

Report for City of Whitewater, Wisconsin

East Side Sanitary Sewer Study



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BACKGROUND

The City of Whitewater is planning to complete several major infrastructure projects on the east side of the City in the next 5 years or so. These projects include the Downtown East Gateway, reconstruction of Milwaukee Street, reconstruction of the Milwaukee Street/Newcomb Street intersection, and reconstruction of Clay Street. Deficiencies and on-going maintenance concerns related to the sanitary sewer conveyance facilities in the project areas have been identified by City staff. In order to assist the City with proper planning, budgeting, and sequencing of the various projects, a study of the existing sewer system in this area of the City was requested.

STUDY AREA

The study area includes all areas tributary to the sanitary sewer on Milwaukee Street east of Wisconsin Street. This includes areas as far north as Cravath Street, as far south as the Village of Tripp Lake Condominium development, and as far east as the East Towne Market area. In addition, the study area includes future development southeast of the intersection of Clay Street and Rice Street. Please see Figure 1 for a map showing the limits of the study area.

The study area includes approximately 250 acres (gross) of existing and future development. The existing sanitary sewer collection system within the study area consists of approximately 25,000 linear feet of sanitary sewer ranging in size from 8 to 10 inches in diameter, approximately 100 manholes, four pumping stations, and approximately 1,100 feet of force main.

STUDY METHODOLOGY

An analysis of the existing and future land use within the study area was conducted. Land use, and number of residential units if applicable, was obtained from the City's zoning maps and City staff. The type of land use and quantity of each land use was used to estimate average wastewater flows using typical flow rates, such as per capita and per acre for various land uses. Peaking factors were then applied to the average flow rates. The peak flow rates were used for preliminary sizing of the proposed sanitary sewers. Table 1 summarizes the total estimated wastewater flow rate for the entire study area:

Land Use	No. of Units	No. of Acres	gpd/unit or acre	Average (cfs)	Peak (cfs)
Single Family	180		350	0.10	0.40
Duplex	36		225	0.01	0.04
Multifamily	91		225	0.03	0.12
Future Mixed Residential		22	1800	0.06	0.24
Commercial		40	1800	0.11	0.28
Manufacturing		18	2500	0.07	0.18
Total				0.38	1.26

Table 1 Total Estimated Wastewater Flow Rate Summary

The City's geographical information system (GIS) mapping of the sanitary sewer system was utilized for the study. This information was supplemented by survey-grade ground surface elevations at critical manholes and other strategic locations obtained with global positioning system (GPS) equipment. Manhole and pumping station depths were collected and provided by City staff. Based on this information, invert elevations of critical sanitary sewer system components were calculated and used to identify potential sanitary sewer routing alternatives.

EXISTING DEFICIENCIES AND MAINTENANCE CONCERNS

City staff has identified several deficiencies and maintenance concerns within the existing sanitary sewer system, including the following:

1. The Clay Street and North Street pumping stations are older, single-pump stations (no backup pump). These pumping stations do not meet current code requirements. The Oak Street pumping station does not have a back-up generator or the ability to connect a portable back-up generator for use during a power outage.
2. The sanitary sewer on Newcomb Street between Milwaukee Street and East Main Street was installed very flat. A sag in the sewer under the railroad tracks has been identified through sewer televising. This sag has resulted in additional sewer maintenance by City staff to avoid backups in the system.
3. The sanitary sewer at the intersection of Clay Street and Dann Street conflicts vertically with a large storm sewer. The sanitary sewer passes through the bottom of the storm sewer, increasing the potential for backups in the system.
4. Numerous deficiencies in the sanitary sewer on Milwaukee Street have been identified, including flat sewers, misaligned sewers, brick manholes, and capacity concerns. The sanitary sewer on Milwaukee Street is original, much of it dating to the 1920s. The sanitary sewer was not replaced when Milwaukee Street was reconstructed in 1978.

UPCOMING PROJECTS

The City's Capital Improvement Plan (CIP) currently includes the following projects within the study area:

- 2012 Clay Street Reconstruction (Dann Street to Esterly Street)
- 2013 Clay Street Reconstruction (Esterly Street to roundabout)
- 2014 Downtown East Gateway
- 2014 Milwaukee Street Reconstruction (Wisconsin Street to Easterly Street)
- 2014 Milwaukee Street/Newcomb Street Intersection Reconstruction
- 2015 Esterly Street

Proper planning and sequencing of these projects may allow the City to address several of the identified sanitary sewer system deficiencies either immediately or as part of a future unscheduled project.

