WATER DISTRIBUTION SYSTEM MASTER PLAN

CITY OF WOOD DALE, ILLINOIS

September 2022

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A. INTRODUCTION

The City of Wood Dale is a community of approximately 14,012 people that serves potable water to customers purchased from DuPage Water Commission (DWC). The City has two connections to DWC located along Richert Rd and Park Lane. The City also owns three emergency wells and has three emergency interconnects with surrounding communities. Local customers include domestic, commercial, and industrial water users of the City of Wood Dale.

The City's distribution system operates within two pressure zones and has 80.4 miles of water distribution mains ranging from 4" to 16" with 5,004 services (residential, commercial, and industrial). The distribution system includes two elevated storage tanks and three ground storage tanks. Water from the ground storage tanks is pumped into the system from high service pumps. The System has two Pressure Reducing Valve (PRV) stations (Wood Dale and Central). The Wood Dale PRV also has a booster pump to pump water from pressure zone 1 to pressure zone 2 if needed. Figure II-1 is a schematic of the existing water distribution system. The schematic is from 2014 and some of the pump capacities are not accurate; however, the schematic still shows an accurate overview of the distribution system components. The schematic is part of the 2019 IEPA Report, which is attached in Appendix D.

The City desires to develop a calibrated hydraulic model and conduct an analysis of its water system to determine improvements necessary, if any, for a 20-year planning period. These improvements include necessary water main improvements, additional storage, and other water distribution assets.

B. EXISTING CONDITIONS

The model demonstrated that the existing system infrastructure is adequate for the existing system demands. However, the lack of elevated storage in Pressure Zone 1 causes the pumps to turn on and off often due to the quick fill and draw cycle of the existing storage tank. The quick fill and draw cycle results in pressure fluctuation throughout Pressure Zone 1. A 750,000 gallon storage tank in Pressure Zone 1 would allow for a longer fill and draw cycle which would prevent the pumps from turning on and off as often and provide more stable pressure throughout the pressure zone. The 750,000 gallon storage tank would increase the elevated storage capacity to 1.25 million gallons, which will be slightly lower than the 20-year design average day demand (1.52 MGD).

Another issue the City experiences with only the 100,000 gallon storage tank in Pressure Zone 1 is that the volume is quickly depleted during hydrant use (flushing/fire use). This causes a quick drop in system pressure, which triggers two valves opening between Zone 2 and Zone 1 to allow more water into Zone 1. The sudden change in pressure and the valves quickly opening can cause water hammer and hydraulic surging. Water hammer and hydraulic surging increases the chance of watermain breaks in the distribution system along with greater wear and tear on the distribution system.

Currently Pressure Zone 1 has higher demand than Pressure Zone 2. Zone 2 helps supplement Zone 1 with water through the Central PRV station. The additional elevated storage tank in Zone 1 would allow Zone 1 to operate without requiring supplementing from Zone 2. Also, the majority of the future demand is located in Zone 2 with the TIF district improvements/redevelopment. This could cause more stress on Zone 2; therefore, supplementing Zone 1, if additional storage weren't added, could become more of an issue. The following are benefits of adding a 750,000 gallon elevated storage tank:

- Longer fill and draw cycle preventing pumps from turning on and off often.
- Less pressure fluctuation throughout the day.
- More storage for future development and usage.
- Allow Zone 1 to operate without requiring as much supplementing from Zone 2
- More elevated storage which is not dependent on pumps to serve the City.
- Minimize water hammer/hydraulic surging when flushing hydrants, fire department usage, or watermain breaks. Preventing other watermain breaks in the distribution system.

Table I-1: OPC – 750,000 Gallon Storage Tank

Description	Cost
750,000 Gallon Storage Tank	$3,960,000[1]
Site Work, Electrical and Controls	$300,000
Contingency (20%)	$852,000
Engineering, Legal, and Administration (10%)	$512,000
Total	**$5,624,000**

1. Quote from CB&I August 31, 2022. Quote includes full paint containment and is based on spread footing foundation assuming at least 4,000 psf soil bearing. If less than 4,000 psf soil bearing, pile/pier foundation shall be required, and cost will increase.

Reconstructing the tower at the existing location presents constructability issues. The issues include possible poor soil bearing causing need for deeper foundation due to the proximity to Salt Creek which would result in higher construction costs when compared to relocating the tower. Also, the tight working space within the wastewater treatment plant creates issues with storing material on-site and constructing the proposed elevated storage tank.

When designing the proposed elevated storage tank, the option to increase the elevation of the tower could be an option. Increasing the elevation of the proposed elevated storage tank would set the pressures in Pressure Zone 1. With pressure in Zone 2 at a higher level, the City could increase the pressure to be closer to Pressure Zone 2 or even match the pressure and become a one pressure zone system.

C. FUTURE NEEDS

The future demands were determined in two phases as determined by the City. Phase 1 included a multi-family development along Wood Dale Road, industrial/commercial development along IL-83, and an industrial user along Lively

Blvd. Phase 2 included the redevelopment of the TIF District (previously analyzed by HR Green in 2017) and servicing existing unincorporated residential area between Wood Dale Rd and Central Ave.

Analysis of both Phase 1 and Phase 2 was completed. The analysis showed that the City's existing system will have capacity for both future phases to maintain pressure and fire flow in the distribution system.

The working model is a tool the City should utilize as development occurs. The model could be utilized to prepare for future development to prevent redoing system improvements. If development plans change over time, the model should be updated to confirm the effect of developmental changes on the existing water system.

D. WATER MAIN AND WATER SYSTEM RECOMMENDATIONS

After analyzing the water main break history of the City, the majority of the breaks were located on cast iron pipes. It is recommended that the City replace cast iron water mains as budget allows.

The City maintains approximately 80.4 miles of watermain ranging from 4" to 16". The watermain material used throughout the distribution system is a mix of cast iron and ductile iron. The life expectancy of cast iron and ductile iron watermain is between 50 years to 100 years depending on many factors such as installation, soil types, water quality and pipe material manufacturing. Assuming the average life expectancy of 75 years, the City would need to replace approximately 5,660 feet of watermain every year. Table I-2 shows the opinion of probable cost for an annual watermain replacement based on a 75-year life expectancy.

As this number is merely a benchmark, the City can use their knowledge of the water distribution system including the watermain break history and other issues within their system to prioritize the location and amount of watermain replacement to be completed in a given year in coordination with available budget and other capital projects.

Table I-2: Opinion of Probable Cost Annual Watermain Replacement

Description	Linear Feet	Cost/Ft	Opinion of Probable Cost
Annual Watermain Replacement	5,660	$350	$1,982,000

The City previously completed a water main project along N. Addison Road south of Potter Street. Phase 2 of this project, from Potter Street to Irving Park Road, was to be completed at a future date. A dead end currently exists on the 12" main at Potter Street and the existing main from Potter Street to Irving Park Road is older cast iron water main. As such, it is recommended that the City prioritize this project under its annual watermain replacement program to eliminate the dead end and replace the existing main. Table I-3 shows the opinion of probable cost to complete the connection.

Table I-3: Opinion of Probable Cost Addison Road Water Main

Description	Linear Feet	Cost/Ft	Opinion of Probable Cost
Addison Road 12" Watermain	1,800	$350	$630,000

The water main along Irving Park Road transitions from 12" watermain to 6" water main back to 12" watermain near Edgebrook Rd. The existing system maintains acceptable pressures and fire flow in the area despite the bottleneck; however, the 12" watermain is limited due to the sudden decrease to 6". It is recommended that the City increase the approximately 300 feet of 6" watermain to 12" watermain. Table I-4 shows the opinion of probable cost to complete the replacement of the 6" water main.

Table I-4: Opinion of Probable Cost Replace Bottleneck Watermain

Description	Opinion of Probable Cost
Replace 6" Bottleneck along Irving Park Road with 12" Watermain	$150,000

The City maintains three deep wells for emergency purposes. The wells only operate in emergency situations; however, the wells need to be operated monthly in order to obtain samples as required by IEPA. The City has not needed to operate the wells in an emergency situation in the recent past. Based on the amount of use the wells receive, it is recommended that the pumps be pulled, and the wells should be inspected every seven to ten years. Table I-5 shows the opinion of probable cost to complete the well inspections. Recent data shows that Well #6 is experiencing significant reduction in output capacity. It is recommended that the City inspect the well and budget for future repairs as needed.

Table I-5: Opinion of Probable Cost Emergency Wells Inspection

Description	Opinion of Probable Cost
Emergency Wells Inspection (per well)	$25,000

In addition to the capital improvements identified above, it is recommended that the City continue with routine inspections and maintenance of its pumping facilities and additional system components including pumps, PRVs, elevated and ground storage tanks, and disinfecting equipment. Routine inspections and repairs should be budgeted for appropriately in each annual operating budget.

II. INTRODUCTION

A. PURPOSE

The City of Wood Dale is a community of approximately 14,012 people that serves potable water to customers purchased from DuPage Water Commission (DWC). The City has two connections to DWC located along Richert Rd and Park Lane. The City also owns three emergency wells and has three emergency interconnects with surrounding communities. Local customers include domestic, commercial, and industrial water users of the City of Wood Dale.

The City's distribution system operates within two pressure zones and has 80.4 miles of water distribution mains ranging from 4" to 16" with 5,004 services (residential, commercial, and industrial). The distribution system includes two elevated storage tanks and three ground storage tanks. Water from the ground storage tanks is pumped into the system from high service pumps. The System has two PRV stations (Wood Dale and Central). The Wood Dale PRV also has a booster pump to pump water from pressure zone 1 to pressure zone 2 if needed. Figure II-1 is a schematic of the existing water distribution system. The schematic is from 2014 and some of the pump capacities are not accurate; however, the schematic still shows an accurate overview of the distribution system components. The schematic is part of the 2019 IEPA Report, which is attached in Appendix D.

The City desires to develop a calibrated hydraulic model and conduct an analysis of its water system to determine improvements necessary, if any, for a 20-year planning period. These improvements include necessary water main improvements, additional storage, and other water distribution assets.

B. SCOPE

HR Green, Inc. was hired in August 2021 to evaluate the City of Wood Dale's water distribution system and develop recommendations for improvements necessary for the City.

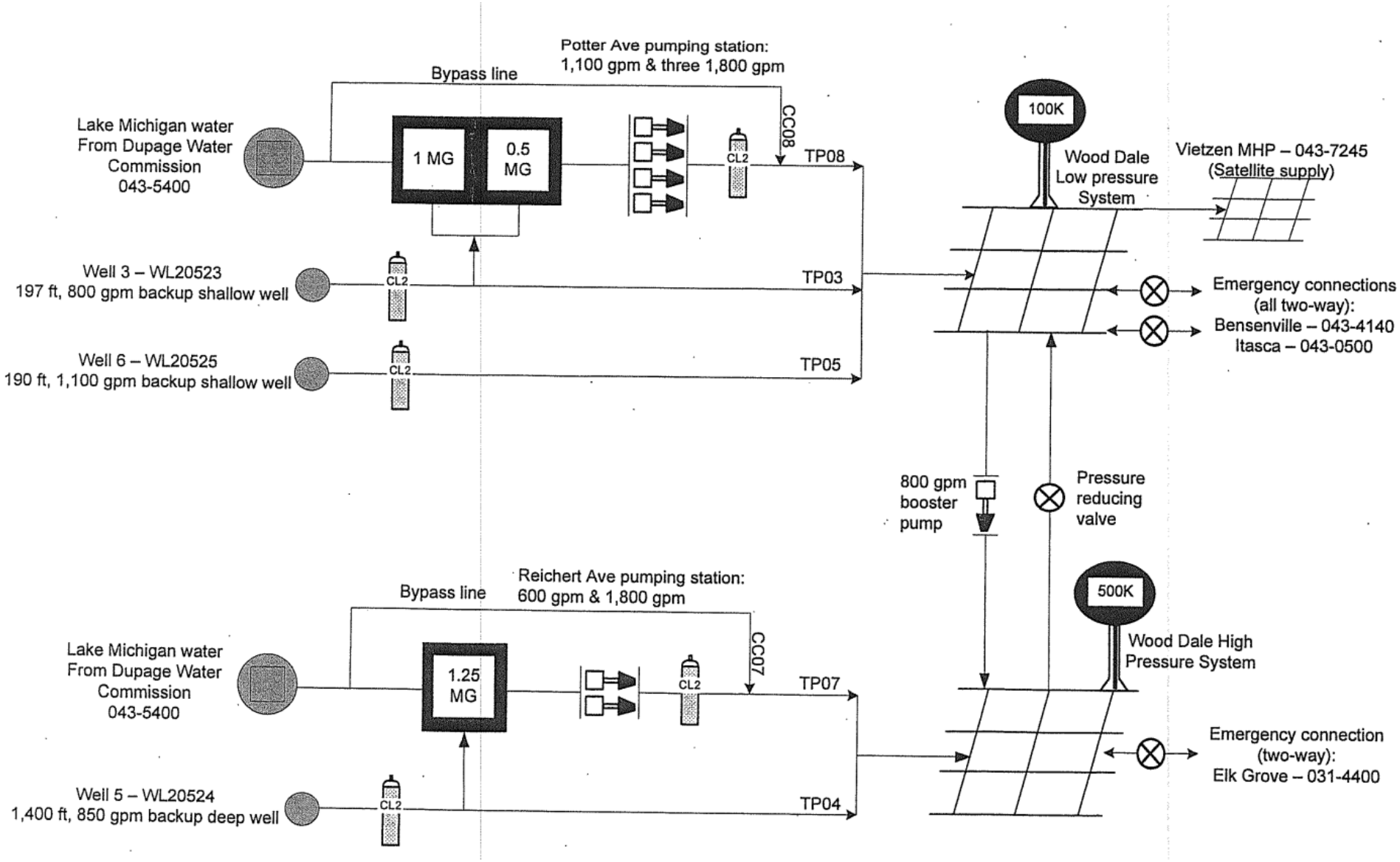

Figure II-1: Water Distribution System Schematic

III. DESIGN CRITERIA

A. GENERAL

Design criteria discussed in this report will meet the requirements of the Illinois Environmental Protection Agency (IEPA), Recommended Standards for Water Works (2018 Edition), and the City of Wood Dale.

B. HISTORICAL WATER DEMANDS

Water demands in the existing water distribution system are based on the City's DWC meter readings for the years 2018, 2019, 2020, and 2021. The City averaged approximately 1.09 million gallons per day (MGD) demand. The maximum day demand was 1.85 million gallons. The ratio of Maximum to Average Day Demands, or peaking factor, is identified as 1.70. The Average and Maximum Day Demands will be used for modeling the City's existing distribution system.

The demands were assigned to nodes in the water model. First the top ten users are added individually to a node at the location of the user. The rest of the demand was evenly distributed throughout the remaining nodes in the water model.

C. FUTURE WATER DEMANDS

The future demands were determined in two phases as determined by the City. Phase 1 included a multi-family development along Wood Dale Road, an industrial/commercial development along IL-83, and an industrial user along Lively Blvd. Phase 2 included the redevelopment of a TIF District (previously analyzed by HR Green in 2017) servicing an existing residential area between Wood Dale Rd and Central Ave. The City is landlocked, and these two phases are what the City expects to develop over the next 20 years.

The multi-family development is a proposed 176-unit complex. Based on 3 people per unit (IL Title 35 Section 370 Appendix A Table No. 1, conservatively assuming 2-bedroom units), the average day demand would be 36.7 gpm with a maximum demand of 62.3 (based on peaking factor calculated). Figure III-1, located in Appendix A, shows a rendering of the multi-family development. The industrial/commercial development along IL-83 is approximately 24 acres of building space or development lots. Based on 25 people/acre and 35 gpd/person (IL Title 35 Section 370 Appendix B Table No. 2), the average day demand is projected to be 14.6 gpm with a maximum day demand of 24.8 gpm. Figure III-2, located in Appendix A, shows the development plan for the area. The industrial user along Lively Blvd. is estimated to use 2,000,000 gallons per month or an average day use of 46.3 gpm and a maximum day use of 78.7 gpm.

The TIF District redevelopment was analyzed previously in 2017 by HR Green. The average day demand for the TIF District is 164.4 gpm with a maximum day demand of 279.4 gpm. Figure III-3 is the concept plan for the TIF District and is in Appendix A. The existing residential area located between Wood Dale Rd. and Central Ave. has approximately 151 houses. Assuming 3.5 people per house (IL Title 35 Section 370 Appendix A Table No. 1), the average day demand is 36.7

gpm with a maximum day demand of 62.4 gpm. Table III-1 is a summary of demands for future development.

The potential for additional future demand exists in the area south of the planned development near IL-83 and Bryn Mawr Avenue and north of Foster Avenue. This area currently entails roughly 40 acres of potential future commercial, industrial, and/or residential development, however as potential water usage data for these future developments are not known this area was excluded from the modeling.

Table III-1: Future Development Water Demands

Description	Average Day (MGD)	Maximum Day (MGD)
Existing	1.09	1.85
Wood Dale Rd Development	0.05	0.09
Commercial Laundry Cleaner	0.07	0.11
IL-83 Development	0.02	0.03
TIF District	0.24	0.40
Existing Residential Area	0.05	0.09
Total	**1.52**	**2.57**

D. WATER SUPPLY

The City's currently relies on two connections to DWC: 1) the Park Lane connection located in Pressure Zone 1, and 2) the Richert Rd. connection located in Pressure Zone 2. The pressure the water is received from DWC ranges from 80 psi – 100 psi. The original design intent for operation is for the water supply from DWC to fill the ground storage tanks for each respective pressure zone and then be pumped and chlorination boosted, if needed, into the distribution system from the respective pumping stations. The pumps operate on variable frequency drives (VFDs) that allow for more operational control. Table III-2 shows the capacity of the pumps at each pump station.

Table III-2: Pump Station Capacity

Potter St. Pump Station	Capacity (gpm)	Capacity (MGD)
B-4	1,000	1.44
B-9, B-10, B-11	1,400	2.02
Firm Capacity	3,800	5.47
Total Capacity	5,200	7.49
Richert Rd. Pump Station	**Capacity (gpm)**	**Capacity (MGD)**
5-1, 5-2	1,400	2.02
Firm Capacity	1,400	2.02
Total Capacity	2,800	4.04

The City can bypass the ground storage tanks and operate with direct flow from DWC's system into the City's distribution system. This operation allows less energy consumption from the pumping stations.

For emergency purposes, the City owns three emergency wells and has emergency interconnects with Bensenville, Elk Grove, and Itasca. Table III-3 shows the emergency well capacity. The emergency well capacity is greater than the average and maximum day demands of the City.

Table III-3: Existing Deep Wells

Description	Capacity (gpm)	Capacity (MGD)
Well #3	800	1.15
Well #5	850	1.22
Well #6	1,100	1.58
Total	**2,750**	**3.95**

E. STORAGE

The City's water system contains two elevated storage tanks and three ground storage tanks. Table III-3 shows the capacity of the existing storage tanks.

Table III-3: Existing Storage Tanks

Name	Capacity (MG)[1]
Tower 1	0.10
Tower 2	0.50
Reservoir 3	1.00
Reservoir 4	0.50
Reservoir 5	1.25
Total	**3.35**

1. The capacity shown is the total volume of the storage tanks. This does not take in account the unusable volume of the tanks based on minimum pump levels required to maintain adequate net positive suction head of the pumps.

The City receives their water supply from DWC. DWC obtains the water from the City of Chicago. The storage requirement for water received from the City of Chicago is two times the average day demand. Therefore, Table III-4 shows the recommended storage for the existing system, Phase 1, and Phase 2.

Table III-4: Recommended Storage

Name	Capacity (MG)
Existing	2.18
Phase 1	2.46
Phase 2	3.04

Since the pumping stations at the ground storage tanks have emergency backup power, the ground storage tanks can be considered storage along with the elevated storage tank. Therefore, the City currently has adequate storage capacity.

The majority of the City's storage capacity is in the ground storage tanks. Although the ground storage tanks can be considered storage, there are operational benefits for elevated water storage and the supply does not rely on a pump to provide the water to the distribution system.

F. DISTRIBUTION SYSTEM PRESSURES

The 2018 Edition of the Recommended Standards for Water Works – also known as the Ten States Standards – outlines the following recommendations for water distribution systems:

- Normal working pressures to be approximately 60 to 80 psi, and not less than 35 psi,
- Minimum pressure of 20 psi anywhere in the system under all flow conditions,
- Water mains shall be minimum 6-inch if serving fire hydrants or providing fire protection

IV. METHODOLOGY – DESCRIPTION OF DISTRIBUTION SYSTEM MODEL

A. GENERAL

HR Green updated a computer model previously updated in 2017. The water model was updated with distribution system improvements that were completed since the distribution map was last updated.

