessment of the Wyndance lift station the developer has remedied the deficiencies listed and turned the facility over to the Town.

Specific information provided for each lift station is based upon best available information collected during a review of the site, IDEM applications, old plans, as-builts, and other available records.

The hydraulic capacity of each lift station and respective force main was evaluated when data was available. A summary of available hydraulic capacity is provided on the following pages.

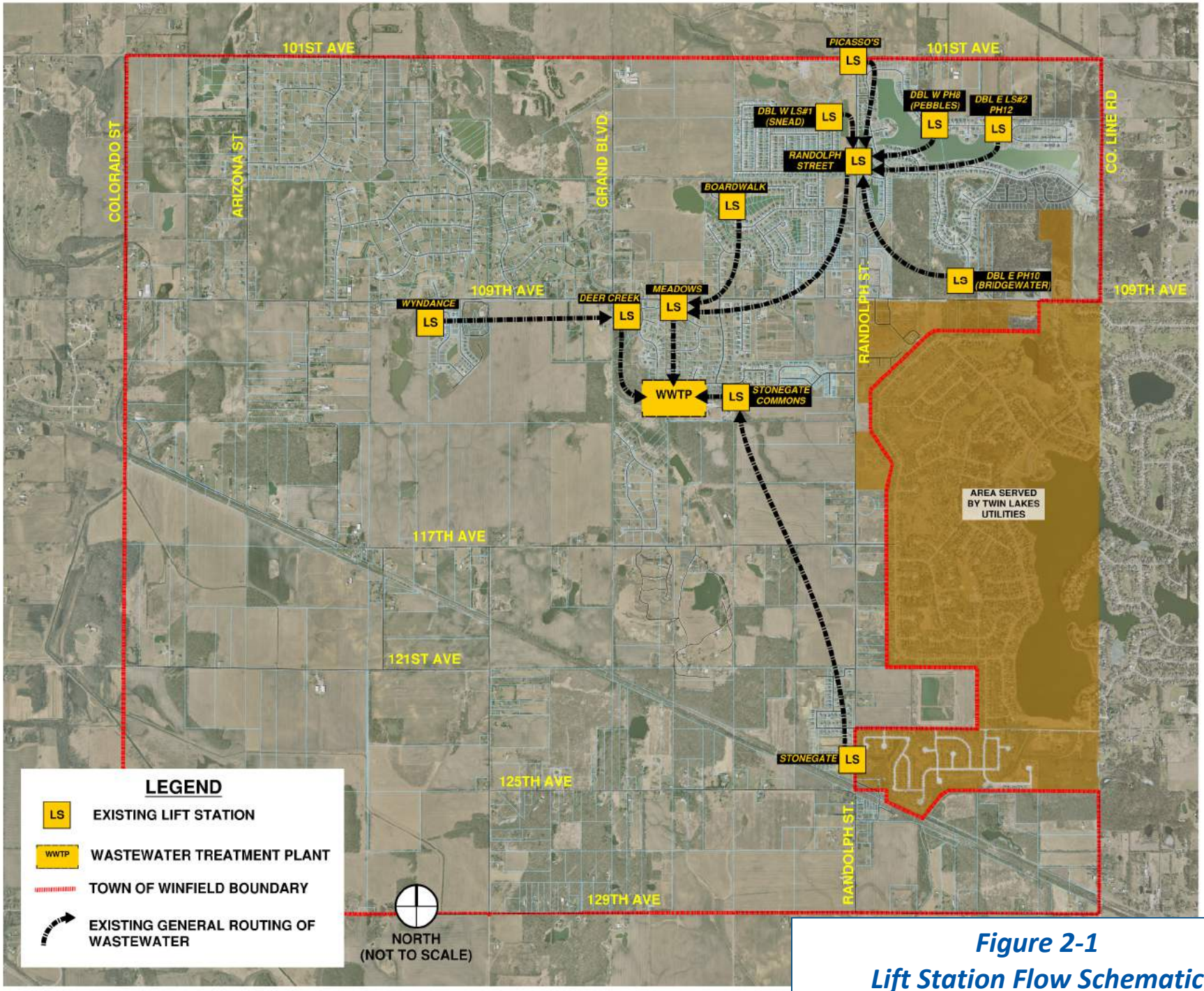


Figure 2-1
Lift Station Flow Schematic

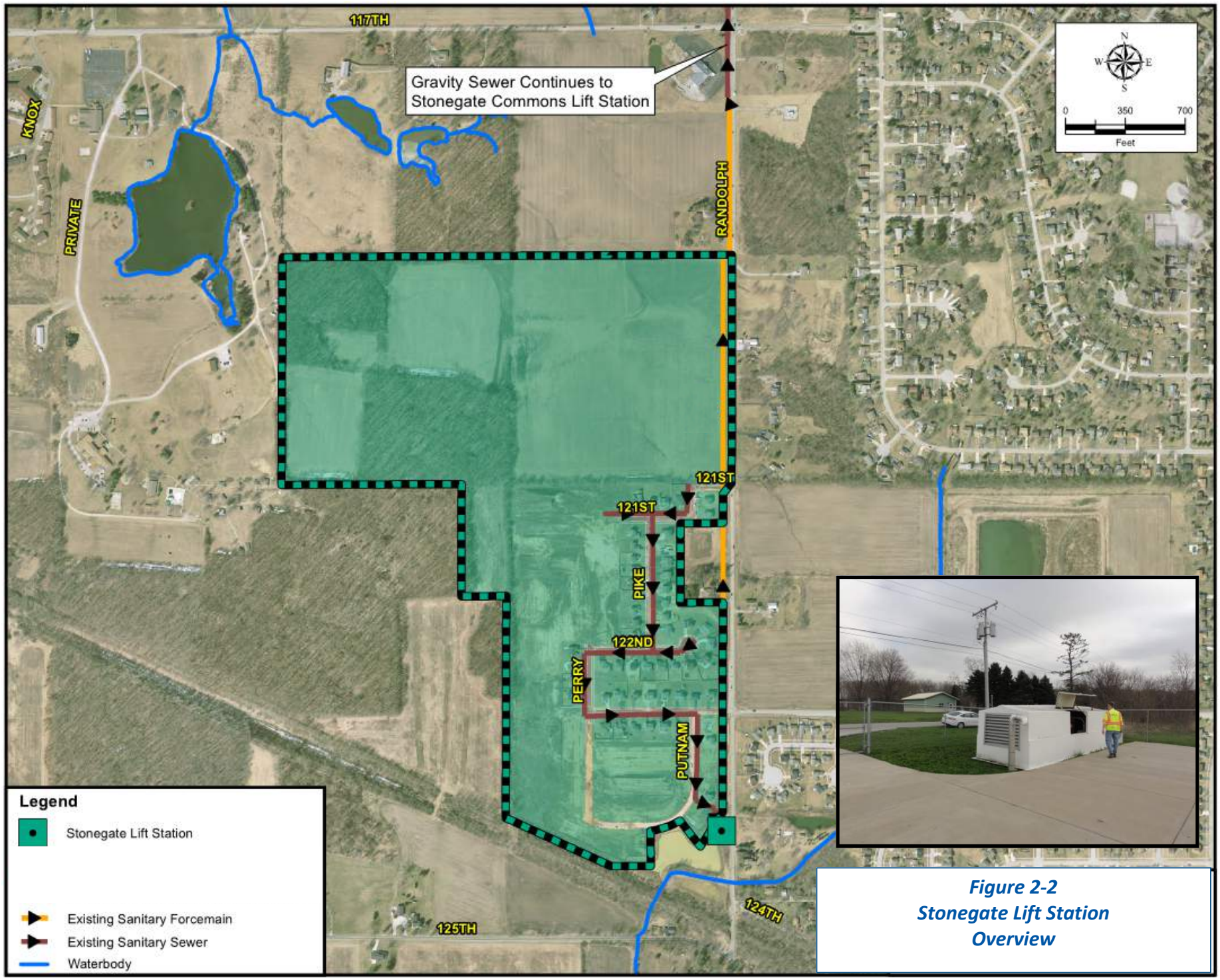


Figure 2-2
Stonegate Lift Station
Overview

2.1.1 Stonegate Lift Station

The Stonegate Lift Station is located on the west side of Randolph Street south of 123rd Avenue as shown in **Figure 2-2**. The pump station pumps northward along Randolph Street to a gravity sewer starting just south of 117th Avenue. For several years after the construction of the lift station, it was not maintained by the Town as the sanitary system had not yet been turned over to the Town. The developer provided minimal, if any, maintenance on the lift station. Several issues developed at the lift station and were reported to have been corrected prior to the Town's acceptance.

Pump Station Information

IDEM Permit #: 18292R Issued April 4, 2007
Style: Submersible; Duplex; Packaged
Brand: Precision Systems Twin Pack 7000 Partial Bury
Pumps: 30 hp; 580 gpm @ 89 ft TDH; Barnes 6XE30044HA
VFD: Danfoss VLT8000 Aqua
Force Main: 8-inch Diameter
Wet Well: Concrete; 8-foot Diameter
Site Power: 3 Phase; 60 Hz; 480 VAC
Emergency: ATS; 85kW Cummins Nat Gas Generator
Odor Control: Aerator
Communications: Strobe Light; Omnisite dialer
Controls: Siemens LC150; Transducer; Backup Floats
Bypass Pump Port: Yes
Site: Fenced; Concrete Driveway
Other: Heater; Sump Pump; Dehumidifier

Observations

Site: Positive Site Drainage
Security: Fence and Hatches Locked
Wet Well: Normal Rusting of Discharge Piping and Metal around Access
Enclosure: Rusting of Floor Beneath Controller; Minor Seepage Around Seam on Side of Generator

Operator Comments

There were no reported issues with this lift station at this time other than temporary plugging of the pumps due to the impeller wear plate.

Service Area and Potential for Expansion

The lift station presently serves currently developed portions of the Stonegate Subdivision. Stubs are constructed that will serve the future Stonegate North subdivision. The total estimated units for Stonegate and Stonegate North are 152 and 176 respectively for a total of 328 units.

Further discussion of expansion capabilities is provided in later sections of this report.

Rusting Due to Leaky Seam

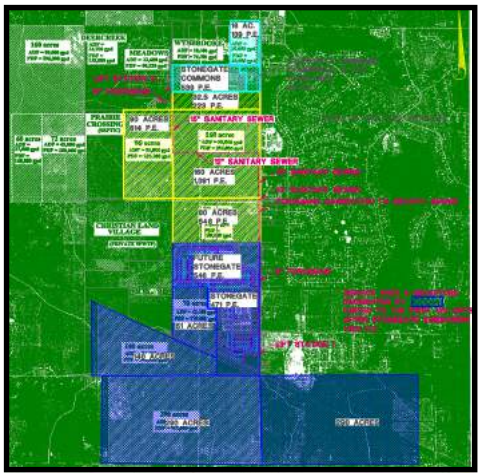


Figure 2-3
Stonegate and Stonegate Commons Recapture Areas

Discharge Piping

Wet Well—Pipe and Frame Rusting

Floor Rusting

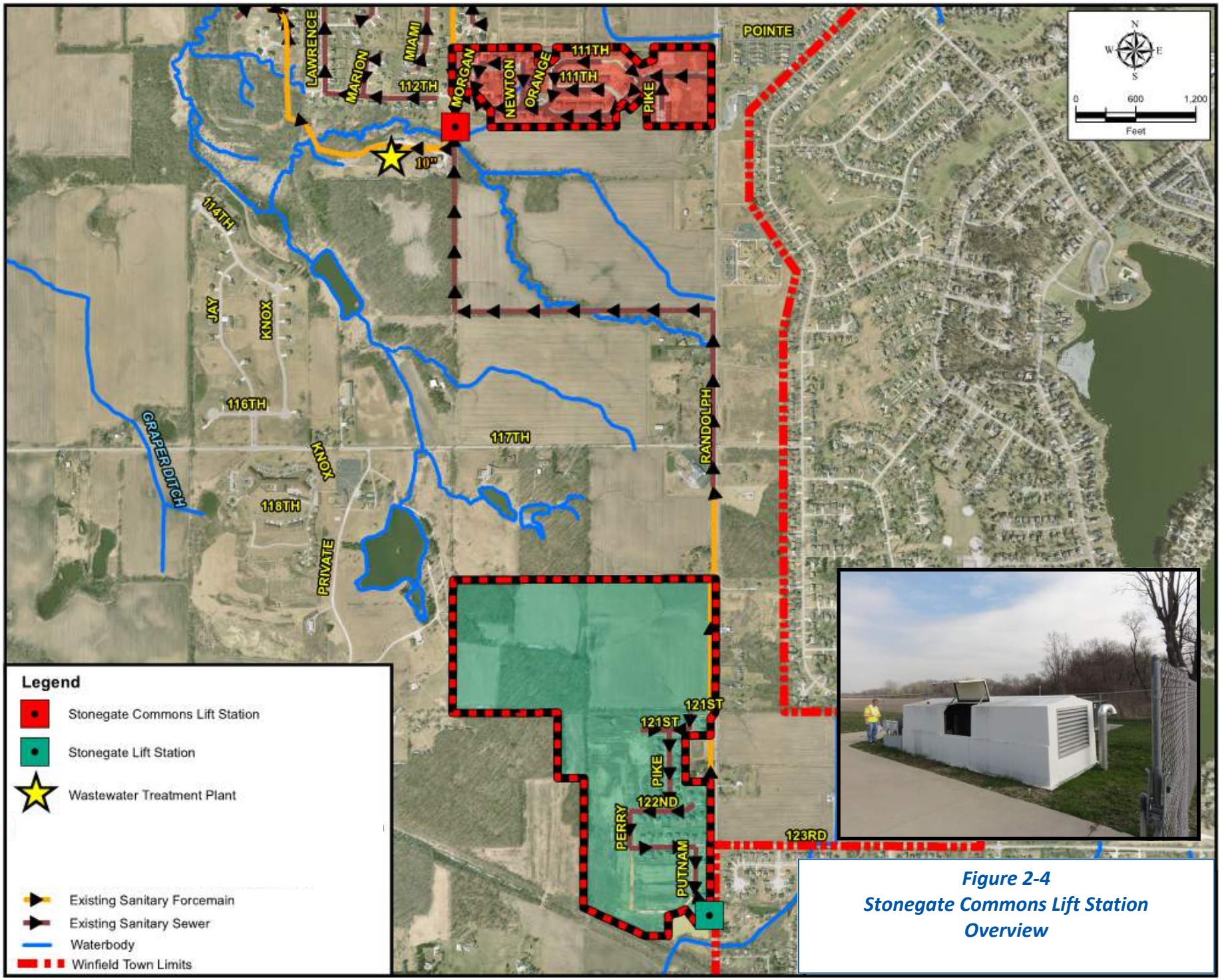


Figure 2-4
Stonegate Commons Lift Station Overview

2.1.2 Stonegate Commons Lift Station

The Stonegate Commons Lift Station is located at the southwest corner of the Stonegate Commons Subdivision adjacent to the Wastewater Treatment Plant as shown in **Figure 2-4**. The pump station pumps directly into the headworks at the Wastewater Treatment Plant. For several years after the construction of the lift station, it was not maintained by the Town as the sanitary system had not yet been turned over to the Town. The developer provided minimal, if any, maintenance on the lift station. Several issues developed at the lift station and were reported to have been corrected prior to the Town's acceptance.

Pump Station Information

IDEM Permit #: 18292R Issued April 4, 2007
Style: Submersible; Duplex; Packaged
Brand: Precision Systems Twin Pack 7000 Partial Bury
Pumps: 10 hp; 600 gpm @ 27 ft TDH; Barnes 6XE10046A
VFD: None
Force Main: 10-inch Diameter
Wet Well: Concrete; 8-foot Diameter
Site Power: 3 Phase; 60 Hz; 480 VAC
Emergency: ATS; 85kW Cummins Nat Gas Generator
Odor Control: Aerator
Communications: Strobe Light; Omnisite dialer
Controls: Siemens LC150; Transducer; Backup Floats
Bypass Pump Port: Yes
Site: Fenced; Concrete Driveway
Other: Heater; Sump Pump; Dehumidifier

Observations

Site: Minor Site Drainage Could Pond Against Housing
Security: Fence and Hatches Locked
Wet Well: Normal Rusting of Discharge Piping and Metal around Access
Enclosure: Rusting of Floor Beneath Controller; Minor Seepage Around Seam on Side of Generator Causing Rusting of the Floor

Operator Comments

There were no reported issues with this lift station at this time other than temporary plugging of the pumps due to the impeller wear plate. The operator did note that the pump run times were significantly different between the two pumps due to a sensor issue that prevented one of the pumps from running. This has been resolved.

Service Area and Potential for Expansion

This pump station currently services the Stonegate Commons and Stonegate Subdivision. A recapture agreement is in place that calls for the inclusion of 1,771 units (one unit is equivalent to a single family residential household at 310 gallons per day) which is a peak flow of 1,223 gpm. This recapture area encompasses the light blue, yellow, and dark blue areas shown in **Figure 2-3** (page 15). Further discussion of expansion capabilities is provided in later sections of this report.

Rusting in Access to Wet Well

Rusting Due to Leaky Seam

Station Piping and ATS

Controller

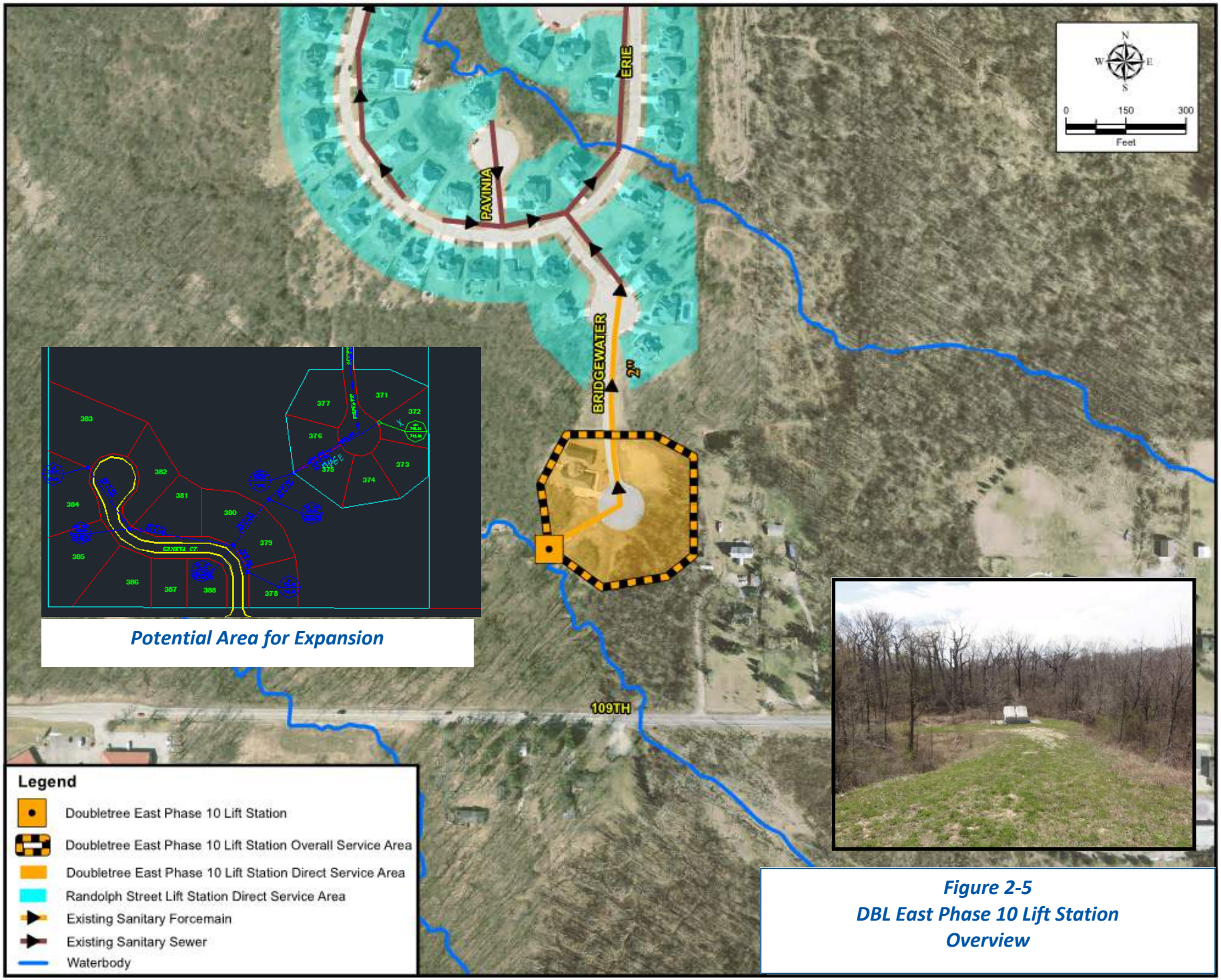


Figure 2-5
DBL East Phase 10 Lift Station Overview

2.1.3 DBL East Phase 10 Lift Station

The Doubletree East—Phase 10 Lift Station (a.k.a. Bridgewater) is located at the southern end of Bridgewater in the Doubletree Lake Estates East Subdivision. The pump station discharges to a 2-inch diameter plastic force main. The pump station was one of the first stations to follow the Town's lift station ordinance, although the Town's policy at the time did NOT include Town operation and maintenance of the lift station.

Pump Station Information

IDEM Permit #: 17986 Issued May 9, 2006
Style: Submersible; Duplex; Packaged
Brand: Precision Systems Twin Pack TUS
Pumps: 2 hp; 20 gpm @ 32 ft TDH (grinder-type pumps)
VFD: None
Force Main: 2-inch Diameter
Wet Well: Concrete; 5-foot Diameter
Site Power: Single Phase
Emergency: ATS; Natural Gas Generator
Odor Control: None
Communications: Strobe Light; Omnisite dialer
Controls: US Filter D152
Bypass Pump Port: No
Site: Sloped Earthen Access
Other: Heater

Observations

Site: Access Down Steep Earthen Drive
Security: No Fence; Hatch Access Locked
Wet Well: Good Condition
Enclosure: Piping is Heat Taped; Normal Rusting of the Surfaces

Operator Comments

There were no reported issues with this lift station at this time other than the electric heater not being operational. This has been resolved by the operator through use of a portable heater.

Service Area and Potential for Expansion

The pump station currently serves one house with the potential to handle 17 more houses on the extended Bridgewater cul-de-sac and a future phase that was once proposed on 109th Avenue (see small inset map entitled "Potential Area for Expansion" on **Figure 2-5**). Due to the small force main size, available power, and limited wet well diameter and surrounding terrain, use of this lift station for additional future development beyond the 18 lots is unlikely without significant infrastructure improvements to the force main, wet well, pumps, generator, and controls. Maximum theoretical flow capacity for this lift station without upgrades is calculated to be 23 units.

Pump Controller and Appurtenances

Pump Station and Appurtenances

Wet Well—Good Condition

Pump Station and Appurtenances

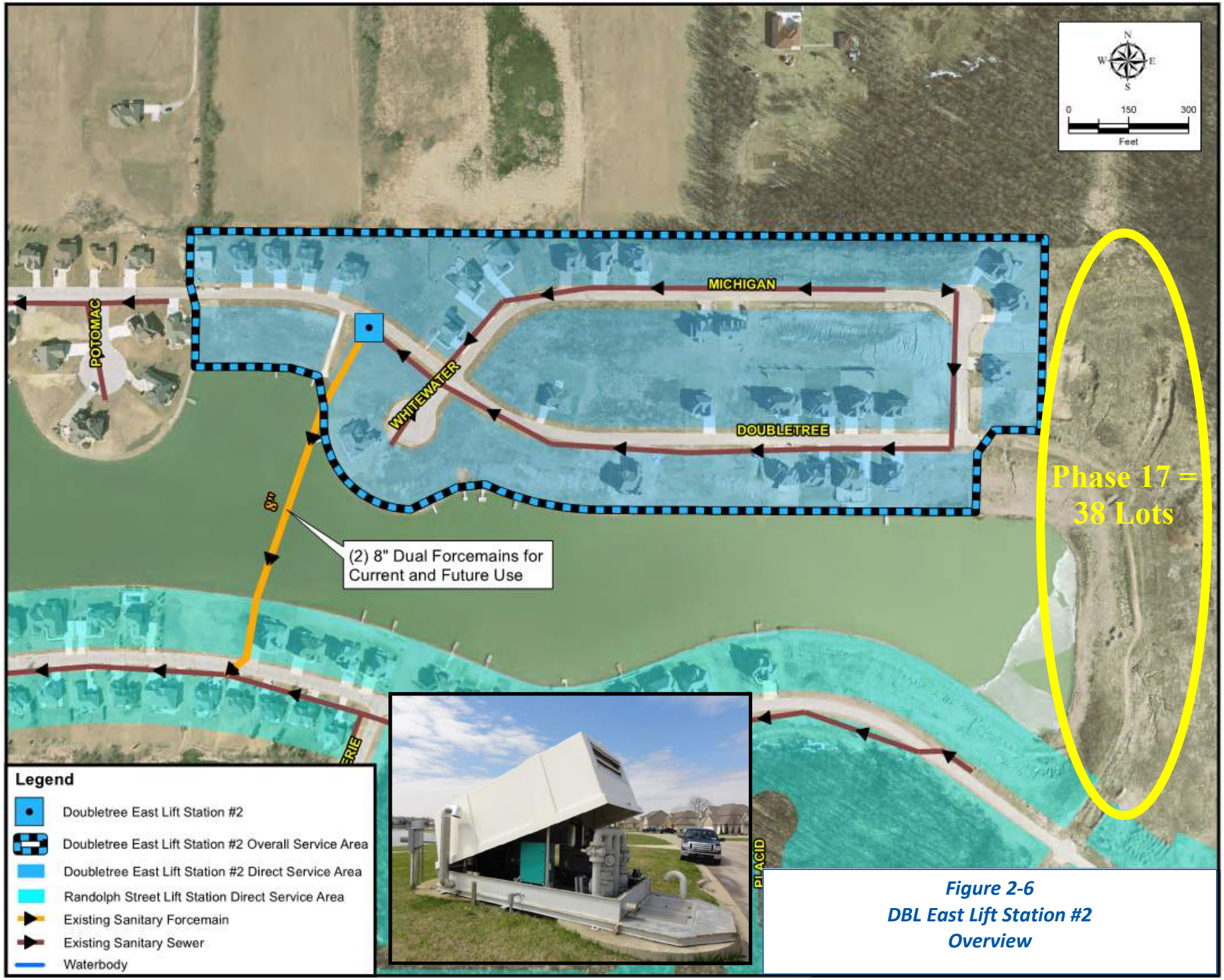


Figure 2-6
DBL East Lift Station #2
Overview

2.1.4 DBL East Lift Station #2

The Doubletree East Lift Station #2 (a.k.a. Boat Ramp or Phase 12 Lift Station) is located on Doubletree North Drive in Doubletree East. The pump station discharges to one of two 8-inch dual force mains that pass beneath the lake to a discharge location on Doubletree South Drive. This lift station was first permitted by IDEM in 1997 as Permit No. 10417. However, only the two dual force mains beneath the lake were apparently constructed. Historical aerial imagery suggests either the valve vault or wet well was constructed at that time as well. The lift station was permitted again in May 9, 2006 and revised again in an IDEM approval dated August 28, 2007 (IDEM #17987R). It appears the remaining portions of the lift station were constructed later that year during the period where Doubletree's association claimed all ownership and operation of the lift stations in Doubletree. While the term future use has been associated for the reason of dual force mains, the exact reasoning behind the dual force mains is not known. It is possible that since the force mains run beneath the lake, one is for backup in the event one fails.

Pump Station Information

IDEM Permit #: 17987R Issued August 28, 2007
Style: Submersible; Duplex; Packaged
Brand: Precision Systems Twin Pack 3000TUS
Pumps: 7.5 hp; 300 gpm @ 28 ft TDH; Barnes 4XSE7544A
VFD: None
Force Main: 8-inch Diameter
Wet Well: Concrete; 8-foot Diameter
Site Power: 3 Phase; 60 Hz; 480 VAC
Emergency: ATS; Cummins Natural Gas Generator
Odor Control: Aerator
Communications: Strobe Light; Omnisite dialer
Controls: US Filter LC150
Bypass Pump Port: Yes
Site: No Driveway; Adjacent to Roadway
Other: Heater

Observations

Site: Close to Roadway without Protection from Errant Vehicle
Security: No Fence; Hatch Access Locked
Wet Well: Good Condition; Normal Rusting of Metal Surfaces/Piping
Enclosure: Normal Rusting of the Surfaces

Operator Comments

There were no reported issues with this lift station at this time.

Service Area and Potential for Expansion

The service area shown for this lift station is shown in **Figure 2-6** and serves approximately 80 current platted lots in Doubletree East Phases 12, 14, and 13. Based upon the IDEM permit application, it should be serving Phase 17 as well (in **Figure 2-6**). However, an inspection of the as-built drawings for Doubletree East indicates that Phase 17 may not be able to drain to the lift station via gravity sewer. The following is a summary of pump station capacity:

Existing Pump Capacity: 300 gpm (370 Units)
Permitted Capacity: 117 lots (August 28, 2007 IDEM Permit 17987R)
Ultimate Force Main Capacity: 1,253 gpm (1,821 Units)

Control Panel

Generator

Discharge Piping

Wet Well

Dual Force Main Vault and Valves

Figure 2-7
DBL East Phase 8 "Pebbles" Lift Station Overview

2.1.5 DBL East Phase 8 Lift Station

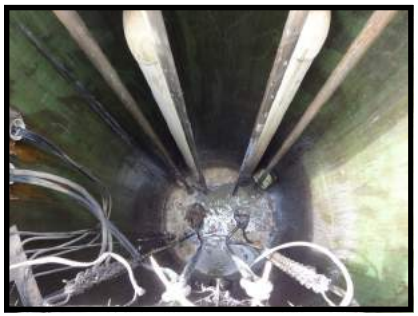
The Doubletree East Phase 8 "Pebbles" Lift Station is located in the front yard of 8521 Doubletree Drive North. According to as-builts, the lift station discharges to the northwest. With the exception of the control cabinet, this lift station (and warning light) are buried beneath artificial landscape rocks. Other than some information provided on the Doubletree East as-built drawings, very little is known about this lift station except for what was observed during the site visit. It should be noted that IDEM's Virtual File Cabinet also yielded no information. The lift station was constructed prior to the Town's involvement in wastewater activities.

Control Panel

Valve Vault

Pump Station Information

Style: Duplex; Packaged
Brand: Unknown
Pumps: 2.8 hp; Barnes 4SE2824L
VFD: None
Force Main: 4-inches Based Upon Valve Pit Observations and Record Drawings
Wet Well: Fiberglass; 3' Dia.
Site Power: Single Phase
Emergency: None
Odor Control: None
Communications: Strobe Light
Controls: Alpha General Series PP2000
Bypass Pump Port: Yes
Site: In Front Yard Beneath artificial landscape rocks
Other: Unknown



Wet Well

Observations

Site: Unknown if Within an Easement
Security: Unlocked
Wet Well: Good Condition
Enclosure: Beneath artificial landscape rocks which Obscure Warning Light. Based on visual detection being the only alarm system on this lift station the warning light needs to remain visible or a dialer installed as soon as possible.

Meter and Disconnect

Operator Comments

There were no reported issues with this lift station at this time other than it appears to cycle frequently and its warning light is obscured beneath the artificial landscape rocks.

Service Area and Potential for Expansion

The pump station apparently serves Doubletree East Phase 8 (approximately 37 lots). Due to the type of lift station and size, it is not likely able to handle additional areas.

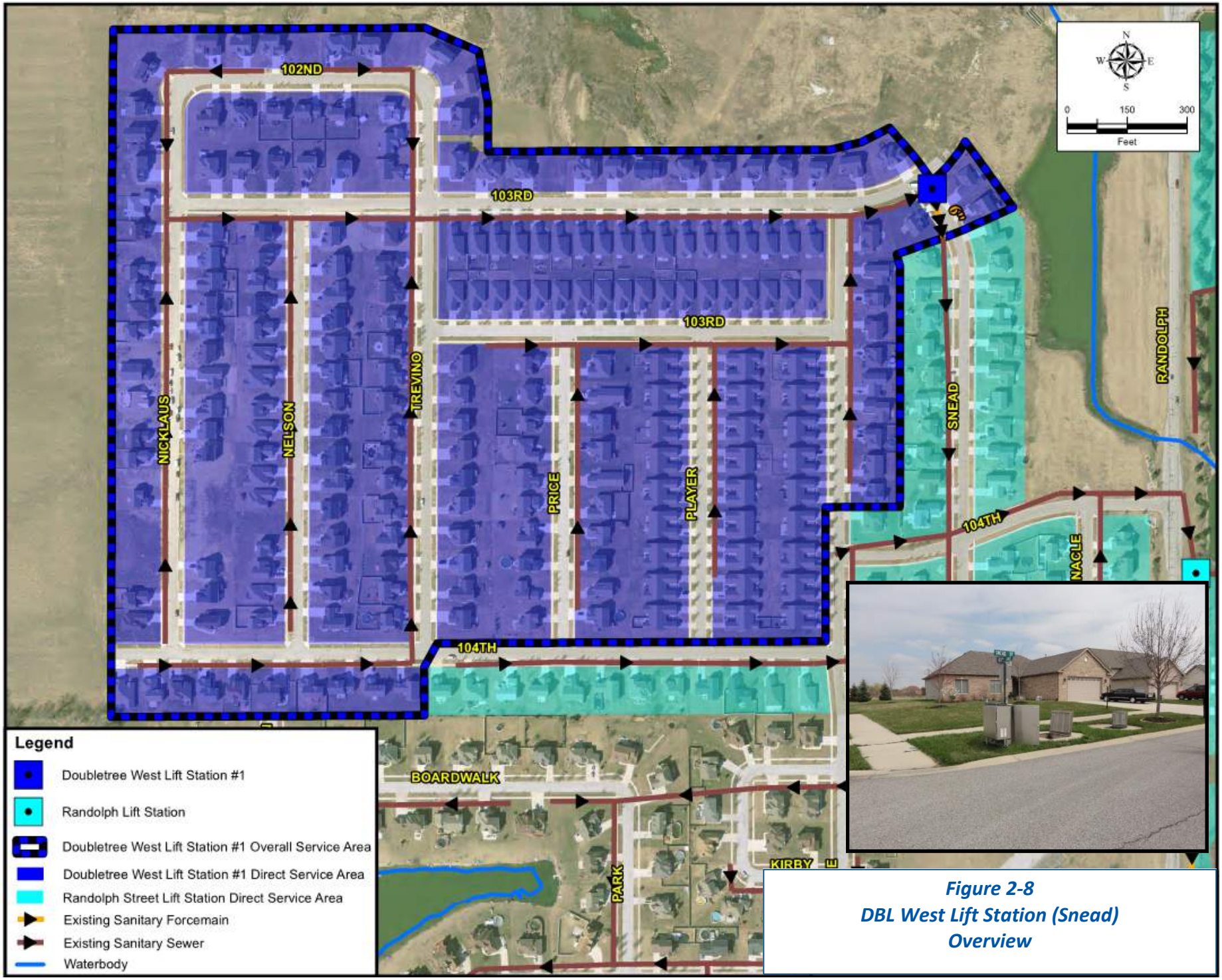


Figure 2-8
DBL West Lift Station (Snead)
Overview

2.1.6 DBL West Lift Station #1

The Doubletree West Lift Station #1 is located at the southeast corner of Snead and 103rd. The lift station serves Doubletree Lake Estates Phases 2 through 8. The construction of the lift station appears to have been an afterthought by the developer prior to the Town's involvement in wastewater activities. Original IDEM permit # 16132 (10/1/03) indicates the original design capacity was 275 gpm. The station reportedly had a history of pump clogging according to the developer's field representative. In 2010 the pump station apparently went through an upgrade to vortex style pumps sponsored by the Doubletree developer as the Town had not yet taken over responsibility for this lift station. This upgrade involved the apparent use of Danfoss VFDs to simulate 3 phase power required by the new pumps.

Pump Station Information

Style: Submersible; Duplex
Brand: Not Applicable
Pumps: 5 hp; 317 gpm @ 44 ft TDH; BJM Pump Model SV37; Vortex Type
VFD: None (although Danfoss VFDs provide 3 phase simulation for pumps).
Force Main: 6-inch Diameter
Wet Well: Concrete; 7-foot Diameter
Site Power: 1Phase; 60 Hz; 230 V
Emergency: Receptacle for Portable Generator Hookup
Odor Control: None
Communications: Omnisite dialer
Controls: US Filter #400129 FP4
Bypass Pump Port: No
Site: Immediately Adjacent to the Roadway
Other: Not Applicable

Observations

Site: Immediately Adjacent to Road; Safety Issue if Hit by Vehicle
Security: No Fence; Hatch Access Locked
Wet Well: Good Condition
Enclosure: None

Operator Comments

There are no current reported issues with the lift station other than the strobe warning light has been removed and electrical tape has been put in its place to cover the opening.

Service Area and Potential for Expansion

The pump station currently serves phases 2 through 8 of Doubletree Lake Estates West. These phases comprise approximately 267 Units. The current pumps can accommodate approximately 393 units. Therefore, this lift station may have additional capacity. Unfortunately, its close proximity to the street may be a discouragement to the use of this lift station as a regional lift station.

Portable Generator Receptacle

Valve Vault

Wet Well

VFDs Used for Phase Conversion

Control Panel

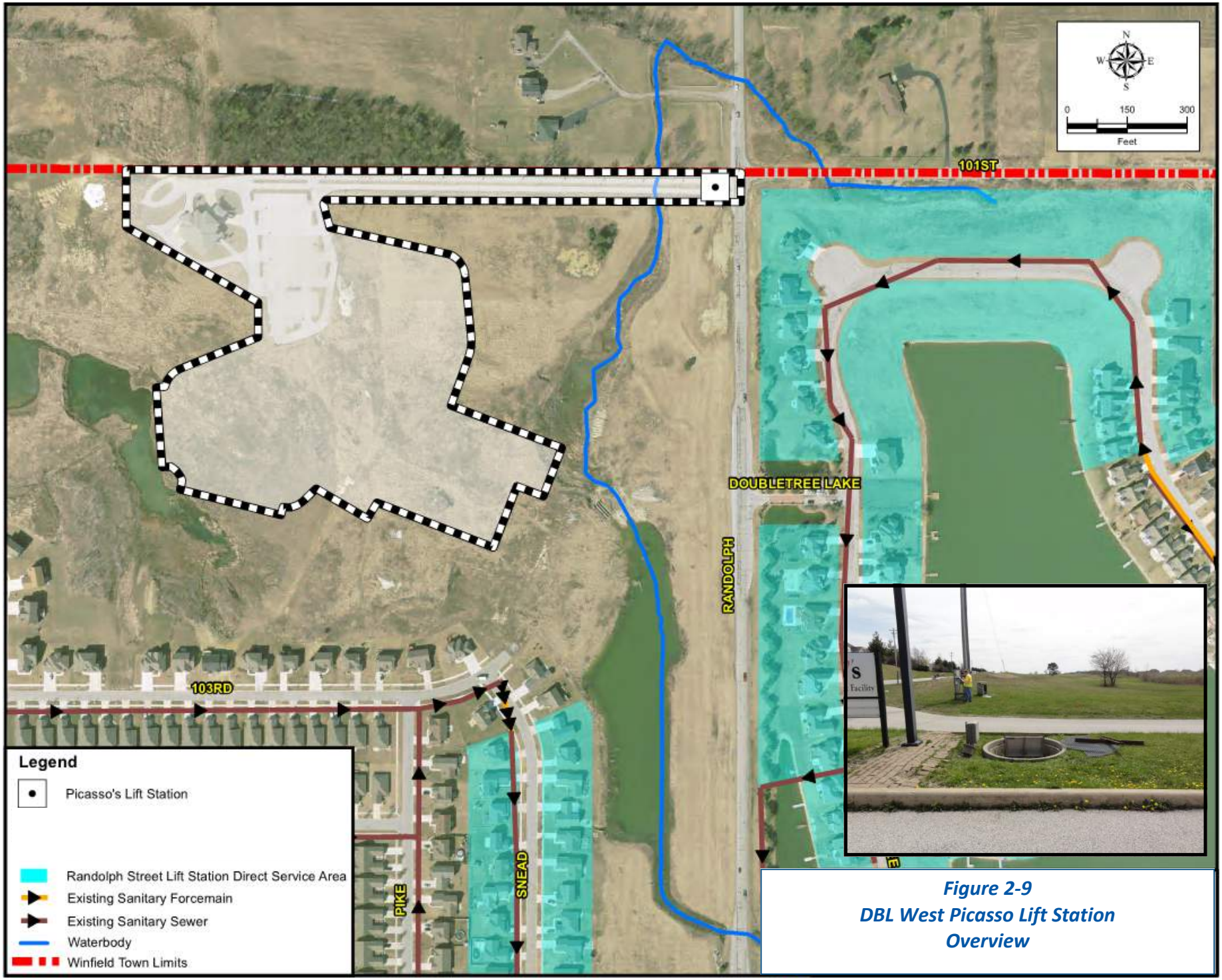


Figure 2-9
DBL West Picasso Lift Station Overview

2.1.7 DBL West Picasso Lift Station

The Doubletree West —Picasso Lift Station is located at the entrance to the old Picasso's Restaurant. Little information is known about this lift station. Information in IDEM's virtual file cabinet was reviewed and no information could be located. This service area and connection point to the Town's infrastructure is further discussed in later sections of this report.

Pump Station Information (Info. From Submittal and Site Visit)

Style: Submersible; Duplex; Packaged
Brand: Unknown
Pumps: 2hp; Myers WGL 20-21
VFD: None
Force Main: 1 - 1/4" PVC (SCH 80)
Wet Well: Fiberglass; 4-foot Diameter
Site Power: 1 Phase; 230 VAC
Emergency: None
Odor Control: None
Communications: None
Controls: Alpha General Services PP2000
Bypass Pump Port: Unknown
Site: In the median of the access drive to the old Picasso's restaurant
Other: No valve vault located

Observations

Site: In the median of the access drive
Security: No Fence; No locks on hatches
Wet Well: Fair Condition
Enclosure: Not Applicable

Operator Comments

This lift station's existence was recently identified in the Town. Its construction must have predated the Town's involvement in wastewater activities. Force main discharge location is unknown. It also is unknown whether the lift station is functional.

Service Area and Potential for Expansion

Due to the physical size and location of this lift station, it offers no possibility for expansion or reuse.

Wet Well

Wet Well

Control Panel

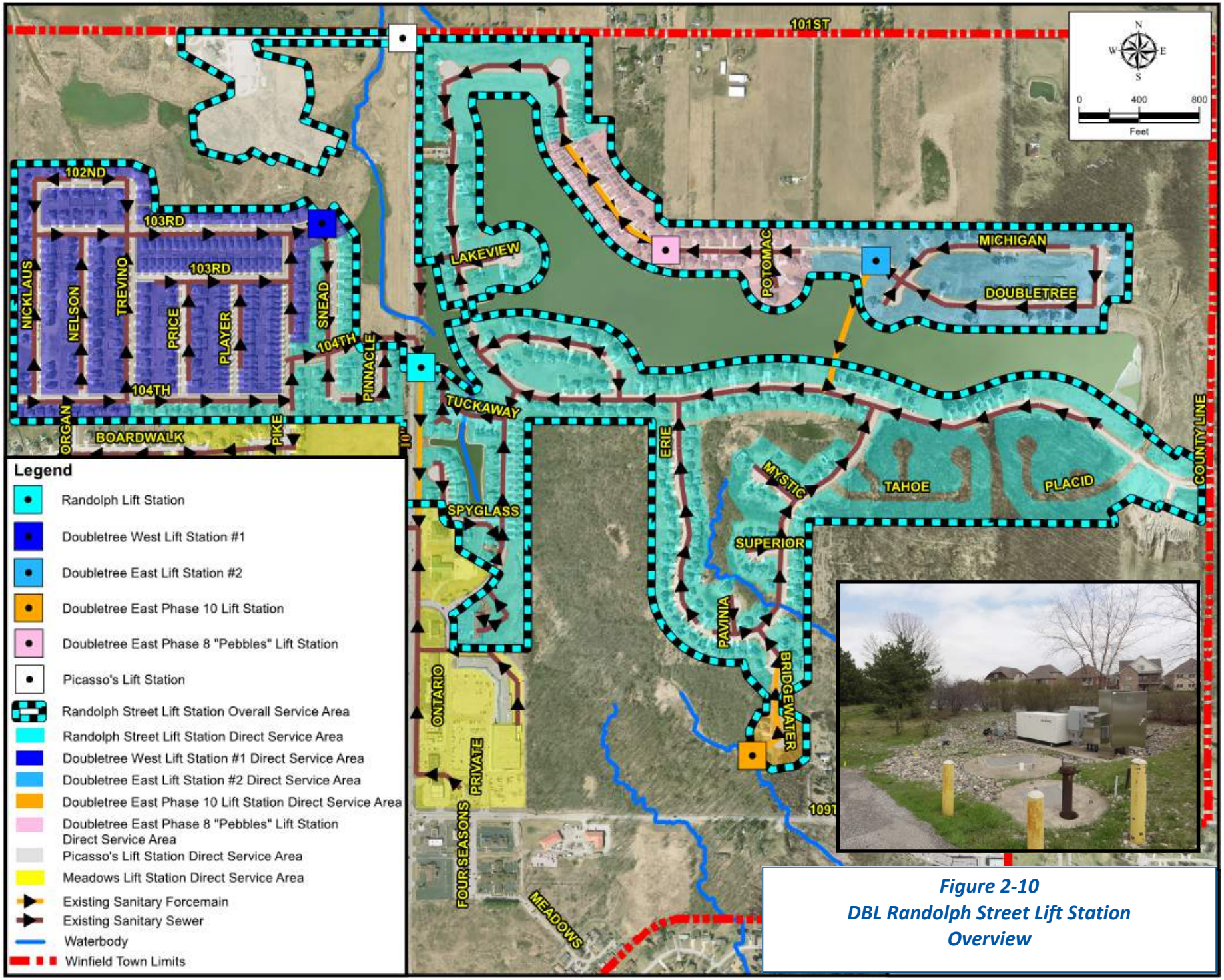


Figure 2-10
DBL Randolph Street Lift Station Overview

2.1.8 DBL Randolph Street Lift Station

The Randolph Street Lift Station (a.k.a. Lift Station #1) is located just south of the intersection of 104th Avenue and Randolph Street on the east side of Randolph Street. This lift station serves the entire Doubletree East and West Subdivisions. The lift station was originally permitted with IDEM in 1997 as IDEM #10417. The Town's historic policy was to not operate and maintain this lift station as it served only the developments of Doubletree East and West. Operation and maintenance of the lift station was by Doubletree Lake Estates as evidenced by their upgrade in 2009 (IDEM Permit #19554).

Pump Station Information (Info. From Submittal and Site Visit)

Style: Submersible; Duplex
Pumps: 950 gpm @ 40 ft TDH; Myers 6VC150M6-23
VFD: Altivar by Schneider Electric
Force Main: 10-inch Diameter
Wet Well: Concrete; 8-foot Diameter
Site Power: 3 Phase, 230 VAC
Emergency: ATS; Nat Gas Generator
Odor Control: None
Communications: Strobe Light; Omnisite dialer
Bypass Pump Port: Yes
Site: Access off Randolph; Sloped into Lift Station
Other: Flow Meter; Bypass Port

Observations

Site: Asphalt Drive, Adjacent to Randolph Street
Security: No Fence; Hatch Access Locked
Wet Well: Good Condition

Operator Comments

There were no reported issues with this lift station at this time.

Service Area and Potential for Expansion

The existing lift station has the theoretical capacity to handle just over 1,300 units. Approximately 864 units are platted. However, there is a limit to which the downstream receiving 15-inch sanitary sewer passing through Country Meadows Subdivision to the WWTP can handle. As of September 17, 2009, only 271 more units were allowed to tap on upstream of the lift station due to limiting downstream capacity of the 15-inch sanitary sewer. 90 new units were tapped into the system as of May 20, 2015, leaving just 181 available units before modifications to the downstream system are required.

Control Panel

Wet Well

Valve Vault

ATS and Generator

Meter Pit

Flow Meter Chart Recorder

Figure 2-11
Boardwalk Lift Station
Overview

2.1.9 Boardwalk Lift Station

The Boardwalk Lift Station is located to the south of Boardwalk Circle and discharges to a manhole to the south on 106th. The lift station serves approximately 40 residential houses and is in poor condition. This lift station has been the source of significant maintenance efforts by the Town's sewer operators. It appears that the lift station is a necessity since it needs to pass sewage beneath the overflow channel between the two lakes in the subdivision. For many years, this lift station and the Meadows Lift Station were the only lift stations where the Town's policy included operation and maintenance.

Valve Vault

Wet Well

Pump Station Information (Info. From Submittal and Site Visit)

Style: Submersible; Duplex Fiberglass Unit by Royce Equipment
Brand: Unknown
Pumps: Unknown
VFD: None
Force Main: 3-inch Diameter
Wet Well: Fiberglass; 5-foot Diameter
Site Power: 1 Phase; 60 Hz
Emergency: None
Odor Control: None
Communications: Strobe Light
Controls: Unknown
Bypass Pump Port: No
Site: Side / Rear yard

Observations

Site: Access difficult during snow or wet conditions
Security: No Fence; No locks; Open to animals or people
Wet Well: Poor

Operator Comments

Operation and maintenance of lift station is troublesome. Poor condition. Station needs to be replaced. Single phase power is not adequate to start the grinder pumps. No overflows have been recorded.

Service Area and Potential for Expansion

The pump station serves an isolated portion of the Country Meadows Subdivision and does not offer any benefit to surrounding areas due to the poor condition of the existing station.

Control Panel

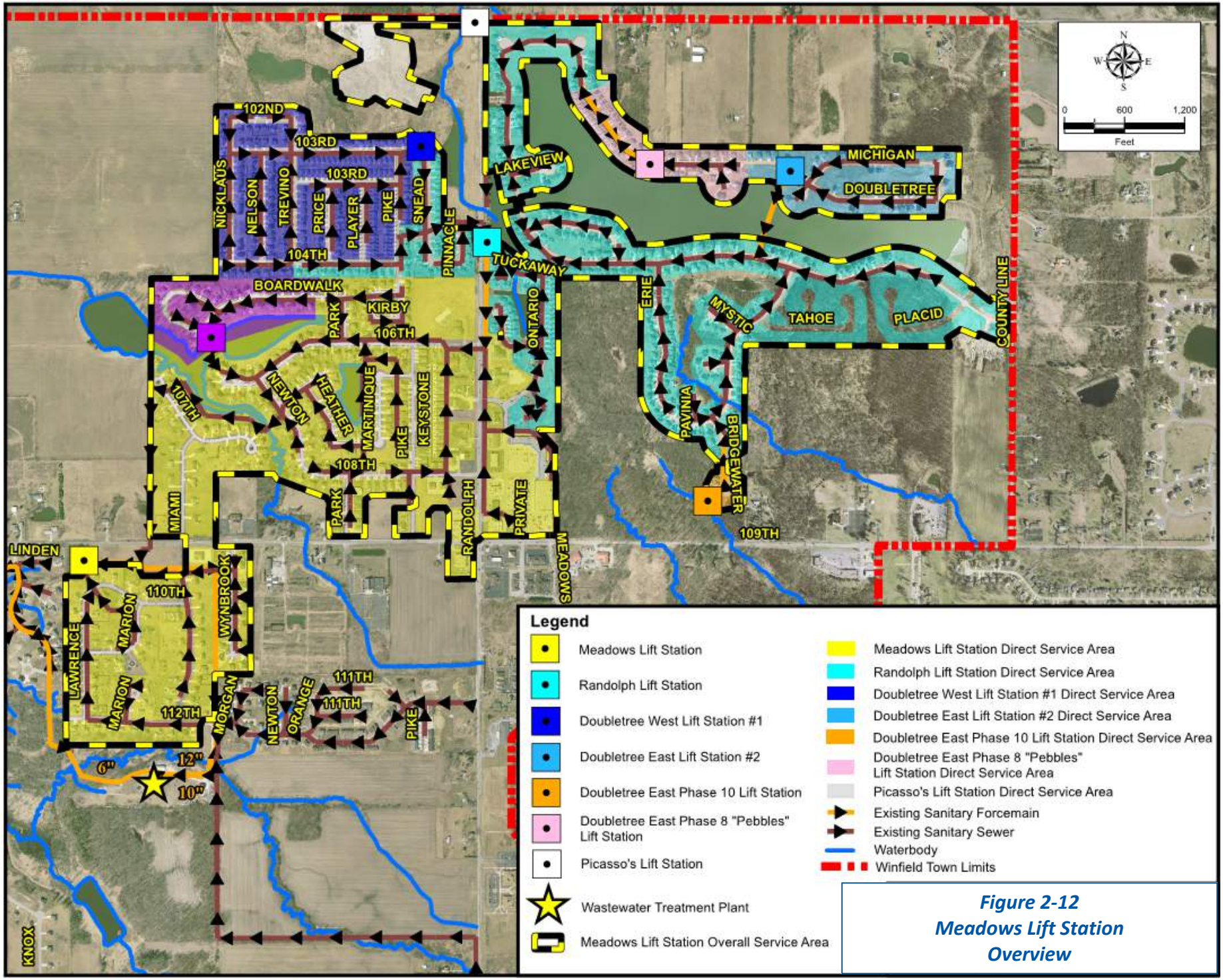


Figure 2-12
Meadows Lift Station Overview

2.1.10 Meadows Lift Station

The Meadows Lift Station is located on 109th Avenue at the northwest corner of the Meadows Subdivision. The lift station receives flow from all of the Meadows, Country Meadows, Wynbrook, Doubletree East and West Subdivisions and all commercial areas located on Randolph Street and 109th Avenue that the Town provides sanitary service. It is a relatively new station constructed in 2008 and discharges through a 12-inch force main directly to the Wastewater Treatment Plant.

Pump Station Information (Info. From Submittal and Site Visit)

Style: Submersible; Duplex; Packaged
Brand: Precision Systems Twin Pac Series 7000
Pumps: 75 hp; 1,800 gpm @ 95 ft TDH; Yoemans 9100-6173
VFD: Yes
Force Main: 12-inch Diameter
Wet Well: Concrete; 10-foot Diameter
Site Power: 3 Phase; 60 Hz; 460 VAC
Emergency: ATS; Cummins 125 kW Nat Gas Generator
Odor Control: Aeration
Communications: Strobe Light; Omnisite dialer
Controls: Siemens Duplex Controller
Bypass Pump Port: Yes
Site: Driveway Access
Other: Heater, Sump

Observations

Security: Fenced and Locked; Hatch Access Locked
Wet Well: Good Condition
Enclosure: Good Condition

Operator Comments

There were no reported issues with this lift station.

Service Area and Potential for Expansion

As described in future sections, this lift station is sized to handle anticipated flows from the 109th Avenue corridor and areas to the north of 109th Avenue. A recapture agreement is in place for this lift station; however it shows the entire Town as falling within the recapture agreement.

The Meadows Lift Station has the capacity to handle growth within the Town.

Access Hatch

Wet Well

Exterior Louvers

Discharge Piping and Valves

Generator

VFD and Omni-Site

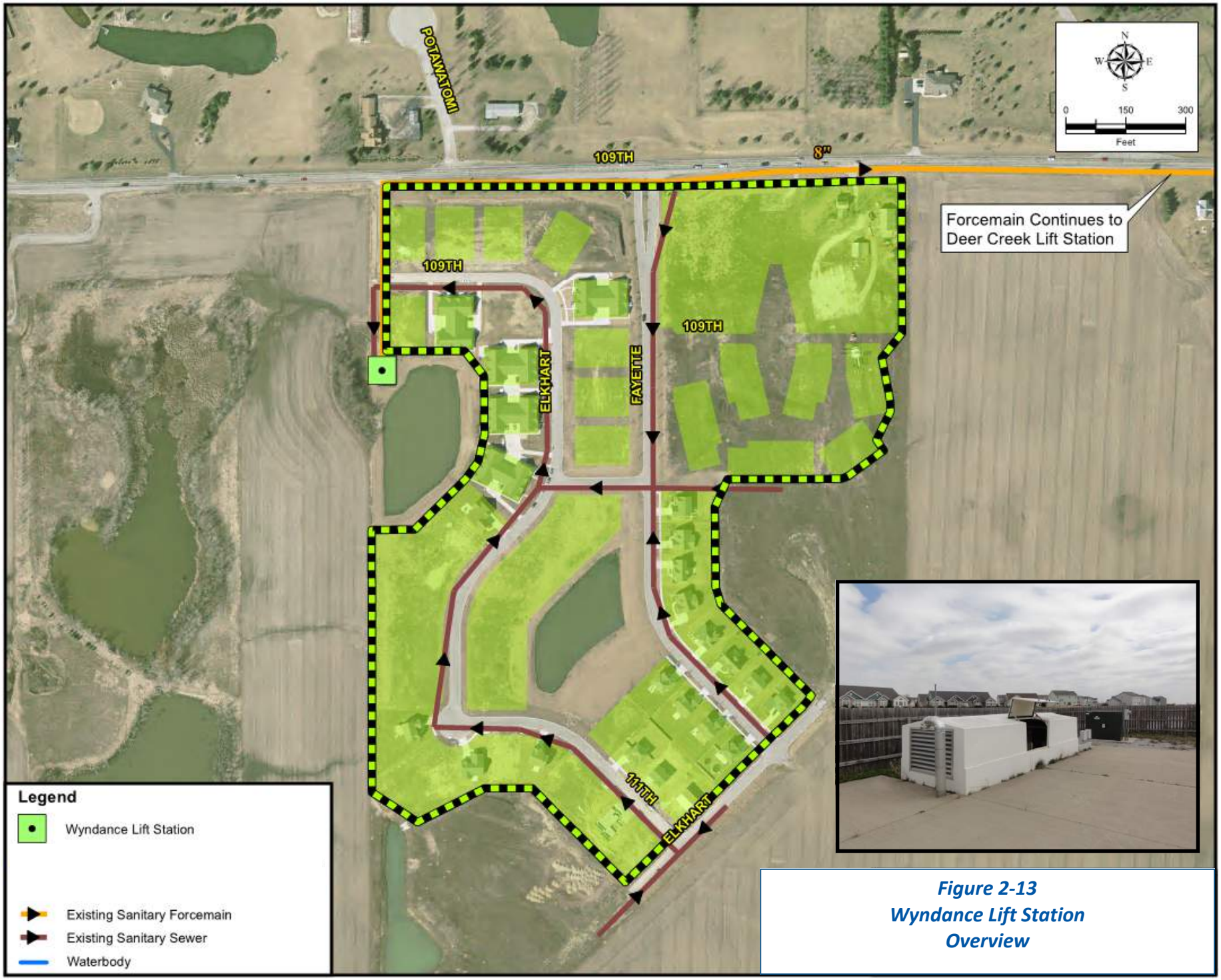


Figure 2-13
Wyndance Lift Station
Overview

2.1.11 Wyndance Lift Station

The Wyndance Subdivision Lift Station is located at the northwest corner of the Wyndance Subdivision. The lift station discharges into an 8-inch force main that runs along the south side of 109th Avenue where it discharges directly into the Deer Creek Lift Station. The lift station was permitted with IDEM on July 17, 2007 (Permit #18736). As part of the permitting requirements, upgrades to the Deer Creek Lift Station were also required and are discussed in later sections of this report. Since the initial site visit the deficiencies noted below have now been corrected. At present, it is understood that this lift station is now operated and maintained by the Town.

Pump Station Information (Info. From Submittal and Site Visit) (Access limited during inspection since Operator did not have all keys)

Style: Submersible; Duplex; Packaged
Brand: Precision Systems Twin Pack 7020N
Pumps: 323 gpm @ 40 ft TDH
VFD: None
Force Main: 8-inch Diameter
Wet Well: Concrete; 10-foot Diameter
Site Power: 3 Phase; 60 Hz
Emergency: ATS; Nat Gas Generator
Odor Control: Aerator
Communications: Strobe Light; Omnisite dialer
Controls: US Filter D152
Bypass Pump Port: Yes
Site: Concrete Drive; Fenced
Other: Heater; Dehumidifier

Observations

Site: Concrete
Security: Fenced, Locked
Wet Well: Severe Groundwater Leak at Interface of Concrete to Prefabricated Structure at SW Corner; Needs Correction ***(Corrected 9/2015)***
Piping: Severely Rusted ***(Corrected 9/2015)***
Enclosure: Interior Floor Severely Rusted; Appears as if the Station Flooded in the past
(Corrected 9/2015)
Other: Sump Pump May Not Be Working ***(Corrected 9/2015)***

Operator Comments

The operator concurred with the observations. They do not operate or maintain the lift station. The generator is not currently operational. ***(Corrected 9/2015)***

Service Area and Potential for Expansion

This pump station may provide a conduit for future growth on 109th near Arizona Street and immediately east of the Wyndance Subdivision.