B. COMPUTER MODEL

The computer model was created using the WaterGEMS Version 8i by Bentley Systems, Inc. The program has the capabilities to analyze steady state, extended period simulation (EPS), and water quality simulations for pipe distribution systems. Information about the City of Wood Dale's distribution system was entered into the computer model and WaterGEMS performed the hydraulic calculations to determine flows and pressures. The information required to run the distribution system analysis program includes:

1. Water Distribution System Data
    a. Pipe sizes, types, roughness coefficients and lengths.
    b. Pipe junction elevations
    c. Water tower location, diameter, head range, and elevation
    d. Pump locations, elevations, and pump curves
    e. Major water users and their locations

2. Flow Data
    a. Peak day water demand
    b. Peak hour water demand
    c. Fire flow demand

Information about the existing water distribution system was obtained from water distribution maps and records with the assistance of City staff. Information on flow data was obtained from DWC metering records. Other than the 10 major water users that were entered in the model using their actual addresses, the remaining flow demands were equally distributed throughout the distribution system. The model has 2,442 pipes (sizes ranging from 1" to 16" in diameter) and 2,199 junctions. The model is operated in two pressure zones. The hydraulic grade line of Pressure Zone 1 is 839.64 and Pressure Zone 2 is 865.39.

The WaterGEMS computer program uses the Hazen-Williams formula for computing the pipe friction losses under flow conditions. To solve the network system hydraulics, the program uses mass continuity and energy conservation equations.

V. EXISTING WATER DISTRIBUTION SYSTEM ANALYSIS

Figure V-1 is a map of the existing distribution system. The controls in the model are set up to operate the water system based on the design intent of operation with DWC supply being controlled by the elevation in the respective ground storage tank and the pump stations pumping to the system based on the elevation in the elevated storage tank in each pressure zone.

A. AVERAGE DAY SYSTEM DEMAND

The model was updated with changes that occurred since the last model was completed in 2017. The Average Day EPS for the existing system model evaluates how the water system operates over a normal 72-hour time period. This evaluation reveals how variations in the flow demands that normally occur over the course of the day affect the operation of wells, pumps, and storage tanks. Average day demands were determined by using the DWC metering data from 2018-2021. Demands were distributed across the nodes (model junctions) for each demand type. Finally, a diurnal demand pattern was developed and applied to the Average Day demand, which represents a typical usage pattern during the course of a day. A typical average day demand pattern has morning and early evening peaks for water usage.

The results of this simulation for existing system conditions show the range of pressures experienced in the different areas within the system. Figure V-2 in Appendix B shows the pressures during peak hour demand throughout the system. The figure's legend indicates pressure (psi) at each junction node. Each color represents a pressure range equal to or less than the indicated pressure. The lowest pressure in the system during peak hour demand is 48 psi. Under Average Day demand conditions, the model indicates the existing water system operates with acceptable pressures.

Figure V-3 and Figure V-4 (Appendix B) show the fill and draw cycle of Tower 1 and the pump run status for Booster Pump 4 respectively. Tower 1 is only 100,000 gallons; therefore, the fill and draw cycle happens quickly causing the pumps to turn on and off often, which puts strain on the equipment.

Figure V-5 and Figure V-6 (Appendix B) show the tower level and pump run status if a 750,000 gallon tank was added to the system. The addition of a 750,000 gallon storage tank slows down the fill and draw cycle in the storage tank, which causes the booster pump to turn on less frequently and run for a longer period of time. With the addition of a 750,000 gallon storage tank, the total elevated storage would be 1.25 million gallons. The total elevated storage would be slightly lower than the future average day demand (1.52MGD).

Currently Pressure Zone 1 has higher demand than Pressure Zone 2. Zone 2 helps supplement Zone 1 with water through the Central PRV station. The additional storage tank in Zone 1 would allow Zone 1 to operate without requiring supplementing from Zone 2. Also, the majority of the future demand is located in Zone 2 with the TIF district improvements/redevelopment. This could cause more

stress on Zone 2; therefore, supplementing Zone 1, if additional storage weren't added, could become more of an issue.

B. MAXIMUM DAY SYSTEM DEMAND

The results of this simulation for existing system conditions show the range of pressures experienced in the different areas within the water distribution system under maximum day demands. Maximum day demands were determined using the DWC metering data from 2018-2021. The average day demands were multiplied by the calculated ratio of maximum day demand to average day demand of 1.70. Demands were distributed across the network nodes of the model to simulate typical demands. Finally, a diurnal demand pattern was applied to the Maximum Day demand, which represents a typical summertime/higher usage pattern during the course of a day. This higher use pattern is reflective of consumers using water for irrigation of lawns, filling pools, etc.

Figure V-7 in Appendix B shows the minimum pressures that the system experienced during the maximum day fluctuations. This figure is formatted the same as Figure V-1. During the 72-hour EPS under Maximum Day demand the model indicates that the existing system lowest pressure is 48 psi. The model demonstrates that the existing water supply is capable of handling the maximum day demands of the existing water system.

C. FIRE FLOW DEMANDS

Fire flow simulations were performed to evaluate the available fire flow at each network node in the model. Note that the fire flow shown is available fire flow at the node based on the size of the water main the node is located on. Higher fire flows will be impacted by losses through smaller diameter fire hydrant lead and the fire hydrant itself. For acceptable fire protection flow in single family residential areas, flow constraints of a minimum of 1000 gpm while maintaining a minimum system pressure of 20-psi were used. For industrial and commercial areas, the available fire flow goal is 3,500 gpm. The available fire flow for each node is shown in Figure V-8 in Appendix B. Most of the nodes with observed fire flow rates below 1,000 gpm are located at dead ends of water mains or are on nodes located on service connections smaller than 6". Increasing the service line sizes and removing dead ends would help maintain the appropriate fire flow throughout the system. The model indicates the existing system has adequate available fire flow above the minimum 1,000 gpm for the majority of the residential areas. The fire flow analysis shows that the majority of the commercial/industrial areas are above the 3,500 gpm recommendation.

D. WATER AGE

Water age is an indicator of water quality in the distribution system. The water age evaluation demonstrates the areas in the distribution system where the retention time of water is short ("new" water), where it is long ("old" water) and where circulation problems may be occurring. Water Age was evaluated for the Existing System. These scenarios were run as an EPS for 1,200 hours (50 days) duration. The time frames shown in each figure for this section were snapshots during a 24-

hour operating period after the system's water age stabilized 500 hours into the EPS.

The typical results for water age are represented in Figure V-9 in Appendix B. The colors in the legend represent the water age in hours ranging from blue being 8 hours or less to magenta being 240 hours or greater.

The water age in the mains near the elevated water tanks are typically longer (i.e. older) due to the residence times in the tanks. When evaluating water age, an initial simulation is run in order to determine the starting age of the water tanks. The initial simulation is run for the usual 1,200 hours and the water age of each tank is charted vs. time. The age where the tank stabilizes becomes the initial age of the tank for the final EPS.

The highest water age for the system occurs on the outsides of the system (southeast and northwest). The water age is only an indicator of possible water quality. Although portions of the City's water system show high water age, the City's operations have not shown an issue with water quality.

E. RECOMMENDATIONS

The model demonstrated that the existing system infrastructure is adequate for the existing system demands. However, the lack of elevated storage in Pressure Zone 1 causes the pumps to turn on and off often due to the quick fill and draw cycle of the existing storage tank. The quick fill and draw cycle results in pressure fluctuation throughout Pressure Zone 1. A 750,000 gallon storage tank in Pressure Zone 1 would allow for a longer fill and draw cycle which would prevent the pumps from turning on and off as often and provide more stable pressure through out the pressure zone. The 750,000 gallon storage tank would increase the elevated storage capacity to 1.25 million gallons, which will be slightly lower than the 20-year design average day demand (1.52MGD).

Another issue the City experiences with only the 100,000 gallon storage tank in Pressure Zone 1 is that the volume is quickly depleted during hydrant use (flushing/fire use). This causes a quick drop in system pressure, which triggers two valves opening between Zone 2 and Zone 1 to allow more water into Zone 1. The sudden change in pressure and the valves quickly opening can cause water hammer and hydraulic surging. Water hammer and hydraulic surging increases the chance of watermain breaks in the distribution system.

Currently Pressure Zone 1 has higher demand than Pressure Zone 2. Zone 2 helps supplement Zone 1 with water through the Central PRV station. The additional storage tank in Zone 1 would allow Zone 1 to operate without requiring supplementing from Zone 2. Also, the majority of the future demand is located in Zone 2 with the TIF district improvements/redevelopment. This could cause more stress on Zone 2; therefore, supplementing Zone 1, if additional storage weren't added, could become more of an issue. The following are benefits of adding a 750,000 gallon elevated storage tank:

- Longer fill and draw cycle preventing pumps from turning on and off often.

- Less pressure fluctuation throughout the day.
- More storage for future development and usage.
- Allow Zone 1 to operate without requiring as much supplementing from Zone 2
- More elevated storage which is not dependent on pumps to serve the City.
- Minimize water hammer/hydraulic surging when flushing hydrants, fire department usage, or watermain breaks. Preventing other watermain breaks in the distribution system.

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Reconstructing the tower at the existing location presents constructability issues. The issues include possible poor soil bearing causing need for deeper foundation due to the proximity to Salt Creek which would result in higher construction costs when compared to relocating the tower. Also, the tight working space within the wastewater treatment plant creates issues with storing material on-site and constructing the proposed elevated storage tank.

When designing the proposed elevated storage tank, the option to increase the elevation of the tower could be an option. Increasing the elevation of the proposed elevated storage tank would set the pressures in Pressure Zone 1. With pressure in Zone 2 at a higher level, the City could increase the pressure to be closer to Pressure Zone 2 or even match the pressure and become a one pressure zone system.

VI. FUTURE WATER SYSTEM ANALYSIS

The future analysis is modeled in two phases as determined by the City. Phase 1 included a multi-family development along Wood Dale Road, an industrial/commercial development along IL-83, and an industrial user along Lively Blvd. Phase 2 included the redevelopment the TIF District (previously analyzed by HR Green in 2017) currently servicing an existing unincorporated residential area between Wood Dale Rd and Central Ave. The City is landlocked, and the two phases are what the City expects to develop over the next 20 years.

A. PHASE 1

The maximum day pressures and fire flow available were analyzed to determine if the distribution system is capable of handling the added demand from the Phase 1 development. The demands were based on development plans provided by the City. The demand was placed in the center of the development area with 8" mains connecting to the existing system.

Figure VI-1 in Appendix C shows the minimum pressures the system experiences during the maximum day fluctuations. The lowest pressure in the water system is 48 psi. The pressure at the Wood Dale multi-family development, the IL-83 development, and the industrial user along Lively Blvd are 61 psi, 70 psi, and 70 psi respectively.

Figure VI-2 in Appendix C illustrates the fire flow available in the system. The Wood Dale multi-family development has an available fire flow of 4,475 gpm, the IL-83 has an available fire flow of 5,000 gpm and the industrial user along Lively Blvd. has an available fire flow of 5,000 gpm.

The Phase 1 analysis shows that the City's existing system can handle the additional demand from the proposed development.

B. PHASE 2

The maximum day pressures and fire flow available were analyzed to determine if the distribution system is capable of handling the added demand from the Phase 2 development. The TIF District concept plan required changes in the existing distribution system based on new proposed roadways. Pipes along the roadway were inserted into the model at 12" with the demand placed in the center of the development area with 8" mains connecting to the existing system.

Figure VI-3 in Appendix C shows the minimum pressures the system experiences during the maximum day fluctuations. The pressure in the TIF District ranges from 70 psi to 80 psi and the pressure in the homes between Wood Dale Rd. and Central Ave is 65 psi.

Figure VI-4 in Appendix C illustrates the fire flow available in the system. The TIF District has an available fire flow of 5,000 gpm and the homes between Wood Dale Rd. and Central Ave have an available fire flow of 3,960 gpm.

The Phase 2 analysis shows that the City's existing system with changes in the TIF District can handle the additional demand from the proposed development and servicing existing housing.

The working model is a tool the City should utilize as development occurs. If development plans change over time, the model should be updated to confirm the effect of developmental changes on the existing water system.

VII. WATER MAIN AND WATER SYSTEM RECOMMENDATIONS

A. WATER MAIN BREAK HISTORY

The City's water main break history was analyzed. The majority of the watermain breaks occurred in Pressure Zone 1 in the areas with cast iron pipe. Older cast iron pipe is susceptible to main breaks. It is recommended that the City replace their cast iron pipe watermains as budget allows.

Water main velocity can be a factor in water main breaks. During the water system analysis, the velocities were analyzed to see if there were high velocities (10 ft/s) in the existing system. The analysis showed no pipes with high velocities to prioritize replacement. After analyzing the water main break history, the following areas appear to be susceptible to water main breaks.

- S. Oakwood Drive south of W. Irving Park Road
- Edgebrook Road south of W. Irving Park Road
- N. Walnut Ave from Elmhurst St. to E. Front St.
- N. Elmwood Ave from Elmhurst St. to E. Irving Park Road
- N. Maple Ave from Elmhurst St. to E. Irving Park Road
- Forest Preserve Dr. from Mill Rd. to S. Addison Rd.
- Gilbert Dr. from Mill Rd. to S. Addison Rd.
- Knollwood Dr. and Sherwood Dr.
- S. Edgewood Ave from Deerpath Rd to Oak Meadow Dr.

B. ANNUAL WATERMAIN REPLACEMENT RECCOMENDATION

The City maintains approximately 80.4 miles of watermain ranging from 4" to 16". The watermain material used throughout the distribution system is a mix of cast iron and ductile iron. The life expectancy of cast iron and ductile iron watermain is between 50 years to 100 years depending on many factors such as installation, soil types, water quality and pipe material manufacturing. Assuming the average life expectancy of 75 years, the City would need to replace approximately 5,660 feet of watermain every year. Table VII-10 shows the opinion of probable cost for an annual watermain replacement based on a 75-year life expectancy.

As this number is merely a benchmark, the City can use their knowledge of the water distribution system including the watermain break history and other issues within their system to prioritize the location and amount of watermain replacement to be completed in a given year in coordination with available budget and other capital projects.

Table VII-1: Opinion of Probable Cost Annual Watermain Replacement

Description	Linear Feet	Cost/Ft	Opinion of Probable Cost
Annual Watermain Replacement	5,660	$350	$1,982,000

C. ADDISON ROAD WATER MAIN RECONNECTION

The City previously completed a water main project along N. Addison Road south of Potter Street. Phase 2 of this project, from Potter Street to Irving Park Road, was to be completed at a future date. A dead end currently exists on the 12" main at Potter Street and the existing main from Potter Street to Irving Park Road is older cast iron water main. As such, it is recommended that the City prioritize this project under its annual watermain replacement program to eliminate the dead end and replace the existing main. Table VII-2 shows the opinion of probable cost to complete the connection.

Table VII-2: Opinion of Probable Cost Addison Road Water Main

Description	Linear Feet	Cost/Ft	Opinion of Probable Cost
Addison Road 12" Water Main	1,800	$350	$630,000

D. IRVING PARK ROAD BOTTLENECK

The water main along Irving Park Road transitions from 12" watermain to 6" water main back to 12" watermain near Edgebrook Rd. The existing system maintains acceptable pressures and fire flow in the area despite the bottleneck; however, the 12" watermain is limited due to the sudden decrease to 6". It is recommended that the City increase the approximately 300 feet of 6" watermain to 12" watermain. Table VII-3 shows the opinion of probable cost to complete the replacement of the 6" water main.

Table VII-3: Opinion of Probable Cost Replace Bottleneck Watermain

Description	Opinion of Probable Cost
Replace 6" Bottleneck along Irving Park Road to 12" watermain	$150,000

E. EMERGENCY WELL MAINTENANCE

The City maintains three deep wells for emergency purposes. The wells only operate in emergency situation; however, the wells need to be operated monthly in order to obtain samples as required by IEPA. The City has not needed to operate the wells in an emergency situation in the recent past. Based on the amount of use the wells receive, it is recommended that the pumps be pulled and the wells should be inspected every seven to ten years. Table VII-4 shows the opinion of probable cost to complete the well inspections. Recent data shows that Well #5 is experiencing significant reduction in output capacity. It is recommended that the City inspect the well and budget for future repairs as needed.

Table VII-4: Opinion of Probable Cost Emergency Wells Inspection

Description	Opinion of Probable Cost
Emergency Wells Inspection (per Well)	$25,000

F. ADDITIONAL ROUTINE INSPECTIONS AND MAINTENANCE

In addition to the capital improvements identified above, it is recommended that the City continue with routine inspections and maintenance of its pumping facilities and additional system components including pumps, PRVs, elevated and ground storage tanks, and disinfecting equipment. Routine inspections and repairs should be budgeted for appropriately in each annual operating budget.

APPENDIX A

Figure III-1: Multi-family Development Rendering

ktgy
Architecture + Planning
217 N Jefferson Street,
Suite #400
Chicago, IL 60661
888.456.5849
ktgy.com

THE LYNMARK GROUP

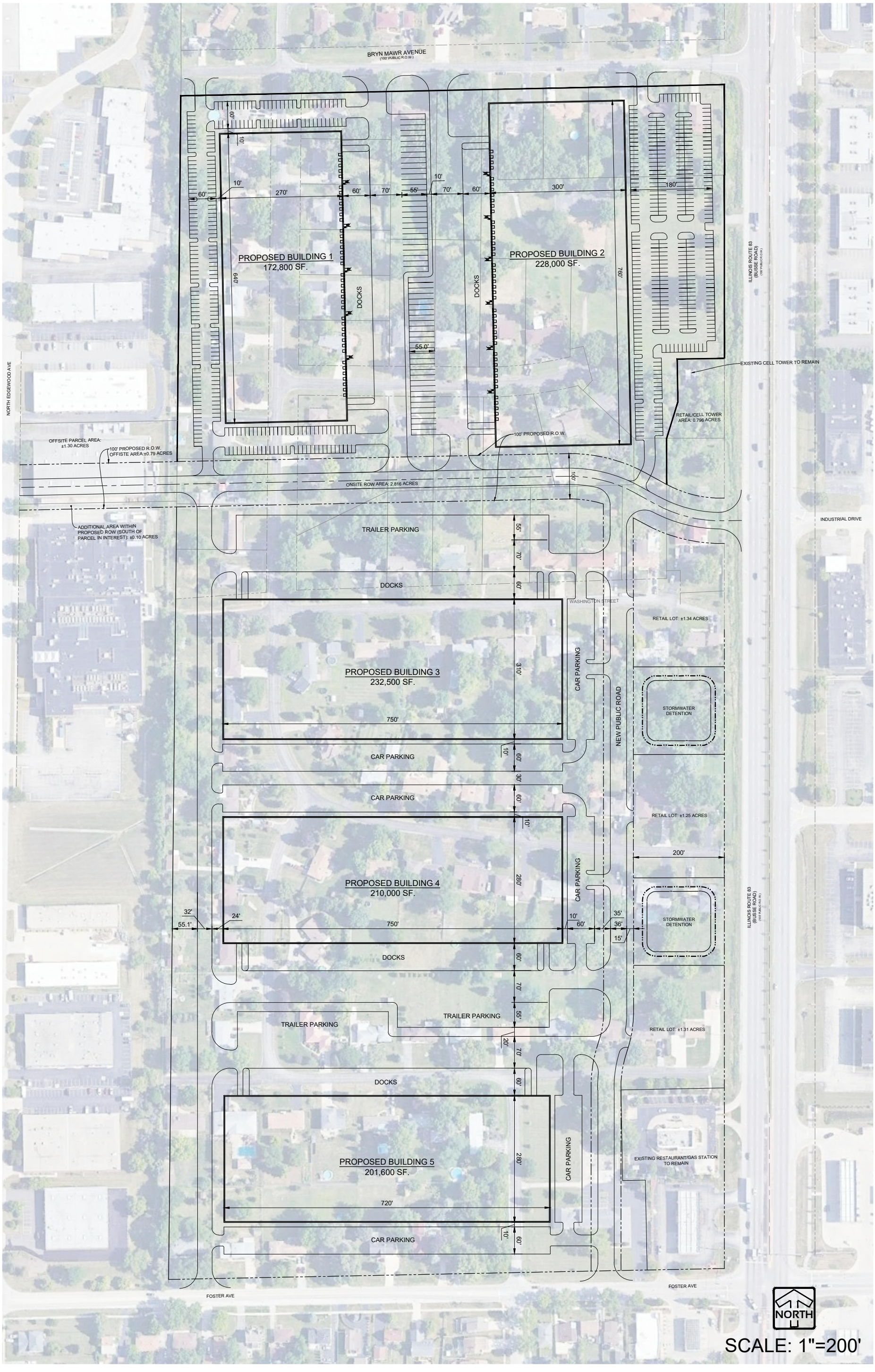
WOOD DALE
WOOD DALE, IL # 2020-0852

CONCEPT DESIGN
AUGUST 25, 2022

PERSPECTIVE

A2.0

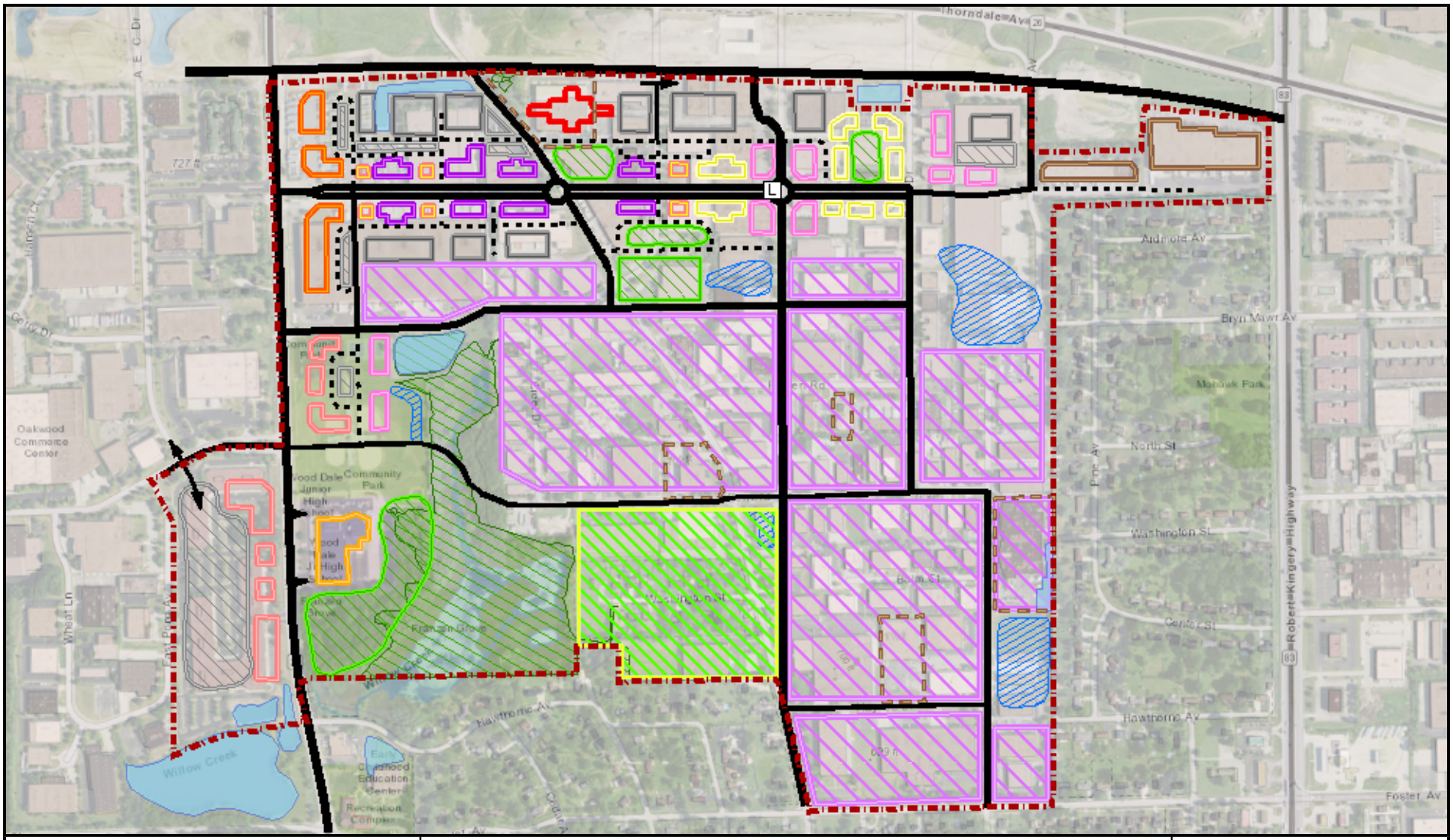
Figure III-2: IL-83 Development Plan



WOOD DALE FULL BUILDOUT CONCEPT PLAN 2 *JOB NO. 1806.00-IL* 01/19/21

PINNACLE ENGINEERING GROUP 1051 EAST MAIN STREET | SUITE 217 | EAST DUNDEE, IL 60118 | WWW.PINNACLE-ENGR.COM | ADMIN@PINNACLE-ENGR.COM **PLAN | DESIGN | DELIVER**

Figure III-3: TIF District Concept Plan



TIF Master Plan Concept (Base)

City of Wood Dale
DuPage County, Illinois

Legend

Buildings
- Commercial
- Existing
- Existing School
- Four Story Mixed Use Residential (Over Retail)
- Hotel
- Multi-Story Res
- Office
- Parking Garage
- Restaurant
- TOD
- Other
- High Value Properties
- Light Industrial Zone
- Recreation Complex
- Open Space / Park / Plaza
- Parking
- Maintain Existing Basin
- Proposed Basin
- Wetland Limits
- Existing Lift Station
- Roads
- Access Roads
- Truck Access
- Project Limits

N

Feet
0 800
1 inch = 800 feet

APPENDIX B

Figure V-1: Existing Distribution System

Water Distribution System Master Plan

Existing System Wood Dale, IL

Legend

- Reservoir
- PRV
- Tower
- Pump
- DWC Connection
- Pressure Zone Boundary

Watermain Size (inches)

- 1
- 2
- 3
- 4
- 6
- 8
- 10
- 12
- 14
- 16

0 750 1,500 3,000 Feet

HRGreen

Tower 2

Richert Road Pump Station:
-DWC Connection
-Reservoir 5
-Pumps 5-1 and 5-2
-Emergency Well 5

Pressure Zone 2

Pressure Zone 1

Tower 1

Potter Street Pump Station:
-Reservoir 3 and 4
-Pumps B-4, B-9, B-10, B-11
-Emergency Well 3 and 6

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

HRG PLOT: 10:19:32 AM 1/14/2022 BY: skokosz FILE: J:\2021\210682\Design\GIS\MXD\map-watersystem.mxd

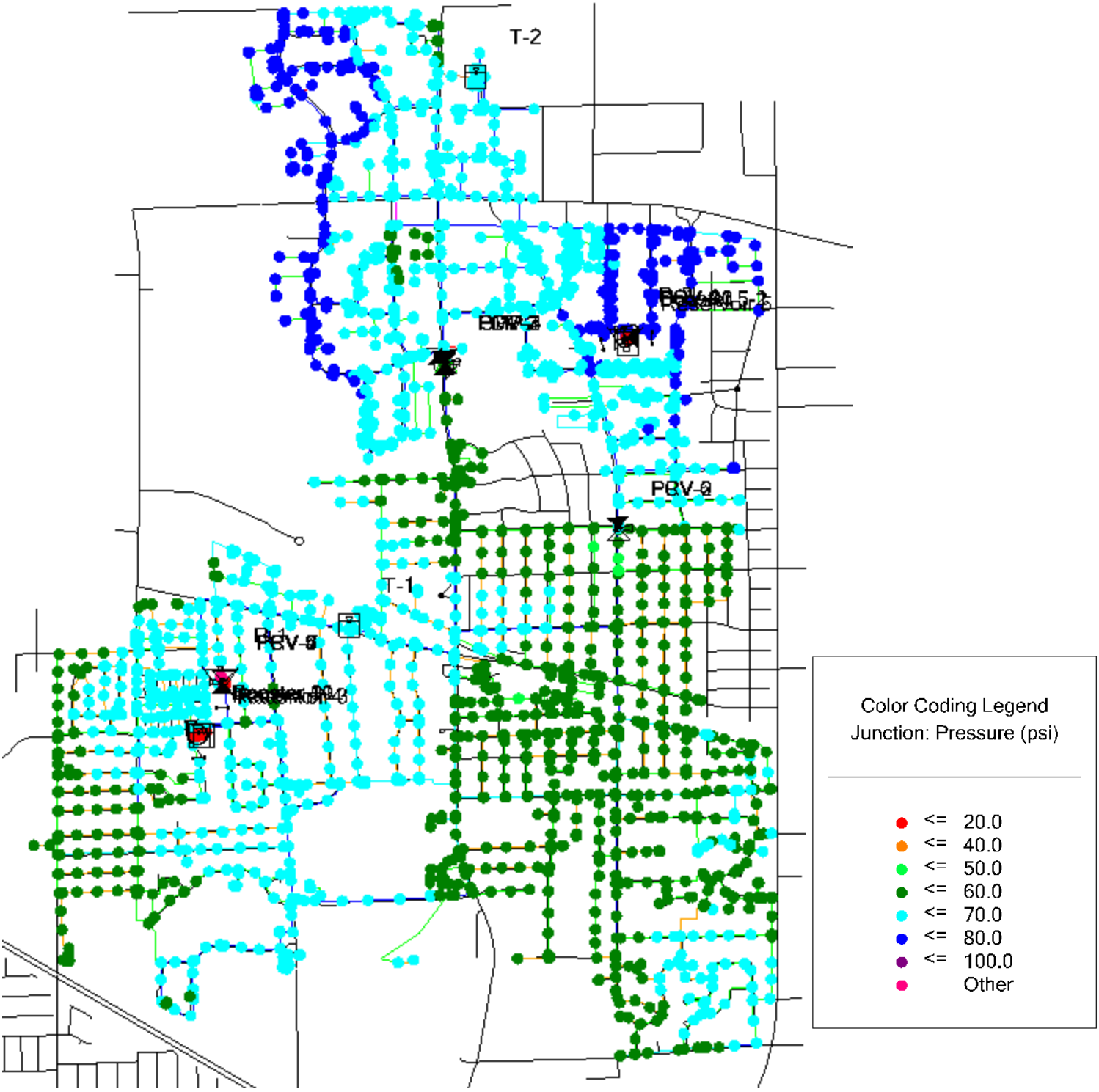


Figure V-2: Existing System Average Day Pressure

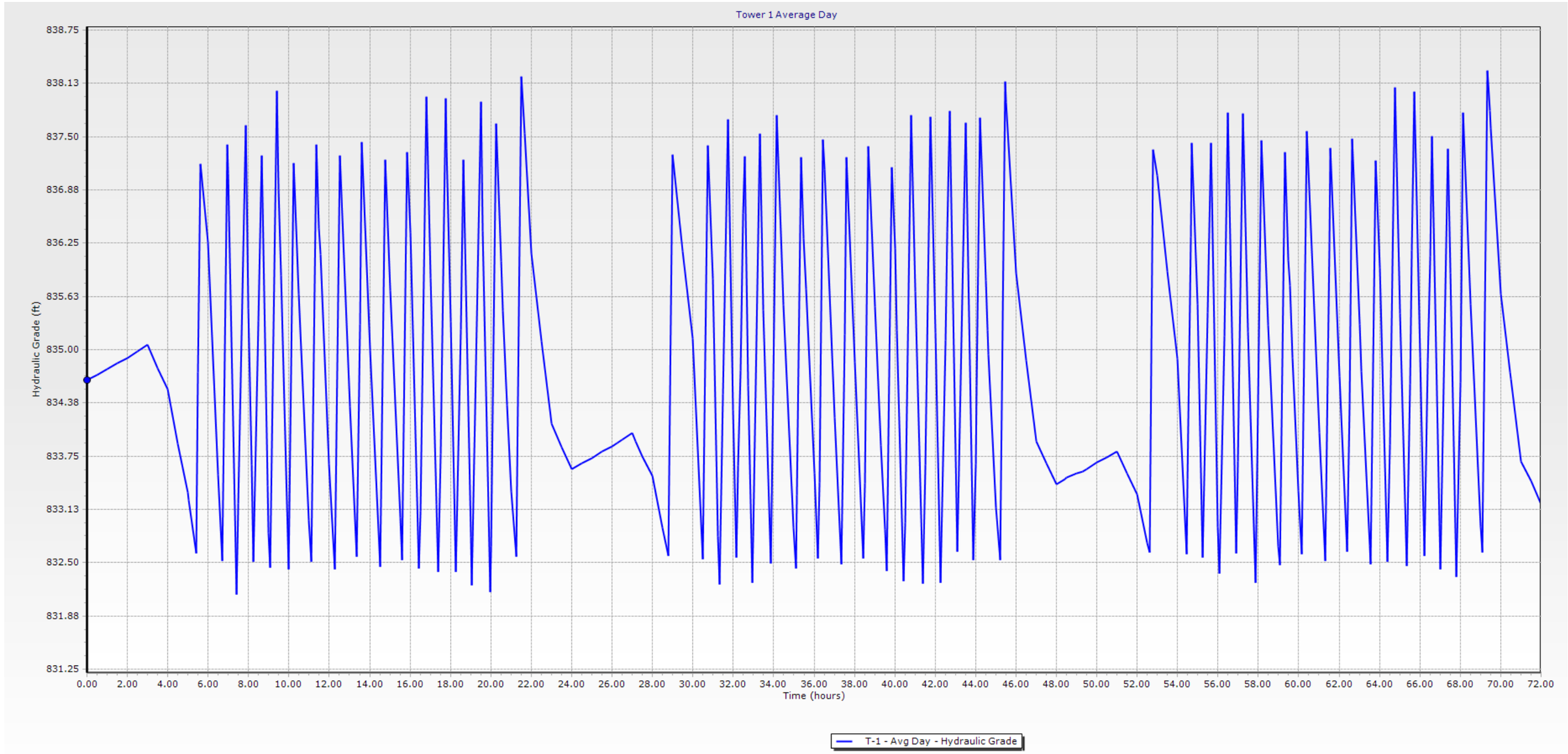


Figure V-3: Existing System Average Day Tower 1 Level

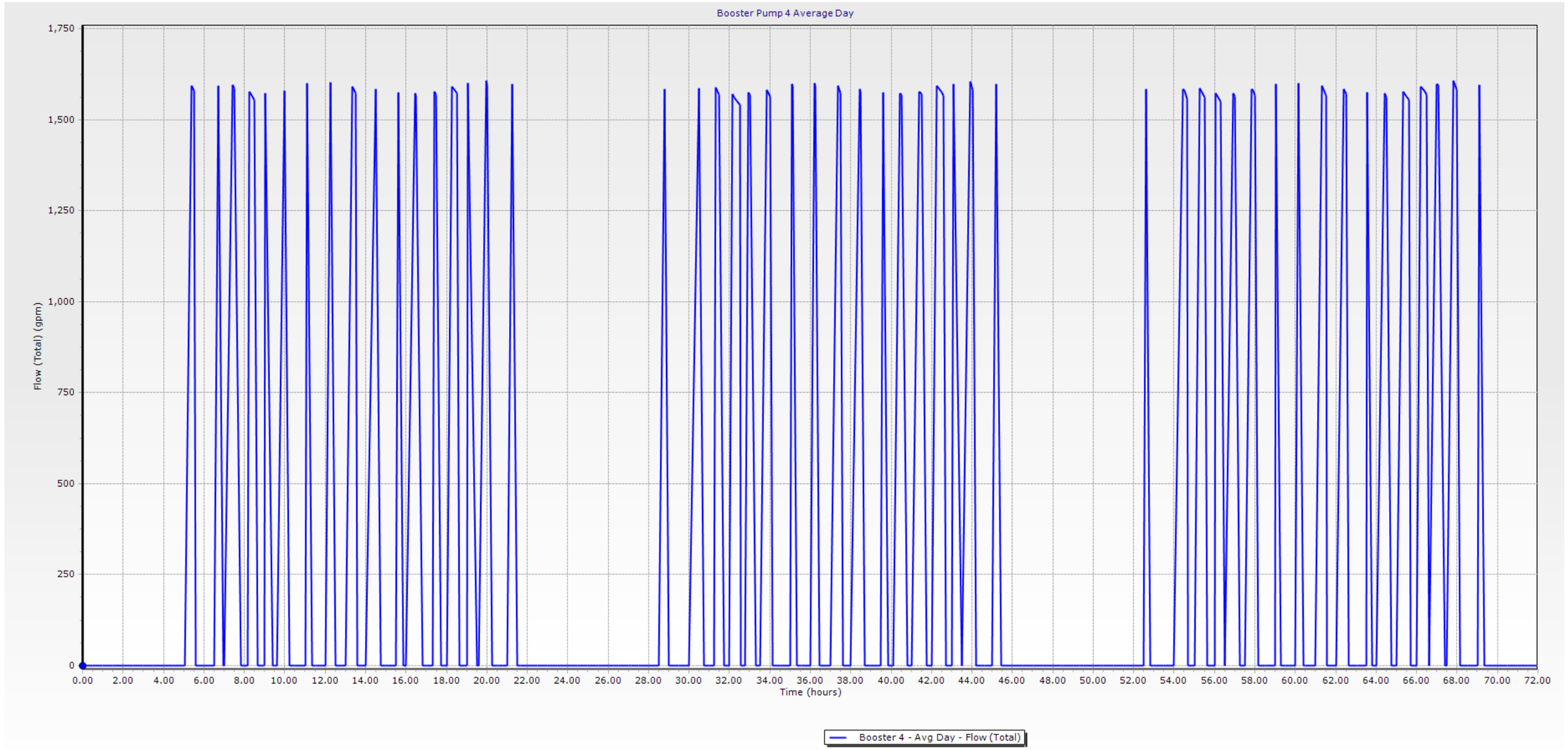


Figure V-4: Existing System Average Day Booster Pump 4 Run Status

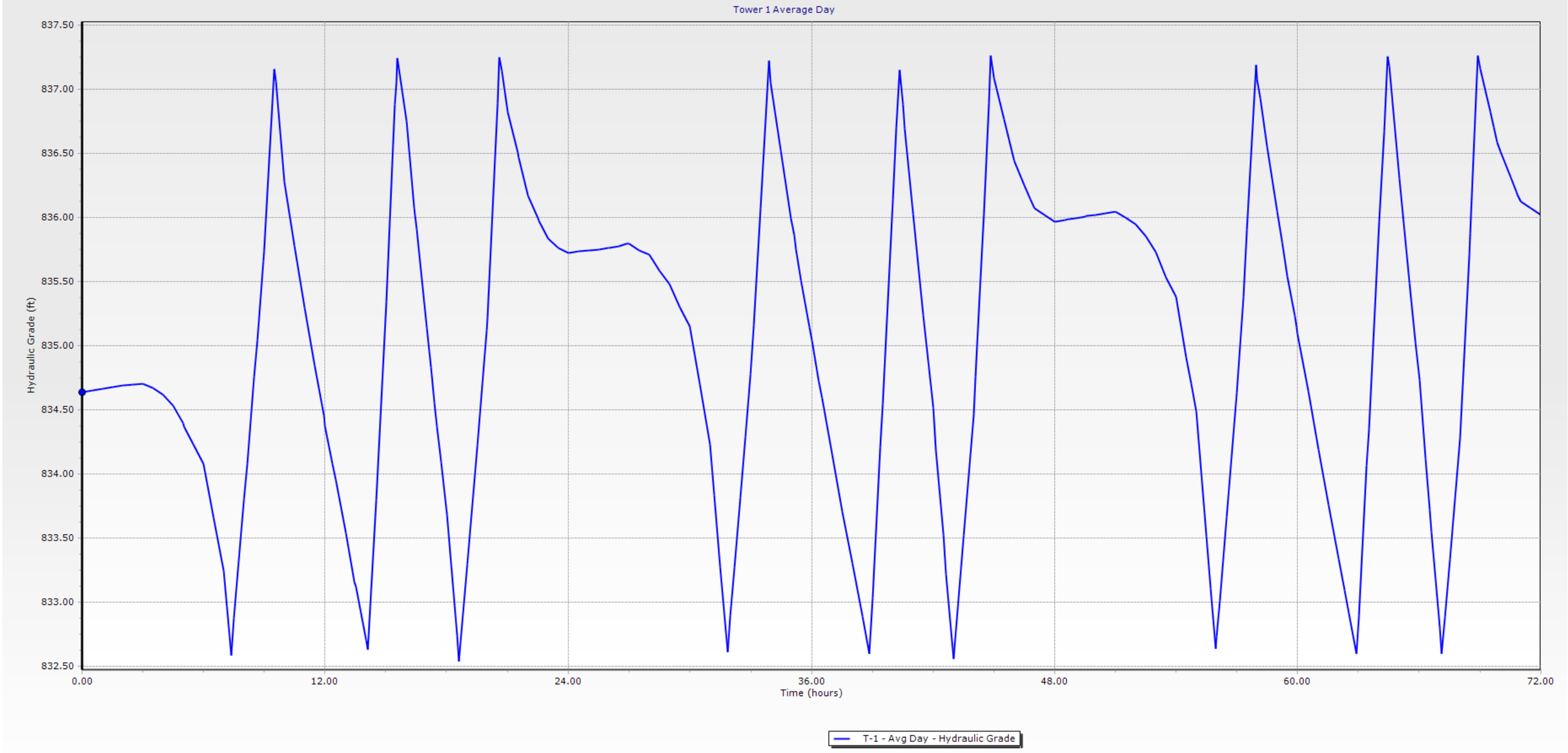


Figure V-5: Existing System Average Day Tower 1 Level – New 750,000 Gallon Elevated Storage Tank