Interior Floor Rust

Wet Well Access Area (Rusting)

Rusting at Entrance to Wet Well

Exterior View of Louver

Exterior Facing South

Valves

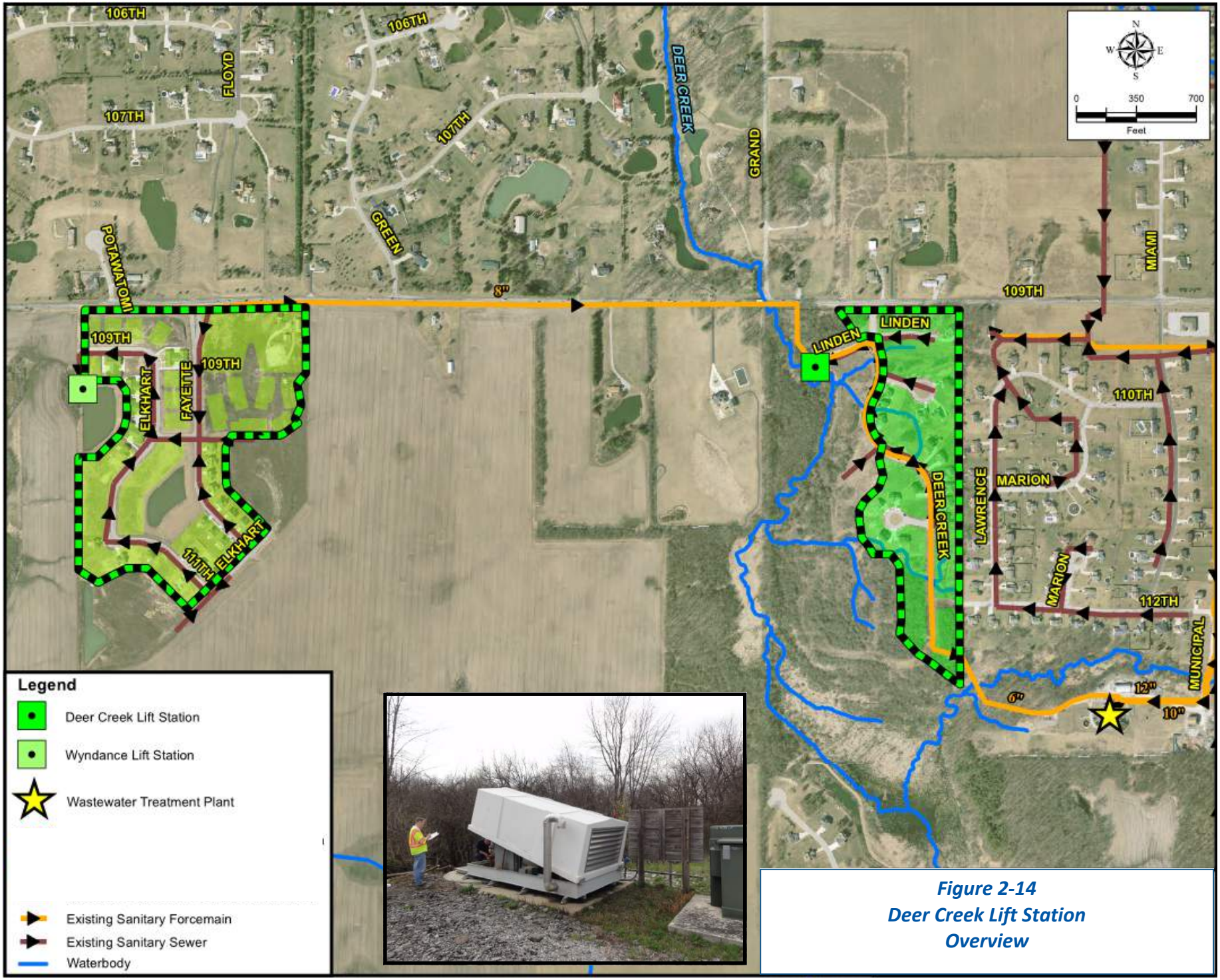


Figure 2-14
Deer Creek Lift Station
Overview

2.1.12 Deer Creek Lift Station

The Deer Creek Lift Station is located in the northwest corner of the Deer Creek Subdivision and discharges through a 6-inch force main that pumps through the subdivision to the wastewater treatment plant. This lift station was installed prior to the Town's acquisition of the wastewater treatment plant. The original IDEM permit # is 17250. The pumps were upgraded in 2008 to accommodate an increase in flow from the Wyndance subdivision (IDEM permit #18736). The Wyndance developer increased the capacity of the Deer Creek Lift Station from 200 gpm to 450 gpm. During the conversion, soft starts were installed. The lift station suffered severely from lack of maintenance since its initial construction until a couple years ago. In 2013, the pumps were reportedly downsized to the original size.

Pump Station Information (Info. From Submittal and Site Visit)

Style: Submersible; Duplex; Packaged
Brand: Precision Systems Twin Pack
Pumps: Unknown (possibly changed in 2013)
VFD: Unknown
Force Main: 6-inch Diameter
Wet Well: Concrete; 8-foot Diameter
Site Power: 3 Phase; 60 Hz; 460 V
Emergency: ATS; Natural Gas Generator
Odor Control: None
Communications: Strobe Light; Omnisite dialer
Controls: US Filter D152
Bypass Pump Port: Yes
Site: Gravel drive

Observations

Site: Poorly maintained gravel drive
Security: No Fence; Hatch Access Locked
Wet Well: Fair Condition
Enclosure: Enclosure is in poor condition. Struts to hold up fiberglass unit has failed and need repairs.
Pumps: Pumps are reported to be newer and may not be the same pumps that were updated with the Wyndance construction.
Piping: Piping and valves are rusting and should be painted.
Other: There is no bird screen and the entire assembly appears to be settling.

Operator Comments

The pump station is currently operating satisfactorily after a couple years of Town intervention into its maintenance.

Wet Well Piping

Inside the Fiberglass Unit

Generator

Evidence of Possible Settlement

Possible Bypass Location

Transformer, Meter, ATS, Breaker

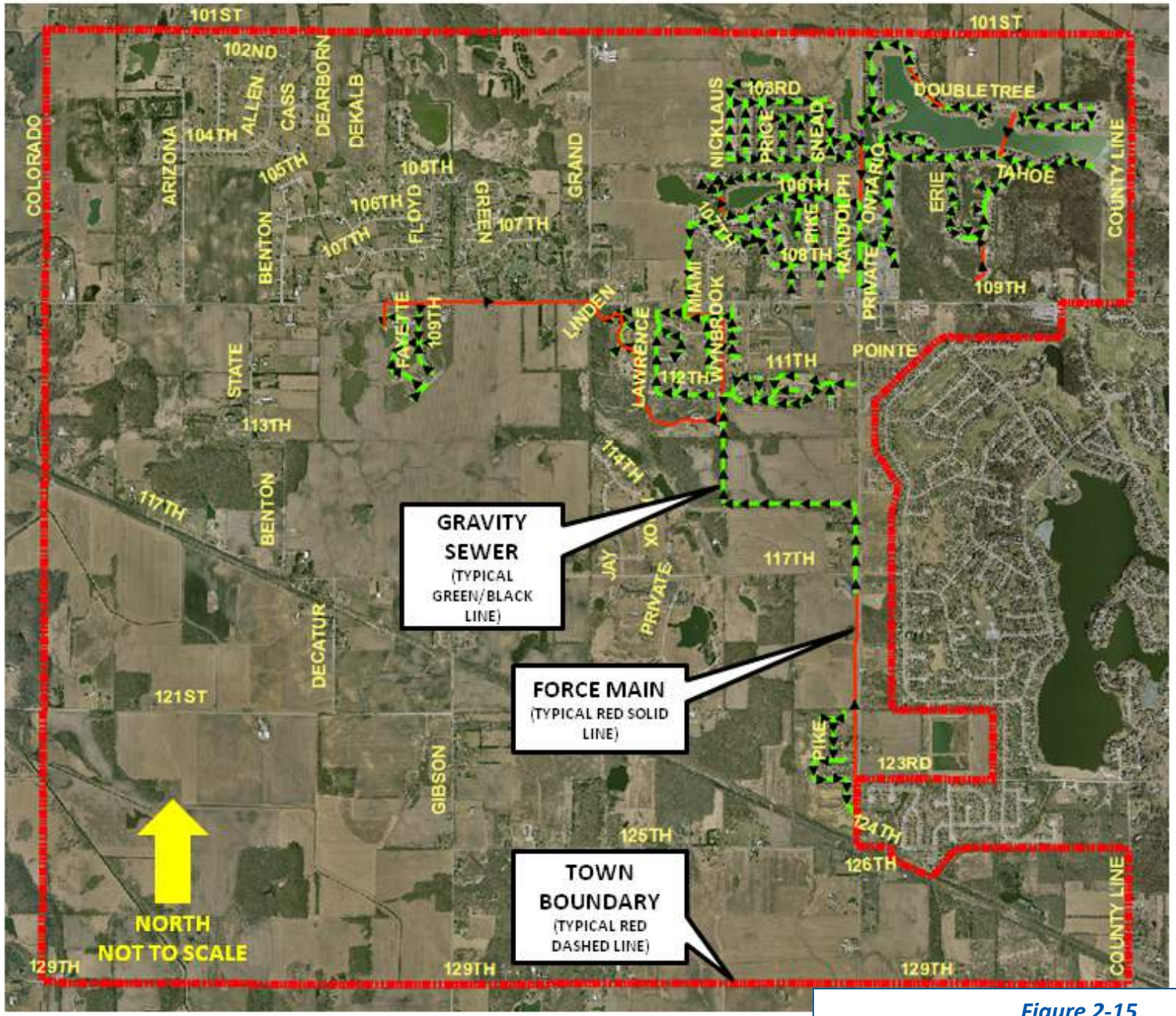


Figure 2-15
Overview of Gravity Sanitary Sewers

2.2 Gravity Sewers

2.2.1 Summary of Gravity Sewers

There are approximately 92,000 lineal feet of gravity sanitary sewer in the Town's collection system. The location of these sewers are summarized on the opposite page and a breakdown of sewer diameter and approximate length is provided in **Table 2-1** to the right. Many of these sewers are anticipated to be polyvinyl chloride (PVC) pipe. The age of the system ranges from recently constructed to approximately 20 years old. The preliminary sanitary sewer atlases are provided in Appendix A.

Table 2-1
Existing Sewer Diameters and Approximate Length

Existing Sanitary Sewer Diameter (Inches)	Approximate Footage (Feet)
6	350
8	68,200
10	10,250
12	4,450
15	8,850
24	30
	92,130

2.2.2 Identified Issues

The gravity sewer system in the Town of Winfield is relatively new and there are not many known issues at the time. Over the course of the past decade, several sources of inflow and infiltration were identified and corrected. As evidenced by "spikes" in flow at the wastewater treatment plant during rain events, the problem of inflow and infiltration still exists, and the magnitude and overall impact to the system is not fully understood. Detailed studies, beyond the scope of this master plan would be required to determine the magnitude and location of the inflow and infiltration sources. Identified issues with respect to the gravity sewer system are identified in the following subparagraphs.

Country Meadows Estates Interceptor

During the years 2007 through 2008, Doubletree Lake Estates expended significant efforts looking at the capacity of the downstream collection system from the Randolph Street pump station. As part of those efforts, it was identified that parts of the 15-inch gravity sewer receiving the discharge from the Randolph Street pump station were constructed close to flat slopes in the vicinity of the ponds in Country Meadows Estates (CME). See **Figure 2-16** to the right. This conclusion resulted in the Doubletree's interim upgrade of the Randolph Street lift station. On September 17, 2009, DLZ conducted its final review on the proposed plans for upgrades to the Randolph Street lift station as prepared by NIES Engineering. The interim upgrade was designed to allow for the building of 271 lots in Doubletree Lake Estates East and West.

Upon completion of these 271 lots, it was recognized that the Randolph Street lift station discharge would need to be routed around this section of 15-inch gravity sewer in Country Meadows Estates. The Town has kept a tally of the number of lots built since September 17, 2009 and at the time of the writing of this report, the total lots built upon are 90, leaving only 181 lots before upgrades to Randolph Street pump station are required.

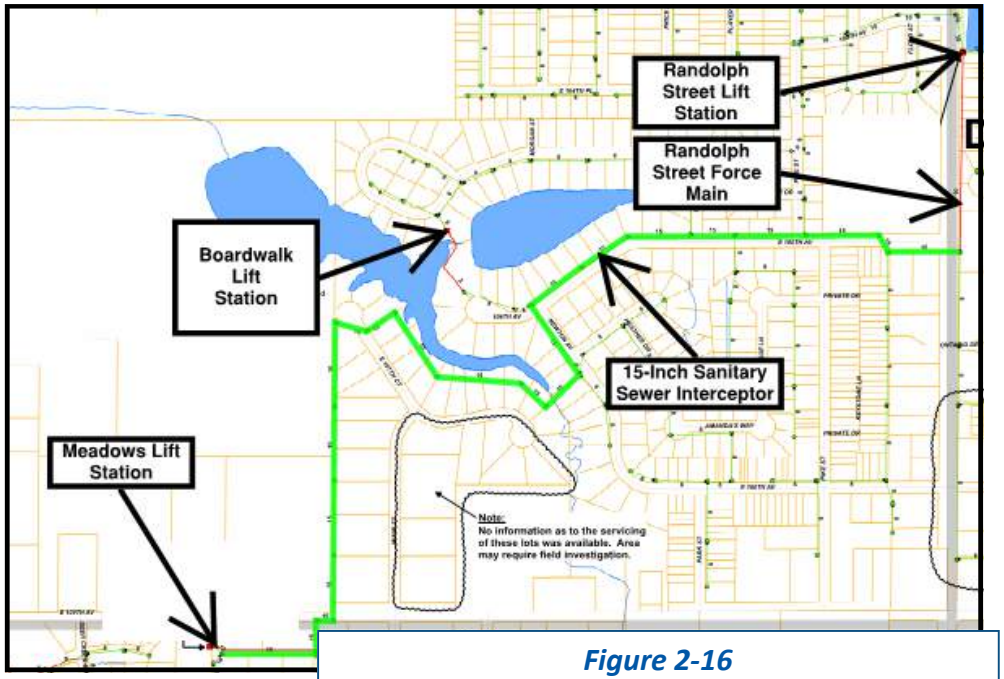


Figure 2-16
Location of 15-Inch CME Interceptor

Areas Where Further Detail is Required

During the development of the preliminary sanitary sewer atlases in 2012, there were three areas where additional detail was required with respect to the collection system location. Knowledge of the sewers in these areas will provide future benefit to the Town during planning efforts. These areas are summarized below and identified on the adjacent excerpts from the preliminary sanitary sewer atlas.

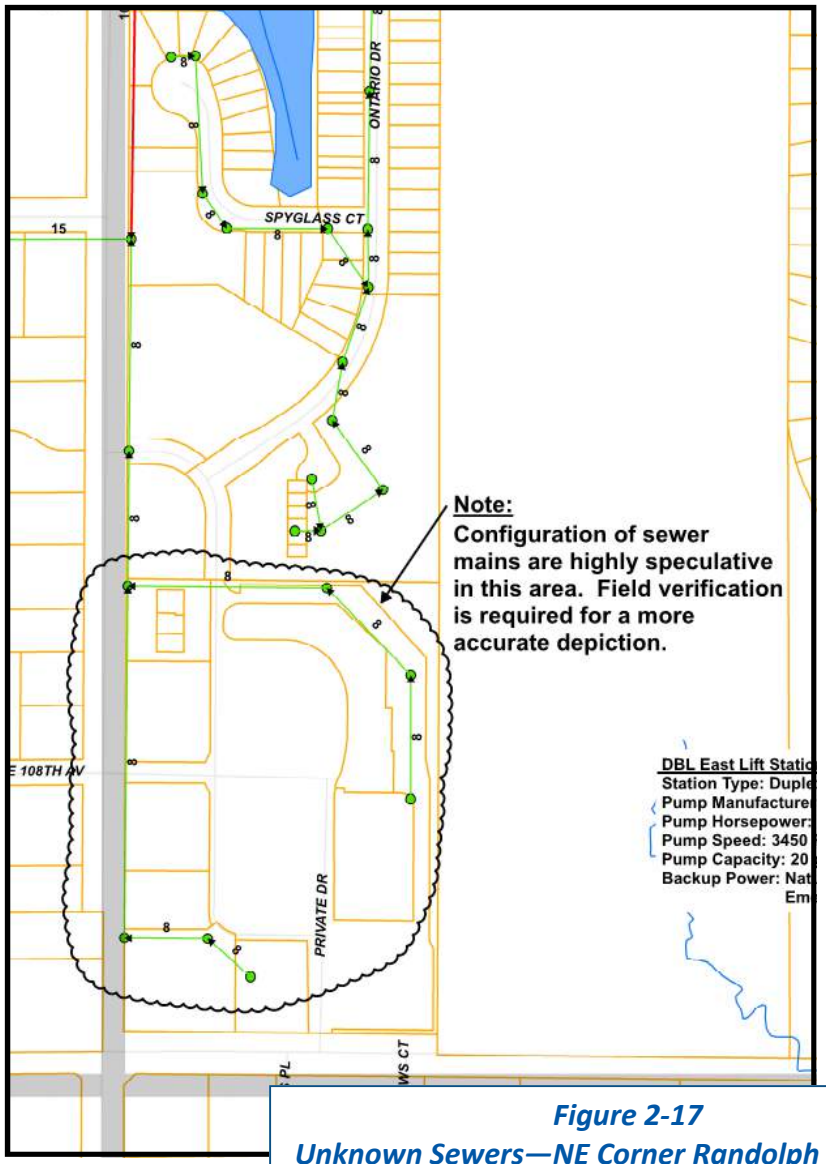


Figure 2-17
Unknown Sewers—NE Corner Randolph and 109th

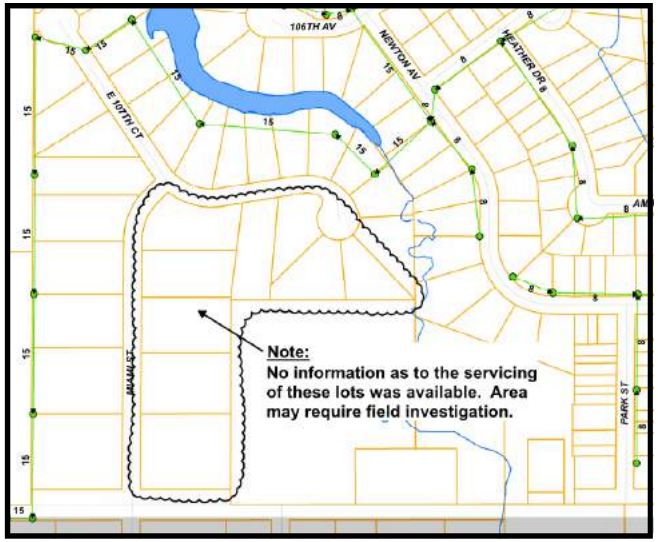


Figure 2-18
Unknown Sewers—CME East of Miami

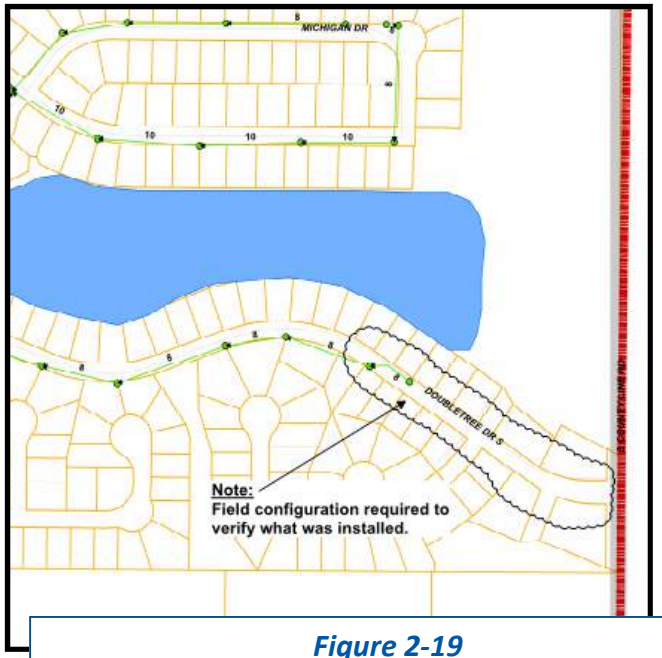
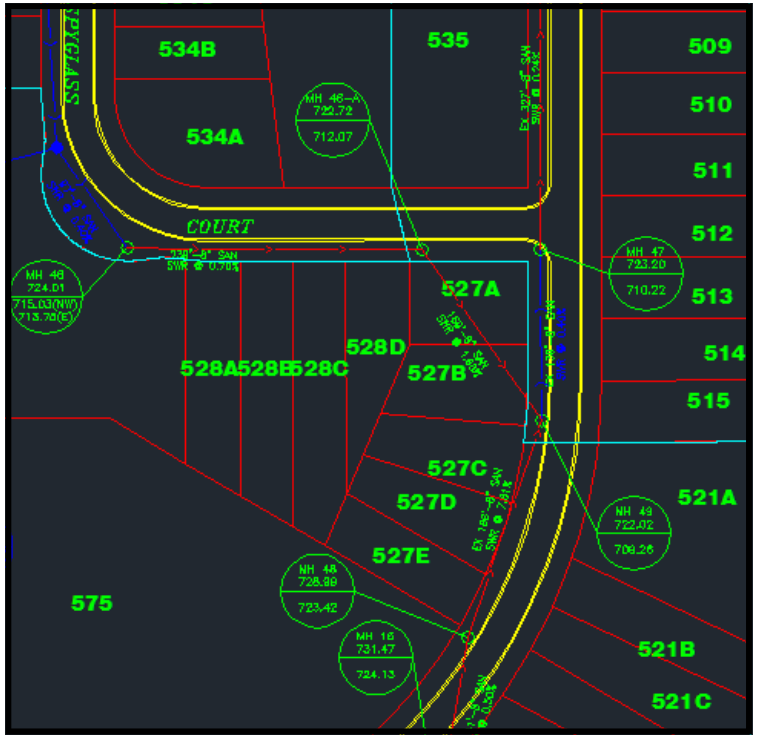


Figure 2-19
Unknown Sewers—DBL East Near Co. Line Rd.

Doubletree East Sewer Status

Based on a review of the Doubletree East Sanitary Sewer Record Drawing completed by Landmark Engineering in 2009 there is a sewer with a reversed slope in the area of Spyglass Ct. Additionally the record drawing indicates that the gravity sewer in this area crosses through lot 527A within the development. This area and associated gravity sewers should be further evaluated to develop an accurate assessment of the system.



Based on a review of the Doubletree East Sanitary Sewer Record Drawing completed by Landmark Engineering in 2009 there also is some question of the routing of the sanitary sewers at the east end of Doubletree Lake (Phase 17). The original design information indicated this area was to feed by gravity to the gravity sewers associated with Doubletree East Lift Station No. 2. Based on the information in the aforementioned Landmark drawing, this does not appear possible due to the proposed rim and invert elevations as related to the as-built elevations in the same drawing. Additionally, in the Landmark drawing there is reference to an additional proposed forcemain connecting to the gravity sewers on the south side of Doubletree Lake. DLZ staff performed a field investigation in the area the drawing shows the origination of the proposed forcemain. DLZ discovered a large +/- 10 foot diameter vault full of water. It is possible this vault is associated with a future lift station. Further review of this area should take place including discussions with the developer.

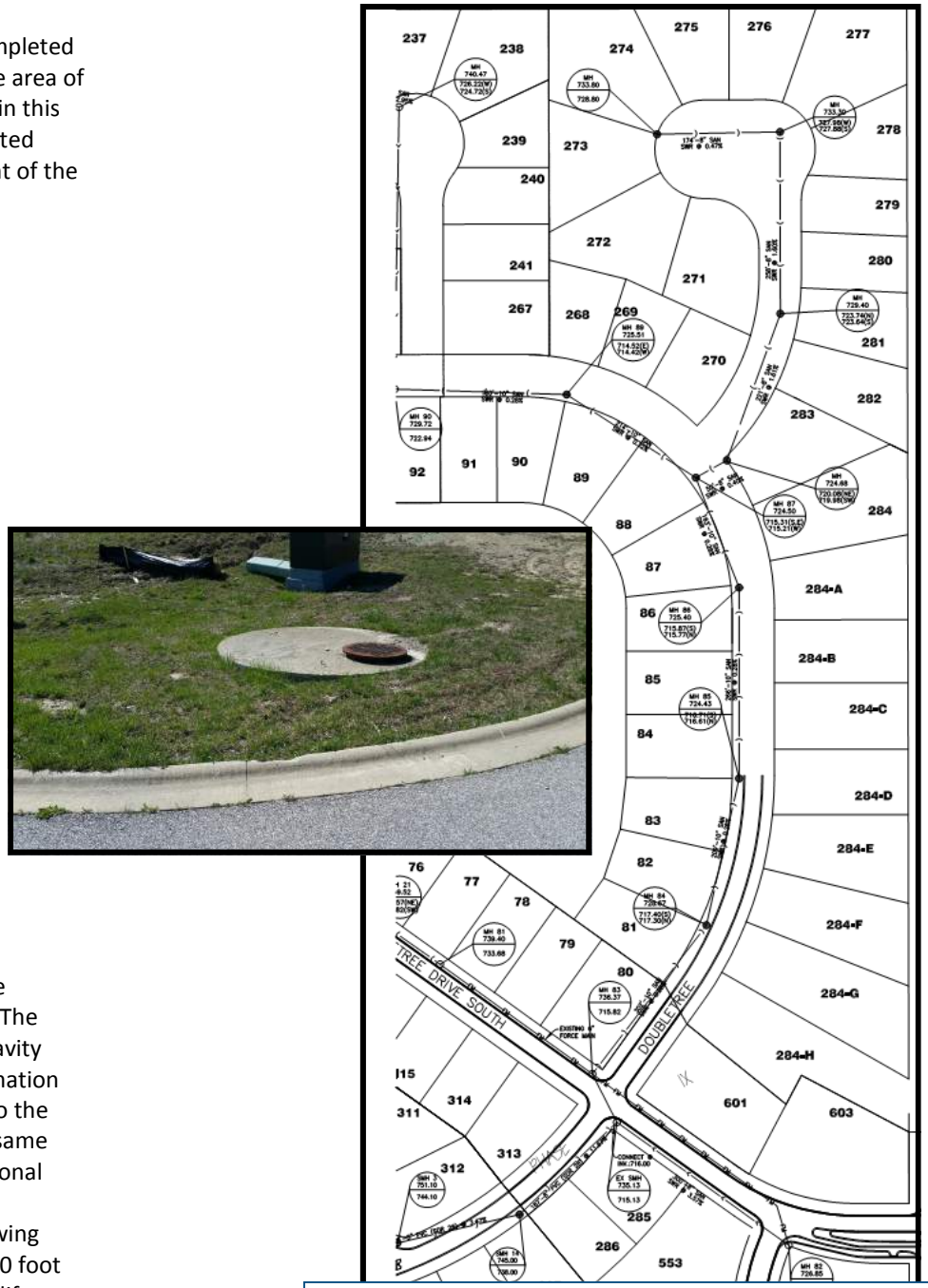


Figure 2-20
Unknown Sewers—DBL East Phase 17

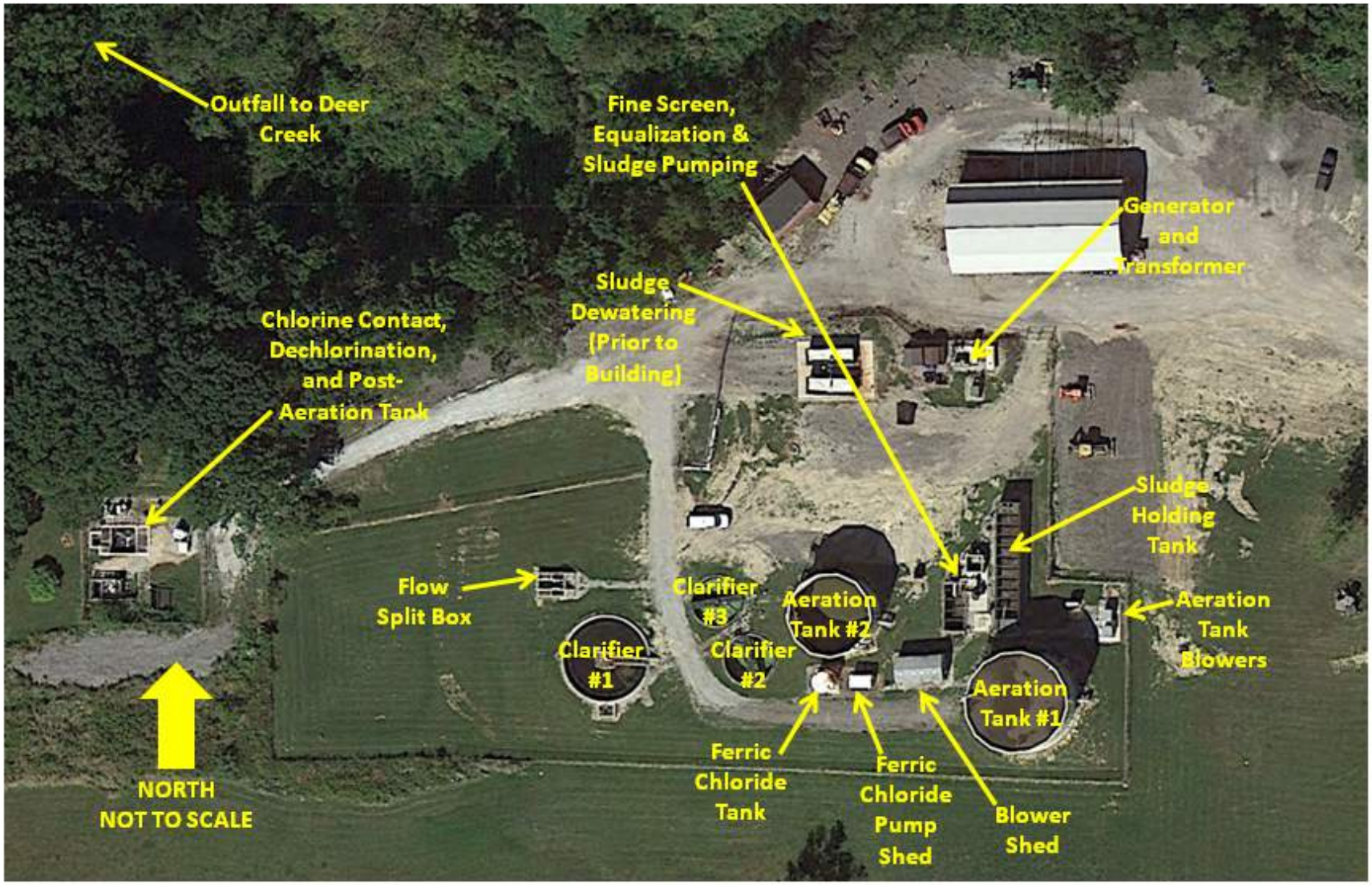


Figure 2-21
Overview of Wastewater Treatment Plant

2.3 Wastewater Treatment Plant

The existing wastewater treatment plant is rated at an average design flow of 0.40 MGD and a peak hour design flow of 1.44 MGD. Plant processes include activated sludge, extended aeration, aerobic digestion, nitrification, phosphorous removal, and post-aeration. Disinfection is accomplished seasonally with liquid chlorine. Sludge is thickened and disposed of in a landfill. The existing processes are described below:

2.3.1 Influent Box

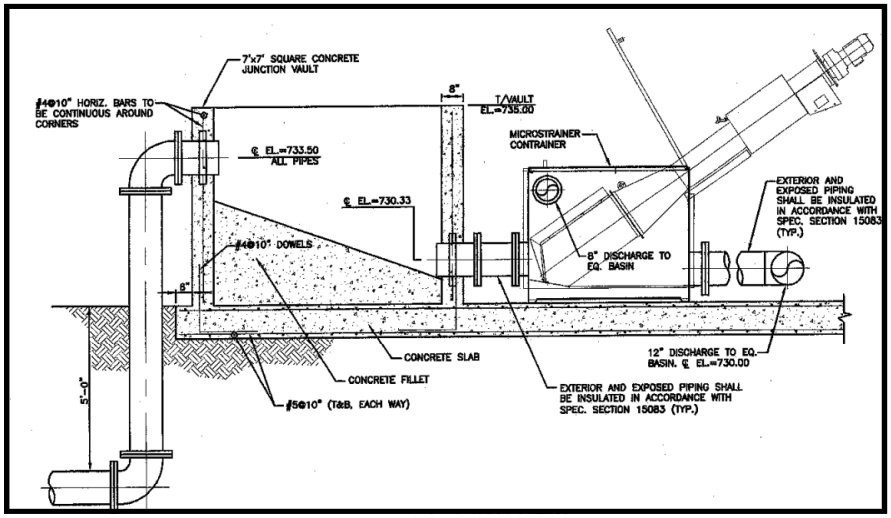
At the head of the plant, force mains from Deer Creek Lift Station, Meadows Lift Station, and Stonegate Commons Lift Station discharge into a 7-ft by 7-ft cast-in-place above grade concrete structure sloped to an outlet location that discharges into the micro-strainer fine screen. This concrete structure was installed as part of the Meadows Lift Station upgrade project in 2007. Two additional connection points exists on the box for two future force mains. The pipe connection on the west side of the tank is from the old Meadows Lift Station and is abandoned.