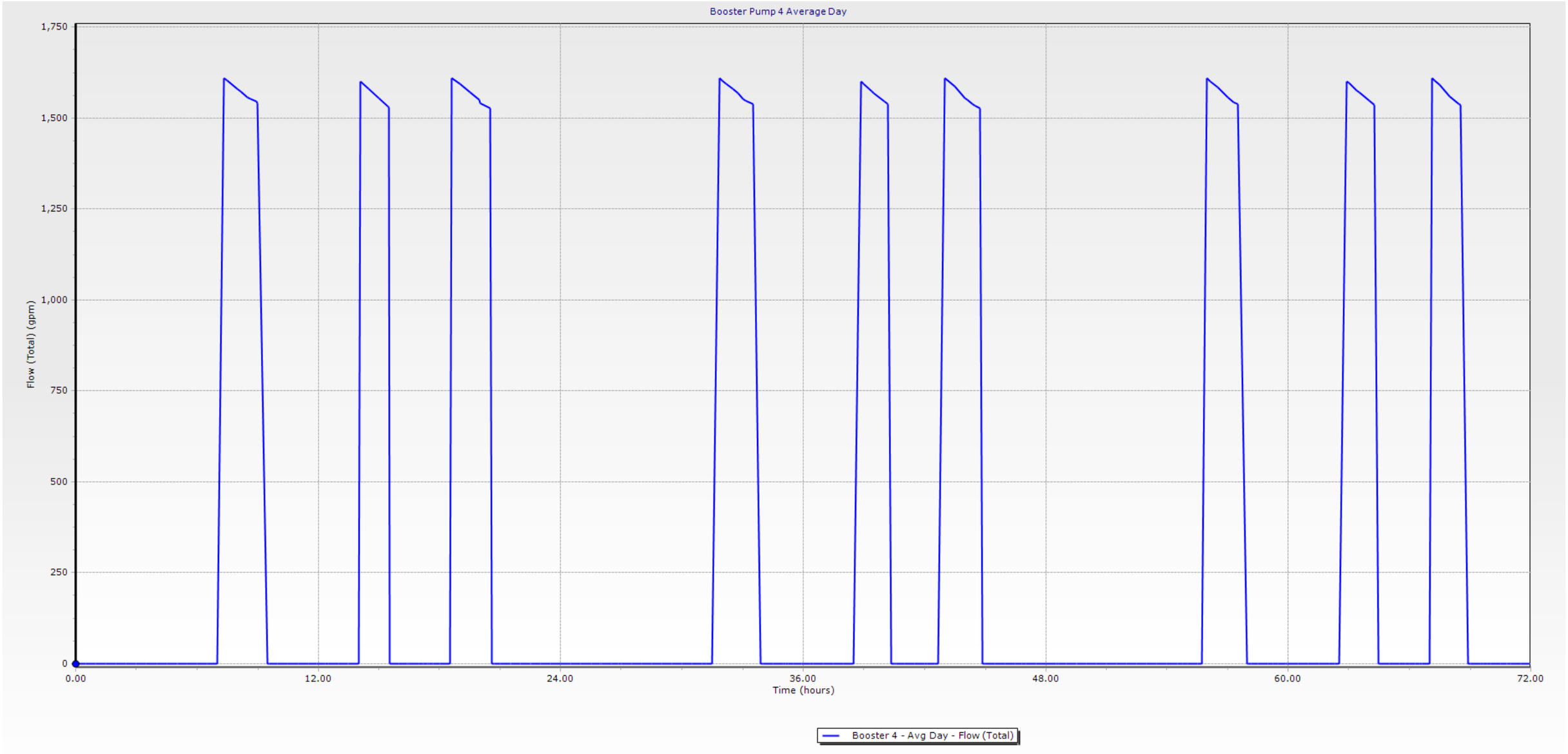


Figure V-6: Existing System Average Day Booster Pump 4 Run Status – New 750,000 Gallon Elevated Storage Tank

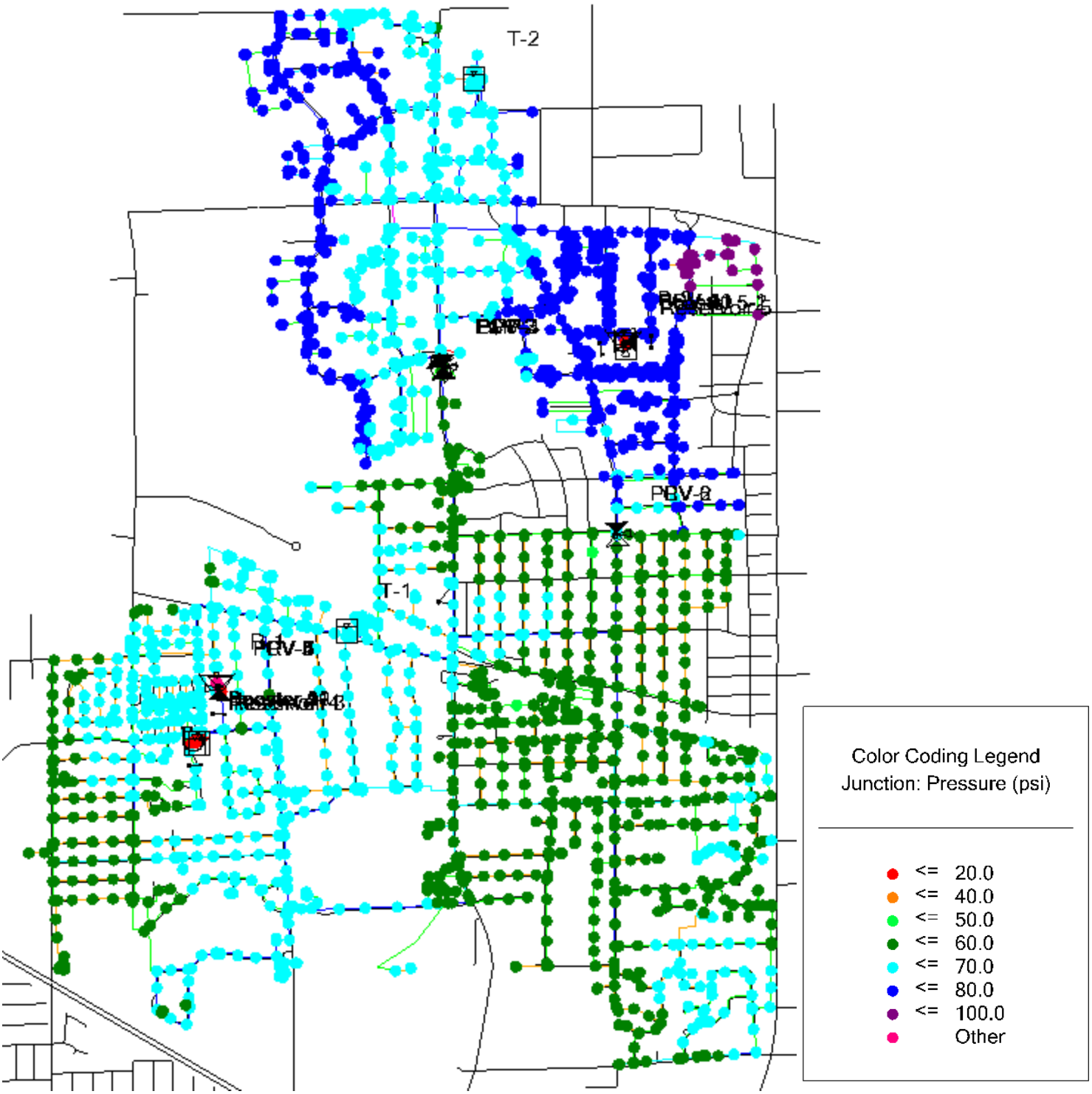


Figure V-7: Existing System Maximum Day Pressure

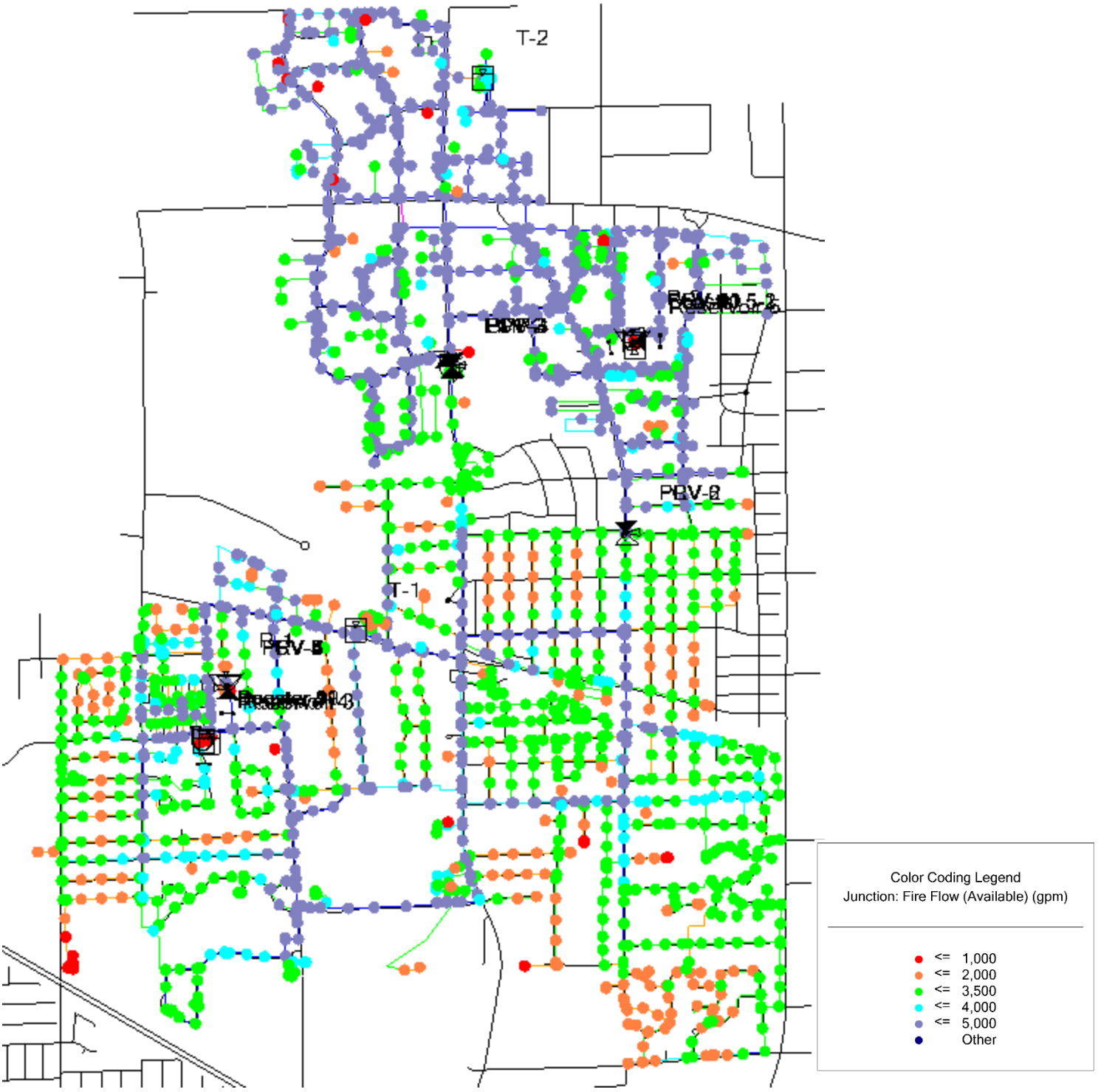


Figure V-8: Existing System Fire Flow

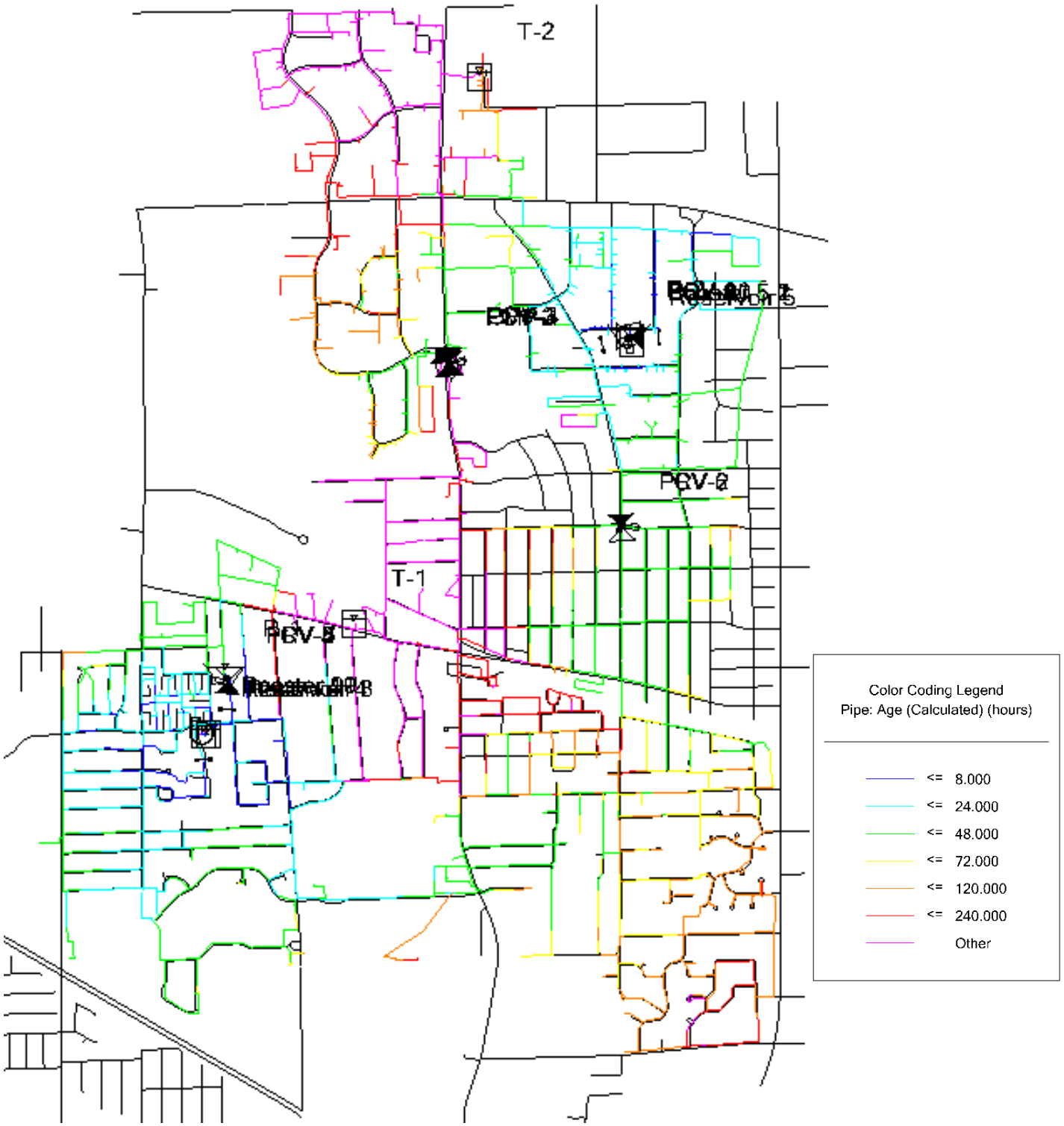


Figure V-9: Existing System Water Age

APPENDIX C

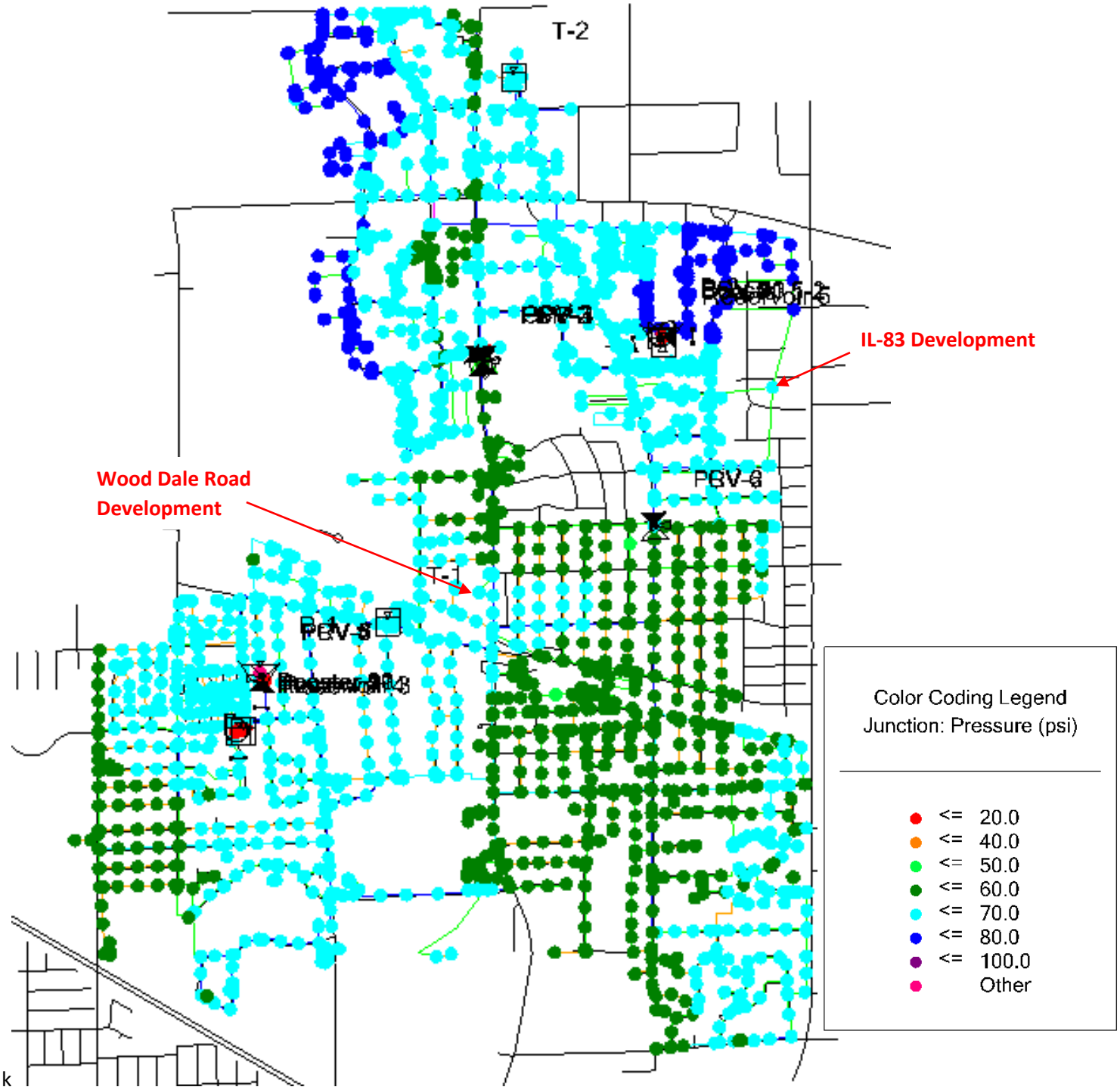


Figure VI-1: Phase 1 Maximum Day Pressure

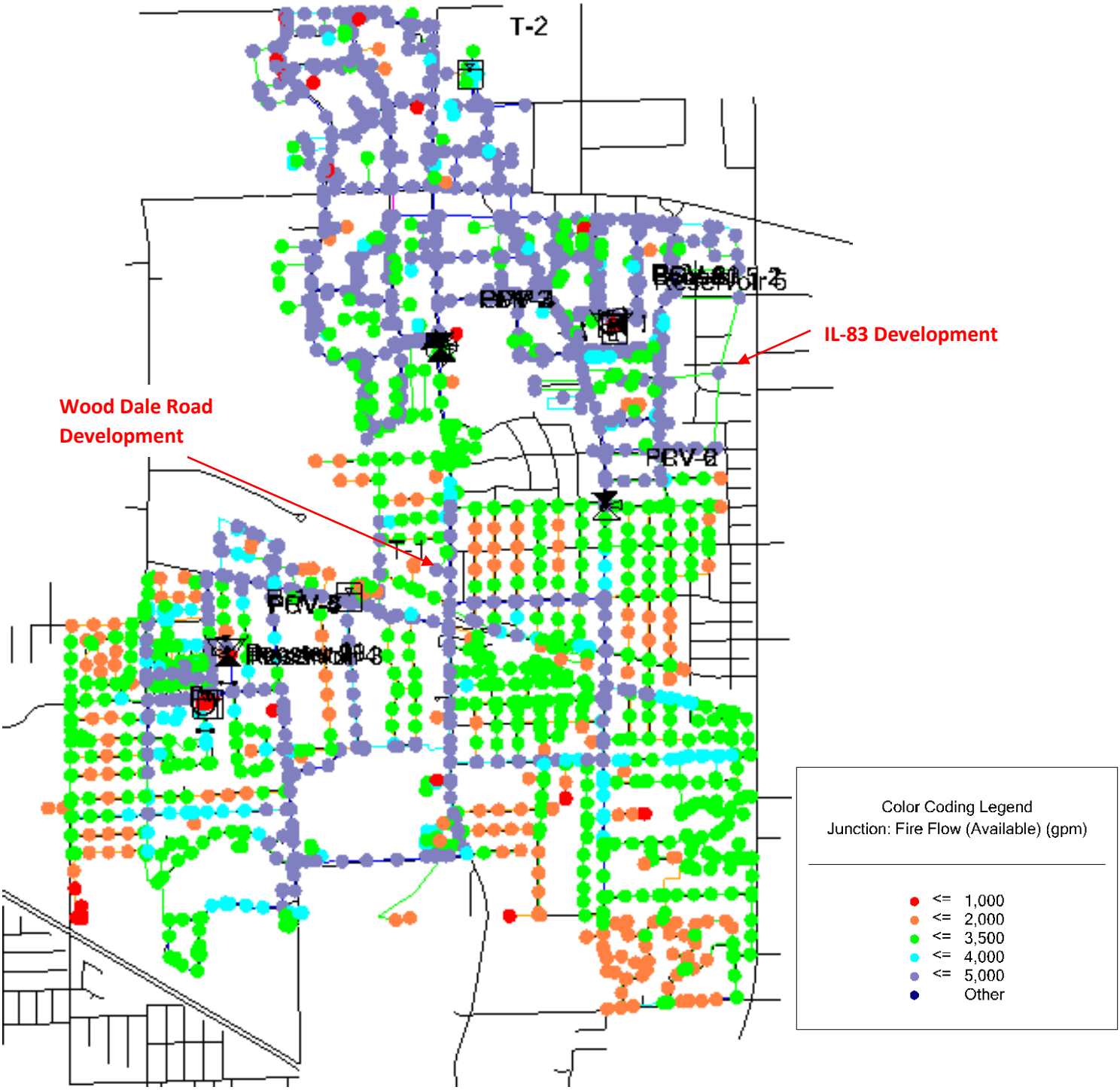


Figure VI-2: Phase 1 Fire Flow Analysis

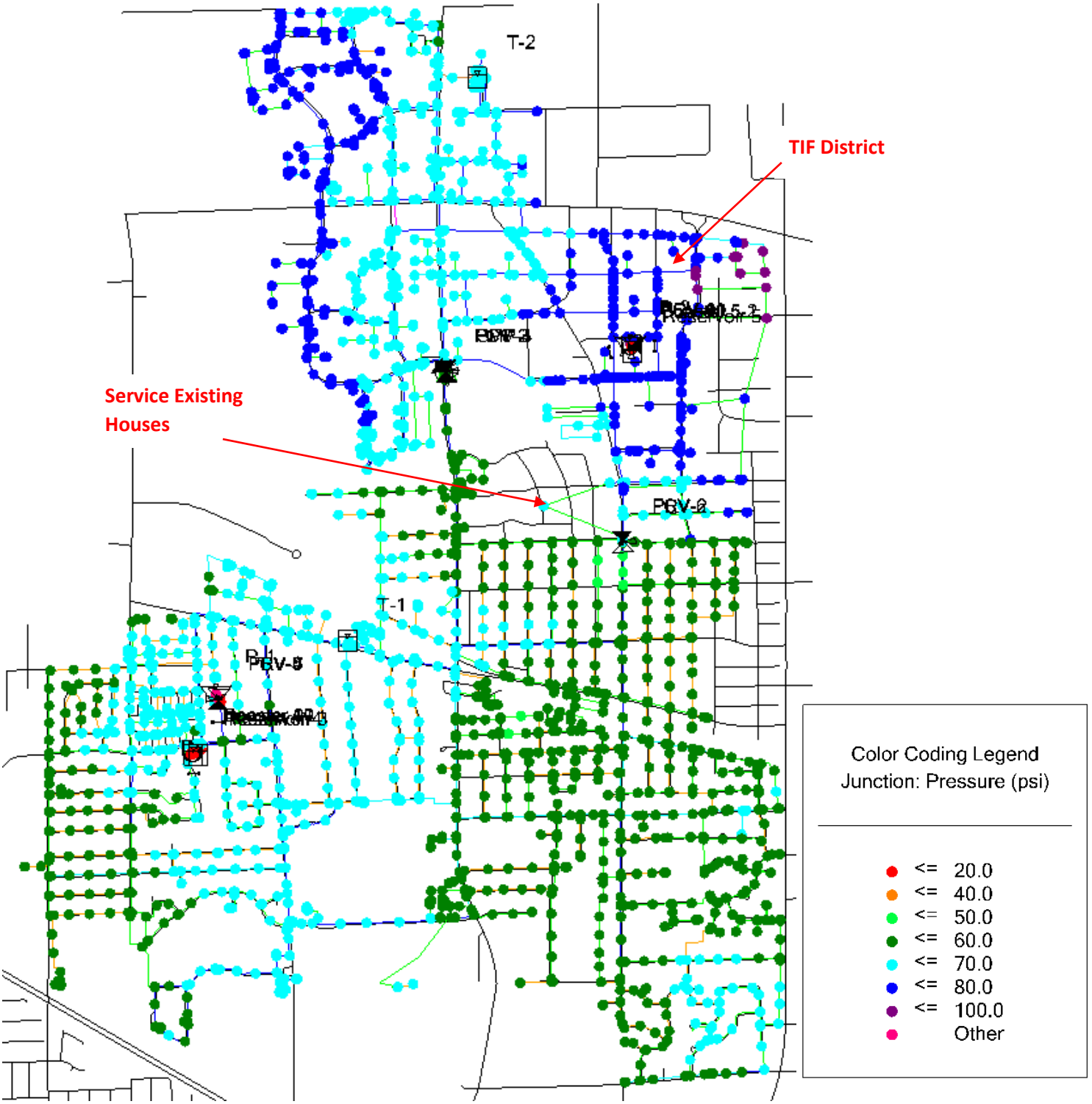


Figure VI-3: Phase 2 Maximum Day Analysis

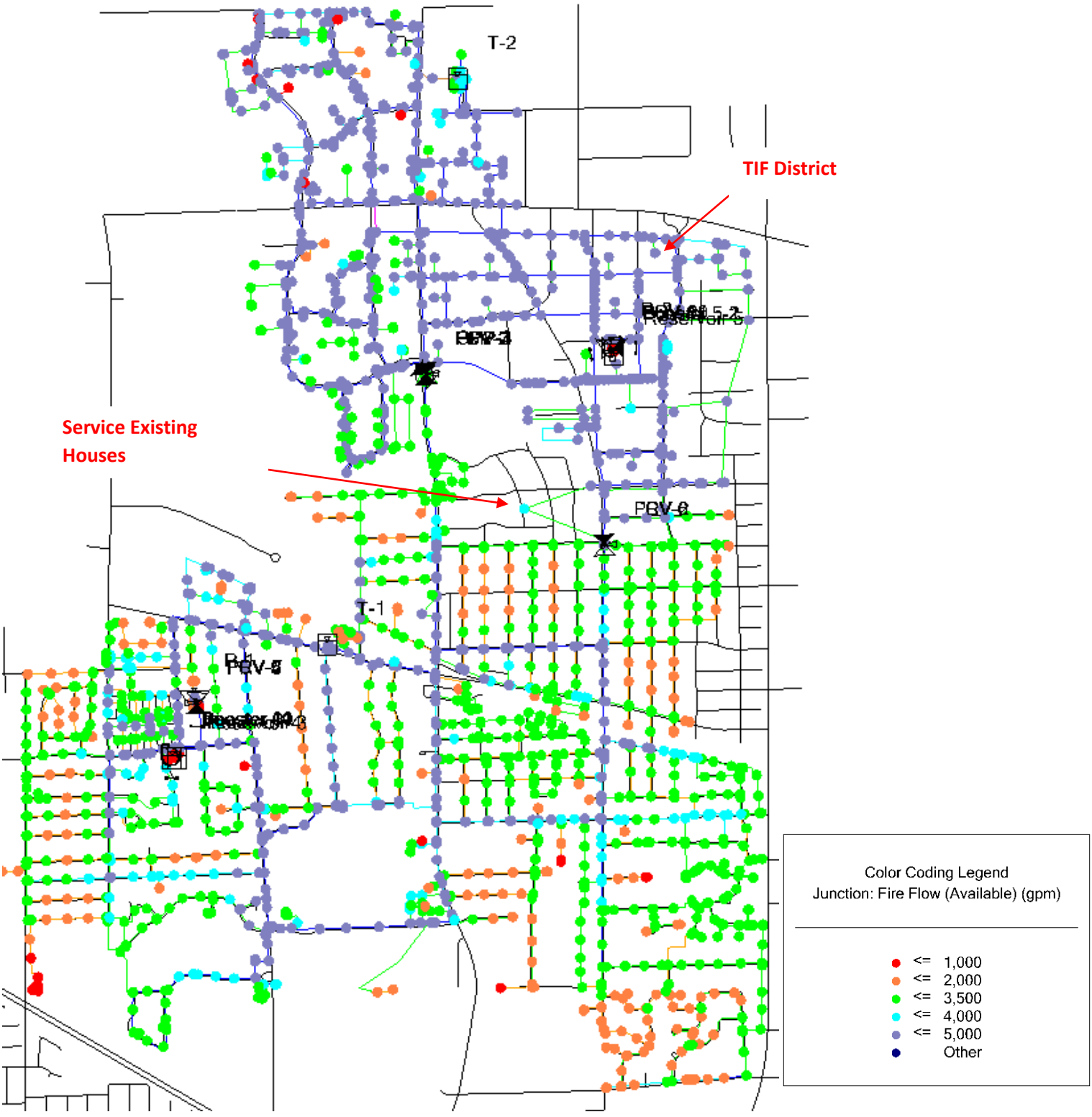


Figure VI-4: Phase 2 Fire Flow Analysis

APPENDIX D

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217)782-2829
JB PRITZKER, GOVERNOR JOHN J. KIM, ACTING DIRECTOR

847-608-3131
FAX: 847-608-3139

February 21, 2019

The City of Wood Dale Public Water Supply
c/o Mr. Jeff Mermuys City Manager
City Hall, 404 North Wood Dale Road
Wood Dale, Illinois 60191

Re: **Wood Dale – IL043-1200**
2019 Public Water Supply Inspection Report

Dear Mr. Mermuys:

An engineering evaluation of the Wood Dale community water supply has been completed. A field inspection was made on January 23, 2019 by Dwayne Booker of this office. Mr. Robert E. Schultze, Certified Water Operator, and Pioty Gradzki, Water Supply Operator were present during this inspection.

The Illinois Environmental Protection Agency conducts periodic inspections of all community water supplies to determine if their ongoing programs for monitoring, maintaining the water supply, and providing appropriate information to the water users meet the requirements of the Illinois Pollution Control Board's public water supply regulations and related standards. The reason for this work is that if the people in a community are to cooperate and use a common water supply, they must feel that their system is properly constructed, operated and maintained.

Aspects of the water system that may not comply with current standards or regulatory requirements are detailed in attachment "A" of this letter. **Please respond to these findings in writing within 30 days. Your response should describe the steps that have been, or will be taken to correct these deficiencies.** Please review Attachment B. This attachment presents reminders and recommended improvements.

This letter is NOT a violation notice as specified in Section 31(a)(1) of the Illinois Environmental Protection Act (415 ILCS 5/31(a)(1). However, if an acceptable response is not received within 30 days, the Illinois Environmental Protection Agency may issue a formal violation notice pursuant to Section 31(a)(1) of the Act.

The Illinois Pollution Control Board Regulations can be downloaded from the internet at**www.ipcb.state.il.us**. The ***Recommended Standards for Water Works*** is available from Health Education Services, P.O. Box 7126, Albany, New York, 12224. (Phone 518-439-7286 / FAX518 - 439-7022). This document may also be purchased through the internet at *www.hes.org*

We also request that you review the enclosed "Public Water Supply Data Sheets". Monitoring requirements are determined by the information included on these data sheets, making it vital that you inform us of any errors or other inaccuracies.

We appreciate the cooperation and courtesy extended during this survey. Questions or comments regarding this evaluation should be directed to Dwayne Booker at 847-931-2767.

Very truly yours,

Segundo Nallatan, P.E.
Regional Manager
Division of Public Water Supplies
Illinois Environmental Protection Agency

Dwayne Booker
Environmental Protection Engineer

cc: Mr. Robert Schultze, Certified Water Operator (Same)
Mr. Pioty Gradzki, Water Supply Operator (Same)
DuPage County Health Department
IDPH
Illinois State Water Survey

ATTACHMENT "A"
VIOLATIONS, DEFICIENCIES AND RECOMMENDATIONS

The current evaluation of your community water supply indicates that the following conditions appear to violate Title IV of the Illinois Environmental Protection Act 415 ILCS 5/1-57.17 (2018) (The Act), 35 Illinois Administrative Code (35 IAC), the Recommended Standards for Water Works (2012) (Standards) and related standards. A written response outlining corrective action is required to be submitted to this office within 30 days

1) Technical Capacity – Pump Station:

At the time of the inspection the Potter Pump Station building had a door in dire need to be replaced. Please replace the Potter Pump Station door to keep your pump station from deteriorating. **(The Act, Section 18)**

2) Technical Capacity – Treatment:

The gas chlorination room at the pump stations has a floor drain. Floor drains in gas chlorination rooms are discouraged, but where provided, shall discharge to the outside of the building and shall not be connected to other internal or external drainage systems. This will prevent any chlorine gas from entering the plant, or other building. Filling the drains with water or placing a rubber stopper in the drains of the floor will prevent chlorine gas from escaping. **(The Act, Section 18; The Standards, Section 5.4.1)**

3) Technical Capacity – Gas Chlorine -No Ventilation:

At the time of the inspection the gas chlorine room at the Potter Pump Station did not have a working ventilation system. It is important that continuous cross ventilation be provided anytime a person enters a room containing chlorine gas cylinders. Construct a fresh air inlet, an exhaust system and a fan that takes suction from near floor level. The exhaust fan must be capable of one complete air change in the chlorine room each minute. All control switches must be located outside the chlorine room next to the doorway.
(The Act, Section 18; 35 IAC 653.601; and the Standards, Section 5.4.1)

4) Technical Capacity – Finished Water Storage:

At the time of inspection, the concrete splash pad was sloped toward the storage tanks, which causes the water to flow back towards the tanks. The current situation may damage the structural integrity of the storage tanks and cause scouring at the base of the tank due to the concrete splash pad not being sloped away from the tank. **(The Act, Section 18)**

5) Technical Capacity – New water System:

At the time of the inspection I noticed that the City of Wood Dale installed new pumps and drives and a diesel generator at the Potter Pump Station without any permits and performed no membrane filter technique tests on new equipment. The new equipment includes pumps and drives and a diesel generator.
(The Act, Section 15 and 18; 35 IAC, Sections 602.200, 602.210, 602.300 and 602.305)

6) Administrative/Managerial – Cross-Connection Control Program Deficiencies

Please note, at the time of my inspection the City of Wood Dale was unable to provide me their RPZ testing and records from any of their residents and businesses in Wood Dale. I was told the cross-connection control program was the responsibility of the Building and Code Department and the person I needed to see was not available at that moment. It's very important for the certified water operator have access to these records at all time. Please give access to the certified water operator so the City could avoid any future violation.
(The Act, Section 18; 35 IAC, Sections 653.801 and 653.802)

I would like to thank Robert Schultze and Pioty Gradzki on the courtesy they both extended to me while I was there.

ATTACHMENT "B"
REMINDERS AND RECOMMENDATIONS

1) Technical Capacity – Finished Water Storage:

At the time of inspection, the 1 million and 500-thousand-gallon ground reservoirs were in dire need of a pressure wash. Please pressure wash the tanks to keep them looking pleasing to the residents.

Illinois Environmental Protection Agency
Bureau of Water - Division of Public Water Supplies
Inspection Report - Elgin Regional Office

FACILITY NAME	Wood Dale	FACILITY NUMBER	IL043-1200
PLANT PHONE	630-350-3530	COUNTY	DuPage
INSPECTION DATE	January 23, 2019	INSPECTED BY	Dwayne Booker
SEND CORRESPONDENCE TO		**EXEMPTION / LABORATORY FEE STATUS**	
NAME OR ENTITY	Jeff Mermuys	CHLORINE (Date)	NO
ADDRESS	404 North Wood Dale Road		
CITY, STATE, ZIP	Wood Dale, Illinois 60191	LAB FEE PARTICIPANT (Y/N)	NO

CONTACT INFORMATION					
CERTIFIED OPERATOR	Robert Schultze	CLASS	C	NUMBER	160418710
PHONE	630-787-3785	FAX	630-238-9039		
MOBILE		EMAIL	R.SCHULTZE@WOODDALE.COM		
OWNER - RESPONSIBLE PERSONNEL	Nunzio Pulice	TITLE OR POSITION	City Mayor		
PHONE	??	FAX	??		
OTHER CONTACTS	NAME	TITLE OR POSITION	PHONE		
	Pioty Gradzki	Water Supply Operator	630-688-0634		
HOME PAGE ADDRESS					

FACILITY STATUS									
Open	X	Critical Review		Restricted Status		Reason		Date	

BRIEF DESCRIPTION OF SYSTEM AND SERVICE AREA

Wood Dale PWS is in northern-eastern corner of DuPage County, Illinois. This water system has 4,956 service connections serving approximately 13,770 residents. This PWS has two different pressure zones: high pressure zone and low-pressure zone. The two pressure systems are interconnected by an 800 gpm booster pump (from low to high) and a pressure reducing valve (from high to low).

Lake Michigan water obtained from Chicago via DuPage Water Commission (DWC) is the primary source of water for the supply. Three wells (shallow wells 3 & 6 and deep well 5) are available to supplement the Lake Michigan water. During an emergency, chlorinated water from wells 3 & 6 can supply Wood Dale's low-pressure system through TP03 and TP05 whereas chlorinated water from well 5 can supply wood Dale's high-pressure system through TP04.

High pressure system: treated Lake Michigan water is obtained from DWC into a reservoir at Reichert Ave pumping station. Reichert Ave pumping station receives DWC water into a 1.25 MG reservoir from which two high service pumps (600 gpm & 1,800 gpm) discharge the re-chlorinated water into Wood Dale's high-pressure system through TP07. Water from DWC can bypass the Reichert Ave pumping station and serve Wood Dale's high-pressure system under direct pressure through CC07. If necessary, well 5 (backup deep well) can fill the 1.25 MG reservoir at TP07. A 0.5 MG elevated tank floats on the high-pressure system.