2.3.2 Fine Screen

The fine screen is intended to separate solids from the wastewater and discharge it into a container for disposal at the landfill. The screen was installed in 2007 as part of the Meadows Lift Station upgrade project. It is a ROTAMAT Micro Strainer Ro 9, manufactured by Huber Technology.

The screen is driven by a 1.5 hp motor and the screen container box is equipped with an emergency overflow connected directly to the equalization basin. The motor is powered by 3-phase/480 V. Water used by the screen is supplied via a 2-inch line and controlled by a solenoid valve. Required components are fitted with heat tape for freeze protection. The screen has a maximum capacity of 3 MGD. There are no reported issues with this piece of equipment at this time and the collection of screened material is manageable by the operator.

Fine Screen



Excerpt from the Design Drawings for Influent Box and Fine Screen

Influent Box and Fine Screen

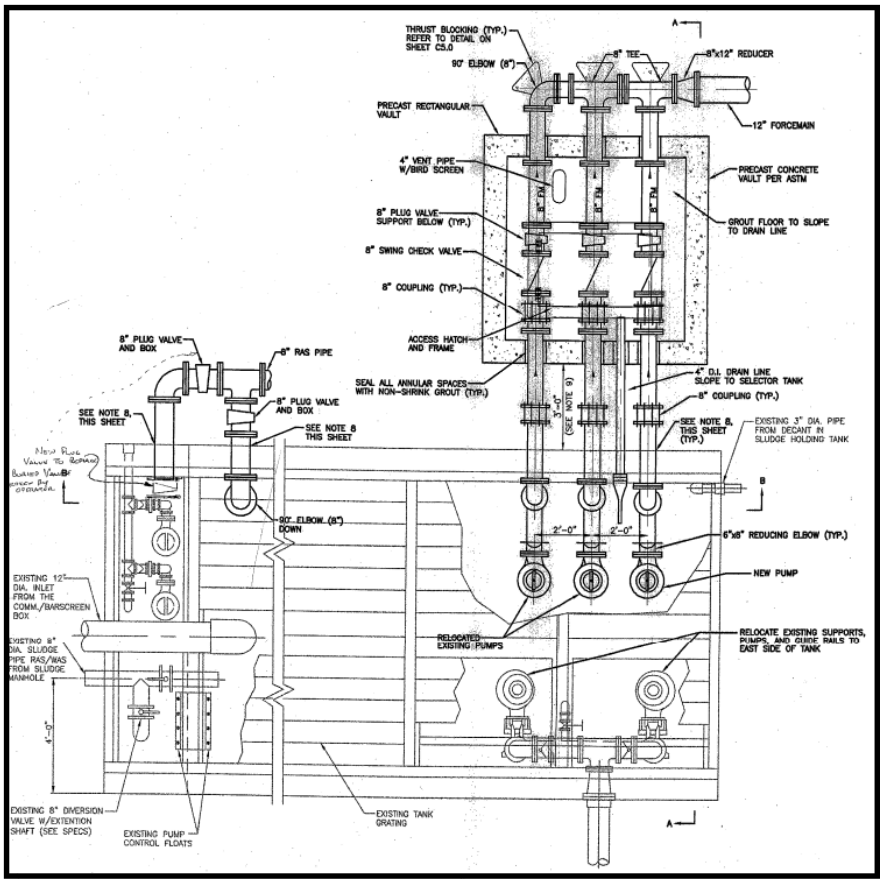
2.3.3 Equalization Basin and Sludge Pumping

Flow from the screen is discharged into the equalization basin. The basin was put into service in 2003 as part of the Phase III Expansion. The equalization basin consists of a buried metal tank open to the atmosphere. There is a divider separating the sludge well from the influent well. Three pumps, one of which was added during the Phase IV expansion, discharge sewage to Aeration Tank #1 for aerobic treatment. As shown in the excerpt from the 2007 design plans below, two of the existing pumps from the 2003 Phase III Expansion were relocated to the opposite side of the tank and an additional pump was added. These pumps are intended to alternate operation with a maximum of two pumps discharging to the tank at one time. A valve vault constructed in 2007 is shown at the top of the image below. Return activated sludge from the secondary clarifier is piped into the equalization tank for mixing with the influent wastewater. Waste activated sludge

Equalization Basin Showing Pump Rails and Discharge Piping

Discharge of Screen Effluent into the Equalization Basin

Northernmost Section of Tank where Sludge Pumping Occurs



Excerpt from Design Plans for Equalization Basin Modifications

is manually discharged to the small chamber on the north side of the tank by opening a valve on the return activated sludge line. This smaller tank is fitted with a pump that discharges the waste activated sludge into the aerobic digester. The pump does not have a lifting system to easily remove the pump. The operator has to enter the tank to disconnect the pump to unclog it or perform maintenance on the pump. The condition of the interior of the tank is in poor conditions showing signs of heavy corrosion. The tank is difficult to maintain and may have served its useful life.

2.3.4 Aeration Tank #1

The equalization basin pumps discharge through a 12-inch force main. Valves allow flow to be discharged to Aeration Tank #1 and/or Aeration Tank #2. Aeration Tank #1 is a bolted steel 300,000 gallon capacity tank equipped with an air header and piping with fine bubble air diffusers at the bottom of the tank. The tank is manufactured by All State Tanks and the diffusers are manufactured by ITT/Sanitaire. Air to the diffusers are provided by two 75 hp VFD driven rotary lobe blowers located to the northeast of Aeration Tank #1 housed in outdoor rated cabinets. Control of the blowers can be based on readings from the dissolved oxygen sensor. The above described equipment was installed in 2007 as part of the Phase IV Expansion. There are no reported issues with the tank, diffuser system, or blowers.

Aeration Tank #2 Blower Shed and Control Panels

Aeration Tank #1

Aeration Tank #1 Blowers (2 Units to the Right) and Control Unit (Left)

Aeration Tank #2

2.3.5 Aeration Tank #2

Aeration Tank #2 is also a bolted steel tank that was constructed in 2003 as part of the Phase III Expansion project. Aeration Tank #2 is a bolted steel 200,000 gallon capacity tank equipped with an air header and piping with fine bubble air diffusers at the bottom of the tank. Air is provided by blowers housed in a wooden shed adjacent to the tank. There are no reported issues with the tank, diffusers, or blowers for Aeration Tank #2.

2.3.6 Ferric Chloride Treatment System

During the permitting of the 2007 Phase IV Expansion project, IDEM required treatment for phosphorous. A ferric chloride phosphorous removal system was included by addendum into the plant expansion. Ferric chloride is housed in a 10-foot diameter cylindrical chemical storage tank to the south of Aeration Tank #2. A Jesco metering pump is housed in a white fiberglass shed adjacent to the tank. Operational concerns include the drain valve which is in a location where it is easily tripped on and could be broken which could cause a spill.

2.3.7 Clarifiers and Flow Split Structure

There are three clarifiers on the plant site. The two smaller clarifiers were constructed in 2003 as part of the Phase III Expansion project. The larger concrete clarifier was constructed during the 2007 Phase IV Expansion project. The two smaller clarifiers are of entirely metal construction. Flow from the aeration tanks is fed to a precast concrete flow split box with four chambers (see photograph) constructed during the 2007 Phase IV Expansion project. One of the chambers is designed to distribute flow through a slide gate to the new concrete clarifier. One of the other chambers is designed to distribute flow to the two steel clarifiers. Both slide gates were difficult to open, close and adjust last winter when the large

Metering Pump Building and Ferric Chloride Tank

Flow Split Structure

Clarifier #1

Clarifiers #2 and #3

clarifier was taken offline for repairs. Maintenance should be performed on both gates to bring them back to good working order. Another flow split box splits flow into the two steel clarifiers. The large clarifier is designed to handle 0.33 MGD and the two smaller clarifiers, are designed to handle 0.035 MGD each.

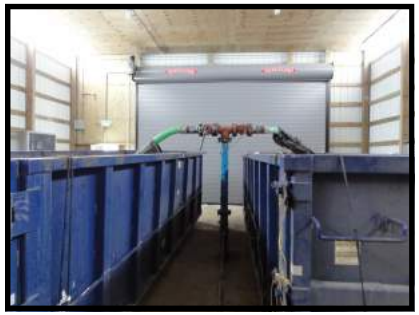
Recently, the bearings, bearing raceway, and the lower drive unit in the larger and newer clarifier failed causing a several month long outage of the clarifier. This issue has been resolved and the clarifier is back in operation.

The two smaller clarifiers have operational problems because of their shallow depth which hinders the settling of solids. Also, the second flow split structure is inefficient and the air lift return activated sludge pumps cause operational problems and require excessive maintenance.

Sludge Holding Tank (Black Tank in Front)

2.3.8 Aerobic Digestion

Waste activated sludge is pumped from the northern chamber of the equalization tank to the aerobic digester for further decompositIon of the organic waste. The aerobic digester was constructed in 2003 as part of the Phase III Expansion project and has a capacity of 51,200 gallons. The operators can decant clear water from the digester to help thicken the sludge and provide additional sludge storage. The 2007 Phase IV Expansion project included the aerobic digester from the Phase II project with a capacity of 24,200 gallons as part of the design. The Phase II tank has since been removed. The loss of the capacity of this tank has been offset by the sludge dewatering facility and building. With a dewatering facility that can operate year-round the additional sludge holding capacity is minimized.



Sludge Manifold into Dumpsters

Polymer Pump Unit

2.3.9 Sludge Dewatering

The operators manually turn on a sludge pump to waste sludge from the aerobic digester to the sludge dewatering system that was constructed in 2009. The dewatering system consists of a polymer pump unit which is used to promote sludge thickening. The operator manually controls valves on the sludge manifold and can control the flow of sludge into one of the dumpsters. The dumpsters are fitted with a geotextile bagging system that allows water to drain out, but keeps the sludge within the bag. The dumpsters, when full, are hauled to a landfill for disposal.

Until recently, the system was a seasonal system due to freezing issues. Then in 2014, a building was constructed over the dewatering system. However, the building was not heated and freezing occurred. Heat tape was installed to remedy this issue.

2.3.10 Chlorination, Dechlorination, and Post-Aeration

The final elements of treatment include seasonal chlorination with dechlorination (April thru October) and post-aeration. This is all accomplished at the far west end of the plant after flow passes through the clarifiers. Chlorination is accomplished through the addition of liquid chlorine to the flow stream ahead of a flow path which utilizes 3 tanks; one that was constructed in 1996 as part of the Phase I Expansion, one that was constructed 2003 as part of the Phase III Expansion, and a structure constructed during the 2007 Phase IV Expansion project to provide the required contact time. Solid dechlorination tablets were abandoned in favor of liquid form in recent years due to less than desirable results. Post-aeration is accomplished by 3 horsepower rotary lobe blowers and a fine bubble aeration system. No operational issues were reported at this time with the equipment or operation.

Part of the Chlorination, De-chlorination, and Post-Aeration Tank

Liquid Dechlorination Assembly

Liquid Chlorination Assembly

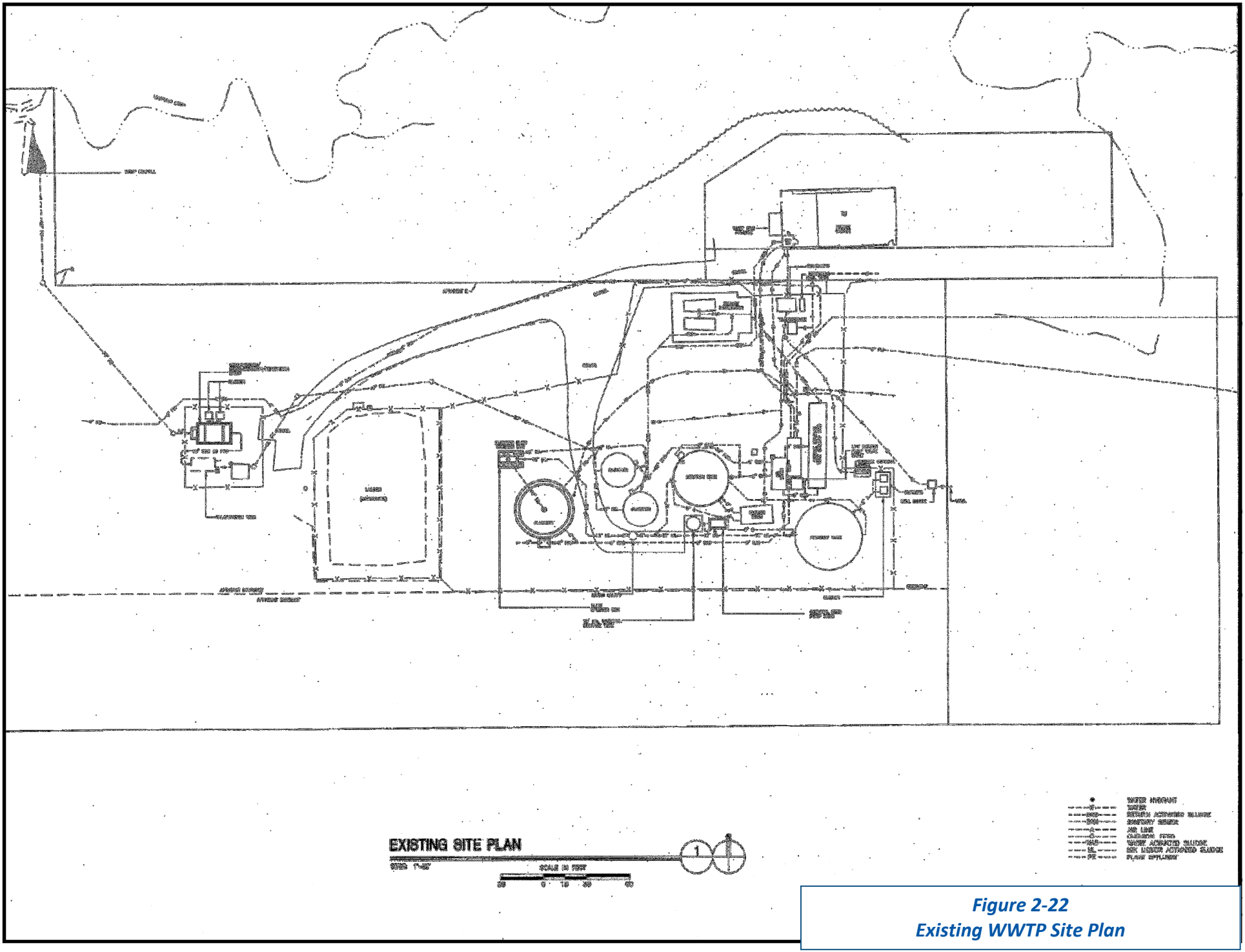


Figure 2-22
Existing WWTP Site Plan

SECTION 3 - COLLECTION SYSTEM MASTER PLAN—CONCEPT A1 & A2

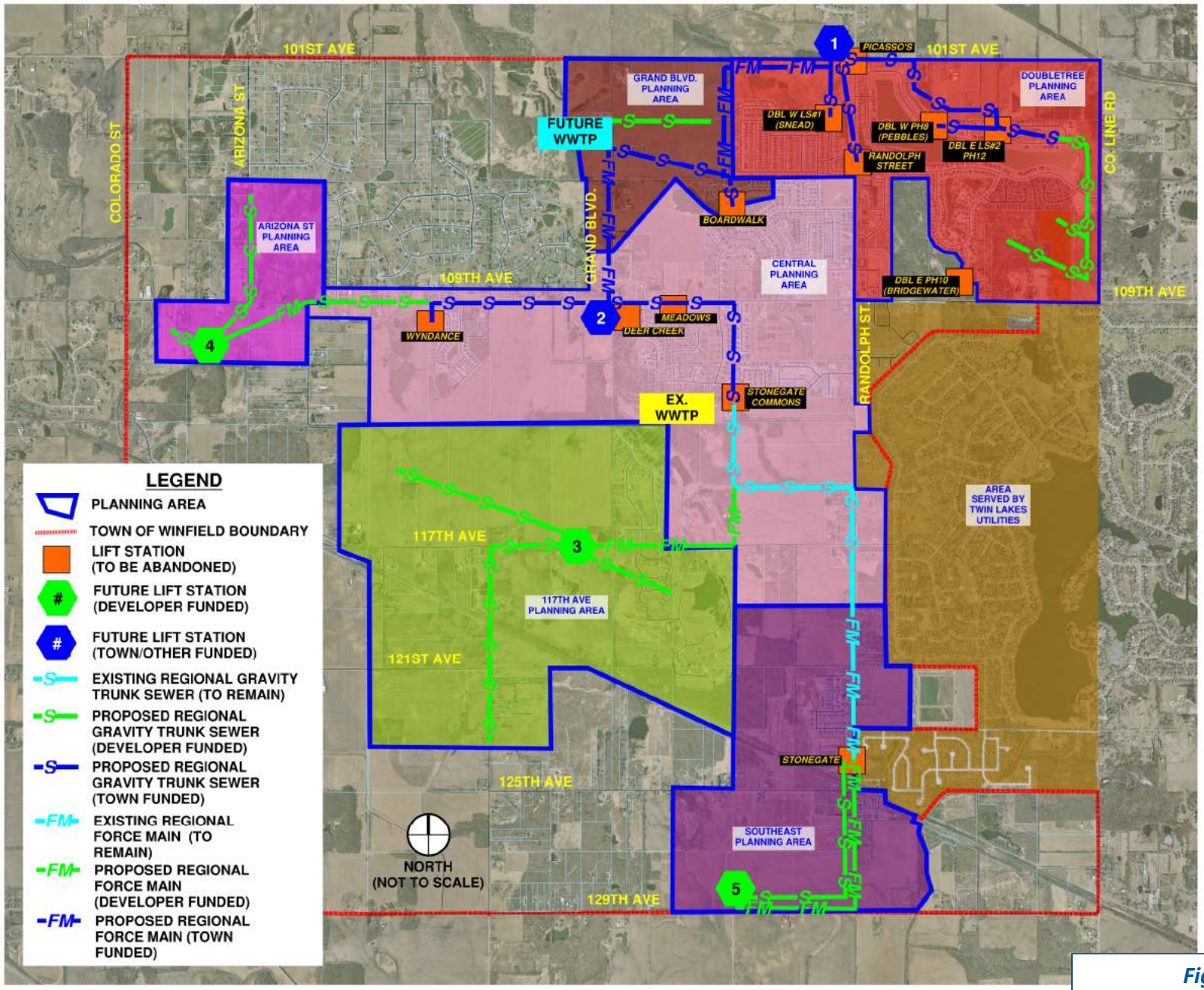


Figure 3-1
Concept A1

3.0 Overview Concept A1

The Collection System Concept A1 involves relocation of the wastewater treatment plant to an area adjacent to the west side of Grand Boulevard along the same branch of Deer Creek that the existing wastewater treatment plant is permitted to discharge. In addition to a major overhaul of the collection system, significant sewer line work is required to redirect all of the connections to the new location.

3.1 Doubletree Planning Area

There are currently six lift stations in the Doubletree developments including the Picasso lift station. There is a seventh lift station that is planned near County Line Road. The plan, schematically shown in **Figure 3-1**, considers the elimination of all seven lift stations and the construction of a single lift station near the intersection of Randolph Street and 101st Avenue. This lift station is denoted as the blue hexagon identifier with the numeral "1". The lift station should have a firm capacity of 800-900 gpm, an 8-inch diameter force main and a minimum of a 10-foot diameter wet well. This plan requires the following additional elements:

1. Redirection of existing sanitary sewer between DBL W Ph8 "Pebbles" lift station and DBL E LS#2 "Ph12".
2. Reconstruction of existing sanitary sewer east of DBL E LS#2 "Ph12".
3. Construction of a new sanitary sewer along the northern edge of Doubletree East and the acquisition of multiple easements along this corridor to 101st Avenue.
4. Construction of a new sanitary sewer along 101st Avenue to avoid construction through the dam located along the northernmost part of Doubletree Drive North.
5. Construction of a new gravity sewer from the existing Randolph Street lift station northward to the new lift station at 101st Avenue and Randolph Street.
6. Construction of a new gravity sewer from DBL W LS#1 "Snead" to the new lift station at 101st Avenue and Randolph Street.
7. Abandonment of the DBL E Ph10 "Bridgewater" lift station and replacement of the service to the one home on the system with an E-One or similar type grinder pump station to be maintained by the homeowner. This would also necessitate E-One or similar type grinder pump stations for the remaining future houses on the cul-de-sac.
8. Abandonment of the Picasso, DBL W Ph8, DBL E LS#2, Randolph Street, and DBL W LS#1 lift stations.
9. Construction of a new force main westward to Grand Boulevard to a gravity sewer which will start at the northwest corner of Country Meadows Estates.
10. Construction of a new gravity sanitary sewer westward across an undeveloped parcel to a new wastewater treatment plant.

This work will significantly disrupt Doubletree Drive North. The excavation will be deep and will likely require reconstruction of the roadway from back of curb to back of curb. Approximately 10-15 easements will be required in order to construct the sewer to 101st Avenue. Approximately 1,200 feet of 101st Avenue roadway will require reconstruction as a result of the excavation.

Developer funded gravity sewer would be required to serve the southeast portion of this planning area as identified by the green line with an "S" notation in **Figure 3-1**.

3.2 Grand Boulevard Planning Area

The Grand Boulevard Planning Area as shown in **Figure 3-1** serves an area roughly one-half square mile. It provides for the elimination of the Boardwalk Lift station by providing an outlet for the area tributary to the Boardwalk lift station at the northwest corner of Country Meadows Estates. Several large undeveloped parcels lie on the east side of Grand Boulevard in this area. These would be served by a developer installed gravity collection system that would convey sewage directly to the new wastewater treatment plant. The developer installed system is schematically shown as a green line with an "S" notation.

3.3 Central Planning Area

The Central Planning Area takes into account areas adjacent to 109th Avenue and Randolph Street. In summary, a regional lift station denoted as "2" inside a blue hexagon would be constructed near the intersection of Grand Boulevard and 109th Avenue as shown in **Figure 3-1**. This concept was of a regional lift station at this location was proposed to the Town in 2007 by DLZ, but was not embraced by the Town. This plan included the elimination of the Wyndance, Deer Creek, and

Meadows Lift Stations. The lift station should be designed to ultimately have a firm capacity of 1,600 gpm, an 12-inch diameter force main and an 12-foot diameter wet well at a minimum. Lower sized pumps and aeration may be required during the interim until the area fully develops.

Not only would this lift station serve the areas along 109th Avenue, it would also receive flows from the Randolph corridor south (Southeast Planning Area) and the 117th Avenue Planning Area. These areas are discussed in later paragraphs of this section.

3.4 Arizona Street Planning Area

The Arizona Street Planning Area is depicted in **Figure 3-2**. This area represents the western -most anticipated limits of development in the Town of Winfield that is to be connected into the Town's WWTP. A portion of this area was recently purchased by the Crown Point School System and was recently in planning as a significantly sized residential subdivision. This planning area is capable of supporting approximately 440 residential units at a rate of 2.3 units per acre. Due to the relief in this area, it is proposed that any development located within this planning area be contributory to a new lift station located at the southwest corner of the planning area. All areas within the planning area would convey wastewater by gravity sewer to this regional lift station via developer installed gravity sewers. The lift station should have a firm capacity of 350 gpm, an 8-inch diameter force main and an 8-foot diameter wet well at a minimum. The lift station would pump flow to a proposed gravity sewer on 109th Avenue that would begin somewhere in the vicinity of State Street. This gravity sewer would convey the wastewater to the proposed regional lift station "2" near the intersection of Grand Boulevard and 109th Avenue.

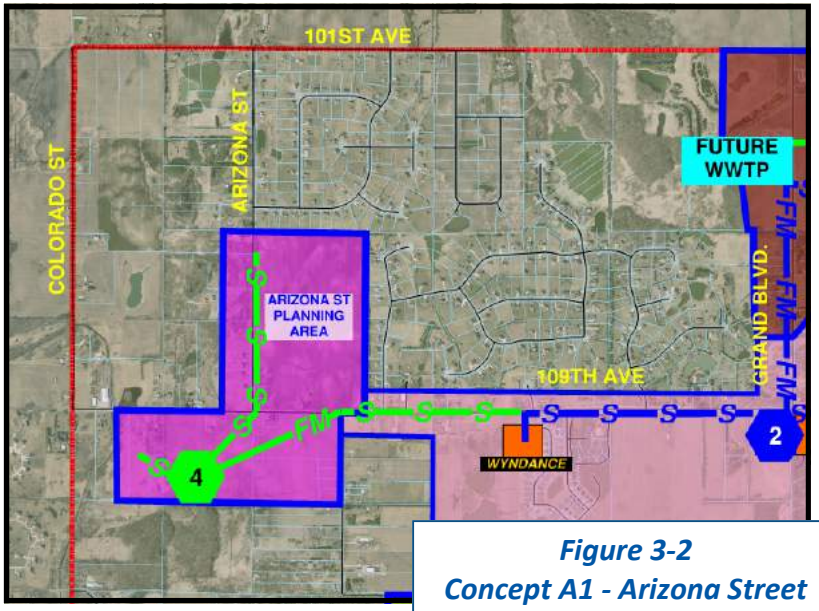


Figure 3-2
Concept A1 - Arizona Street Planning Area

3.5 117th Avenue Planning Area

The 117th Avenue Planning Area is shown in **Figure 3-3** and encompasses the Crown Point Christian Village (CCV). The CCV presently operates its own WWTP. This WWTP is in poor condition and CCV approached the Town about connection of their facilities into the Town's WWTP. As part of this master plan, the area surrounding CCV was reviewed and it was determined that a regional lift station would be required along 117th Avenue at a low point in the topography just west of CCV.

Proposed expansion plans and existing usage represents an equivalent of 100 units at CCV. The remaining planning area has a potential to contribute and additional 770 units. Prairie Crossing could tie onto this system at 46 units (although not graphically shown). The Prairie Crossing system would likely take the form of a low pressure system where each unit would have a grinder pump that pumped to a common header and force main. This system most easily adapts to retrofit applications where sewers are not currently present.

The area shown south of the abandoned railroad tracks is not intended to be developed out to the 2.3 units per acre as part of this master planning effort. However, it is intended to accommodate a future school and tie ins of existing residential units along the route of the gravity sewer that would be extended to the school.

The regional lift station should have an ultimate buildout firm capacity of 1,300 gpm, a 10-inch force main, and a 12-foot diameter wet well as a minimum. Routing of the force main is recommended to run eastward along 117th Avenue to a point located on the southern prolongation of the west line of Stonegate Commons; then run

northward within portions of the existing off-site Stonegate sewer to the WWTP. Running the force main northward along the west boundary and then east along the north boundary of Prairie Crossing should not be considered because access to the WWTP would require a long wetland crossing north of Prairie Crossing Subdivision. This would make the forcemain for this regional lift station difficult to access and maintain in the future.

3.6 Southeast Planning Area

The Southeast Planning Area encompasses the Stonegate Subdivision, future Stonegate North Subdivision and areas southward to 129th Avenue as shown in **Figure 3-3**. All the improvements in this planning area would be developer driven. As the area south of Stonegate develops, a regional lift station is required adjacent to 129th Avenue and one of the tributaries to Stony Run Creek. Gravity sanitary sewer would be extended to intercept all sewers tributary to the existing Stonegate Lift Station. The sanitary sewer would extend southward to the regional lift station. The regional lift station would pump northward and tie into the existing Stonegate force main. The regional lift station, denoted as a green hexagon and "5" , would need to be sized for an ultimate 1,000 gpm firm capacity, 8-inch diameter force main, and a minimum 10-foot diameter wet well. Lower sized pumps and aeration may be required during the interim until the area was fully developed. The existing size of the Stonegate lift station force main would require an analysis at the time of development to determine whether pumps could be provided for the flow and head conditions, or whether a parallel force main was required.

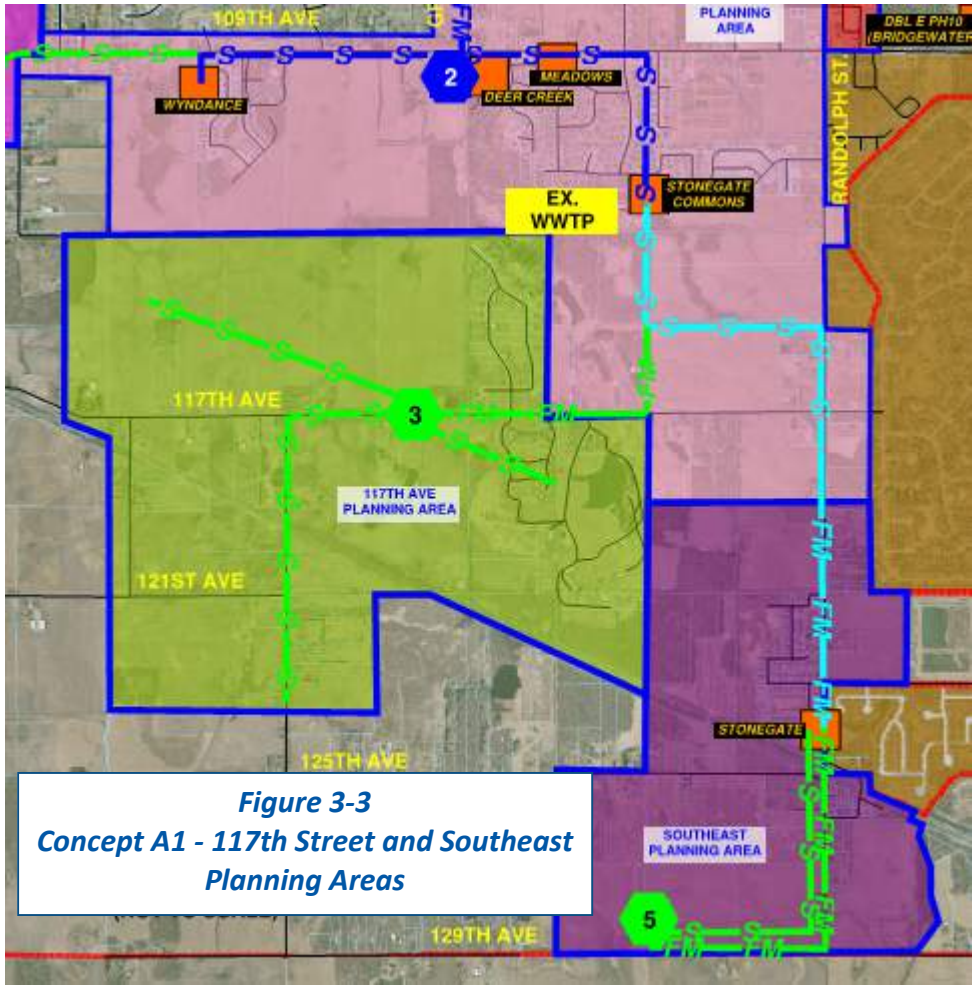


Figure 3-3
Concept A1 - 117th Street and Southeast Planning Areas

LEGEND

- PLANNING AREA
- TOWN OF WINFIELD BOUNDARY
- LIFT STATION (TO BE ABANDONED)
- # FUTURE LIFT STATION (DEVELOPER FUNDED)
- # FUTURE LIFT STATION (TOWN/OTHER FUNDED)
- S EXISTING REGIONAL GRAVITY TRUNK SEWER (TO REMAIN)
- S PROPOSED REGIONAL GRAVITY TRUNK SEWER (DEVELOPER FUNDED)
- S PROPOSED REGIONAL GRAVITY TRUNK SEWER (TOWN FUNDED)
- FM EXISTING REGIONAL FORCE MAIN (TO REMAIN)
- FM PROPOSED REGIONAL FORCE MAIN (DEVELOPER FUNDED)
- FM PROPOSED REGIONAL FORCE MAIN (TOWN FUNDED)

3.7 Concept A2

A slight modification to Concept A1 would be to place the new WWTP along Deer Creek near the intersection of 109th Avenue and Grand Boulevard as opposed to north on Grand Boulevard. Figure 3-1 would be modified to include a WWTP located near where regional lift station #2 is and a lift station near where the future WWTP is shown. Regional lift station #1 could pump directly to the WWTP, or it could be allowed to pass through any development in the Grand Boulevard Planning Area via gravity and be pumped by that regional lift station. Further analysis would be required to develop this option further.