Low pressure system: Potter Ave pumping station receives DWC water into two interconnected reservoirs (0.5 MG & 1 MG) from which four high service pumps (1,100 gpm & three 1,800 gpm) discharge the re-chlorinated water into Wood Dale's low-pressure system and Vietzen MHP (satellite supply) through TP08. Water from DWC can bypass the Potter Ave pumping station and serve Wood Dale's low-pressure system and Vietzen MHP under direct pressure through CC08. If necessary, well 3 (backup shallow well) can fill the two reservoirs at TP08. A 100K elevated tank floats on the low-pressure system

This facility's high-pressure zone has emergency Lake water interconnections with Village of Elk Grove and low pressures zone has emergency Lake water interconnections with Villages of Bensenville and Itasca. Reichert Ave station is equipped with a 150 KW diesel generator capable of powering the entire station whereas Potter Ave station is equipped with a 460 KW diesel generator to power the entire station. Well 6, which can only discharge into distribution, is equipped with a 155 KW diesel generator to provide emergency power. The facility is served by a sanitary sewer system. The supply has a SCADA system. The supply has low pressure, chlorine leak, and security alarm systems. The facility's water distribution system consists of 76 miles of asbestos cement, cast iron, ductile iron, and HDPE water distribution mains (6-14 inches in diameter). ***Please note the City of Wood Dale install new pumps and drives and a new generator at the Plotter Pump Station without permits.***

SERVICE CONNECTIONS		# METERS	
NUMBER OF DIRECT SERVICES	4,956	4,956	
DIRECT SERVICES OUTSIDE CORPORATE LIMITS			
Residential Customers	4,440	4,440	
Commercial Customers	181	181	
Industrial Customers	335	335	
SATELLITE WATER SYSTEMS / INTERCONNECTIONS	FACILITY NUMBER	Source?	Customer?
Bensenville (emergency interconnection with low zone)	043-4140	x	x
Elk Grove (emergency interconnection with high zone)	031-4400	x	x
Itasca (emergency interconnection with low zone)	043-0500	x	x
Vietzen MHP (satellite supply) Feed off the low-pressure zone	043-7245		x

ADEQUACY OF SUPPLY						
DATE RANGE	FROM	Survey	TO	Survey	PLANT CAPACITY (MGD)	16.77 MGD
					FIRM CAPACITY (MGD)	14.18 MGD
LIMITING FACTOR FOR PLANT CAPACITY?						** Combined pumping capacities of both pumping stations (12.8 MGD) plus combined capacities of three wells (3.96 MGD).
ANNUAL PUMPAGE (MG)	RAW				FINISHED	385.045 (Survey)
AVERAGE DAILY (MGD)	RAW				FINISHED	1.054 (Survey)
MAX Day (MGD)	RAW				FINISHED	1.571 (Survey)
POPULATION	13,770			Estimated or Census Data		?
				How was Estimated Population Figured?		Not Applicable
AVERAGE DAILY PER CAPITA USAGE:	76.54 Gallons			Time to Produce Average Daily (Finished)		1.50 Hours
				Time to Produce Average Daily (FIRM)		1.78 Hours

TREATMENT APPLICATION POINT SUMMARY

TP #	Location or Description	Source Name	Source ID	Status (A, I or X)	Well Depth	Casing Length	Aquifer	Current Production (GPM)	GWUDI Eval. (DATE)	Waivers	
										VOC	SOC
TP03	W3 to low zone	Well 3	WL20523	A	197 ft	92 ft	shallow well	800**	?	W3 no waiver	W3 no waiver

Source Use (Disconnected sources, backups, seasonal use, etc.)	This TP is one of the two backup sources of water for Wood Dale's low-pressure zone. Water from shallow well 3 is available to supplement the Lake Michigan water. During an emergency, chlorinated water from well 3 can supply Wood Dale's low-pressure system and Vietzen MHP (satellite supply) through TP03. If necessary, well 3 (backup shallow well) can fill the two reservoirs at TP08.
Bacteriological History (Distribution water samples)	Distribution samples had one bad hit, but repeat was okay. All clean raw samples in the past 12 months (01/22/18 – 01/22/19).

TREATMENT	Disinfectant Used	Fluoridation Chemical Used	Other Chemical Addition	Other Treatment
	Chlorine gas	None	None	None
	Installation Deficiencies			General Condition of Plant
	See Attachment A			Satisfactory

Other Comments regarding this TAP	1) ** Well 3 capacity.	Emergency Power	None

TREATMENT APPLICATION POINT SUMMARY											
TP #	Location or Description	Source Name	Source ID	Status (A, I or X)	Well Depth	Casing Length	Aquifer	Current Production (GPM)	GWUDI Eval. (DATE)	Waivers	
										VOC	SOC
TP04	W5 to high zone	Well 5	WL20524	A	1,400 ft	481 ft	Deep well	850**	?	W5 no waiver	W5 no waiver

Source Use (Disconnected sources, backups, seasonal use, etc.)	This TP is the only backup source of water for Wood Dale's high-pressure zone. Water from deep well 5 is available to supplement the Lake Michigan water. During an emergency, chlorinated water from well 5 can supply Wood Dale's high-pressure system through TP04. If necessary, well 5 (backup deep well) can fill the reservoir at TP07.				
Bacteriological History (Distribution water samples)	Distribution samples had one bad hit, but repeat was okay. All clean raw samples in the past 12 months (01/22/18 – 01/22/19).				
TREATMENT	Disinfectant Used	Fluoridation Chemical Used	Other Chemical Addition	Other Treatment	
	Chlorine gas	None	None	None	
	Installation Deficiencies			General Condition of Plant	
	See Attachment A			Satisfactory	
Other Comments regarding this TAP	1) ** Well 5 capacity.			Emergency Power	155 KW Diesel Generator

TREATMENT APPLICATION POINT SUMMARY											
TP #	Location or Description	Source Name	Source ID	Status (A, I or X)	Well Depth	Casing Length	Aquifer	Current Production (GPM)	GWUDI Eval. (DATE)	Waivers	
										VOC	SOC
TP05	W6 to low zone	Well 6	WL20525	A	190 ft	101 ft	shallow well	1,100**	?	W6 no waiver	W6 no waiver

Source Use (Disconnected sources, backups, seasonal use, etc.)	This TP is one of the two backup sources of water for Wood Dale' low-pressure zone. Water from shallow well 6 is available to supplement the Lake Michigan water. During an emergency, chlorinated water from well 6 can supply Wood Dale's low-pressure system and Vietzen MHP (satellite supply) through TP05.				
Bacteriological History (Distribution water samples)	Distribution samples had one bad hit, but repeat was okay. All clean raw samples in the past 12 months (01/22/18 – 01/22/19).				
TREATMENT	Disinfectant Used	Fluoridation Chemical Used	Other Chemical Addition	Other Treatment	
	Chlorine gas	None	None	None	
	Installation Deficiencies			General Condition of Plant	
	See Attachment A			Satisfactory	
Other Comments regarding this TAP	1) ** Well 6 capacity.			Emergency Power	150 KW Diesel Generator

TREATMENT APPLICATION POINT SUMMARY												
TP #	Location or Description	Source Name	Source ID	Status (A, I or X)	Well Depth	Casing Length	Aquifer	Current Production (GPM)	GWUDI Eval. (DATE)	Waivers		
										VOC	SOC	
TP07	Reichert Ave station	Well 5	WL20654	A	1,400 ft	481 ft	Deep well	850**	?	W5 no waiver	W5 no waiver	
		DWC	043-5400	A	NA	NA	Lake Michigan	2,400***	NA	TP07 no sampling	TP07 no sampling	
Source Use (Disconnected sources, backups, seasonal use, etc.)		Reichert Ave pumping station receives DWC water into a 1.25 MG reservoir from which two high service pumps (600 gpm & 1,800 gpm) discharge the re-chlorinated water into Wood Dale's high-pressure system through TP07. Water from DWC can bypass the Reichert Ave pumping station and serve Wood Dale's high-pressure system under direct pressure through CC07. If necessary, well 5 (backup deep well) can fill the 1.25 MG reservoir at TP07.										
Bacteriological History (Distribution water samples)		Distribution samples had one bad hit, but repeat was okay. All clean raw samples in the past 12 months (01/22/18 – 01/22/19).										
TREATMENT		Disinfectant Used		Fluoridation Chemical Used		Other Chemical Addition		Other Treatment				
		Chlorine gas (W5 & TP07)		None		None		None				
		Installation Deficiencies						General Condition of Plant				
		See Attachment A						Satisfactory				
Other Comments regarding this TAP		1) ** Well 6 capacity. 2) *** Combined capacities of two high service pumps. 3) The free chlorine residual measured in the high-pressure zone yielded 0.90 mg/l.						Emergency Power		150 KW Diesel Generator		

TREATMENT APPLICATION POINT SUMMARY												
TP #	Location or Description	Source Name	Source ID	Status (A, I or X)	Well Depth	Casing Length	Aquifer	Current Production (GPM)	GWUDI Eval. (DATE)	Waivers		
										VOC	SOC	
TP08	Potter Ave station	Well 3	WL20653	A	197 ft	92 ft	Shallow well	800**	?	W3 no waiver	W3 no waiver	
		DWC	043-5400	A	NA	NA	Lake Michigan	6,500***	NA	TP08 no sampling	TP08 no sampling	
Source Use (Disconnected sources, backups, seasonal use, etc.)		Potter Ave pumping station receives DWC water into two interconnected reservoirs (0.5 MG & 1 MG) from which four high service pumps (1,100 gpm & three 1,800 gpm) discharge the re-chlorinated water into Wood Dale's low-pressure system and Vietzen MHP (satellite supply) through TP08. Water from DWC can bypass the Potter Ave pumping station and serve Wood Dale's low-pressure system and Vietzen MHP under direct pressure through CC08. If necessary, well 3 (backup shallow well) can fill the two reservoirs at TP08.										
Bacteriological History (Distribution water samples)		Distribution samples had one bad hit, but repeat was okay. All clean raw samples in the past 12 months (01/22/18 – 01/22/19).										
TREATMENT		Disinfectant Used		Fluoridation Chemical Used		Other Chemical Addition		Other Treatment				
		Chlorine gas (W3 & TP08)		None		None		None				
		Installation Deficiencies						General Condition of Plant				
		See Attachment A						Satisfactory				
Other Comments regarding this TAP		1) ** Well 3 capacity. 2) *** Combined capacities of four high service pumps. 3) The free chlorine residual measured in the low-pressure zone yielded 0.91 mg/l.						Emergency Power		460 KW Diesel Generator		

Service Area / Pressure Zone / Distribution System												
Water Source(s)						Primary source(s): Lake Michigan water from Chicago via DWC (CC08/TP08) Backup source(s): shallow wells 3 & 6						
Location or Description						Service Area Population	No. of Service Connections	Finished Water Storage (Show Capacities)				
								Ground	Elevated	Standpipe		
Wood Dale low-pressure system Vietzen MHP (satellite supply)						Not available	Not available	0.5 MG 1.0 MG	100 K	None		
Maximum System Pressure		Location				Minimum System Pressure	Location		Free Chlorine Residual (mg/l)	Location		
68 PSI		Pressure reducing valve				40 PSI	Far end of the system		0.50 mg/l	North Plant waste water		
Flushing Program				Fire Protection Provided?		Current Map Available?		Valve Maintenance Program			Notes and Other Observations	
None	Yearly	2 x year	More Often	No	Yes	No	Yes	No Valves	No Program	OK		
	X				X		X			*X		

Service Area / Pressure Zone / Distribution System											
Water Source(s)						Primary source(s): Lake Michigan water from Chicago via DWC (CC07/TP07) Backup source(s): deep well 5					
Location or Description						Service Area Population	No. of Service Connections	Finished Water Storage (Show Capacities)			
								Ground	Elevated	Standpipe	
Wood Dale high pressure system						Not available	Not available	1.25 MG	500K Gal.	None	
Maximum System Pressure		Location				Minimum System Pressure	Location		Free Chlorine Residual (mg/l)	Location	
74 PSI		Pressure reducing valve				64 PSI	Far end of the system		0.90 mg/l	Reichert Pump Station	
Flushing Program				Fire Protection Provided?		Current Map Available?		Valve Maintenance Program			Notes and Other Observations
None	Yearly	2 x year	More Often	No	Yes	No	Yes	No Valves	No Program	OK	
	X				X		X			*X	

Operating Reports / Records												
Monthly Reports Being Submitted?			Content of Monthly Reports								Notes and Other Observations	
			Report for each TAP?		Daily Production from Each Well?		Daily Measured Residuals?		Daily Dosage Calculations?			
Yes	No	Late	Yes	No	Yes	No	Yes	No	Yes	No		
X			X		X		X		X			
Cross Connection control Ordinance											*** - If there are private wells in the service area, well owners are required to install backflow prevention devices (RPZ) and provide annual inspection by CCCDI certified plumbing inspector.	
Does the system have an ordinance?		Date Approved (by IEPA)		Program Enforced?		Do Private Wells Exist in the Service Area?						
Yes	No			Yes	No	Yes		No				
X		09/01/2003		X		***X						

Monitoring												
Bacteriological Summary												
Monitoring History (2018-2019 Year)				Primary Lab		Phone		FAX				
	Raw	Finished	Distribution									
Number of Samples	36	0	183									
Number Satisfactory	36	0	182	Secondary Lab		Phone		FAX				
Number Invalid	0	0	0									
Number Unsatisfactory	0	0	1									
Fecal / E. Coli. Positive	0	0	0	Coliform Monitoring Plan Approved?		All Major Portions of system included in Plan?		Chlorine Residuals taken at Sample Sites?		Monitoring FREE Residual?	
				Yes	No	Yes	No	Yes	No	Yes	No
Monitoring Violations	0	MCL Violations	0	X		X		X		X	

Chemical Summary	
	NO FLUORIDATION FOR BACK UP WELL
Nitrate/Nitrite	No Detection: (09/09/14 – 01/22/19)
Radium	Well #5 tested high for combined radium on 4/12/17: (09/09/14 – 01/22/19)
VOC	No Detection: (09/09/14 – 01/22/19)
SOC	No MCL exceedance: (09/09/14 – 01/22/19)
IOC	No MCL Exceedance: (09/09/14 – 01/22/19)
DBP	TTHM and HAA are below MCL from (09/09/14 - 01/22/19).
Cu	Distribution: No Action Level exceedance (09/09/14 – 01/22/19)
Pb	Distribution: No Action Level exceedance (09/09/14 - 01/22/19)

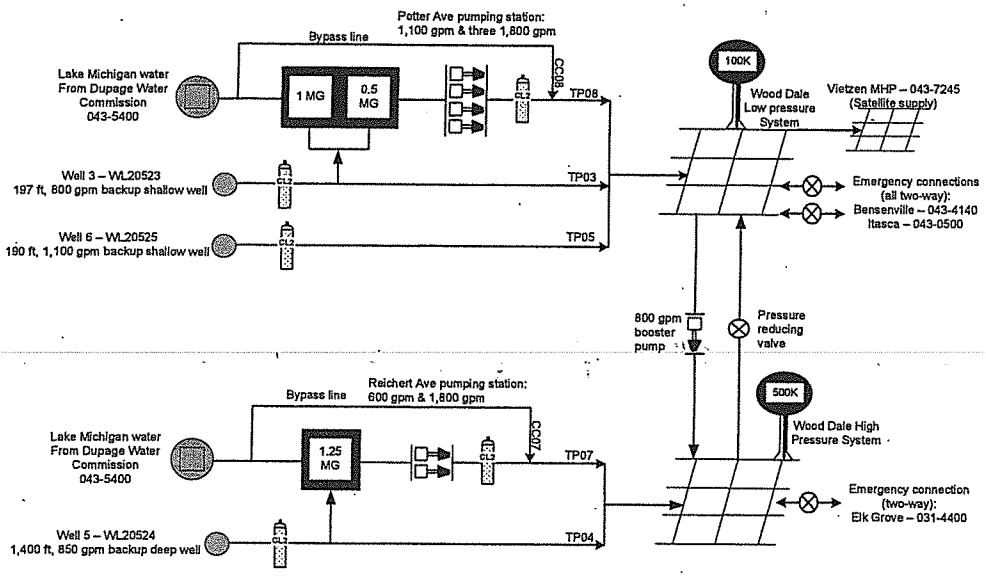
Viability / Financial Management			
Service Fee (Minimum Charge)	$3.06	Other source(s) of income used to maintain the water system	Yes
Direct Charge (cost per 1,000 gallons)	$10.93	Does the Utility have an ACTIVE program to ensure all customers pay bills?	Yes
Billing Frequency	Monthly	Does the utility have a fund to cover major repairs?	Yes
ICC Regulated? (Y/N)	No	Name and phone no. of person responsible for system repairs.	Robert Schultze
Date of Last Rate Increase	01/01/2017	Name and Phone No. of Person Responsible for Financial Management of the Water System	Nunzio Pulice
		Major Water Supply Concerns expressed by Residents/ Customers.	None
What was the most recent major repair or Improvement Involving This Water System			
New pumps and drives and new generator at the Potter Pump Station.			
Planned, Anticipated or Needed Upgrades and Improvements (Include dates or timeframe if known)			

Deficiencies noted in Attachment "A" in the last inspection (September 09, 2014)	
Deficiencies from last inspection	**Corrected (Yes/No)**
1) Failure to obtain operating permit.	Yes
2Failure to enforce their cross-connection control program.	Yes

Reminders and Recommendations noted in Attachment "B" in the last inspection (September 09, 2014)	
Reminders and Recommendations from last inspection	**Corrected (Yes/No)**
None	

Service connections: 4,956
Population: 13,770

Public Water System Flow Chart
Wood Dale 043-1200
January 23, 2019



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

847/608-3131
FAX #847/608-3139

Wood Dale Public Water Supply
c/o Mr. Nunzio Pulice, City Mayor
404 North Wood Dale Road
Wood Dale, Illinois 60191

DATE: August 31, 2018

RE: Wood Dale – IL043-1200
Public Water Supply Inspection / Sanitary Survey
Last Inspection Completed on September 09, 2014

Dear Mr. Pulice,

The Illinois Environmental Protection Agency will be conducting an inspection of your Public Water Supply in the near future. The purpose of these periodic inspections is to identify areas where your water system may not comply with Public Water Supply standards. We will be reviewing our copies of permits, test results, previous inspection reports, sample results and general correspondence to prepare for an on-site inspection of your water supply. The inspection will be scheduled within the next **15** days.

To help with the evaluation process, please have members of your water system complete the enclosed Capacity Assessment Worksheet and update the information on the Public Water Supply Data Sheet. Input from several persons may be necessary to complete the forms. The information requested should be available from your water supply records. Also please mark any changes on the attached schematic drawing.

Please return the Capacity Development worksheet and updated Public Water Supply Data Sheet to this office within **10** days so that it can be reviewed before the on-site inspection. You may return the worksheets to us by FAX or mail. Our FAX number is 847-608-3139. Please contact me at phone number 847-608-3131 if you have any questions on the worksheets or upcoming inspection.

Thank you for your time and attention to this matter.

Sincerely,

Dwayne Booker, Environmental Protection Engineer,
Elgin Regional Office - Division of Public Water Supplies
Illinois Environmental Protection Agency

cc: Robert E. Schultze, Certified Water Operator (Same)
Elgin-file

Dwayne.Booker@Illinois.GOV

TECHNICAL CAPACITY

TECHNICAL CAPACITY ASSESSMENT	YES	NO	Does not apply
Record your systems total annual pumpage for the past year: 385,045,000 (__ MG) (✓ gal)			
Record your systems peak day pumpage: July 9, 2018 1,571,00 (__ MGD) (✓ gpd)			
List amount of water billed or sold to customers 337,488,000 (__ MG) (✓ gal)			
Number of customers / population served 4956 / 13,770			
List plant capacity 16.76 (✓ MGD) (__ gpd) List total well capacity 3.96 (✓ MGD) (__ gpd)			
List plant capacity with largest well or treatment unit out of service (__ MGD) (__ gpd)			
Is standby/emergency power equipment exercised? Check frequency equipment exercised (__ weekly) (✓ monthly) (__ quarterly) (__ annual) (__ other)			
Can your water system provide uninterrupted water service for 24 hours without electrical power?	✓		
Are hydrants routinely flushed and maintained? Flushing frequency: ✓ annual __ spring/ fall __ as needed			
Are the locations of all valves in the distribution system precisely known?	✓		
Are all valves periodically exercised and maintained? List exercising frequency __ Yearly	✓		
Are locations, size and type of mains and valves detailed on records or maps kept in a secure area?	✓		
Are meter pits and curb stops located, unobstructed and accessible?	✓		
Is the unaccounted-for water less than 15% of the total water delivered to the mains? List amount of water unaccounted for: 8.6 % (check if information is not available)	✓		
Are all customers, water sources and treatment plants metered? List frequency of meters changed/calibrated Every 10 years or as needed	✓		
It your treatment equipment adequate to provide drinking water that meets all drinking water standards?	✓		

MANAGERIAL CAPACITY

MANAGERIAL CAPACITY ASSESSMENT	YES	NO	N/A
Is there a clear plan of organization and control among the people responsible for management and operation of the water system?	✓		
Are contingency plans in place for unanticipated loss of key personnel?	✓		
Is a written emergency response plan in place and up to date?	✓		
Are employees and water system officials encouraged to attend conferences and seminars to stay current with Public Water Supply requirements and technology?	✓		
Does the utility perform inspections of work performed on the system by outside contractors?	✓		
Are construction permits obtained prior to starting water supply projects that require a permit, and are operating permits obtained before placing those improvements into service?	✓		
Do you maintain copies of all water sample results, operating reports and inspection reports?	✓		
Do you have a cross connection control program?	✓		
Where are cross connection control survey results and record kept? _BSI Online			

FINANCIAL CAPACITY

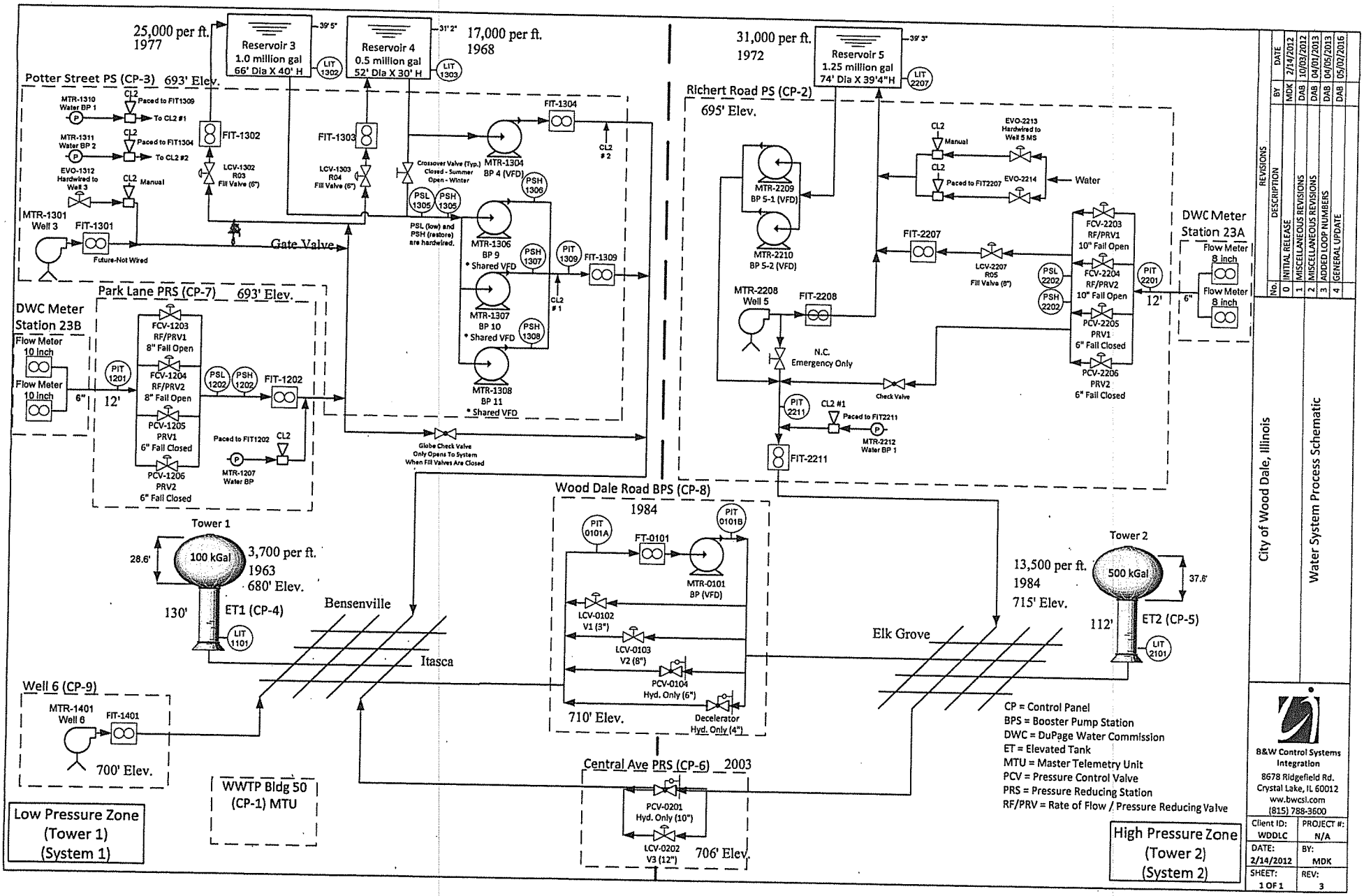
FINANCIAL CAPACITY ASSESSMENT	YES	NO	N/A
Does your organization have an annual budget for operating and maintaining the water system?	✓		
Are water rates regularly reviewed? Date of last rate increase January 1, 2017	✓		
Does your water system generate sufficient revenue to meet estimated expenses during the current and forecasted budget years?	✓		
Are adequate reserve funds in place to provide for emergency repairs?	✓		
Can your organization cover the costs of an emergency or failure of its most vulnerable system component? (source / storage / treatment etc?)	✓		
Does your organization have a written 5-year Capital Improvement Plan for major water system improvements?	✓		
Are rates sufficient to meet the costs of the 5-year Capital Improvement Plan?	✓		
Does your organization have adopted procedures for selecting outside contractors and suppliers?	✓		

Public Water Supply Name: Wood Dale ID: IL0431200

Date: 9/14/2018 Prepared by: Robert Schultze

Sanitary survey inquiry

Plant phone number	630-350-3530
Name of Village Administrator/Mayor/ Village President (to receive correspondence):	Mayor - ANNUNZIATO PUNZIO
Title & Address of administrator:	City Manager - Jeff Mermuys
1) Name of certified operator: 2) Operator class & number: 3) Operator phone: 4) Operator fax: 5) E-mail address (if available):	Robert Schuetz "C" 16041870 630-787-2785 630-938-9039 R.Schuetz@wooddalerr.com
Other contact info (name, title & phone number):	Piotr Gradecki, Water Supply Oper. 1-630-688-0534
1) Number of service connections (total): a) Residential connections: b) Commercial (if available): c) Industrial (if available): d) All connections metered?	4,956 4940 181 335 yes
Satellite water system (do not include emergency connections):	Villa Park IL 630-782-9545
Emergency interconnections:	3 - Elk Grove, Bensenville, Itasca
Population (explain if estimated or from census data):	13,770
1) Minimum water charges: 2) Charge per 1,000 Gal: 3) Billing frequency:	W&S 3.06 0.93 Water 2.62 Sewer Monthly
Hydrant flushing frequency:	Annual / D/S Quarterly
Valve maintenance frequency:	Annual
1) Cross-connection ordinance? 2) Approved by IEPA? 3) Date of approval:	(Yes)/No 9-1-2003 (Yes)/No 2-24-2003
Maximum & minimum system pressures & locations:	System I HP Max 68, Min 65 System II HP Max 74, Min 64
Water main material, size & length:	AC Pipe, Cast Iron, Ductile, HDPE 6" to 24" in dia
List all elevated tank(s), pressure tank(s) and/or ground storage tanks (include each tanks capacity & cleaning frequency):	2 Towers 100,000 gal, 0.5 Mil gals 3 Ground Storage - 1, 2.5, 1.0 and 0.5 Mil gals $ 70 (Excavate as needed)
Sanitary sewers or septic tanks?	Sanitary Sewers
Any private wells in the service area?	Yes/(No)
Is your supply participant of Community Water Testing or Lab fee Program?	Yes/(No)
ICC regulated?	Yes/(No)


25,000 per ft.
1977
Reservoir 3
1.0 million gal
66' Dia X 40' H
39' 5"
LIT 1302
Reservoir 4
0.5 million gal
52' Dia X 30' H
31' 2"
LIT 1303
17,000 per ft.
1968
31,000 per ft.
1972
Reservoir 5
1.25 million gal
74' Dia X 39'4"H
39' 3"
LIT 2207
Potter Street PS (CP-3) 693' Elev.
MTR-1310 Water BP 1
Paced to FIT1309
To CL2 #1
MTR-1311 Water BP 2
Paced to FIT1304
To CL2 #2
EVO-1312 Hardwired to Well 3
CL2 Manual
MTR-1301 Well 3
FIT-1301
Future-Not Wired
FIT-1302
LCV-1302 R03 Fill Valve (6")
FIT-1303
LCV-1303 R04 Fill Valve (6")
Gate Valve
Crossover Valve (Typ.) Closed - Summer Open - Winter
FIT-1304
MTR-1304 BP 4 (VFD)
CL2 # 2
PSL 1305
PSH 1305
PSL (low) and PSH (restore) are hardwired.
PSH 1306
MTR-1306 BP 9 * Shared VFD
PSH 1307
PIT 1309
FIT-1309
MTR-1307 BP 10 * Shared VFD
PSH 1308
CL2 # 1
MTR-1308 BP 11 * Shared VFD
Park Lane PRS (CP-7) 693' Elev.
DWC Meter Station 23B
Flow Meter 10 inch
Flow Meter 10 inch
6"
12'
PIT 1201
FCV-1203 RF/PRV1 8" Fail Open
FCV-1204 RF/PRV2 8" Fail Open
PCV-1205 PRV1 6" Fail Closed
PCV-1206 PRV2 6" Fail Closed
PSL 1202
PSH 1202
FIT-1202
Paced to FIT1202
CL2
MTR-1207 Water BP
Globe Check Valve Only Opens To System When Fill Valves Are Closed
Richert Road PS (CP-2) 695' Elev.
MTR-2209 BP 5-1 (VFD)
MTR-2210 BP 5-2 (VFD)
CL2 Manual
EVO-2213 Hardwired to Well 5 MS
CL2
Paced to FIT2207
EVO-2214
Water
FIT-2207
LCV-2207 R05 Fill Valve (6")
FCV-2203 RF/PRV1 10" Fail Open
FCV-2204 RF/PRV2 10" Fail Open
PCV-2205 PRV1 6" Fail Closed
PCV-2206 PRV2 6" Fail Closed
PSL 2202
PSH 2202
PIT 2201
12'
6"
DWC Meter Station 23A
Flow Meter 8 inch
Flow Meter 8 inch
MTR-2208 Well 5
FIT-2208
N.C. Emergency Only
Check Valve
PIT 2211
CL2 #1
Paced to FIT2211
MTR-2212 Water BP 1
FIT-2211
Wood Dale Road BPS (CP-8) 1984
PIT 0101A
FT-0101
PIT 0101B
MTR-0101 BP (VFD)
LCV-0102 V1 (3")
LCV-0103 V2 (8")
PCV-0104 Hyd. Only (6")
Decelerator Hyd. Only (4")
710' Elev.
Tower 1
28.6'
100 kGal
3,700 per ft.
1963
680' Elev.
130'
ET1 (CP-4)
LIT 1101
Bensenville
Itasca
Tower 2
13,500 per ft.
1984
715' Elev.
500 kGal
37.6'
112'
ET2 (CP-5)
LIT 2101
Elk Grove
Well 6 (CP-9)
MTR-1401 Well 6
FIT-1401
700' Elev.
WWTP Bldg 50 (CP-1) MTU
Central Ave PRS (CP-6) 2003
PCV-0201 Hyd. Only (10")
LCV-0202 V3 (12")
706' Elev.
Low Pressure Zone (Tower 1) (System 1)
High Pressure Zone (Tower 2) (System 2)
CP = Control Panel
BPS = Booster Pump Station
DWC = DuPage Water Commission
ET = Elevated Tank
MTU = Master Telemetry Unit
PCV = Pressure Control Valve
PRS = Pressure Reducing Station
RF/PRV = Rate of Flow / Pressure Reducing Valve
REVISIONS
No. | DESCRIPTION | BY | DATE
0 | INITIAL RELEASE | MDK | 2/14/2012
1 | MISCELLANEOUS REVISIONS | DAB | 10/03/2012
2 | MISCELLANEOUS REVISIONS | DAB | 04/01/2013
3 | ADDED LOOP NUMBERS | DAB | 04/05/2013
4 | GENERAL UPDATE | DAB | 05/02/2016
City of Wood Dale, Illinois
Water System Process Schematic
B&W Control Systems Integration
8678 Ridgefield Rd.
Crystal Lake, IL 60012
www.bwcsi.com
(815) 788-3600
Client ID: WDDLC
PROJECT #: N/A
DATE: 2/14/2012
BY: MDK
SHEET: 1 OF 1
REV: 3

City of Wood Dale
Water Supply Data
DuPage Water Supply

UPDATE:05/20/2016

Location	No.	Size	GPM/GPD	System	
1992, 326 E. Richert Rd.	RF/PRV-1	10"	4,900 / 7,056,000	2	695'.0 U.S.G.S. Elev.
	RF/PRV-2	10"	4,900 / 7,056,000	2	
	PRV-1	6"	1,300/1,872,000	2	
	PRV-2	6"	1,300/1,872,000	2	
Sub-Total	4		12,400/17,856,000		
Location					
1992, 411 Parl Lane	RF/PRV-1	8"	3,100 / 4,464,000	1	693'.0 U.S.G.S. Elev.
	RF/PRV-2	8"	3,100 / 4,464,000	1	
	PRV-1	6"	1,300/1,872,000	1	
	PRV-2	6"	1,300/1,872,000	1	
Sub-Total	4		8,800/12,672,000		
Total DWC	8		21,200/30,528,000		

Storage Capacity

Location	No.	Type	Height/Gallons	System	Overflow Elev.
1963, 269 W. Irving Pk.	1	Elevated	158'.4" / 100,000	1	838.'4"/680'.0 U.S.G.S Elev.
1984, 1401 N. WD Rd.	2	Elevated	149'.6"/500,000	2	864'6"/715'.0 U.S.G.S Elev.
1979, 444 W. Potter Rd.	3	Ground	39'.0"/1,000,000	1	732'.9"/693'.0 U.S.G.S Elev.
1968, 444 W. Potter Rd.	4	Ground	32'.0" / 500,000	1	724'.5"/693.0' U.S.G.S Elev.
1972, 326 Richert Rd.	5	Ground	39'.4"/1,250,000	2	734'.4"/ 695'.0 U.S.G.S. Elev
		Total	3,350,000		

Booster Pumps

Loaction	No.	HP/GPM/GPD	Drive	System
1968, 444 W. Potter Rd.	4	60/1,100/1,584,00	VFD	1
1972, 326 Richert Rd.	5-1	75/1,100/1,584,000	VFD	2
1972, 326 Richert Rd.	5-2	75 / 1,800 / 2,592,000	VFD	2
1979, 444 W. Potter Rd.	9	125 / 1,800 / 2,592,000	VFD	1
1979, 444 W. Potter Rd.	10	125 / 1,800 / 2,592,000	VFD	1
1979, 444 W. Potter Rd.	11	125 / 1,800 / 2,592,000	VFD	1
1985 765 WD Rd.	P-2	15 / 800 / 1,152,000	VFD	2
Total		9,400/1,3536,000		
Sub-Total without #10&#11		8,352,000		

Gravity Valves

Loaction	No.	Size/GPM/GPD	Drive	System
1985 765 WD Rd.	V-1	3" / 400 / 576,000	Motor	2 to1
1985 765 WD Rd.	V-2	8" / 1,200 / 1,728,000	Motor	2 to1
1985 765 WD Rd.	PRV	6" / 1,100 / 2,592,000	PSI Reducing Vaves	2 to1
999, Elmhrust/Central	V-3	12" / 1,500 / 2,160,000	Motor	2 to1
Elmhrust.Central	PRV	10" / 1,500 / 2,160,000	PSI Reducing Vaves	2 to1
Total		5,700 / 9,216,000		

Well Water Supply-Stanby

Loaction	No.	GPM/HOURS/GPD	Pump Setting
1963, 444 W. Potter	3	800 / 12 / 576,000	170"
1972, 326 Richert Rd.	5	950 / 18 / 1,025,000	1,027"
1977, 625 W. Sarah	6	1,100 / 18 / 1,188,000	100"
Total		2,850 / 2,789,000	

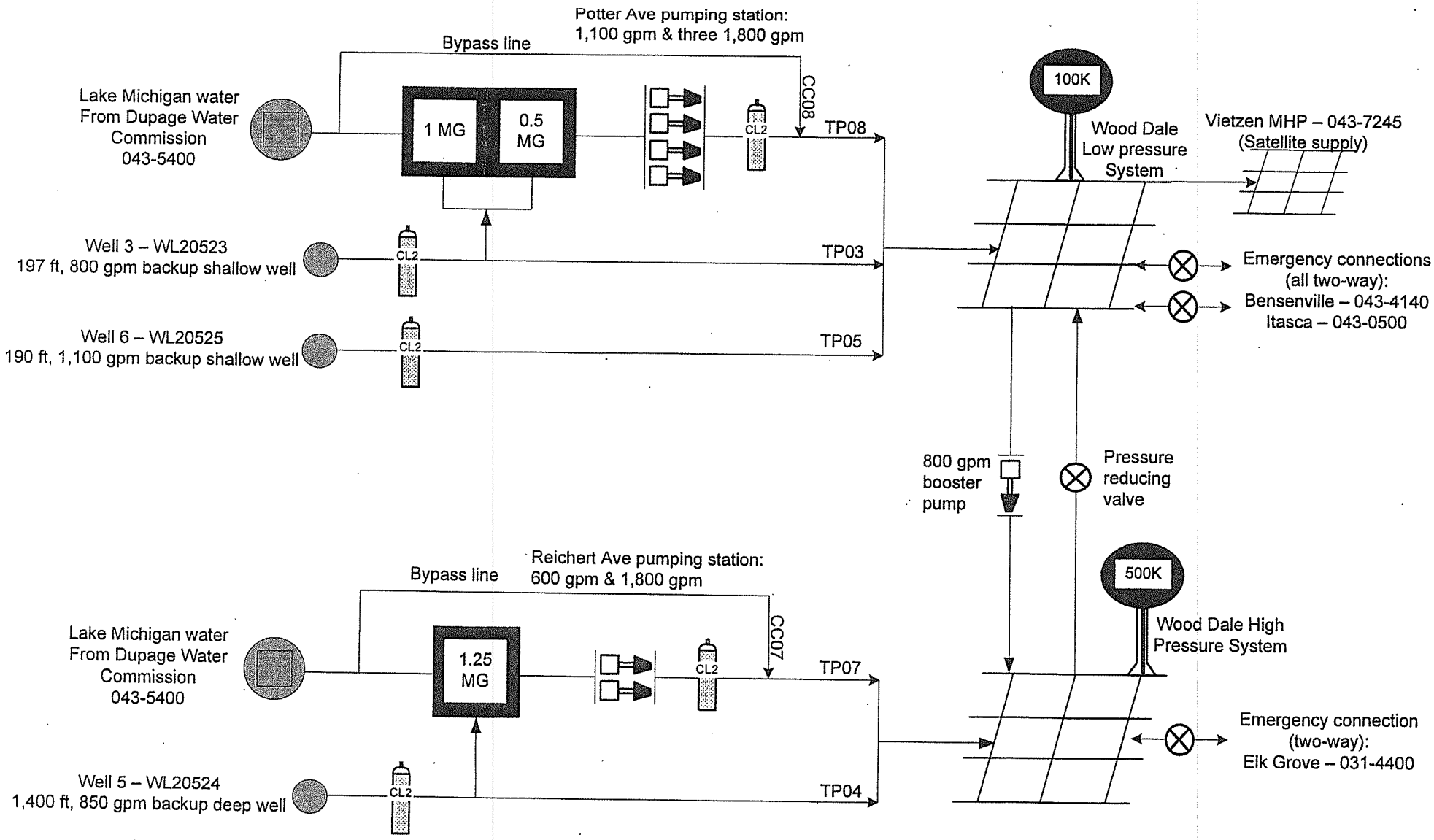
Loaction	No.	HP/GPM/GPD	Drive	System
1985 765 WD Rd.	P-1	60/0-800/1,152,000	VFD	1to2