3.8 Opinion of Probable Costs—Concept A1

Opinions of probable costs were developed for "Town/Other Funded" Improvements for Concept A1 and are provided in **Table 3-1**. These improvements include those shown with the blue line and "S" or "FM" notations on **Figure 3-1** through **Figure 3-3**. They also include lift stations denoted by the blue hexagons on **Figure 3-1** through **Figure 3-3**. The opinions of probable costs in Section 3 are prepared generally in accordance with a Class 4 Estimate, "Study or Feasibility" as defined in the Association for the Advancement of Cost Engineering (AACE). Costs are estimated using year 2016 dollars and do not include: land acquisition or easements; remediation of unusual soils; environmental remediation; utility relocations; or complex dewatering. Costs assume a 20-percent contingency, and 25-percent engineering, legal and administration factor.

3.9 Sequencing/Implementation—Concept A1/A2

Preliminary planning, land acquisition, design, permitting and construction of the wastewater treatment plant are the first element to be implemented as part of this concept. Permitting a new wastewater treatment plant will be a time consuming activity considering the Town already has a permitted facility located on the same creek.

Upon completion of the wastewater treatment plant, the Town could proceed from either the Doubletree basin or the Central basin or both. Removal of Stonegate Commons from the existing wastewater treatment plant would be preceded by construction of a gravity interceptor to the new Grand Boulevard/109th regional lift station and force main.

Table 3-1
Concept A1/A2—Town Funded

	DESCRIPTION	Amount
DOUBLETREE AND GRAND BOULEVARD PLANNING AREA		
	FUTURE LIFT STATION #1	$670,000
	ABANDON LIFT STATIONS	$70,000
	GRAVITY SEWER ALONG DOUBLE TREE DRIVE NORTH	$1,820,000
	GRAVITY SEWER BETWEEN DOUBLE TREE NORTH DRIVE AND 101ST AVENUE	$240,000
	GRAVITY SEWER ALONG 101ST AVENUE TO FUTURE LIFT STATION #1	$660,000
	GRAVITY SEWER FROM RANDOLPH PUMP STATION TO FUTURE LIFT STATION #1	$370,000
	GRAVITY SEWER FROM SNEAD LIFT STATION TO FUTURE LIFT STATION #1	$140,000
	FORCE MAIN FROM FUTURE LIFT STATION #1 TO THE SOUTHWEST CORNER OF DOUBLETREE WEST	$640,000
	GRAVITY SEWER FROM THE SOUTHWEST CORNER OF DOUBLETREE WEST TO THE NEW WWTP	$420,000
	CONVERT BRIDGEWATER SERVICE AREA TO GRINDER SYSTEM	$60,000
CENTRAL PLANNING AREA PROJECTS		
	FUTURE LIFT STATION #2	$1,100,000
	ABANDON LIFT STATIONS	$60,000
	GRAVITY SEWER ALONG 109TH AVENUE FROM WYNDANCE TO THE FUTURE LIFT STATION #2	$1,090,000
	GRAVITY SEWER ALONG 109TH AVENUE FROM THE NORTHEAST CORNER OF MEADOWS TO THE FUTURE LIFT STATION #2	$900,000
	GRAVITY SEWER BETWEEN THE STONEGATE COMMONS LIFT STATION AND FUTURE 109TH AVENUE GRAVITY SEWER	$320,000
	FORCE MAIN FROM THE FUTURE LIFT STATION #2 TO THE NEW WWTP	$620,000
GRAND TOTALS (WITHOUT WASTEWATER TREATMENT PLANT COMPONENT)		
		$9,180,000

SECTION 4 - COLLECTION SYSTEM MASTER PLAN—CONCEPT B

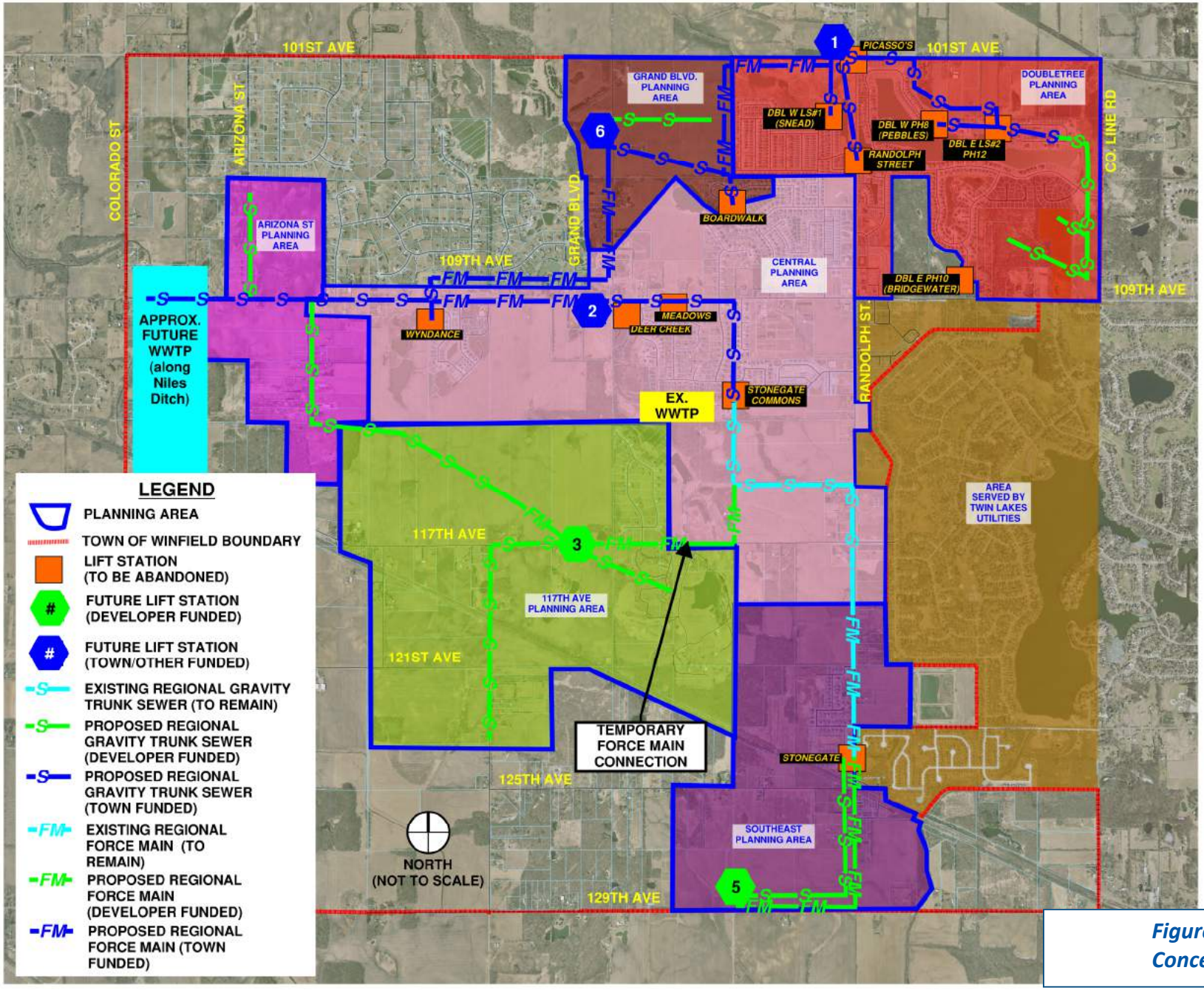


Figure 4-1
Concept B

4.0 Overview

Concept B is very similar to Concepts A1 and A2, except Concept B contemplates moving the WWTP to Niles Ditch on the west end of Town. This concept is shown in **Figure 4-1**. Niles Ditch runs northward along a significant portion of the west side of the Town. Placement of the WWTP could occur in a number of locations along this border. It is shown in concept closer to 109th Avenue in **Figure 4-1.**

Each of the planning areas are not described in this section. The reader should refer to Section 3 for information on each planning area. However, some minor differences between Concept A1/A2 and Concept B are noted below:

1. The Grand Boulevard/109th Avenue lift station (#2 in the blue hexagon) pumps westward to approximately State Street where it would discharge into a gravity sewer that would head westward to the new lift station at Niles Ditch.
2. The lift station on north Grand Boulevard (#6 in the blue hexagon) pumps southward to 109th, then westward to the same discharge sewer as lift station #2. This avoids pumping the Grand Boulevard twice and Doubletree Planning Areas three times.
3. Future lift station #3 pumps to the existing Stonegate offsite sewer until the new WWTP is up and running. Then, the force main is abandoned, and a short force main lifts the pump into the Graper Ditch valley where a new gravity sewer is run to the interceptor on 109th Avenue near State Street.

4.1 Opinion of Probable Costs—Concept B

Opinions of probable costs for Concept B are shown in **Table 4-1** for Town installed items. The costs were prepared in a similar fashion that costs were prepared for Concepts A1. Town installed items are shown in dark blue in **Figure 4-1**.

Table 4-1
Concept B—Town Funded

	DESCRIPTION	Amount
DOUBLETREE AND GRAND BOULEVARD PLANNING AREA		
	FUTURE LIFT STATION #1	$670,000
	ABANDON LIFT STATIONS	$70,000
	GRAVITY SEWER ALONG DOUBLE TREE DRIVE NORTH	$1,820,000
	GRAVITY SEWER BETWEEN DOUBLE TREE NORTH DRIVE AND 101ST AVENUE	$240,000
	GRAVITY SEWER ALONG 101ST AVENUE TO FUTURE LIFT STATION #1	$660,000
	GRAVITY SEWER FROM RANDOLPH PUMP STATION TO FUTURE LIFT STATION #1	$370,000
	GRAVITY SEWER FROM SNEAD LIFT STATION TO FUTURE LIFT STATION #1	$140,000
	FORCE MAIN FROM FUTURE LIFT STATION #1 TO THE SOUTHWEST CORNER OF DOUBLETREE WEST	$640,000
	GRAVITY SEWER FROM THE SOUTHWEST CORNER OF DOUBLETREE WEST TO FUTURE LIFT STATION #6	$420,000
	CONVERT BRIDGEWATER SERVICE AREA TO GRINDER SYSTEM	$60,000
	FUTURE LIFT STATION #6	$670,000
	FORCE MAIN FROM FUTURE LIFT STATION #6 TO THE FUTURE GRAVITY SEWER ON 109TH AVENUE NEAR WYNDANCE	$1,060,000
CENTRAL PLANNING AREA PROJECTS		
	FUTURE LIFT STATION #2	$1,100,000
	ABANDON LIFT STATIONS	$60,000
	GRAVITY SEWER ALONG 109TH AVENUE FROM WYNDANCE TO FUTURE WWTP	$1,990,000
	GRAVITY SEWER ALONG 109TH AVENUE FROM THE NORTHEAST CORNER OF MEADOWS TO FUTURE LIFT STATION #2	$900,000
	GRAVITY SEWER BETWEEN STONEGATE COMMONS LIFT STATION AND 109TH AVENUE	$320,000
	FORCE MAIN FROM FUTURE LIFT STATION #2 WESTWARD TO GRAVITY SEWER ON 109TH AVENUE NEAR WYNDANCE	$720,000
GRAND TOTALS (WITHOUT WASTEWATER TREATMENT PLANT COMPONENT)		
		$11,910,000

SECTION 5 - COLLECTION SYSTEM MASTER PLAN—CONCEPT C

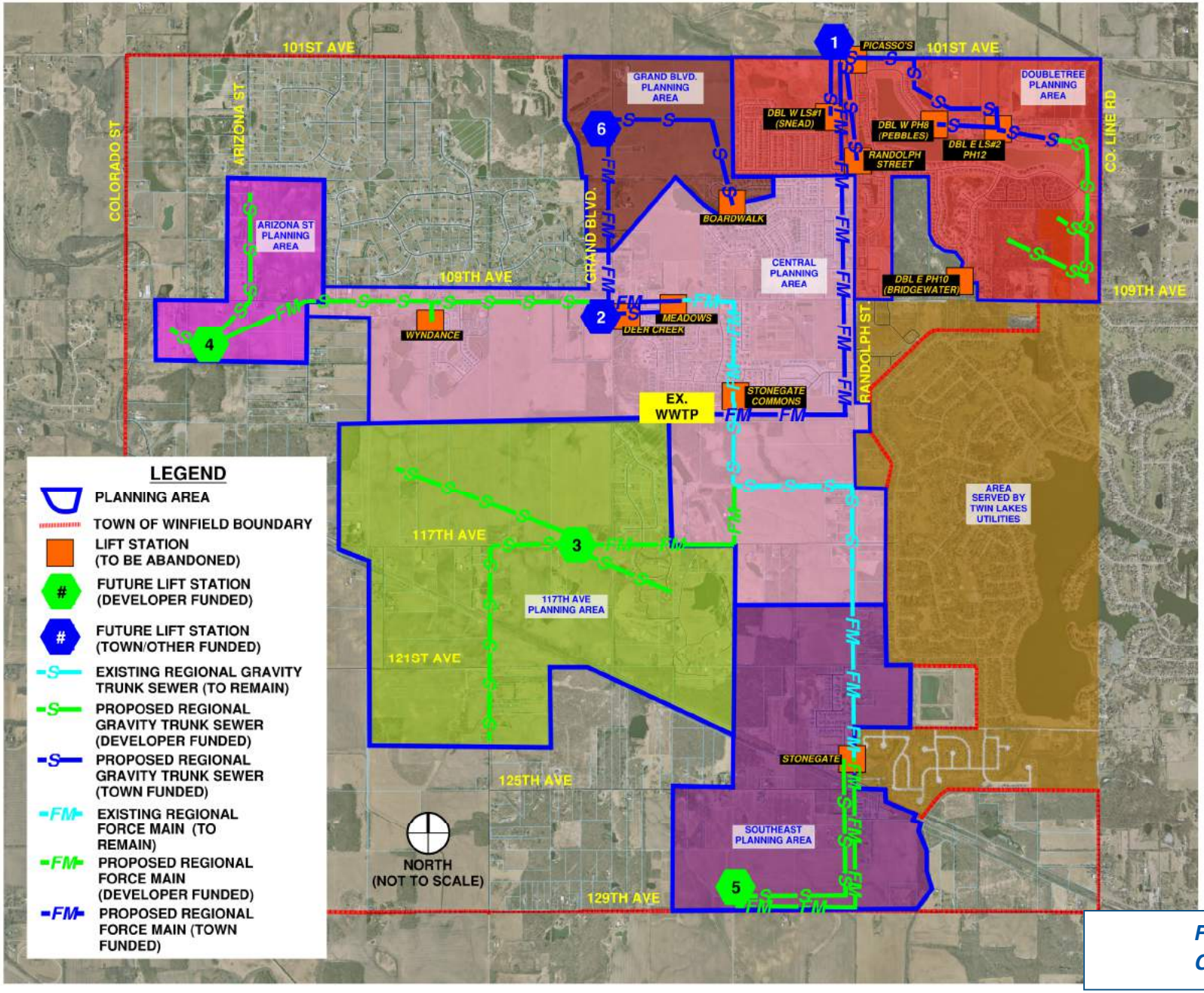


Figure 5-1
Concept C

5.0 Overview

Concept C is very similar to Concepts A1, A2, and B except Concept C contemplates leaving the WWTP at its current location. This concept is shown in **Figure 5-1**.

Each of the planning areas are not described in this section. The reader should refer to Section 3 for information on each planning area. However, some minor differences are noted between Concept A1/A2 and Concept C below:

1. The Grand Boulevard/109th Avenue lift station (#2 in the blue hexagon) pumps east to the existing Meadows Force Main to the existing WWTP.
2. The lift station on north Grand Boulevard (#6 in the blue hexagon) pumps southward to 109th into future lift station #2.
3. There is no gravity line between Lift Station #2 and the Stonegate Commons lift station.
4. Lift Station #1 pumps southward along Randolph Street, then west, directly to the existing WWTP.
5. Stonegate Commons Lift Station remains. All other lift stations are abandoned and consolidated.
6. The Wyndance Lift Station continues to pump to Lift Station #2 until such time that Lift Station #4 is put in by a developer. At that time a requirement of the developer should be to install a new gravity sewer trunk line to receive Lift Station #4 at approximately State Street. The new trunk line should then convery that flow to Lift Station #2 at a depth sufficient to gravity the Wyndance flows into the sewer, eliminating the need for Wyndance Lift Station.

5.1 Opinion of Probable Costs—Concept C

Opinions of probable costs for Concept C are shown in **Table 5-1** for Town installed items. The costs were prepared in a similar fashion that costs were prepared for Concepts A1, A2, and B. Town installed items are shown in dark blue in **Figure 5-1**.

Table 5-1
Concept C—Town Funded

	DESCRIPTION	Amount
DOUBLETREE AND GRAND BOULEVARD PLANNING AREA		
	FUTURE LIFT STATION #1	$670,000
	ABANDON LIFT STATIONS	$70,000
	GRAVITY SEWER ALONG DOUBLE TREE DRIVE NORTH	$1,820,000
	GRAVITY SEWER BETWEEN DOUBLE TREE NORTH DRIVE AND 101ST AVENUE	$240,000
	GRAVITY SEWER ALONG 101ST AVENUE SEWER TO FUTURE LIFT STATION #1	$660,000
	GRAVITY SEWER FROM RANDOLPH PUMP STATION TO FUTURE LIFT STATION #1	$370,000
	GRAVITY SEWER FROM SNEAD LIFT STATION TO FUTURE LIFT STATION #1	$140,000
	FORCE MAIN FROM FUTURE LIFT STATION #1 TO EXISTING WWTP	$1,290,000
	CONVERT BRIDGEWATER SERVICE AREA TO GRINDER SYSTEM	$60,000
	FUTURE LIFT STATION #6	$550,000
	FORCE MAIN FROM FUTURE LIFT STATION #6 TO FUTURE LIFT STATION #2	$540,000
CENTRAL PLANNING AREA PROJECTS		
	FUTURE LIFT STATION #2	$1,100,000
	ABANDON LIFT STATIONS	$40,000
	GRAVITY SEWER ALONG 109TH AVENUE FROM MEADOWS TO FUTURE LIFT STATION #2	$590,000
	FORCE MAIN FROM FUTURE LIFT STATION #2 TO THE EXISTING MEADOWS FORCE MAIN	$270,000
GRAND TOTALS (WITHOUT WASTEWATER TREATMENT PLANT COMPONENT)		
		$8,410,000

SECTION 6 - COLLECTION SYSTEM MASTER PLAN—CONCEPT D

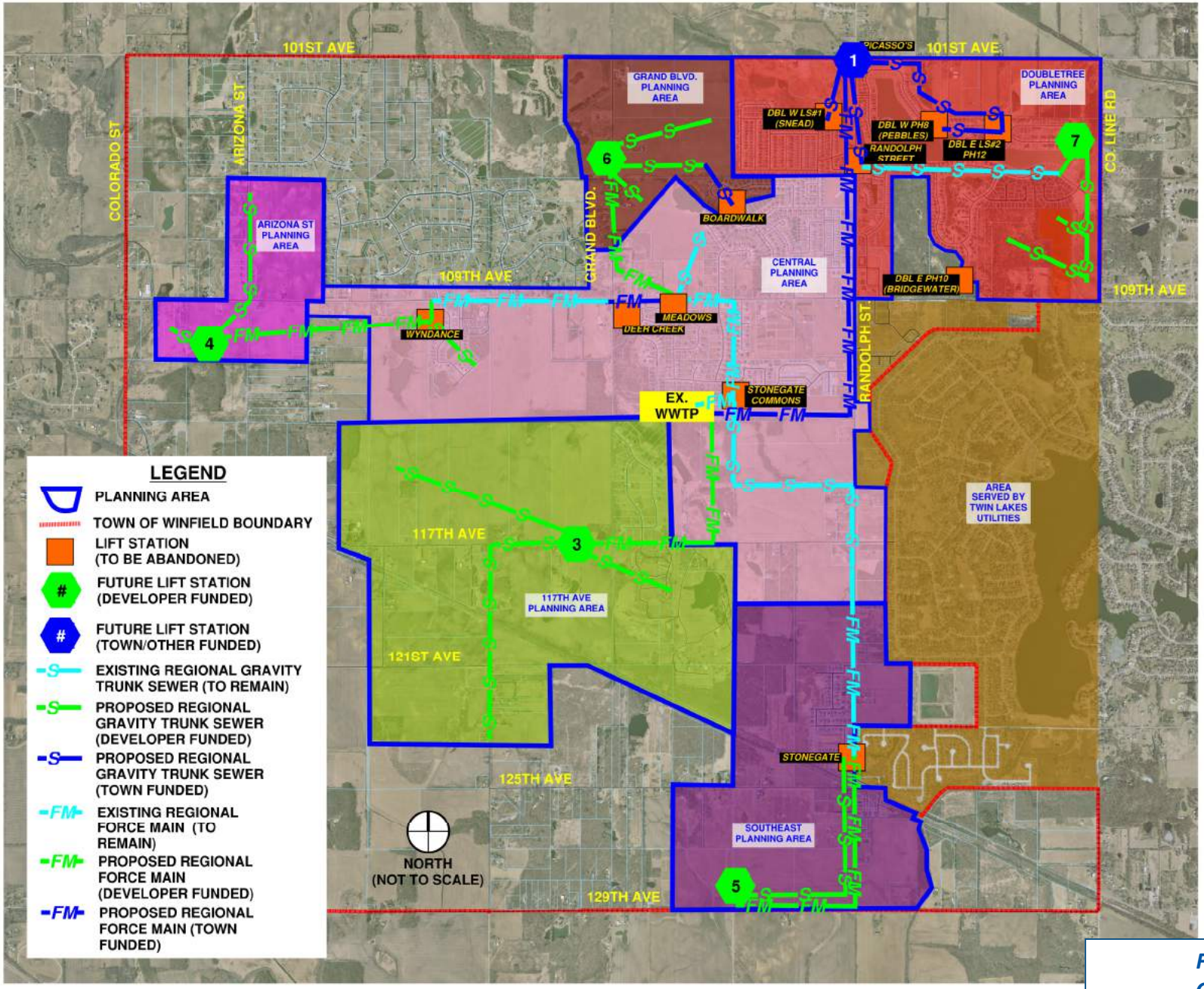


Figure 6-1
Concept D

6.0 Overview

The planning areas in Concept D do not vary significantly from the planning areas in the other concepts. This concept provides for the elimination of six lift stations and is shown in **Figure 6-1**. The six lift stations eliminated include: DBL West LS#1 (Snead); Randolph Street; DBL W Ph 8 (Pebbles); Picasso; DBL E LS#2 Ph 12; DBL E Ph10 (Bridgewater); and Deer Creek.

Each of the planning areas are not described in this section. The reader should refer to Section 3 for information on each planning area. Other elements to this plan include:

1. The developer installs Future Lift Station #7 to service the eastern portion of Doubletree East. This lift station discharges to the existing gravity sanitary sewer along the south side of the lake.
2. The Town eliminates the DBL E Ph10 (Bridgewater) lift station by converting the single home to a grinder system and providing for future homes to tie into the grinder system.
3. A new Town installed lift station is constructed near 101st Avenue and Randolph Street (Future Lift Station #1). This lift station pumps directly to the existing wastewater treatment plant along Randolph Street.
4. The Town abandons DBL W LS#1 (Snead) and the Randolph Street lift station and constructs two gravity sewers northward to the new Future Lift Station #1.
5. The Town installs a new gravity sewer along Double Tree Drive North and up to 101st Avenue to the new Future Lift Station #1 to eliminate the need for DBL W Ph8 (Pebbles) and DBL E LS#2 Ph 12.
6. The Town extend the Wyndance force main from the Deer Creek Lift Station to the Meadows lift station. The Deer Creek lift station will only service the Deer Creek subdivision.
7. The Town upgrades the existing wastewater treatment plant.

6.1 Opinion of Probable Costs—Concept D

Opinions of probable costs for Concept D are shown in **Table 6-1** for Town installed items. The costs were prepared in a similar fashion that costs were prepared for Concepts A1, A2, B, and C. Town installed items are shown in dark blue in **Figure 6-1**.

Table 6-1
Concept D—Town Funded

	DESCRIPTION	Amount
DOUBLETREE AND GRAND BOULEVARD PLANNING AREA		
	FUTURE LIFT STATION #1	$670,000
	ABANDON LIFT STATIONS	$70,000
	GRAVITY SEWER ALONG DOUBLE TREE DRIVE NORTH	$870,000
	GRAVITY SEWER BETWEEN DOUBLE TREE NORTH DRIVE AND 101ST AVENUE	$240,000
	GRAVITY SEWER ALONG 101ST AVENUE SEWER TO FUTURE LIFT STATION #1	$660,000
	GRAVITY SEWER FROM RANDOLPH PUMP STATION TO FUTURE LIFT STATION #1	$370,000
	GRAVITY SEWER FROM SNEAD LIFT STATION TO FUTURE LIFT STATION #1	$140,000
	FORCE MAIN FROM FUTURE LIFT STATION #1 TO EXISTING WWTP	$1,290,000
	CONVERT BRIDGEWATER SERVICE AREA TO GRINDER SYSTEM	$60,000
CENTRAL PLANNING AREA PROJECTS		
	EXTEND WYNDANCE FORCE MAIN TO MEADOWS LIFT STATION	$270,000
	ABANDON LIFT STATIONS	$10,000
GRAND TOTALS (WITHOUT WASTEWATER TREATMENT PLANT COMPONENT)		
		$4,650,000

SECTION 7 - COLLECTION SYSTEM MASTER PLAN—STATUS QUO

SECTION 7 - COLLECTION SYSTEM MASTER PLAN—STATUS QUO

7.0 Overview

The existing collection system is generally functional and provides for future hydraulic requirements with minimal Town installed improvements. The "status quo" alternative or concept was developed to provide a baseline for the minimum improvements required by the Town if the WWTP were not relocated and most of the existing lift stations remained in place. The following subsections identify improvements that are required for the existing collection system. Note that other improvements may be determined to be necessary after the Town conducts recommended investigative studies described in Section 8 of this report.

7.1 Boardwalk Lift Station Replacement

The Boardwalk Lift Station is difficult to operate and maintain. It is also dangerous and a hazard to the public. This lift station needs to be replaced or taken out of service as quickly as possible. One of the main issues is that it is supplied by single phase power that does not provide enough energy to grind the solids in the wastewater at all times. This item calls for the installation of a new lift station to replace the existing lift station. The new lift station would have the same capacity as the existing lift station as no additional growth is possible in the area. However, it is recommended to be fitted with electronics which simulate 3-phase power.

Other alternatives as described in Concepts A1, A2, B, C, and D were considered and are still viable should the Town elect to proceed in those directions. Relaying the sanitary sewers along Boardwalk and Boardwalk Circle were reviewed; however, it was determined that by doing so, the sanitary sewer would be shallower than Indiana Code allows for a portion of the system.

7.2 DBL West Lift Station #1 Control Panel Relocation

This lift station was installed prior to the Town taking over the wastewater treatment plant and the associated infrastructure. The original operator of the plant and the development's design engineer located this station within the Town's right-of-way. It also appears that this station was represented as a gravity manhole until late into the Town's review process. As the Town is aware, this station now has the control panel very near the road at the intersection of East 103rd Avenue and Snead Street. The proximity to the road makes the control panel vulnerable to damage due to a vehicle potentially leaving the roadway.

The recommendation for this lift station is to reroute the cabling and place the control panel in a safer area farther away from the road. The control panel could be fenced or landscaped in such a way to make it less visible and most importantly less vulnerable to damage by motor vehicles. As the wet well and valve vault are flush with the ground, no damage should occur by a vehicle leaving the roadway after the control panel is relocated. Additionally, due to the vaults being flush with the ground, the visual detraction of the area would be resolved for significantly less cost than relocating the entire station. Note that other alternatives such as abandonment of this lift station were reviewed in Concepts A, B, C, and D.

7.3 Wyndance Lift Station Force Main Extension

In 2011 and early 2012, DLZ, on behalf of the Town, designed and permitted the extension of the Wyndance force main directly to the Meadows lift station. This routing would bypass the Deer Creek Lift Station in its entirety. This project was never implemented by the Town. Some reasons to consider this course of action in the near future are noted below:

1. The Meadows Lift Station has available capacity to handle the existing flow currently being pumped along with Wyndance and future flows generated along the 109th Avenue corridor.
2. The Meadows Lift Station condition and equipment is superior to that of the Deer Creek Lift Station.
3. The Meadows Lift Station has had a better history in as far as maintenance and reliability.

4. The Deer Creek Lift Station force main and maximum pump size will limit the future growth in the Wyndance service area.
5. Within the past few years the pumps currently in the Deer Creek Lift Station were downsized from the pumps required and permitted to handle Deer Creek Lift Station absorbing the Wyndance subdivision build-out flows. This is in violation of the permit that was issued by IDEM at the time of Wyndance's construction.

Other alternatives discussed in previous sections involved abandonment of this lift station with the construction of a gravity sewer to a new regional lift station located near 109th Avenue and Grand Boulevard.

7.4 DBL East Phase 8 Lift Station (Pebbles) Upgrades

This lift station does not have any means of warning the operator if there is a failure. With this alternative, this lift station should be retrofitted with an appropriate means of notifying the operator in case of failures. Notification may consist of warning light and an automatic dialer. Another recommendation to this lift station includes providing a means to operate the lift station by a portable generator in the event of an outage.

7.5 DBL East Lift Station #2 Traffic Protection

This lift station is located close to the traveled road and should require additional traffic protection measures. Bollards or other measures should be investigated.

Table 7-1
Status Quo—Town Funded

	DESCRIPTION	Amount
STATUS QUO PROJECTS		
	BOARDWALK LIFT STATION REPLACEMENT	$150,000
	DBL WEST LIFT STATION #1 CONTROL PANEL RELOCATION	$25,000
	WYNDANCE LIFT STATION FORCE MAIN EXTENSION	$270,000
	DBL EAST PHASE 8 LIFT STATION (PEBBLES) UPGRADES	$30,000
	DBL EAST LIFT STATION #2 TRAFFIC PROTECTION	$5,000
	OTHER IMPROVEMENTS (TO BE DETERMINED AFTER INVESTIGATIVE PHASE DESCRIBED IN SECTION 8)	UNKNOWN
GRAND TOTALS (WITHOUT WASTEWATER TREATMENT PLANT COMPONENT)		
		$480,000

SECTION 8 - COLLECTION SYSTEM MASTER PLAN—INVESTIGATIVE

SECTION 8 - COLLECTION SYSTEM MASTER PLAN—INVESTIGATIVE

8.0 Investigative Projects Overview

Most of the sewer system in the Town of Winfield was not inspected during installation as the WWTP and systems were owned and operated by a private utility. Furthermore, sewers in the Doubletree Subdivisions were considered to be operated by the property owner association. This is reinforced by many of the permit approvals obtained from IDEM for the collection systems and pump stations. Not until recently has the Town taken the position that the Town is responsible for the maintenance and operation of all sanitary sewers systems that convey wastewater to the wastewater treatment plant.

There are some areas where investigative field services are required to further understand the sewer system and its limitations. The following investigative projects have been identified.

8.1 Televise & Survey the CME Interceptor Sewer

The CME Interceptor Sewer was identified in Section 2 as a key sewer that serves all of Doubletree Lake Estates Subdivision plus areas of the commercial corridor and the Country Meadows Subdivision. It is reported that this sewer is flat and even sloped backwards in some locations. To obtain a greater understanding of how this impacts the system, it is recommended to survey and video inspect the sewer. This information will be beneficial as areas upstream (e.g. County Line Road Planning Area) are developed.

8.2 Televise & Survey DBL East Sewers

There have been many reported issues with sewers in Doubletree Lake Estates East. Plan information is inconsistent and it appears as if field changes in several of the areas may have been made without correction to the plans. It is recommended video inspection and the as-built drawings be verified as part of this project.

8.3 Televise & Survey Sewers in the Wiseway Commercial Area

There appears to be no information regarding the sanitary sewer system in the commercial area northeast of the intersection of 109th Avenue and Randolph Street. It is recommended that field investigations occur in this area to identify the location and condition of these sewers. Field survey and video inspection is required for this project.

8.4 Investigate Location of Picasso LS Connection

While the Picasso Lift Station appears to be a single service and may not fall under the jurisdiction of the Town, its connection to the Town's infrastructure should be verified. Doing this task may be difficult. However, it is suspected it ties in somewhere in the northwest corner of Doubletree Lake Estates East. Testing the operation of the lift station and visual observations at manholes will help identify potential connections. At a minimum, should this lift station be inoperable, it should be locked out and tagged. Future owners should be notified that this station is not functional.

8.5 Preliminary Analysis of Pump Station Run Times for I/I

Although beyond the scope of this report, it is apparent that there are some inflow and infiltration (I&I) issues with the Town's collection system. Review of the monthly reports of operation (MROs) indicate spikes in flows to the WWTP during and after rain events. I&I is difficult and very expensive to track. However, some clues may be afforded by a review of the lift station pump run time data. This project provides for the initial review of pump run times at various lift stations (where available). The goal of the review would be to help isolate lift station sewer sheds where I&I may be present.

Table 8-1
Recommended Investigative Projects (Town Funded)

ITEM	DESCRIPTION	Amount
INVESTIGATIVE PROJECTS		
A1	Televise and Survey the CME Interceptor Sewer	$7,000
A2	Televise and Survey all sewers in Doubletree East	$13,000
A3	Televise and Survey all sewers in the Wiseway commercial area	$7,000
A4	Investigate Location of Picasso's Lift Station connection to the Town infrastructure	$5,000
A5	Preliminary Analysis of Pump Station Run Times with Respect to Identifying I&I Sources	$17,000
GRAND TOTAL		
		$49,000

SECTION 9 - WASTEWATER FLOWS AND PROJECTIONS

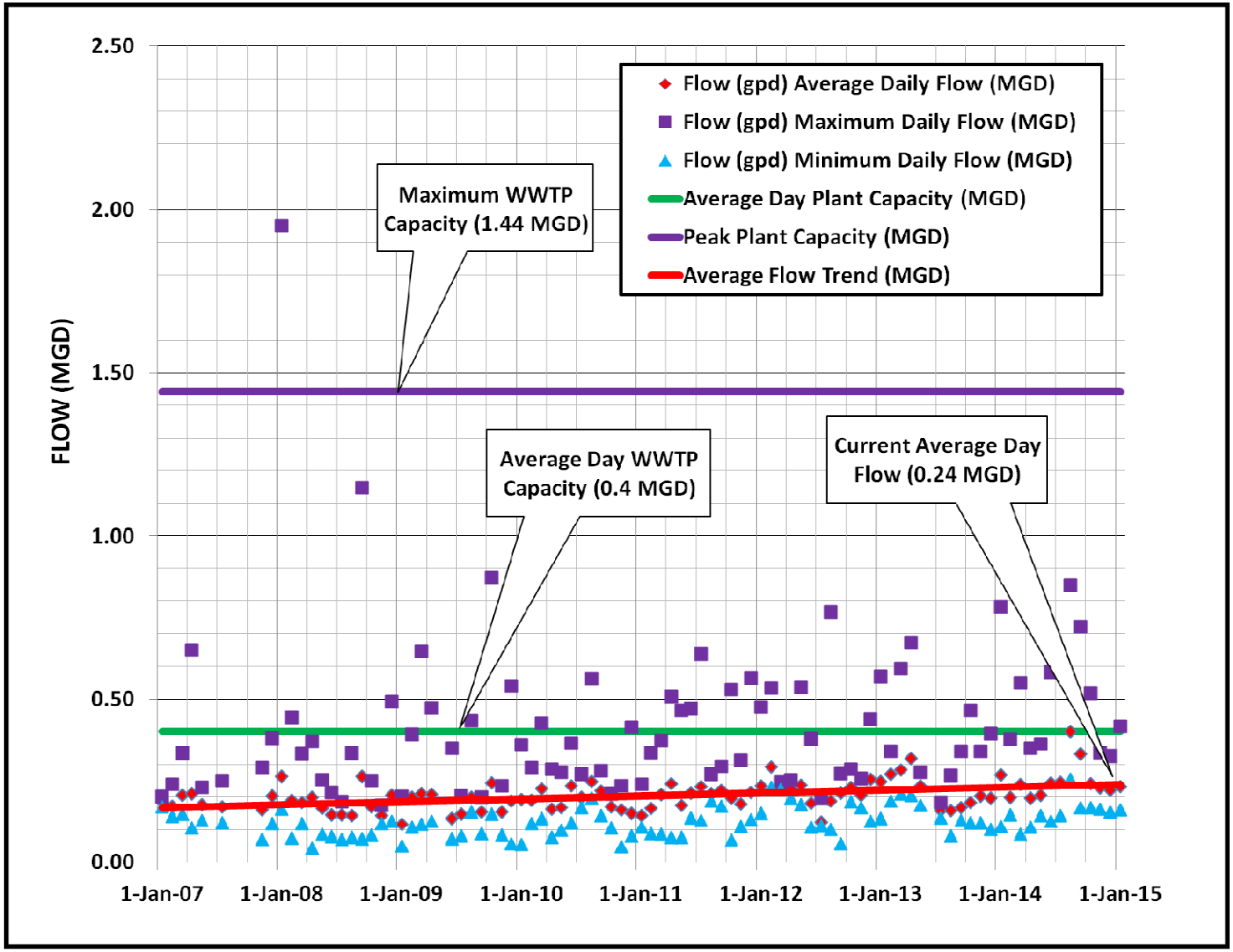


Figure 9-1
History of Flows at the WWTP (2007-2015)

9.0 Overview

A comprehensive review of the existing flows to the wastewater treatment plant, the number of existing homes and commercial properties tributary to the existing lift stations, and future growth potential was conducted to develop this section.

9.1 Existing Flows to the WWTP

Figure 9-1 provides a plot of the minimum flow, average flow, and peak flow values as reported in the monthly reports of operation (MROs) for the WWTP between the months of January 2007 and January 2015. The graph also indicates the maximum WWTP design capacity (1.44 MGD), the average day WWTP design capacity, and a trend line identifying the average day flow to the treatment plant based upon the 8 years of data. The average daily flow to the WWTP is estimated to be approximately 0.24 MGD (240,000 gpd) as of January 2015.

A detailed analysis was conducted utilizing a combination of aerial photography and building permit data from the Town to estimate the number of residential units and other units in the Town that currently generate wastewater flow. The following table summarizes the number of residential units constructed within the Town of Winfield. It also provides an estimate of the number of commercial facilities. Based upon this data and an average flow of 0.24 MGD, the average constructed residential unit contributes less than 177 gpd/unit of flow to the WWTP. This is significantly lower than the design standard of 310 gpd/unit.

Table 9-1
Number of Built Units

Subdivision	Constructed Units
Stonegate	65
Stonegate Commons	149
Wyndance	62
Deer Creek	18
Doubletree (East and West)	678
Country Meadows Estates	333
Meadows	74
Wynbrook	18
TOTAL	**1,397**

9.2 Estimated Wastewater Growth Rate

As noted in earlier sections, the average daily flow to the WWTP is 240,000 GPD. Its current capacity is 400,000 GPD average day with a peak hourly flow of 1,440,000 GPD. Based on the defined planning areas discussed earlier in this chapter, **Figure 9-2** was developed to identify the growth rate of the Town. The growth rate was determined based on meetings with Town officials familiar with land developers interested in the area and the potential for development under certain economic conditions. The rate of growth was estimated based on housing starts at 80 per year starting in the year 2016 and increase by 10-percent per year until 120 housing starts per year was reached which is estimated to be in 2021. Once housing starts reach 120 starts per year, the number of housing starts is estimated to remain at a constant 120 starts per year throughout the duration of the planning period.

The wastewater generation was estimated using two methods:

1. The Indiana Department of Environmental Management (IDEM) through 327 IAC 3-6-11 establishes average flow rates for residential service as follows:
   200 GPD/unit for 1 bedroom apartment
   300 GPD/unit for 2 bedroom apartment
   310 GPD/unit for single-family homes

   This method is very conservative. Using this method with the wastewater generation set at 310 GPD/unit for single-family homes is shown in the steeper red graph line of **Figure 9-2**.

2. The current average day flow/single-family homes, based on WWTP flow data, is calculated to be 177GPD/single –family home. This is shown in the green graph line of **Figure 9-2.**

Both graphs show a steep increase in 2017. This is from the connection of Christian Village to the WWTP system at a wastewater flow rate of 28,000 GPD. Upon complete buildout of the current identified planning areas shown in **Sections 3 through 6**, the average day WWTP flow could range up to 1,800,000 GPD.

Under the growth rate described above, the wastewater flows will be at the WWTP 0.4 MGD capacity somewhere between 2020 and 2022. Based on a one year design period and a one year construction schedule, the Utility will need to start the expansion process between late 2017 and 2020 depending on the growth rate and wastewater generation caused by that growth.

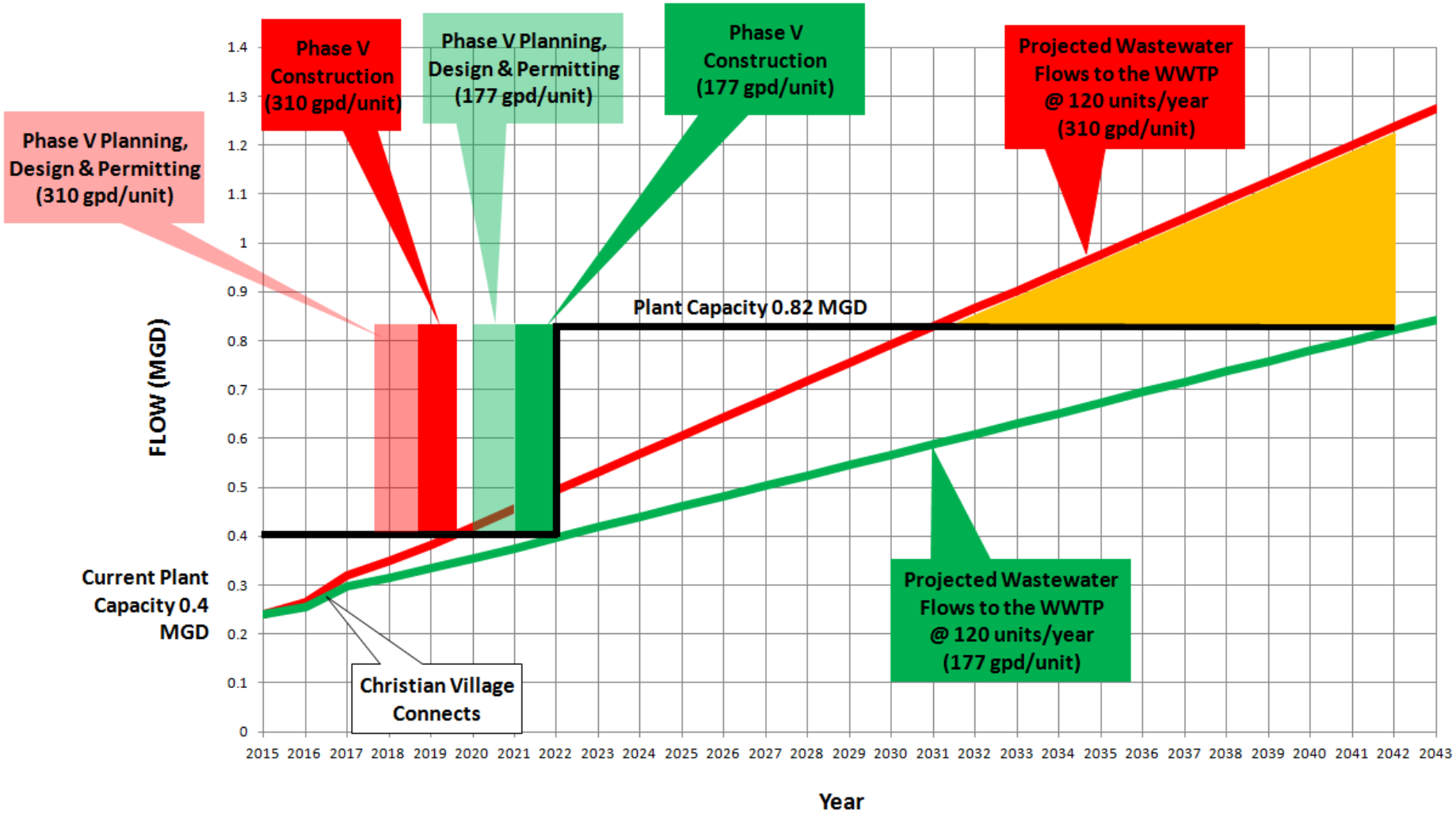


Figure 9-2
Wastewater Flow Projections and Estimated WWTP Expansions

SECTION 10 - WWTP MASTER PLAN CONCEPTS

SECTION 10 - WWTP MASTER PLAN CONCEPTS

10.0 Overview

As discussed in Section 9.2, the WWTP flows are expected to reach the WWTP's 0.4 MGD capacity somewhere between the year 2017 and 2020. This section presents a number of alternatives to expand the WWTP to meet the Town's growth demands.

10.1 Relocate WWTP

As an alternative to the expansion of the current wastewater treatment plant site (See proposed Phase 5 Expansion in Section 10.3), a function of this master plan is the review of concepts for a relocation of the wastewater treatment plant. These concepts are more specifically discussed in Sections 3, Concepts A1 and A2 along with Section 4, Concept B. Each of these concepts as presented would eliminate many of the lift stations currently serving the Town and propose to install sanitary sewer interceptors to new regional lift stations. These regional lift stations would be required in order to make the necessary gravity sewer interceptors installation viable due to the varying topography within the study area. The current wastewater treatment plant lies at the approximate elevation of 725 ft based on the Lake County GIS contour map. The elevations at the location of Concepts A1 and A2, which are both located along the Grand Boulevard corridor in the center / north center region of the Town, are approximately 700 ft. This would essentially lower the entry into the plant by approximately 25 feet. The location presented in Section 4 for Concept B is adjacent to Niles Ditch at the western extreme of the Town near 109th Avenue. Elevations in this area are lower; however, a review of the FEMA maps in the area indicate floodplain areas along the ditch, in some areas to a significant extent. Initial review indicates this elevation is approximately 675 feet. Any future treatment plant site considered would be required to be constructed at a higher elevation.

A review of the costs for the required infrastructure installation sponsored by the Town (not private development) is presented in the aforementioned sections. These costs represent the base infrastructure costs to re-route the existing flows to a new relocated treatment plant facility. The costs associated directly with the land acquisition, engineering, legal, and construction of a brand new modern treatment plant are presented in **Table 10-1**. An assumption in the numbers presented is that the new treatment plant would be constructed with an average day capacity of 0.82 MGD. This is the size of the proposed Phase V expansion of the existing plant presented in Section 10. The reasoning behind this assumption is that the Town is leading towards an expansion due to projected growth in the foreseeable future. Any relocation of a new plant should be sized based on the next growth milestone at a minimum. Should an expansion of the existing facilities (either in part or per the proposed Phase V option presented) take place prior to a treatment plant relocation, the projected size of the new wastewater treatment plant should be re-examined.

Aggregate costs for each of the wastewater treatment plant relocations and the required sewer infrastructure re-routing presented in the aforementioned sections are presented in **Table 10-1**.

Table 10-1— Aggregate Treatment Plant Relocation Costs

CONCEPT	RELOCATED PLANT COST	REGIONAL COLLECTION SYSTEM COSTS	TOTAL COST
A1 OR A2	$12,000,000	$9,180,000	$21,180,000
B	$12,000,000	$11,910,000	$23,910,000
NOTE: OPINIONS OF PROBABLE CONSTRUCTION COSTS ARE IN YEAR 2016 DOLLARS.			

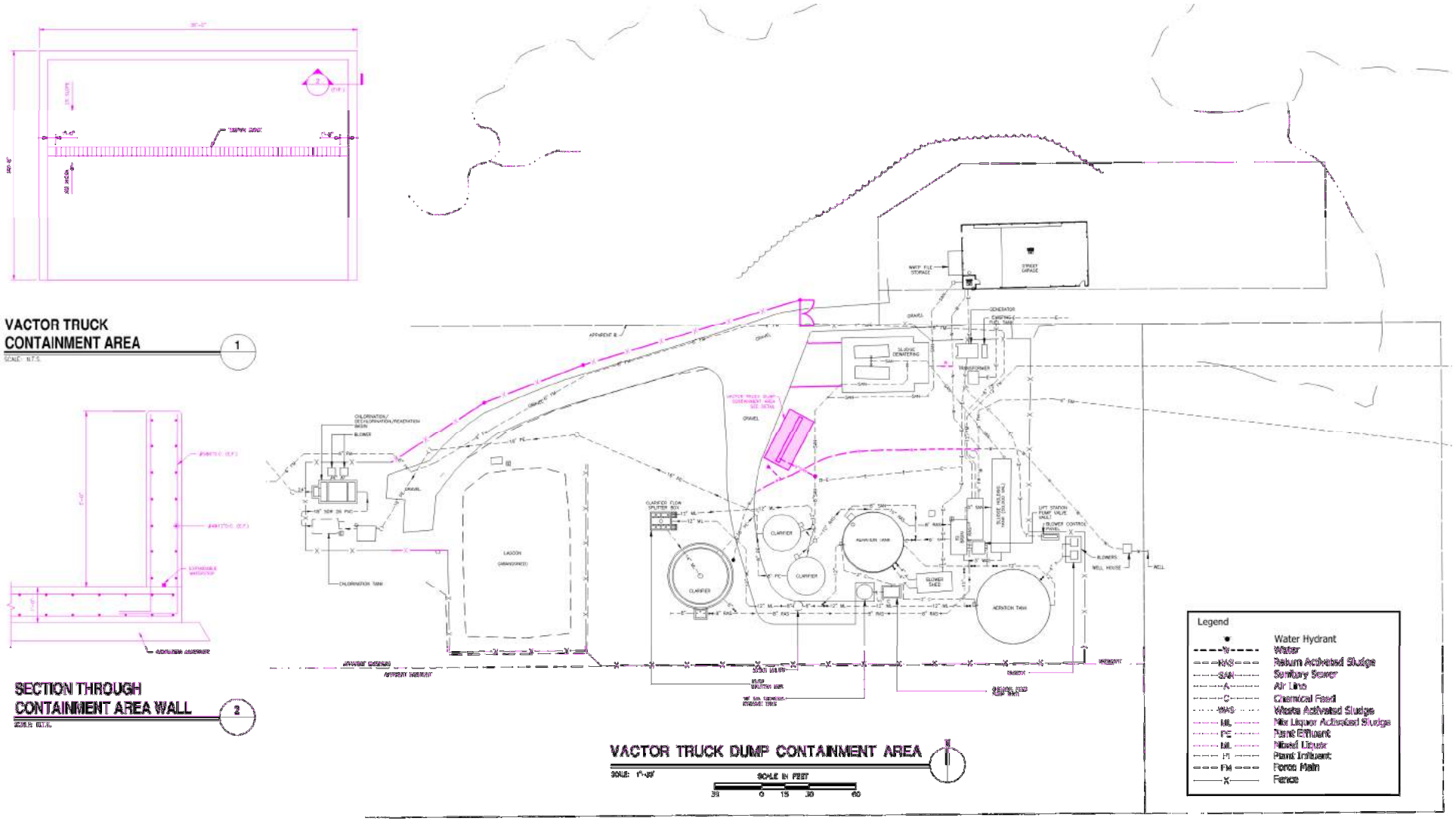


Figure 10-1
Vactor Truck Dump Containment Area

10.2 Advance Projects

The following items contained within 10.2.1 and 10.2.2 have been identified in discussions with Town staff and the treatment plant operator as items to consider independent of the more broad based plan of upgrading the current plant or relocating it. With the projected need for a relocated or expanded plant being several years away, the cost benefit (10.2.1 Vactor Truck Dump Containment Area) or need (10.2.2 Equalization Tank Replacement) to each project could be realized if the plant is relocated. These concepts are further discussed in the following sections. Additionally, if the plant is left in its current location and expanded at some future date, each of the proposed items have been master planned into the next expansion in regards to physical location or can be re-tasked in the case of 10.2.2 Equalization Tank Replacement.

10.2.1 Vactor Truck Dump Containment Area

Currently the Town contracts with companies to clean sewers, manholes and catch basins. Vactor trucks are used for this cleaning and have nowhere to dump the accumulated debris from its tank other than the landfill. Trips to the landfill cause long down times and additional operational cost for fuel.

The Utility has requested a dumping area for the vactor truck at the WWTP so that debris can accumulate to fill a dumpster or a truck. This would also allow debris to dewater and dry out to reduce weight and volume for disposal. With a local dumping station the Utility could see a savings from the cleaning companies resulting in less down time, transportation and tipping costs at the landfills.

The dump containment area that is proposed is shown on **Figure 10-1**. The dump containment area would be a reinforced concrete structure with knee walls on 3 sides and include a trench drain. The drain would connect to the plant drain in that area. Also, a non-freeze water hydrant would be located nearby to assist in cleaning the area. To accommodate the dump containment the fence and entrance gate will have to be moved as shown on **Figure 10-1**.

The dump containment could be included in the next WWTP expansion or constructed as a separate project as it will not affect the WWTP process and save the utility in the long run with landfill tipping costs and transportation cost.

The opinion of probable construction cost for the Vactor Truck Dump Containment Area is **$120,000** in Year 2016 Dollars. Costs include: mobilization/demobilization; construction engineering; materials testing; site clearing and erosion control; site restoration; earth moving; drain; concrete work; and professional design and construction services. Costs do not include unusual soils, environmental remediation, or dewatering.

10.2.2 Equalization Tank Replacement

The existing equalization tank (eq. tank) was installed during the 2003 Phase III Expansion and reconfigured during the 2007 Phase IV expansion project as discussed in Section 2.3.3. The steel tank is showing signs of corrosion and the activated waste sludge pump is difficult to maintain. Also, the tank may be undersized, as during wet weather high flows the water level in the tank exceeds normal heights and have caused water to back into the sludge dewatering facility. This backup could be caused by reduced capacity of the pumps that drain the equalization tank to the aeration tanks due to some plugging or maintenance issues. In the event that it is determined that a new tank is needed due to continued deterioration of the existing tank, it may be necessary to undertake this project in advance of a final decision on the existing plant's future.

To replace the tank it is recommended that a new cast in place reinforced concrete tank be constructed to the northwest of the existing tank as shown in **Figure 10-2**. If it was decided by the utility to relocate the WWTP to a new location as discussed in **Section 10.1** and the new equalization tank was required prior to the relocation, the tank could be constructed of steel if it was determined cost effective based on the timing of the WWTP relocation.

The equalization tank would include three chambers as follows:

Waste Activated Sludge (WAS) Chamber

As with the existing equalization tank, WAS will be wasted to the chamber through a valve on the return activated sludge line. The chamber will also act as a wet well for two WAS pumps to transfer the WAS to the aerobic digester. The WAS pumps will be mounted on rails to allow pump removal without entering the chamber unlike the existing tank.

Return Activated Sludge (RAS) Chamber

The RAS Chamber will have a valved connection with the Aeration Tank Lift Station Chamber and under the existing WWTP process will act the same as the existing equalization tank. Screened wastewater flow will enter the Aeration Tank Lift Station Chamber and will be mixed with RAS and pumped to the Aeration tank. During the next plant expansion the Aeration Tank Lift Station Chamber and RAS Chamber will be disconnected by closing the valve connection. This will be described in a later section.

Aeration Tank Lift Station Wet Well Chamber

As discussed above, the Aeration Tank Lift Station Chamber will transfer a mixture of RAS and screened flow from the chamber to the aeration tank. During the next plant expansion the Aeration Tank Lift Station Chamber and RAS Chamber will be disconnected by closing the valve connection. This will be described in a later section.

Each chamber will include a valve vault with pump isolation valves and check valves to prevent backflow. To accommodate the new equalization tank some site piping will need to be relocated. This includes the RAS line from the Clarifiers to the new equalization tank, the WAS line to the Aerobic Digester and the plant influent line to the aeration tank as shown in **Exhibit 10-2**.

As with the dump containment area, the equalization tank could be included in the next WWTP expansion or expedited and constructed as a separate project to prevent a tank failure due to corrosion. The tank layout and location will not affect and would be designed to accommodate a future expansion as discussed.

It is recommended that the Utility consider moving the three existing plant influent pumps as the one pump that when into service in 2007 is only 8 years old and the other two are 12 years old. The WAS pump should be replaced as it will not work in the new WAS Chamber because it lacks a proper lifting device

The opinion of probable construction cost for the new equalization basin is **$380,000** in Year 2016 Dollars. Costs include: mobilization/demobilization; construction engineering; materials testing; site clearing and erosion control; site restoration; excavation; concrete work; pumps and controls; piping; abandonment of the existing equalization basin; electrical work; and professional design and construction services. Costs do not include unusual soils, environmental remediation, or dewatering.

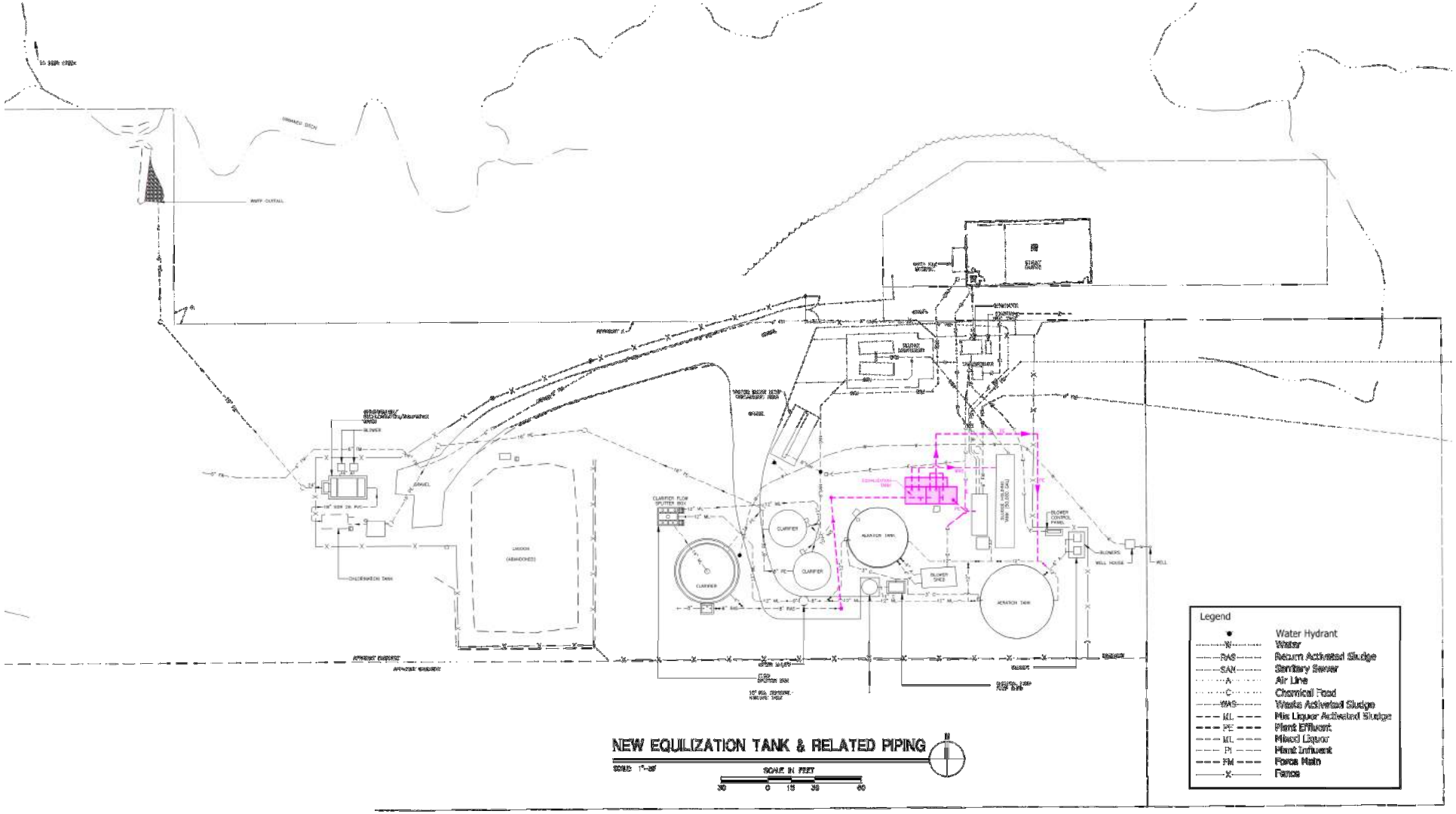


Figure 10-2
New Equalization Tank and Related Piping

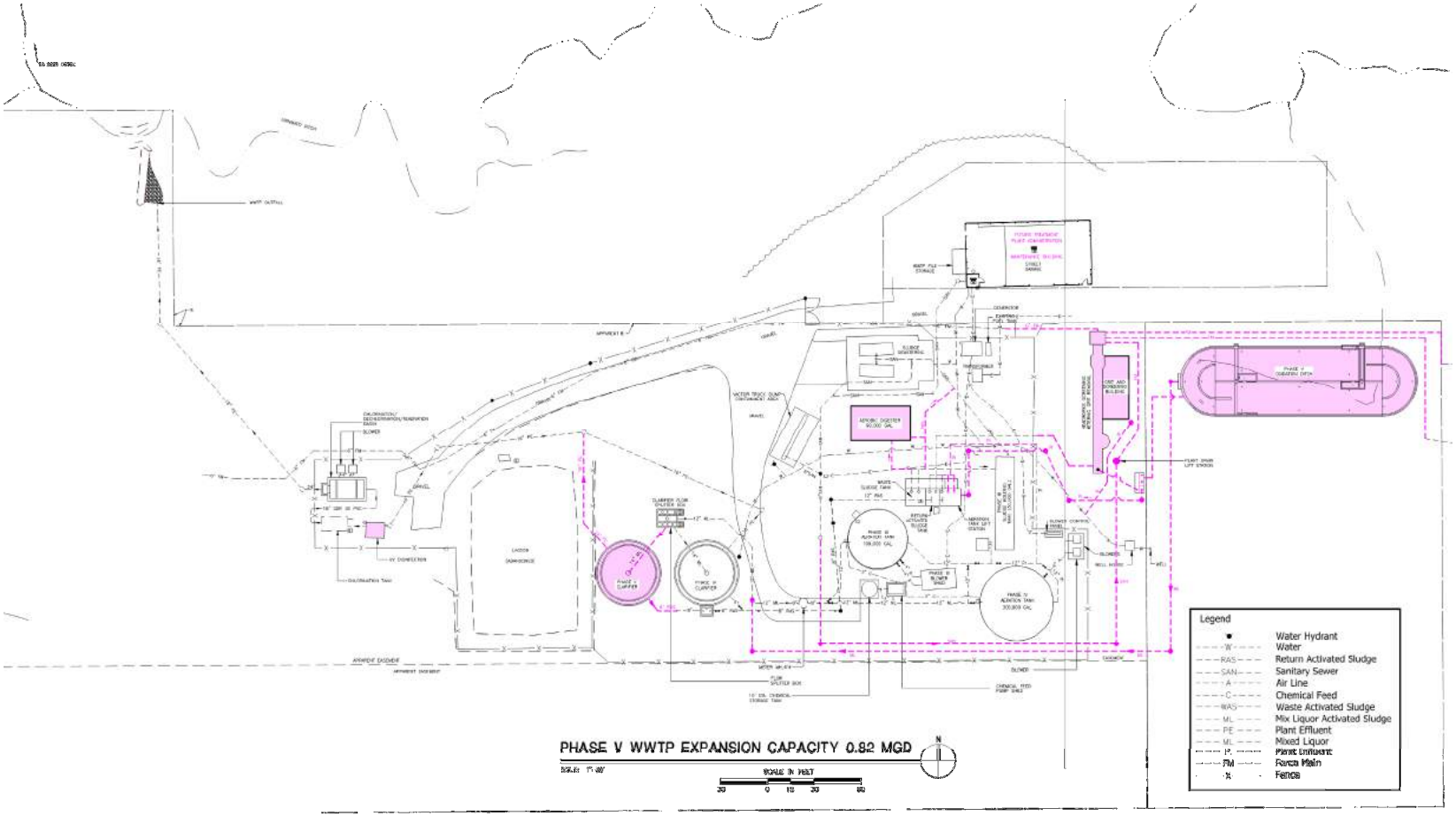


Figure 10-3
Phase V WWTP Expansion Schematic

10.3 Phase V WWTP Expansion

As discussed in Section 9.2, a plant expansion or plant relocation will be required to be operational, based on growth, in the next 4 to 7 years. It is recommended that the WWTP Phase V Expansion include a treatment capacity increase to 0.82 MGD average daily flow with a peak hourly flow of 2.5 MGD. This would allow the utility to avoid another plant expansion for 11 to 20 years depending on the growth of the Town and wastewater generation rate. This will also allow the Utility to plan for future expansions to lessen the costs of those expansions. Generally, utilities complete 20 year expansions to allow the pay off of 20 year bonds to avoid a second bond sale. Also, the equipment has a 20 year life and replacement can be incorporated into a 20 year bond sale.