City of Wood Dale
Water Billing History
7/03 - Current

WATER gallons billed	Church	Commercial	Gov't	Industrial	Residential	School	TOTAL	Purchased from DWC	% Billed	# of Days Billed	Date
Oct-03	90	3,790	63	7,345	26,697	140	38,125	40,668	0.94		
Nov-03	58	2,560	42	5,208	20,538	85	28,491	36,795	0.77		
Dec-03	47	3,569	41	6,347	34,672	95	44,771	38,481	1.16		
Jan-04	56	3,435	53	10,006	27,245	152	40,947	40,403	1.01		
Feb-04	51	3,309	55	6,464	25,663	149	35,691	37,270	0.96		
Mar-04	51	2,531	88	6,817	26,518	111	36,116	38,443	0.94		
Apr-04	55	2,676	111	5,884	20,434	109	29,269	39,300	0.74		
May-04	61	4,869	385	7,082	38,001	165	50,563	43,714	1.16		
Jun-04	63	3,408	279	8,714	29,038	37	41,539	45,703	0.91		
Jul-04	86	3,831	325	10,333	29,258	29	43,862	51,768	0.85		
Aug-04	97	4,418	211	20,074	31,544	156	56,500	50,177	1.13	This one is questionable	
Sep-04	92	5,157	110	9,742	38,143	138	53,382	48,522	1.10		
	807	**43,553**	**1,763**	**104,016**	**347,751**	**1,366**	**499,256**	**511,244**	**0.98**		
Oct-04	46	3,144	59	8,142	22,659	125	34,175	42,760	0.80		
Nov-04	58	4,789	64	11,221	27,646	133	43,911	38,987	1.13		
Dec-04	47	3,569	41	6,347	34,672	95	44,771	42,685	1.05		
Jan-05	47	2,927	42	6,577	23,964	141	33,698	48,345	0.70		
Feb-05	54	3,238	38	6,355	23,358	126	33,169	44,887	0.74		
Mar-05	61	3,807	71	7,906	28,232	129	40,206	45,574	0.88		
Apr-05	57	3,208	70	6,757	24,339	157	34,588	44,581	0.78		
May-05	98	18,557	411	7,888	32,423	148	59,525	50,663	1.17	This one is questionable	
Jun-05	179	6,061	474	14,815	52,397	87	74,013	62,935	1.18		
Jul-05	119	7,425	372	9,540	29,464	28	46,948	69,473	0.68		
Aug-05	184	4,574	207	12,417	34,858	94	52,334	62,552	0.84		
Sep-05	156	3,820	170	11,104	30,469	14	45,733	57,286	0.80		
	1,106	**65,119**	**2,019**	**109,069**	**364,481**	**1,277**	**543,071**	**610,728**	**0.89**		
Oct-05	100	3,344	89	8,123	24,759	139	36,554	51,089	0.72		
Nov-05	68	2,872	75	6,113	27,180	125	36,433	41,982	0.87		
Dec-05	76	3,019	59	5,267	28,121	91	36,633	45,226	0.81		
Jan-06	53	2,663	37	5,006	19,085	113	26,957	43,759	0.62		
Feb-06	78	3,372	44	6,576	24,243	139	34,452	39,250	0.88		
Mar-06	70	2,675	50	5,080	20,886	99	28,860	42,244	0.68		
Apr-06	72	3,100	73	6,488	24,609	162	34,504	43,053	0.80		
May-06	106	3,848	359	9,081	29,456	165	43,015	49,001	0.88		
Jun-06	155	4,464	338	10,815	37,857	71	53,700	52,336	1.03		
Jul-06	118	3,355	247	8,259	27,379	38	39,396	58,048	0.68		
Aug-06	74	4,552	221	10,557	35,397	119	50,920	58,525	0.87		
Sep-06	74	2,824	86	13,032	23,546	144	39,706	49,651	0.80		
	1,044	**40,088**	**1,678**	**94,397**	**322,518**	**1,405**	**461,130**	**574,164**	**0.80**	**0.80**	
Oct-06	78	3,884	358	6,881	30,690	174	42,065	43,321	0.97		11/26/2006
Nov-06	60	2,733	45	5,428	35,036	119	43,421	40,160	1.08		12/26/2006
Dec-06	56	2,698	45	5,588	25,921	88	34,396	37,722	0.91		1/26/2007
Jan-07	54	2,075	43	5,034	20,085	95	27,386	37,718	0.73		2/26/2007
Feb-07	56	2,955	60	6,211	28,076	125	37,483	37,479	1.00		3/29/2007

Service connections: 4,908
Population: 13,770

Public Water System Flow Chart
Wood Dale 043-1200
September 22, 2014



Sanitary survey inquiry

Plant phone number	630-350-3530
Name of Village Administrator/Mayor/ Village President (to receive correspondence):	Mayor - ANN UZIATO PULICH
Title & Address of administrator:	City Manager - Jeff Mermuys
1) Name of certified operator: 2) Operator class & number: 3) Operator phone: 4) Operator fax: 5) E-mail address (if available):	Robert Schultz "C" 16041 8710 630-787-2785 630-238-9039 R.Schultze@woodalevile.com
Other contact info (name, title & phone number):	Piotr Gradecki, Water Supply Oper. 1-630-688-0634
1) Number of service connections (total): a) Residential connections: b) Commercial (if available): c) Industrial (if available): d) All connections metered?	4,956 4940 181 335 yes
Satellite water system (do not include emergency connections):	Westzen MHP IL 043-7245
Emergency interconnections:	3 - Elk Grove, Bensenville, Itasca
Population (explain if estimated or from census data):	13,770
1) Minimum water charges: 2) Charge per 1,000 Gal: 3) Billing frequency:	was 3.06 10.93 Water 7.62 Sewer Monthly
Hydrant flushing frequency:	Annual, D/E Quarterly
Valve maintenance frequency:	Annual
1) Cross-connection ordinance? 2) Approved by IEPA? 3) Date of approval:	Yes/No 9-1-2003 Yes/No 2-24-2003
Maximum & minimum system pressures & locations:	System I HP Max 68, Min 65 System II HP Max 74, Min 64
Water main material, size & length:	AC Pipe, Cast Iron, Ductile, HDPE 6" to 14", Indiv.
List all elevated tank(s), pressure tank(s) and/or ground storage tanks (include each tanks capacity & cleaning frequency):	2 Towers 100,000 gal, 0.5 Milgals 3 Ground Storage - 1, 2.5, 1.0 and 0.5 milgals 8 TO 10 years as Needed
Sanitary sewers or septic tanks?	Sanitary Sewers
Any private wells in the service area?	Yes/No
Is your supply participant of Community Water Testing or Lab fee Program?	Yes/No
ICC regulated?	Yes/No

TECHNICAL CAPACITY

TECHNICAL CAPACITY ASSESSMENT	YES	NO	Does not apply
Record your systems total annual pumpage for the past year: 385,045,000 (__ MG) (✓ gal)			
Record your systems peak day pumpage: July 9, 2018 1,571,00 (__ MGD) (✓ gpd)			
List amount of water billed or sold to customers 337,488,000 (__ MG) (✓ gal)			
Number of customers / population served 4956 / 13,770			
List plant capacity 16.76 (✓ MGD) (__ gpd)			
List total well capacity 3.96 (✓ MGD) (__ gpd)			
List plant capacity with largest well or treatment unit out of service (__ MGD) (__ gpd)			
Is standby/emergency power equipment exercised? Check frequency equipment exercised (__weekly) (✓ monthly) (__quarterly) (__annual) (__other)			
Can your water system provide uninterrupted water service for 24 hours without electrical power?	✓		
Are hydrants routinely flushed and maintained? Flushing frequency: ✓ annual __spring/ fall __as needed			
Are the locations of all valves in the distribution system precisely known?	✓		
Are all valves periodically exercised and maintained? List exercising frequency __Yearly	✓		
Are locations, size and type of mains and valves detailed on records or maps kept in a secure area?	✓		
Are meter pits and curb stops located, unobstructed and accessible?	✓		
Is the unaccounted-for water less than 15% of the total water delivered to the mains? List amount of water unaccounted for: 8.6 % (check if information is not available)	✓		
Are all customers, water sources and treatment plants metered? List frequency of meters changed/calibrated Every 10 years or as needed	✓		
It your treatment equipment adequate to provide drinking water that meets all drinking water standards?	✓		

MANAGERIAL CAPACITY

MANAGERIAL CAPACITY ASSESSMENT	YES	NO	N/A
Is there a clear plan of organization and control among the people responsible for management and operation of the water system?	✓		
Are contingency plans in place for unanticipated loss of key personnel?	✓		
Is a written emergency response plan in place and up to date?	✓		
Are employees and water system officials encouraged to attend conferences and seminars to stay current with Public Water Supply requirements and technology?	✓		
Does the utility perform inspections of work performed on the system by outside contractors?	✓		
Are construction permits obtained prior to starting water supply projects that require a permit, and are operating permits obtained before placing those improvements into service?	✓		
Do you maintain copies of all water sample results, operating reports and inspection reports?	✓		
Do you have a cross connection control program?	✓		
Where are cross connection control survey results and record kept? BSI Online			

FINANCIAL CAPACITY

FINANCIAL CAPACITY ASSESSMENT	YES	NO	N/A
Does your organization have an annual budget for operating and maintaining the water system?	✓		
Are water rates regularly reviewed? Date of last rate increase January 1, 2017	✓		
Does your water system generate sufficient revenue to meet estimated expenses during the current and forecasted budget years?	✓		
Are adequate reserve funds in place to provide for emergency repairs?	✓		
Can your organization cover the costs of an emergency or failure of its most vulnerable system component? (source / storage / treatment etc?)	✓		
Does your organization have a written 5-year Capital Improvement Plan for major water system improvements?	✓		
Are rates sufficient to meet the costs of the 5-year Capital Improvement Plan?	✓		
Does your organization have adopted procedures for selecting outside contractors and suppliers?	✓		

Public Water Supply Name: Wood Dale ID: IL0431200

Date: 9/14/2018 Prepared by: Robert Schultze

April 18, 2017

City of Wood Dale
269 West Irving Park Rd.
Wood Dale, IL 60191

Attention: Brad

Reference: 15 Point Annual Water Tank Inspection
(1) – Elevated Tank

Dear Brad,

Corrpro Waterworks recently completed the 15-point annual tank review for the above referenced tank. A copy of the field report is included along with photographs from the site that illustrate any areas of concern described in the report. Areas of concern noted on the report should be investigated and appropriate action taken to make corrections. Any repairs and or replacements concerning the cathodic protection system will result in a quote forthcoming.

Corrpro Waterworks can provide competitive pricing on many of the common areas of concern found on water tank sites. Please call us for assistance on these repairs. Also, references can be provided for those repair items that do not fall within our area of expertise.

Coating Services: Contact Corrpro Waterworks for information on issues regarding recommended practices for Protective Coatings Engineering, Inspection, Specifications & Application.

We appreciate the opportunity to be of service. Should you have any questions or require additional information, please contact our Nationwide Customer Service toll free at 1-800-443-3516 or visit our web-site at www.corrpro.com.

Respectfully Submitted,
CORRPRO WATERWORKS

William Bearden
Operations Associate
Telephone: 770-761-5400

CORRPRO WATERWORKS

15 POINT WATER TANK REVIEW

100,000 GALLON ELEVATED

(WOOD DALE TANK)

SYSTEM # 77749

Prepared For:

CITY OF WOOD DALE

WOOD DALE, IL.

APRIL 18, 2017

****

ANNUAL WATER TANK SERVICES

• HEALTH • SECURITY • SAFETY

15 POINT TANK REVIEW

corrpro®
An Aegion™ Company

Phone: 1-800-443-3516 • www.corrpro.com

C.P. SYSTEM NO. 77749

	PHOTOS	AREAS OF CONCERN
1. PHOTOGRAPH FULL VIEW OF TANK: **THIS IS NOT AN OPTIONAL ITEM.**		
2. FOUNDATION: OBSERVE FOR SETTLING, CRACKS, AND DETERIORATION. Appears Good	(YES) NO	YES (NO)
3. EXTERIOR TANK COATING: OBSERVE FOR COATING FAILURE, CORROSION, AND LEAKS. Poor - Coating appears to be failing in many areas	(YES) NO	(YES) NO
4. INTERIOR TANK COATING: OBSERVE AS ALLOWED FROM ACCESS HATCH. Fair - Some minor coating failure	(YES) NO	YES (NO)
5. WATER LEVEL INDICATOR: TYPE, STYLE, AND CONDITION. N/A	~~YES NO~~	~~YES NO~~
6. OVERFLOW PIPE: CHECK FLAP VALVE COVER OR SCREEN, FOR OPERATION AND SEAL. Appears Good - Screen intact	(YES) NO	YES (NO)
7. ACCESS LADDER: CHECK FOR LOOSE BOLTS AND RUNGS. Appears Good	(YES) NO	YES (NO)
8. FALL PROTECTION DEVICES: CHECK OPERATION. Appears Good - Rail is intact	(YES) NO	YES (NO)
9. TANK ROOF: CHECK FOR HOLES, RUST, AND PONDING WATER LOW SPOTS. Appears Good	(YES) NO	YES (NO)
10. AIR VENTS: CHECK SCREENS, SEALED EDGES, AND SEAMS. Appears Good	(YES) NO	YES (NO)
11. CATHODIC PROTECTION ANODE COVERS: CHECK FOR DETERIORATED GASKETS, AND SEAL. N/A	~~YES NO~~	~~YES NO~~
12. ALL ACCESS HATCHES: CHECK LOCKS, HINGES, BOLTS, AND GASKETS. Appear Good - Lock on main access hatches	(YES) NO	YES (NO)
13. VISUAL WATER QUALITY: OBSERVE FOR FOREIGN MATTER AS DISCERNABLE FROM ROOF HATCH. Appears Good	(YES) NO	YES (NO)
14. TANK LIGHTING: CHECK CONDITION AND OPERATION. Appears Good	(YES) NO	YES (NO)
15. TANK SITE SECURITY: CHECK FENCES, GATES, AND ACCESS DOORS. Appears Good - Fence around whole property	(YES) NO	YES (NO)

NOTE: The service provided is an annual visual evaluation for the purpose of noting possible areas which may require further investigation or possible corrective action in accordance with AWWA Manual M42 recommended annual maintenance practices. It is limited to areas of the tank visible from access points such as ladders and catwalks. The work performed is not a structural evaluation, detailed coatings integrity evaluation, nor does it take the place of a complete 3-5 year water tank inspection as recommended by AWWA standards.

WRITTEN RECOMMENDATIONS FOR CORRECTIVE ACTION IF REQUIRED:

Have tank inspected by a qualified coatings inspector.

CORRPRO WATERWORKS

BY: _____ DATE: 2-2-2017

SUBSCRIBER'S ACCEPTANCE

BY: TM _____ DATE: 2-2-17

WHITE - ORIGINAL YELLOW - CUSTOMER

PHOTOGRAPH INDEX

1. FULL VIEW OF TANK
2. FOUNDATION
3. EXTERIOR TANK COATING
4. INTERIOR TANK COATING
5. WATER LEVEL INDICATOR
6. OVERFLOW PIPE
7. ACCESS LADDER
8. FALL PROTECTION DEVICES
9. TANK ROOF
10. AIR VENT(S)
11. CATHODIC PROTECTION ANODE COVERS
12. ALL ACCESS HATCHES
13. VISUAL WATER QUALITY
14. TANK LIGHTING
15. TANK SITE SECURITY

* ADDITIONAL PICTURES

1. FULL VIEW

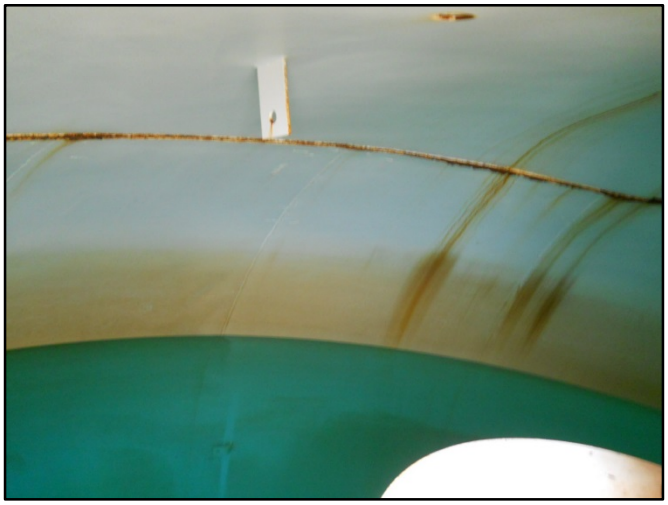
2. FOUNDATION

3. EXTERIOR TANK COATING

3. EXTERIOR TANK COATING

3. EXTERIOR TANK COATING

4. INTERIOR TANK COATING



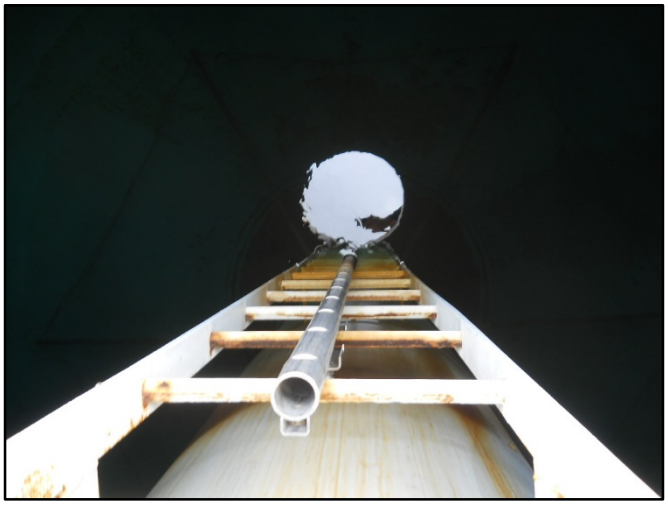
4. INTERIOR TANK COATING

5. WATER LEVEL INDICATOR

N/A

6. OVERFLOW PIPE

7. ACCESS LADDER



7. ACCESS LADDER

7. ACCESS LADDER

7. ACCESS LADDER

8. FALL PROTECTION DEVICE

9. TANK ROOF

9. TANK ROOF

10. AIR VENT

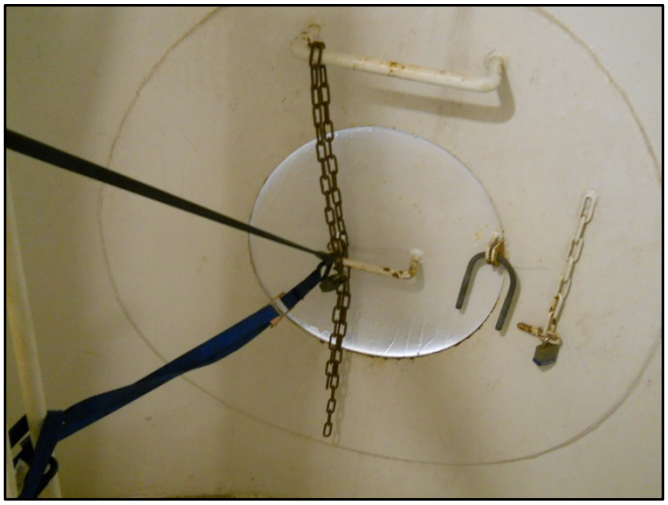
11. C.P. ANODE COVER

12. ACCESS HATCH

12. ACCESS HATCH

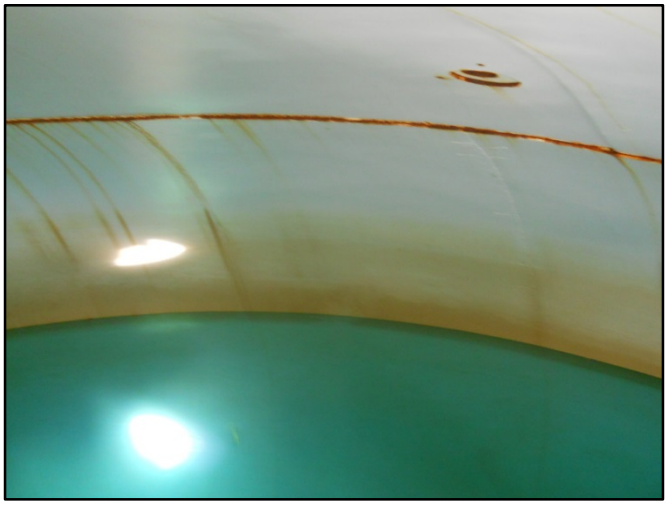
12. ACCESS HATCH

12. ACCESS HATCH



12. ACCESS HATCH

13. VISUAL WATER QUALITY



13. VISUAL WATER QUALITY

14. TANK LIGHTING

14. TANK LIGHTING