To expand the WWTP to 0.82 MGD it is recommended that the following unit processes be expanded on the locations identified in **Figure 10-3** which shows the vactor dump containment area and new equalization tank already in place.

10.3.1 Headworks

The proposed Headworks include screening, influent flow meter, grit removal and an aeration tank flow split box. The headworks will be designed to eliminate the aeration tank lift station in future expansions and allow gravity flow through the WWTP to the outfall.

Collection Channel

The Deer Creek, Meadows, and Stonegate Commons Lift Stations forcemains will be redirected to pump into the headworks. The pump impellers of each pump may need to be adjusted to pump up to the final height of the headworks to allow gravity flow and should be checked during design.

Screening

For screening, it is recommended that the Utility consider relocating the existing screen to the new headworks. The screen has a capacity of 3 MGD with an operational life of 20 years and went into service in 2007. Depending on the timing of the expansion, the Utility could utilize a number of years with that unit. The screen and dumpster should be enclosed in a building to reduce odors and prevent freezing during the winter months.

Grit Removal

It is recommended that a circular vortex style system be used for the grit removal system. The grit pumps, concentrator and dumpster will be in the same room as the screenings dumpster to reduce odors and prevent freezing during the winter months.

Influent Flow Meter

The influent flow meter will be a parshall flume and installed in the headworks channel. The meter should be designed to allow expansion in the future.

Aeration Tank Flow Split Box

A flow split box will be constructed at the south end of the headworks channel. The flow split box will be similar to the secondary clarifier flow spilt box and proportionally split the flow between up to 4 aeration tanks. This expansion will require the flow spilt between the two aeration tanks.

10.3.2 Aeration Tanks

The WWTP expansion will require an additional aeration tank to meet the 0.82 MGD capacity. This can be accomplished by utilizing the two existing tanks and adding a new third tank as described below.

Existing Aeration Tanks

As discussed in Sections 2.3.4 and 2.3.5, the WWTP currently has two lined bolted steel tanks in use as aeration tanks to obtain the 0.4 MGD capacity. One tank was put on line in 2003 and the other in 2007. Both tanks should provide many years of service to the Utility. As shown in **Figure 10-3,** the two existing tanks will be fed from

the new equalization tank aeration tank lift station. Flow to the existing tanks will be feed to the equalization tank from the headwork flow spilt box by gravity. No additional work to the tanks should be required for the WWTP expansion.

Oxidation Ditch Style Aeration Tank

To expand the aeration process to 0.82 MGD an additional aeration tank will need to be constructed. It is recommended that a reinforced concrete tank be added to meet the aeration needs of the WWTP. The aeration process could be a similar to the existing two tanks with blowers and a grid of aeration diffuser along the bottom of the tank. Another option is an oxidation ditch. The oxidation ditch tank would be constructed of concrete 12 ft – 15ft deep with a partial center wall and a circular end at each end of the tank. The tank is referred to as a ditch because two variable speed driven rotors will be mounted at the water surface on opposite ends of the tank to provide aeration and mixing. Water is moved around the tank from one rotor to the other. An adjustable outlet weir will be provided to allow the operator to vary the level in the tank. A dissolved oxygen (DO) meter will be installed in the tank to monitor DO and vary the speed of the rotors to save energy cost.

An evaluation of the benefits between the conventional aeration tank and the oxidation ditch should be made during the preliminary design stage of the expansion design phase.

If it is determined that the Utility wants to move the WWTP to a new location at a later date (after the need for the expansion) the additional aeration tank could be constructed as a bolted steel like the other two at a possible savings over a concrete tank.

10.3.3 Phosphorous Chemical Feed

An additional chemical feed pump and chemical line will be added to the oxidation ditch for phosphorus removal. To prevent a spill at the chemical feed tank, containment under the existing tank drain valve or protection of the valve and drain line from breakage should be added.

10.3.4 Secondary Clarifier

As part of this expansion it is recommended that a new concrete clarifier be installed west of the existing larger clarifier of the same type and size. The new clarifier will be connected to the flow split box as shown in **Figure 10-3**. The two smaller steel clarifiers should be abandoned and removed. However, they still have some years of useful life left and could be put on standby status to be used only if one of the two larger clarifiers is down for maintenance. As discussed in Section 2.3.7 these clarifiers are inefficient and require high maintenance.

A final decision on the future of the smaller clarifiers with the expansion should be made with input from the Owner, Operator and Engineer.

10.3.5 Equalization Tank Reconfiguration

The equalization tank discussed in Section 10.2.2 will need to be reconfigured during this expansion. The valve between the Aeration Tank Lift Station Wet Well Chamber and the RAS chamber will be closed and RAS pumps will be added to the RAS chamber. A RAS line will be installed between the RAS pumps and the headworks flow split box to mix the RAS and influent flow prior to the aeration flow split. A line will also be installed between the Aeration Flow Split Box and the Aeration Tank Lift Station Wet Well Chamber to feed the existing aeration tanks.

10.3.6 Aerobic Digester

This expansion will require an additional 90,000 gallons of aerobic digester capacity. The location of the digester is proposed just south of the sludge drying facility as shown on **Figure 10-3**. The existing digester will remain in service and both digesters will be interconnected. A sludge pump will be required to transfer sludge to the sludge drying facility. The digester will require an air blower and air diffusers mounted on the floor of the digester.

10.3.7 Disinfection

The WWTP currently uses liquid chlorine for disinfection. If this process is to remain, an additional 26,100 gallons will be added to the chlorine contact tank to meet the 15 minute detention time at the peak hourly flow rate of 2.5 MGD. An additional chemical storage tank should also be considered.

As an alternative, Ultra Violet light (UV) disinfection could be added to replace the chlorination and de-chlorination system. The UV system would be mounted in the existing 2003 chlorine contact tank.

10.3.8 Administration Building

Currently, the WWTP only has a small records room attached to the highway garage. There is no heated maintenance, storage area or laboratory. If the street department moves to a different location, the current maintenance garage should be renovated to meet the needs of the WWTP. This renovation could only be accomplished if the street department is relocated.

Table 10-2—WWTP Expansion (Phase V) - Existing Site

ITEM	DESCRIPTION	Amount
1	MOBILIZATION/DEMOBILIZATION	$139,000
2	CONSTRUCTION ENGINEERING	$28,000
3	MATERIAL TESTING	$14,000
4	SITE CLEARING AND EROSION CONTROL	$56,000
5	SITE RESTORATION	$83,000
6	OXIDATION DITCH	$1,034,000
7	CLARIFIER	$519,000
8	AEROBIC DIGESTER	$409,000
9	HEAD WORKS	$481,000
10	UV DISINFECTION	$342,000
11	PLANT DRAIN	$77,000
12	SITE PIPING	$138,000
	SUBTOTAL	$3,320,000
	SUBTOTAL WITH 25% CONTINGENCY	$4,150,000
	PROFESSIONAL DESIGN & CONSTRUCTION SERVICES (20%)	$830,000
	SUBTOTAL	**$4,980,000**

Note: Costs are not inclusive of unusual soils, environmental remediation/mitigation, or dewatering. Costs are in Year 2016 Dollars.

10.4 Ultimate Wastewater Flow Scenario

As discussed in Section 9.2, a plant expansion or plant relocation will be required to be opperational, based on growth, in the next 4 to 7 years. Additional projections in regard to the overall study area have also been made. The projected treatment needs of the study area are projected to be an average daily flow of 1.8 MGD. If the treatment plant is relocated, it is recommended to master plan the layout in such a way to provide expansion opportunities to a level no less than the 1.8 MGD build out needed. Additionally, the receiving waterway should be able to be permitted to receive the effluent from a plant at a minimum of that size. The current wastewater treatment plant site is capable of supporting the 1.8 MGD. This build out of the existing site is presented in **Figure 10-4.** The current site is permitted by IDEM up to an ultimate plant size of 3.0 MGD.

Should the Town annex additional area or the uses differ substantially from what has been presented within this report, the ultimate wastewater treatment needs should be re-examined. Additional land area or permitting may be required.

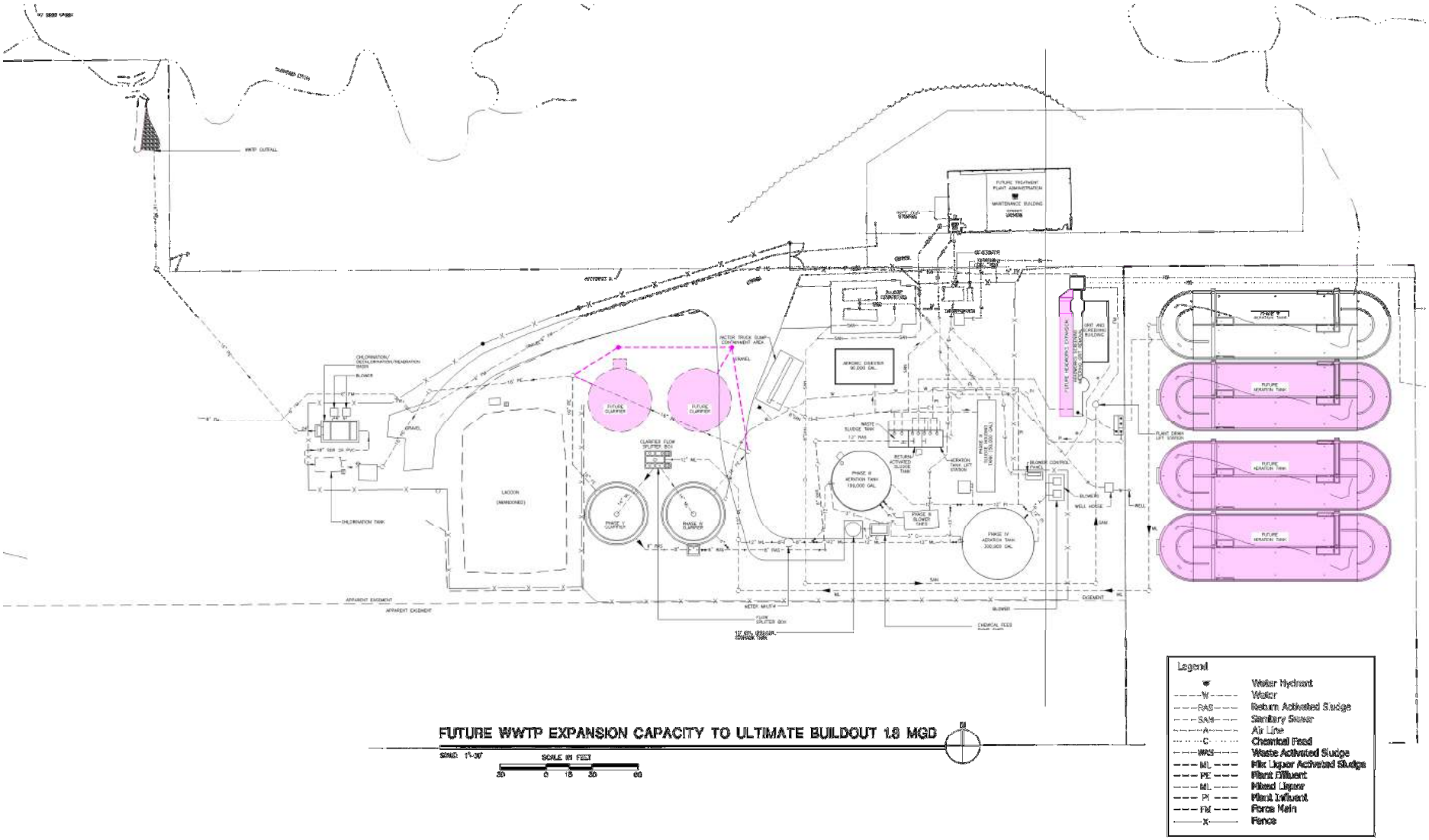


Figure 10-4
Utlimate WWTP Expansion Footprint (Existing Site)

SECTION 11 - MAINTENANCE RECOMMENDATIONS

SECTION 11 - MAINTENANCE RECOMMENDATIONS

11.1 Overview

Maintenance of the collection system, lift stations, and wastewater treatment plant are integral components to protecting the Town's capital investments. This section discusses some recommended maintenance strategies. Tables are presented that identify common maintenance practices for certain lift station and wastewater treatment plant components. These tables are not meant to be all inclusive. The Operator and the Town should consult the operation and maintenance manuals for each component of the system. Practicing these maintenance strategies in the manuals will help ensure the life expectancy of the equipment and processes are met or exceeded.

11.2 Collection System

Over 92,000 feet of sanitary sewer exists in the Town of Winfield. Some communities video inspect and clean their sewers on an annual basis. Others place their sewer inspections on a 5-year cycle. It is recommended that the Town develop a program to video inspect and clean their sewers on a 5-year cycle since the system is not very old. Video inspection will provide a means to spot potential inflow and infiltration problems, while cleaning, will aid the video inspection process and help keep the sewers in optimal operating conditions. Typical video inspection and cleaning costs per lineal foot are estimated to be $10/foot. Annualized over a 5 year period, costs in Year 2016 dollars to clean one-fifth of the system is $184,000.00

11.3 Lift Stations

Maintenance of the lift stations is an important function of the Operator. Inspection of each lift station should occur on a weekly basis at a minimum. Some may require more frequent inspection. Many of the lift stations in the Town are packaged pump stations which house a number of ancillary components in addition to pumps that should be checked for operation on a weekly basis. **Table 11-1** provides a listing of common elements and common frequencies.

These items should be checked for proper operation on a regular basis. Valves should be exercised on a regular basis.

11.4 Wastewater Treatment Plant

Table 11-2 summarizes typical equipment and processes at the Winfield WWTP. Again, this table is not intended to be all inclusive. The operation and maintenance manuals for each piece of equipment should be consulted.

Table 11-1
Common Maintenance Items for Lift Stations

Item or Process	Operation & Maintenance Description	Frequency
Wet Well	Pump out and clean	1 or more times per year
Pumps	Pull and inspect for clogging	4 or more times per year
Check Valves	Check for proper working condition	2 or more times per year
Light and alarm system	Proper operation	Weekly
Meters	Proper operation	Weekly
Amp Readings	Identifies clogging or entry of water in the motor housing	Monthly
Electrical Motor Control Equip.	Check for poor connections, corrosion, and worn parts	Semi-annual
Emergency Generator	Manufacturer's recommendations; battery level; general condition	Manufacturer's recommendations
Sump Pumps	Check for proper operation	Weekly
Unit Heaters	Check for proper operation	Weekly
Dehumidifiers	Check for proper operation	Weekly
General condition	Seepage into packaged lift station	Weekly
Safety	Identification of hazards	Weekly
Other	Cleaning and Painting of all metal surfaces within the lift station	Several Years

Table 11-2
Summary of Common Maintenance Items for the WWTP

Item or Process	Operation & Maintenance Description	Daily	Weekly	Monthly	Yearly	Other	Source
Screen	Check screenings container and replace or empty as required	X					O&M Manual, Page 1-33
Screen	Flushing of the wash water valve		X				O&M Manual, Page 1-33
Screen	Hose down deposits on the screen basket		X				O&M Manual, Page 1-33
Screen	Hose down the unit with high pressure cleaning device			X			O&M Manual, Page 1-33
Screen	Check the condition of the brush			X			O&M Manual, Page 1-33
Screen	Remove material wrapped around the screw shaft at the discharge end			X			O&M Manual, Page 1-33
Screen	Gear motor lubricant replacement					2 yrs or 20,000 hrs	O&M Manual, Page 1-33
Screen	Frost protection system check					As needed	
Tank Aeration System	Moisture purging		X				O&M Manual, Page II-23
Tank Aeration System	Air bumping		X				O&M Manual, Page II-23
Tank Aeration System	Drain Tank, Remove Excess Solids, Clean Diffusers, Inspect Hardware				X		O&M Manual, Page II-24
Dissolved Oxygen Sensor	Clean					2-3 months	O&M Manual, Page 33
Dissolved Oxygen Sensor	Calibrate					6 months	O&M Manual, Page 33
Chemical Meter Pumps	Replace diaphragm and o-ring seals					Minimum one time per year	O&M Manual, Page SD6
Chemical Meter Pumps	Replace speed reducer oil					See O&M Manual	O&M Manual, Page SD6
Main Clarifier	Bottom Scraper Arms					Every 6 Months	O&M Manual, Ch 4, Page 1
Main Clarifier	Surface Skimmer		X				O&M Manual, Ch 4, Page 1
Main Clarifier	Worm Gear Section Main Drive		X				O&M Manual, Ch 4, Page 2

Table 11-2 (Continued)
Summary of Common Maintenance Items for the WWTP

Item or Process	Operation & Maintenance Description	Daily	Weekly	Monthly	Yearly	Other	Source
Main Clarifier	Final Turntable Section Main Drive		X				O&M Manual, Ch 4, Page 2
Main Clarifier	Weir and Scum Baffle				Minimum		O&M Manual, Vol 1, Page 3
Valves	Exercise		X				

11.5 Miscellaneous Items

The following items are recommended as a result of this master plan:

1. Locks with a common key should be placed on all lift station fencing, wet well hatches, valve pit hatches, and fiberglass enclosures. It is our understanding that most of the lift stations are set up in this manner; however, during site inspections it was noted that several do not. These include Picasso's Lift Station, DBL East Phase 8 (Pebbles), and Wyndance.
2. An expanded inventory beyond what is included in this report of the main components in each of the lift stations. This should include last rebuild and startup date.
3. Maintenance records of last wet well cleaning for each lift station.
4. Maintenance records of last pump inspection / cleaning for each lift station.

SECTION 12 - PUBLIC PARTICIPATION

SECTION 12 - PUBLIC PARTICIPATION

12.1 Overview

Two workshops were held with Town officials from the Sewer Board, Town Council, Town Stormwater Management Board, Town Plan Commission, Town BZA, and Township Trustee (sign in sheets are included as **Figures 12-1 and 12-2**). The purpose of the meetings was to provide an overview of the status of the master plan development and obtain input from members regarding future growth within the Town, current wastewater system needs, and future wastewater needs.

12.2 April 2, 2015 Workshop Summary

The following were areas of growth potential as discussed at the workshop:

1. 109th and 117th Avenue Corridors
2. 98 acres for future school off of Gibson just south of 121st
3. Crown Point Christian Village connection

All in attendance agreed that Arizona Street appears to be the western limits of the service area and that the areas along Colorado Street are unlikely to develop into areas requiring Town of Winfield sanitary service. Expansion of the Town limits cannot occur to the north, east or west due to the corporate limits of Merrillville, Porter County, and Crown Point, respectively. Expansion of the Town to the south is unlikely to occur within this generation.

The following issues were identified as problems or concerns within the collection system:

1. Access issues to the Deer Creek lift station
2. Randolph Lift Station and the CME Interceptor Sewer is a bottleneck
3. Snead lift station is located too close to the roadway
4. Boardwalk lift station is dangerous and not reliable
5. The WWTP at the Crown Point Christian Village is failing
6. Backwards sewer exists in DBL East
7. Bollards should be placed around the DBL East Phase 12 Lift Station

There are no known problems with septic systems with the exception of Prairie Crossing.

Issues identified at the wastewater treatment plant include:

1. The equalization basin at the WWTP is deteriorating
2. An additional clarifier at the WWTP would be desirable
3. Plan for a street department building

12.3 June 23, 2015 Workshop Summary

A second workshop was held on June 23, 2015 to present the draft report to the Town for discussion. Areas within the draft report were left incomplete until feedback from the Town was received by DLZ relating to the overall concepts presented. In addition to the meeting, review memorandum was delivered to DLZ by the Town Attorney regarding the draft report. The following summarizes the meeting and memorandum:

1. Additional detail to be provided by DLZ in regards to the abandonment of the current treatment plant and relocating it to lower ground
2. Review plant expansion timelines based on the calculated sewer flows based on plant usage as opposed to IDEM standard rates.
3. DLZ to review the removal of lift stations wherever feasible.
4. Review specifically what options are available to rectify the Boardwalk lift station issues.
5. Review the Deercreek, Wyndance and Meadows relationship and what can be done to minimize the lift stations in that quadrant of Town.
6. Look for an alternative in Doubletree East to the force mains from DBLE #2 currently pumping under the lake.
7. Service life of the wastewater treatment plant equipment.
8. Discussion of replacement equalization basin
9. Discussion of vactor truck dumping pad
10. Discussion of a backflow preventer for the sludge drying facility sewer line

Town of Winfield
Wastewater Collections and Treatment Master Plan
Workshop #1 - April 2, 2015
Sign-in Sheet

Name	Organization	Email Address	Phone Number
Rick Anderson	Town of Winfield	anderson@winfieldgov.com	219-662-2665
Nick Bellar	Town of Winfield	bellarn@winfieldgov.com	219-662-2665
Paulette Skinner	Winfield Trustee	rennik@sbc.global.net	219-663-7027
David Anderson	Town of Winfield	andersond@winfield.com	219-663-7240
Tim Clayton	Town of Winfield	claytont@winfieldgov.com	219-7985340
Joe Gacsy	Town of Winfield	jpg745k@sbcglobal.net	219-898-5199
Anthony Clark	Winfield Sewer Board	AClark1@aol.com	219 689 8927
Don Sandberg	Town Winfield	dcsandberg@yahoo	219-712-1657
Bruce Rivera	Town of Winfield	brivera@netscape.net	219-775-1040

Town of Winfield
Wastewater Collections and Treatment Master Plan
Workshop #2 – June 23, 2015
Sign-in Sheet

Name	Organization	Email Address	Phone Number
MARK WACNIK	SEWER BOARD	MARK.WACNIK@SBCGLOBAL.NET	219-545-4323
Anthony Clark	Sewer Board	AClark1@aol.com	219 689 8927
Gerry Stiener	TOWN COUNCIL / Sewer Bd.		
Rick Anderson	Town of Winfield	anderson@winfieldgov.com	219-662-2665
Don Sandberg	" " "	dcsandberg@yahoo	219-712-1657
David Anderson	Town of Winfield	andersond@winfieldgov.com	(219) 662-2665
BILL BIZANES	PLAN COMMISION	mbizanes@ARB4LAW.com	219 712 8244
Tim Clayton	Town of Winfield	claytont@winfieldgov.com	219 7985340
Jim Simmons	Town of Winfield	simmonsja@winfieldgov.com	226-1662

Town of Winfield
Wastewater Collections and Treatment Master Plan
Workshop #1 - April 2, 2015
Sign-in Sheet

Name	Organization	Email Address	Phone Number
Jon Derwinski	Town of Winfield P.C / B.Z.A.	JDERWINSKI@NISOURCE.com	219-810-2222
Gerry Stiener	TOWN COUNCIL	CALL NICK	CALL NICK 219-663-7027
MARK WACNIK	SEWER BOARD	MARK.WACNIK@SBCGLOBAL.NET	

Town of Winfield
Wastewater Collections and Treatment Master Plan
Workshop #2 – June 23, 2015
Sign-in Sheet

Name	Organization	Email Address	Phone Number
JOE GACSY	PLAN COMMISSION	jpg745k@sbcglobal.net	219-898-5199
Paulette Skinner	Winfield Trustee	RENNIKS@SBCGLOBAL.NET	219-663-7027
Nick Bellar	Town of Winfield	bellarn@winfieldgov.com	
DAVID AUSTGEN	Austgen Kegan Jasaitis	akspc@austgenlaw.com	(219) 663-5600
REX SHERRARD	"	rsherrard@austgenlaw.com	"

Figure 12-1
Sign In Sheet for April 2, 2015 Workshop

Figure 12-2
Sign In Sheet for June 23, 2015 Workshop

SECTION 13 - FUNDING

SECTION 13 - FUNDING

13.0 Overview

The Town may pursue a variety of grants, loans, or alternative construction contract methods to help fund improvements outlined in this report. Some of these opportunities may include:

1. Indiana Office of Energy Development Grants
2. Indiana's Wastewater State Revolving Fund Loan
3. Guaranteed Maximum Savings Contracts
4. U.S Department of Agriculture Rural Development Loan
5. Developer Participation

Each of these options will have specific requirements, funding matches, and other requirements which will require further investigation.

13.1 Indiana Office of Energy Development Grants

The Office of Energy Development (OED) is offering a total of $500,000 to help government-owned wastewater treatment plants (WTP) to reduce their energy demand and lower their energy costs. WTP grants provide funding of up to $100,000 per grantee for the installation of efficient equipment and processes, anaerobic digesters, or waste-heat recovery. There is no minimum grant request. Current applications are due October 23, 2015; however, there may be opportunities for future funding along these lines. More information regarding this program can be found at www.in.gov/oed.

13.2 Wastewater State Revolving Fund Loan

Indiana's Wastewater State Revolving Fund (WWSRF) Loan program provides low interest-rate financing to construct water quality protection projects. As loans are repaid, money is available to be used again for new financings, thus making the program a "revolving fund." Eligible projects include:

1. Treatment plant improvements and upgrades;
2. Sewer line extensions to existing unsewered properties;
3. Combined sewer overflow corrections; and
4. Infiltration/inflow projects

More information regarding this program can be found at www.in.gov/ifa/srf.

13.3 Guaranteed Maximum Savings Contracts

The guaranteed maximum savings contract provides a means by which a contractor (qualified provider) can be selected to provide construction related services to install wastewater projects that constitutes the installation of "conservation measures" as defined in I.C. 36-1-12.5-1 under a "guaranteed savings contract". The projects that apply involve projects that result in energy savings and operational savings. Many of the projects represented in this report may apply. These types of projects typically result in a guaranteed price to be provided by the selected contractor at the 60-percent design stage. The benefits of this type of contract are that the Owner obtains firm budget numbers during the process; savings during construction are passed directly on to the Owner; minimal if any change orders result; and the designer and Contractor work together during the design to provide value engineering and constructability reviews.

13.4 U.S. Department of Agriculture Rural Development Loan

This loan program provides funding for clean and reliable sewage disposal systems in eligible rural areas. Winfield is part of this rural area; however, more coordination is required to determine if it is eligible for this funding. More information can be found at www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program.

13.5 Developer Participation

The opportunity for improvements may exist through developer participation. As areas are developed, developers typically fund utility extensions to parcels where utilities do not exist. Recapture agreements can occur which allows the developer to recapture portions of their initial capital outlay as customers are connected to the utility.

SECTION 14 - RECOMMENDED IMPLEMENTATION

SECTION 14 - RECOMMENDED IMPLEMENTATION

14.0 Overview

Based on a review of the Draft report by the Sanitary Sewer Board of the Town of Winfield in addition to the discussions at multiple workshops between DLZ and the the Board, the following implementation recommendations are presented below. These items are not recommended to run in series but instead concurrently. It would be recommended that a portion of the budget be allocated yearly to advance projects in all categories as funds and manpower resources allow. It should be noted that these projects may also be comprised of varying levels of public and private monetary participation. Additionally, the items presented below are anticipated to be dynamic and be implemented in varying order based on need.

14.1 Collection System - Investigative

The Town has several areas within the collection system where further research and evaluation is needed. This investigation was recommended in order to best plan for future capital improvement projects and maintenance projects.

1. Doubletree Planning Area - Doubletree East Sewer Investigation:
   Since the previous draft of this report there has been another instance of a sewer issue within Doubletree East. As previously discussed, much of this development was installed without Town oversight as it was considered private. Now that this system has been added to the Town inventory a complete as-built along with video investigation of this subdivision is recommended for a proper assessment of the needs of the system.

2. Central Planning Area -Televise and Survey the Country Meadows Interceptor:
   Based on continued interest in the development of the Town the need to determine the remaining capacity of this interceptor sewer will be required. Currently there is enough capacity to handle the projected buildout of the approved PUD for Doubletree East. Beyond that, per previous studies, limited additional service area expansion is possible without corrective measures being taken on this interceptor line or a potential reroute undertaken. This would affect any future development in the entire Doubletree Planning area.

14.2 Collection System - Capital Improvement

The Town has several areas within the collection system where capital improvement is needed for either maintenance issues or lift station inventory reduction efforts.

1. Doubletree Planning Area - Retirement of Bridgewater lift station:
   Currently the Bridgewater lift station is serving one home. The station appears to be sized to handle 17 more residences only 6 of which are platted. DLZ recommends that the current residence be disconnected from the lift station and a grinder type ejection system be used at the residence with all future residential connections handled in a similar manner. Bridgewater can then be salvaged for any usable components for possible re-purposing in a retrofit of the Boardwalk lift station. Boardwalk station is currently in need of repair / replacement so this could be a possible interim solution to address safety and performance issues.

2. Doubletree Planning Area - Telemetry System:
   Installation of a telemetry system for the Doubletree East Phase 8 (Pebbles) lift station.

3. Doubletree Planning Area - Doubletree West #1 lift station (Snead):
   Relocation of the control panel for the Doubletree West lift station #1 (Snead) to a position not adjacent to the road.

4. 117th Avenue Planning Area - Creation:
   Establishment of the 117th Avenue Planning area district lift station as presented in Section 6 Concept D. This will place a centralized lift station south of 117th Avenue and run a force main directly to the WWTP.

5. Doubletree Planning Area - Consolidation:
   The implementation of the plan for the abandonment of Picasso, Doubletree East Phase 8 (Pebbles), Doubletree lift station #2, Doubletree West lift station #1 (Snead) and Doubletree lift station #1 (Randolph) per Section 6 Concept D. This will place a new lift station near 101st Ave and Randolph Street and a new force main to the WWTP. Based on timing this may eliminate the desire to execute 14.2.3 above.

14.3 Collection System - Maintenance

1. Scheduled Cleaning / Inspection - General:
   Now that the Town has recently acquired a Vactor truck a cleaning and inspection program should be put in place. DLZ would recommend a cleaning of the wet wells of the lift stations on a yearly basis at a minimum. Additionally, DLZ recommends that the sewer manholes be cleaned and inspected on a bi-annual schedule at a minimum.

14.4 WWTP - Maintenance

1. WWTP—Flow Split Structure:
   Cleaning and Repair of the Flow Spilt Structure slide gates. DLZ understands that these gates are currently frozen in place. Proper repairs should be undertaken and the gates exercised on a monthly basis.

14.5 WWTP - Capital Improvement (non capacity related)

1. Heating system for the sludge drying building.
2. Electrical service points throughout the WWTP.
3. Extension of air line from the existing compressors to run the air lift pumps on the two small phase 3 clarifiers.
4. Construction of a new Equalization Basin per Section 10.2.2. This tank should be constructed of concrete based on the recommendation to leave the WWTP in its present geographical location. This new basin should be designed for the future expansion of the WWTP in terms of purpose, location and size.
5. With the recent acquisition of a Vactor truck construction of a Vactor truck dump containment area should be constructed to offset hauling costs of removed material. This area should be constructed per Section 10.2.1.

14.6 WWTP - Capital Improvement (capacity related)

1. The monitoring of the flows to the WWTP should be continued with attention given to the timeframes necessary for the design and construction of a WWTP Phase 5 upgrade. This expansion should be done as outlined in Section 10.3. However, this expansion may need to be adjusted based on the size of any new user added to the system outside of those considered and outlined in this report.

14.7 Projects Based on Future Opportunity

Within this Master Plan additional areas of the Town have capital improvement opportunities. These opportunities are related to the reduction and consolidation of the reliance on lift stations for the conveyance of flows to the WWTP. Along with this goal, additional emphasis is on the elimination / reduction of re-pumping waste water flows to the WWTP. This will result in an energy savings and improved overall reliance within the system. Future projects with these goals are presented below. It would be recommended to implement these concepts as outlined below when the opportunity arises. These opportunities may occur due to future development within the Town or as maintenance / replacement projects as each of these lift stations to be removed reach their service life.

1. Central Planning Area - Consolidation and Elimination:
   The elimination of Wyndance, Deer Creek and Meadows lift stations. This project would be accomplished by placing a new regional lift station along 109th Ave in the vicinity of Grand Boulevard. A new series of gravity lines would be installed to convey flow from Wyndance, Deer Creek and Meadows lift stations wet wells. This new lift station would extend and make use of the existing Meadows force main to the WWTP. This project would happen per Section 5 Concept C.

2. Grand Boulevard Planning Area - Boardwalk lift station:
   A new regional lift station is anticipated to be required to serve this planning area. When this station is added a new gravity service line from existing Boardwalk lift station can be added thereby eliminating the necessity for the Boardwalk lift station. This project would be implemented per Section 5 Concept C. It is understood that the Town's desire is to eliminate Boardwalk station, however, if this service area is not developed in the near future it would be recommended Boardwalk station be replaced in its current location.

3. Arizona Street Planning Area - Regional lift station:
   To serve the Arizona Street planning area it is anticipated that a new

regional lift station will be required to serve this north western quadrant of Town. This new station will pump into the new gravity line extended from the former Wyndance lift station. Should this new replacement gravity line not yet be available the new Arizona Planning Area lift station will be able to tie into the Wyndance lift station within the allowable excess capacity available on an interim basis.

4. Southeast Planning Area—New Regional lift station:
At the time the Southeast quadrant of Town develops a new regional lift station will be required. This new lift station will generally be north of 129th Avenue near the intersection of 129th Avenue and Montgomery Street. A new gravity sewer from Stonegate Subdivision's lift station

14.8 Opinion of Cost Summary

The Opinion of Cost Summary tables for each of the items presented in Sections 14.1-14.7 are shown on the following tables. These costs are in 2016 dollars and are not inclusive of unusual soils, environmental remediation/mitigation, or dewatering.

Table 14-1
Collection System - Investigative (14.1.1 to 14.1.2)

ITEM	DESCRIPTION	Amount
14.1.1	DOUBLETREE EAST PLANNING AREA - TELEVISE AND SURVEY ALL SEWERS IN DOUBLETREE EAST	$13,000
14.1.2	CENTRAL PLANNING AREA - TELEVISE AND SURVEY THE CME INTERCEPTOR SEWER	$7,000

Table 14-2
Collection System - Capital Improvement (14.2.1 to 14.2.3)

ITEM	DESCRIPTION	Amount
14.2.1	DOUBLETREE PLANNING AREA - RETIREMENT OF BRIDGEWATER LIFT STATION	$60,000
14.2.2	DOUBLETREE PLANNING AREA - TELEMETRY SYSTEM DOUBLETREE EAST PHASE 8 LIFT STATION (PEBBLES)	$15,000
14.2.3	DOUBLETREE PLANNING AREA—DOUBLETREE WEST #1 LIFT STATION (SNEAD) CONTROL PANEL RELOCATION	$20,000

Table 14-3
Collection System - Capital Improvement (14.2.4)
117th Planning Area - Creation

DESCRIPTION	Amount
FUTURE LIFT STATION #3	$640,000
FORCE MAIN FROM LIFT STATION #3 TO WWTP	$510,000
TOTAL	
	$1,150,000

Table 14-4
Doubletree Planning Area - Consolidation (14.2.5)

DESCRIPTION	Amount
DOUBLETREE AND GRAND BOULEVARD PLANNING AREA	
FUTURE LIFT STATION #1	$670,000
ABANDON LIFT STATIONS	$70,000
GRAVITY SEWER ALONG DOUBLE TREE DRIVE NORTH	$870,000
GRAVITY SEWER BETWEEN DOUBLE TREE NORTH DRIVE AND 101ST AVENUE	$240,000
GRAVITY SEWER ALONG 101ST AVENUE SEWER TO FUTURE LIFT STATION #1	$660,000
GRAVITY SEWER FROM RANDOLPH PUMP STATION TO FUTURE LIFT STATION #1	$370,000
GRAVITY SEWER FROM SNEAD LIFT STATION TO FUTURE LIFT STATION #1	$140,000
FORCE MAIN FROM FUTURE LIFT STATION #1 TO EXISTING WWTP	$1,290,000
TOTAL	
	$4,310,000

Table 14-5
Collection System - Maintenance (14.3.1)

ITEM	DESCRIPTION	Amount
14.3.1	SCHEDULED CLEANING / INSPECTION - GENERAL	$40,000

Table 14-6
WWTP - Maintenance (14.4.1)

ITEM	DESCRIPTION	Amount
14.4.1	WWTP—FLOW SPLIT STRUCTURE	$5,000

Table 14-7
WWTP - Capital Improvement non capacity related (14.5.1 to 14.5.5)

ITEM	DESCRIPTION	Amount
14.2.1	HEATING SYSTEM FOR THE SLUDGE DRYING BUILDING	$25,000
14.2.2	ELECTRICAL SERVICE POINTS THROUGHOUT THE WWTP	$5,000
14.2.3	EXTENSION OF AIR LINE TO AIR LIFTS IN PHASE III CLARIFIERS	$5,000
14.2.4	NEW EQUALIZATION BASIN	$380,000
14.2.5	VACTOR TRUCK DUMP CONTAINMENT AREA	$120,000

Table 14-8
WWTP - Capital Improvement capacity related (14.5.6)
Phase V Expansion

DESCRIPTION	Amount
MOBILIZATION/DEMOBILIZATION	$139,000
CONSTRUCTION ENGINEERING	$28,000
MATERIAL TESTING	$14,000
SITE CLEARING AND EROSION CONTROL	$56,000
SITE RESTORATION	$83,000
OXIDATION DITCH	$1,034,000
CLARIFIER	$519,000
AEROBIC DIGESTER	$409,000
HEAD WORKS	$481,000
UV DISINFECTION	$342,000
PLANT DRAIN	$77,000
SITE PIPING	$138,000
SUBTOTAL	$3,320,000
SUBTOTAL WITH 25% CONTINGENCY	$4,150,000
PROFESSIONAL DESIGN & CONSTRUCTION SERVICES (20%)	$830,000
TOTAL	
TOTAL	**$4,980,000**

Table 14-9 Project Based on Future Opportunity (14.7.1) Central Planning Area Consolidation	
DESCRIPTION	**Amount**
FUTURE LIFT STATION #2	$1,100,000
ABANDON LIFT STATIONS	$40,000
GRAVITY SEWER ALONG 109TH AVENUE FROM MEADOWS TO FUTURE LIFT STATION #2	$590,000
FORCE MAIN FROM FUTURE LIFT STATION #2 TO THE EXISTING MEADOWS FORCE MAIN	$270,000
TOTAL	
	$2,000,000*

* Note: Wyndance lift station abandonment and gravity from Wyndance lift station to Future Lift Station #2 is assumed to be installed by a developer either in whole of in part when Arizona Street planning area is established. Estimated additional cost of $1,300,000 to those presented in Table 14-8.

Table 14-10 Project Based on Future Opportunity (14.7.2) Grand Boulevard Planning Area	
DESCRIPTION	**Amount**
FUTURE LIFT STATION #6	$550,000
ABANDON BOARDWALK LIFT STATION	$7,500
FORCE MAIN FROM LIFT STATION #6 TO LIFT STATION #2	$540,000
TOTAL	
	$1,097,500*

* Note: If Future Lift Station #2 is not currently installed when Future Lift Station #6 is added, an alternative route to existing Meadows lift station. This would equate to an additional cost to those presented in Table 14-9 of $172,000.

Table 14-11
Project Based on Future Opportunity (14.7.3)
Arizona Street Planning Area

DESCRIPTION	Amount
FUTURE LIFT STATION #4	$600,000
FORCE MAIN TO CENTRAL PLANNING AREA GRAVITY	$193,000
TOTAL	
	$793,000

* Note: If Wyndance lift station is not abandoned at this point and the Central Planning gravity sewer is not yet installed, Future Lift Station #4 can pump to Wyndance lift station at an addition cost of $320,000 than that presented in Table 14-10.

Table 14-12
Project Based on Future Opportunity (14.7.4)
Southeast Planning Area

DESCRIPTION	Amount
FUTURE LIFT STATION #5	$700,000
FORCE MAIN TO STONEGATE FORCEMAIN	393,900
GRAVITY FROM STONEGATE TO FUTURE LIFT STATION #5	$725,000
ABANDON STONEGATE LIFT STATION	$15,000
TOTAL	
	$2,487,000

APPENDIX A - PRELIMINARY SANITARY SEWER ATLASES

Town of Winfield
Sanitary Sewer Atlas

Scale: 200

C

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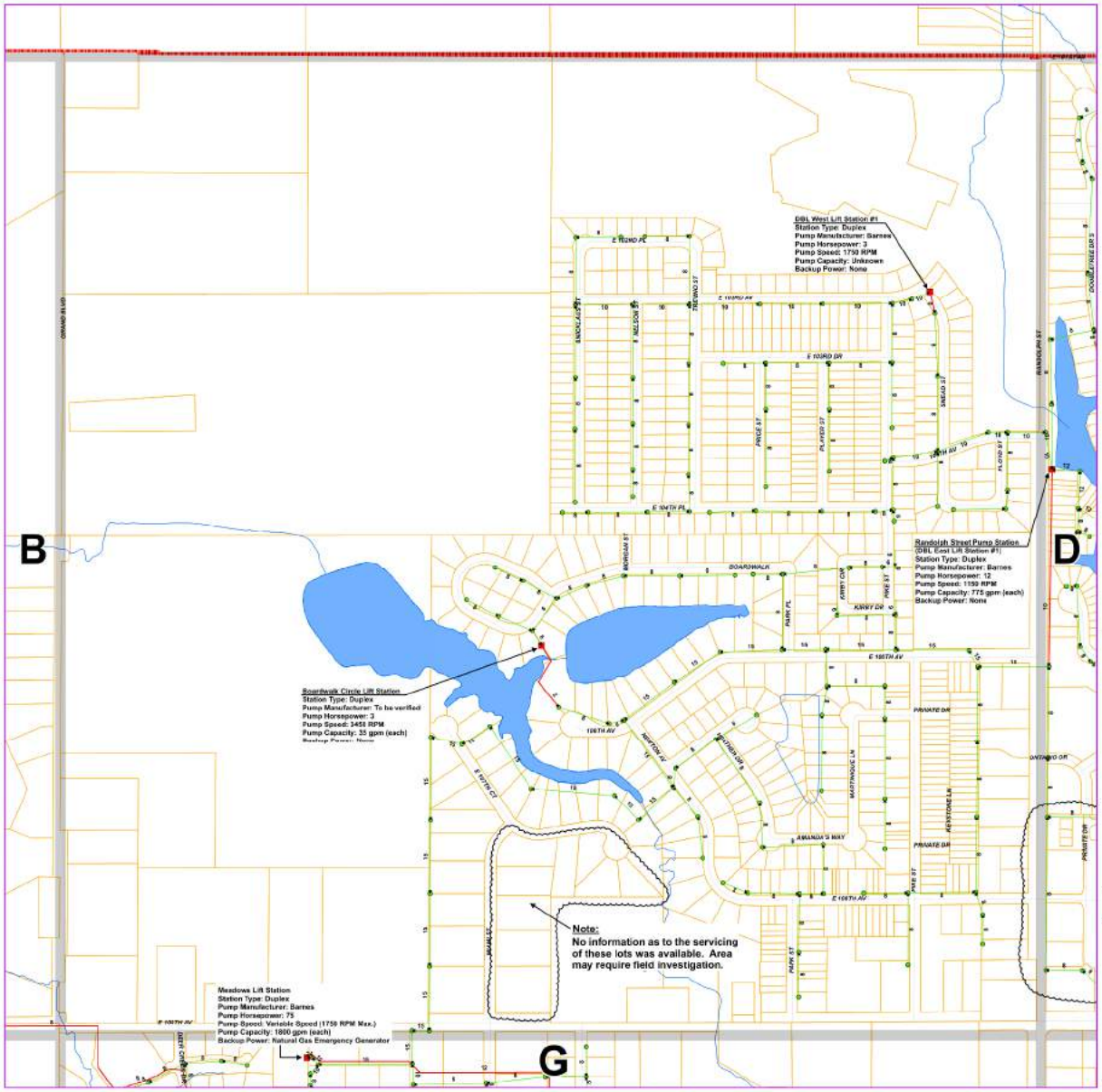

PRELIMINARY

400 200 0 400

Feet

Legend

- Lift Station
- Sanitary Manhole
- Sanitary Forcemain
- Sanitary Pipe
- Streams
- Ponds
- Town Boundary
- Parcels
- Map Grid

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P

General Note:

The locations of all facilities were placed based on as-built drawings, design drawings, sketches, and other available information from numerous sources. In many cases, locations of facilities were "best fit" and may not accurately represent the actual location and/or configuration. Should exact configuration or location be required, it is recommended that field verification be conducted. Information pertaining to the lift stations should be field verified and updated as required as well. This document is intended to be a "living" document and should be updated as new development and facilities are constructed.

Town of Winfield
Sanitary Sewer Atlas

Scale: 200

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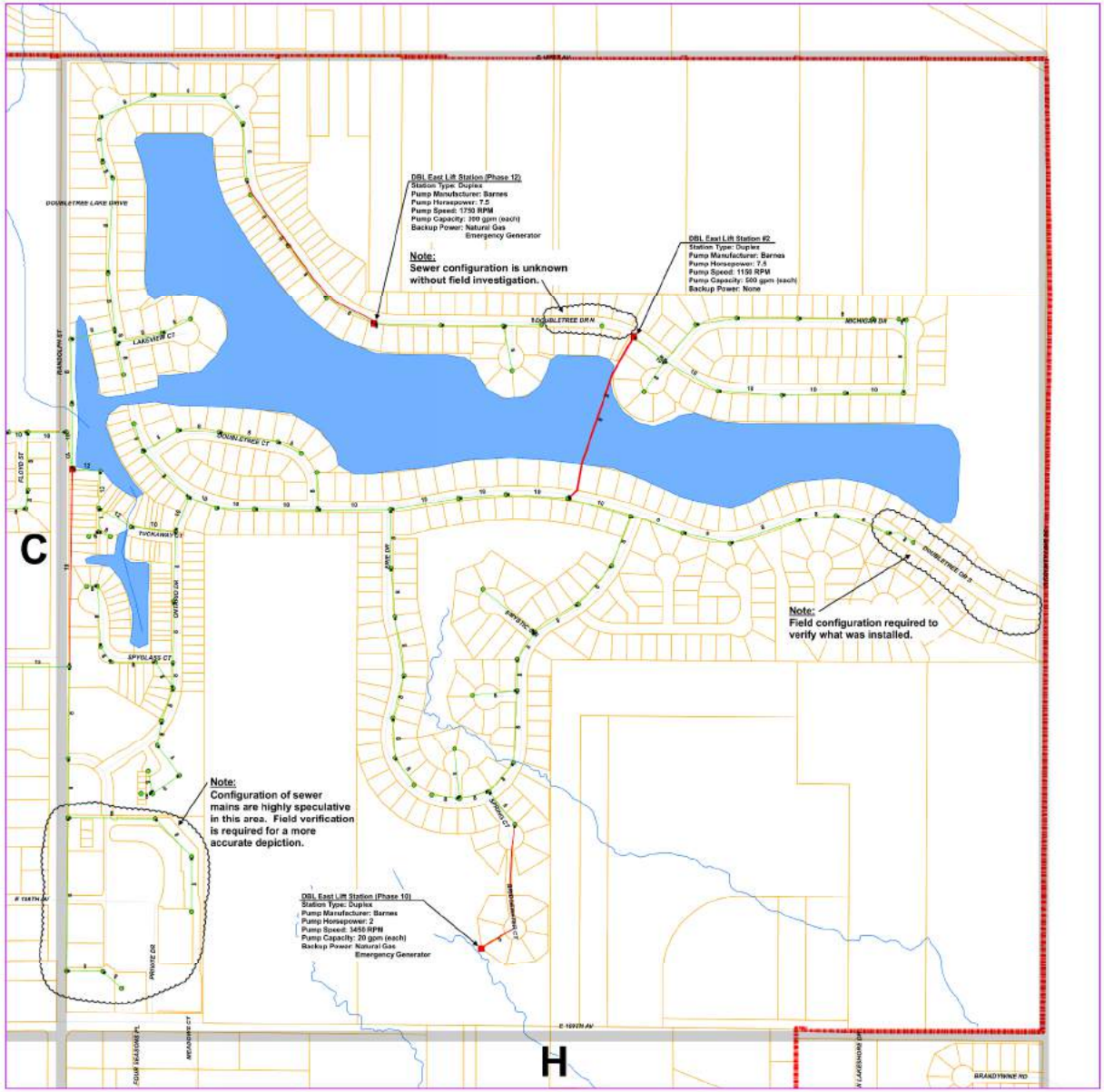

PRELIMINARY

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Feet

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Town of Winfield
Sanitary Sewer Atlas

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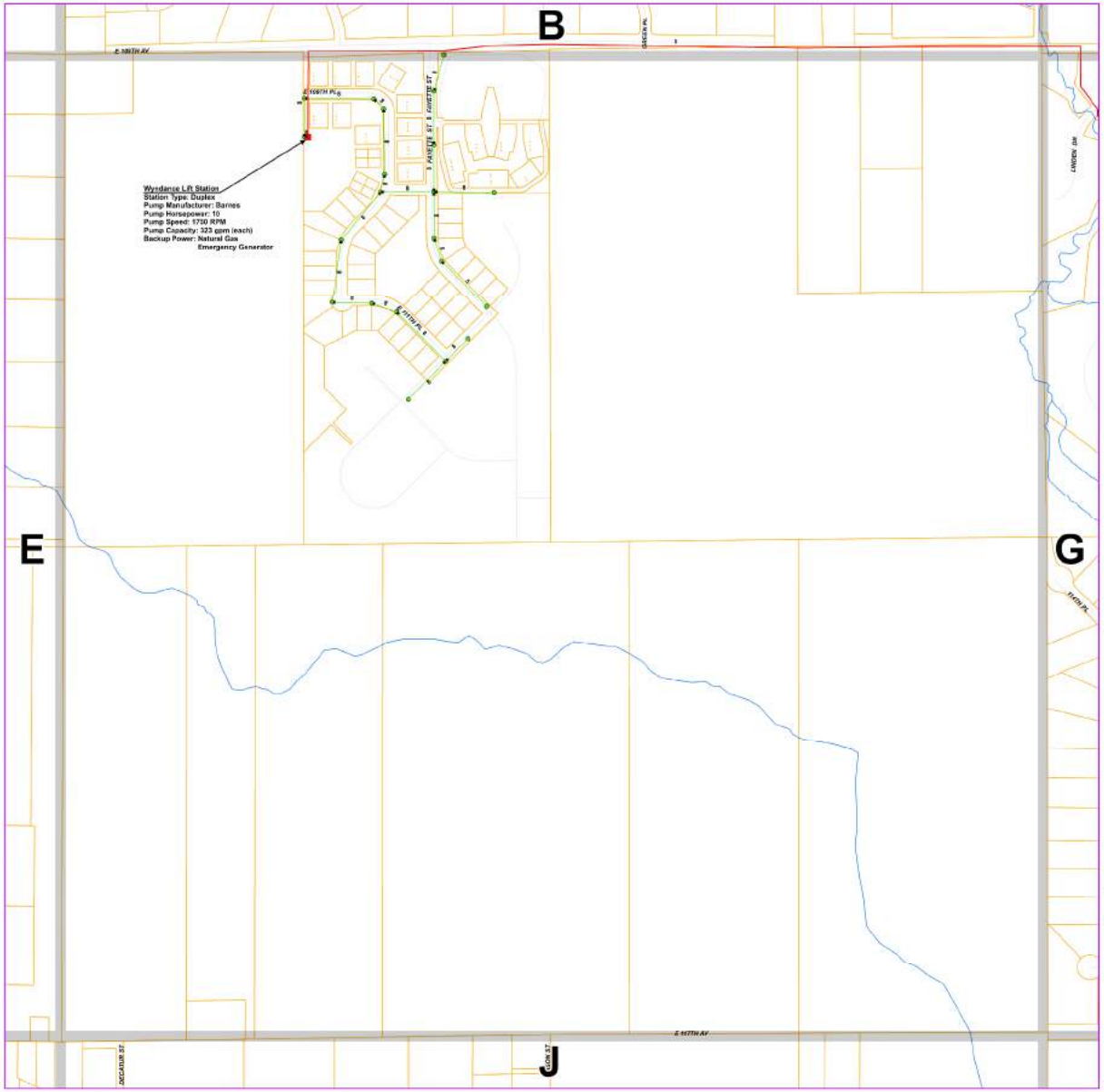

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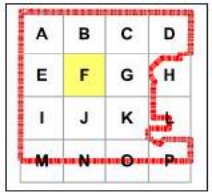

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Town of Winfield
Sanitary Sewer Atlas

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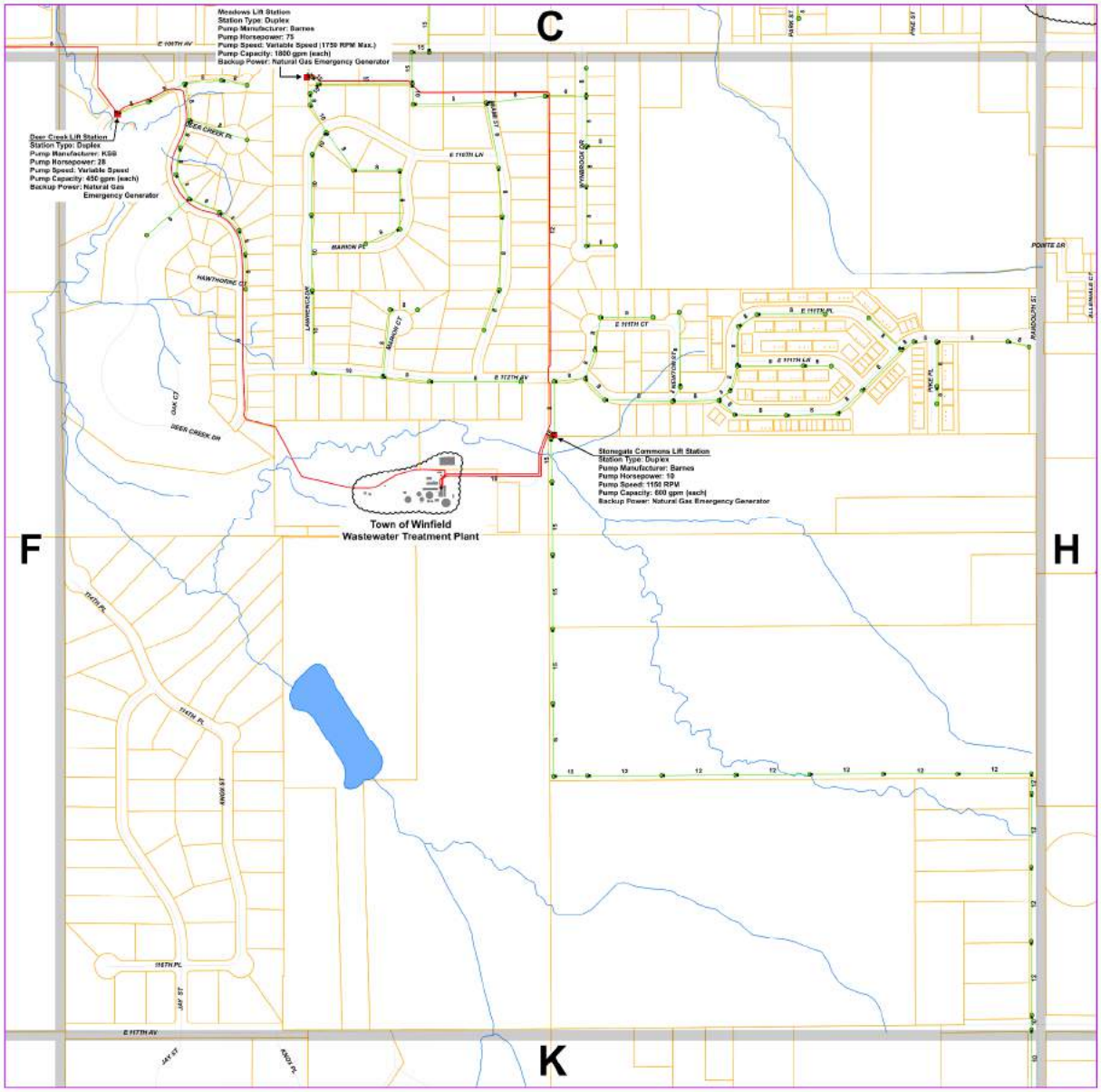

PRELIMINARY

400 200 0 400

Feet

Legend

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- Sanitary Manhole
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Town of Winfield
Sanitary Sewer Atlas

Scale: 200

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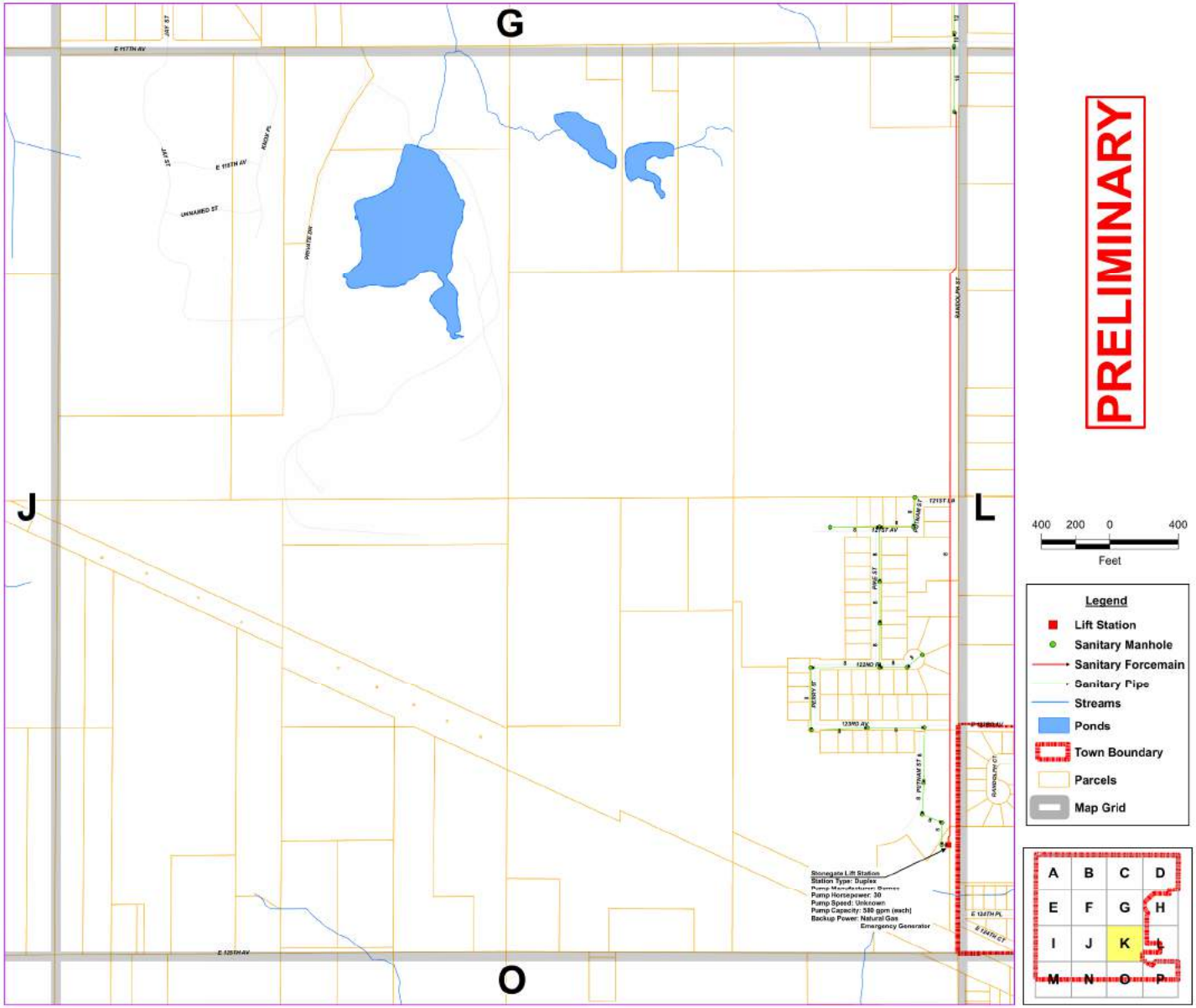

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