DISCUSSION OF ALTERNATIVES

Several alternative sanitary sewer routing concepts were discussed with City staff and dismissed. These alternatives included redirecting sanitary sewers from the Milwaukee Street area northward to existing interceptor sewers along the Starin Road Extension corridor and in the Whitewater Business Park. These alternatives were dismissed based on the length of sewer required and the anticipated costs, which would be over and above the cost for sewer replacement required to address the actual deficiencies in the system.

Three alternatives were selected for further consideration. These alternatives were selected because they involved streets already scheduled for reconstruction in the CIP. It should be noted that sanitary sewer construction on Milwaukee Street and Newcomb Street will likely require provisions for addressing soil and groundwater contamination related to leaking underground storage tanks on current and former gas stations in the corridor. These provisions may include special pipe materials, treatment of groundwater, and landfilling of contaminated soils materials. Since each of the three alternatives would likely have similar costs for dealing with these issues, and since the scope of the issue is not known at this time, all costs for contaminated soil and groundwater provisions are excluded from the opinions of probable cost. The three alternatives are discussed in further detail as follows.

A. Alternative 1—Deeper Sanitary Sewer on Milwaukee Street

This alternative includes installation of approximately 2,200 linear feet of new 12-inch sanitary sewer on Milwaukee Street from Wisconsin Street east to Esterly Street. New manholes and sanitary sewer laterals would be installed. The new sewer would be installed 4 to 6 feet deeper than the existing sewer.

The existing sanitary sewer manhole at the intersection of Milwaukee Street and Wisconsin Street has an approximate 4-foot difference in elevation between the sewer coming east from Milwaukee Street and the sewer flowing north on Wisconsin Street. This elevation change would allow the Milwaukee Street sewer to the east to be lowered by approximately 4 feet when it is reconstructed.

The existing sanitary sewer on Milwaukee Street from just west of Ridge Street to just west of Dann Street is 20 to 25 feet deep. Replacing this sewer at a lower elevation as described above would result in a sewer as deep as 30 feet in this area. This is deep sewer, and it would be expensive and disruptive to install. However, since Milwaukee Street is scheduled for reconstruction anyway, there would not be pavement restoration costs directly related to the sanitary sewer installation.

Alternative 1 would address all but one of the deficiencies previously discussed, either as part of the project or as part of a future project. The Oak Street pumping station generator would not be addressed as part of this concept.

Alternative 1 is shown on attached Figure 2. As noted on the figure, a sanitary sewer could be installed on Esterly Street to eliminate the Clay Street pumping station. It would also be possible to install a sanitary sewer from Milwaukee Street to North Street (across the Washington School playground) to eliminate the North Street pumping station. Additional sewer could also be installed to eliminate the flat, sagging sewer on Newcomb Street. The opinion of probable cost for Alternative 1 is summarized in Table 2. Detailed cost breakdowns are provided in the Appendix.

Milwaukee Street Sanitary Sewer	\$820,000
Milwaukee Street and Newcomb Street Sanitary Sewer (Esterly Street to East Main Street)	\$200,000
Esterly Street Sanitary Sewer (Abandon Clay Street PS)	\$120,000
Milwaukee Street to North Street Sanitary Sewer (Abandon North Street PS)	\$200,000
Total	\$1,340,000

Table 2 Alternative 1 Opinion of Probable Cost

The additional cost to replace the Dann Street sanitary sewer to address the storm sewer conflict on Clay Street is \$130,000. This cost was not included above since the other alternatives discussed below do not allow for the Dann Street storm sewer conflict to be addressed. This will allow for a fair comparison of the cost of the alternatives.

B. Alternative 2—Replace Milwaukee Street Sanitary Sewer at Existing Depth with Combined Pumping Station

This concept includes installation of approximately 2,200 linear feet of new 12-inch sanitary sewer on Milwaukee Street from Wisconsin Street east to Esterly Street. New manholes and sanitary sewer laterals would be installed. The new sewer would be installed at approximately the same elevation as the existing sanitary sewer.

Alternative 2 would address all but two of the deficiencies previously discussed, either as part of the project or as part of a future project. The Oak Street pumping station generator and Dann Street storm sewer conflict would not be addressed as part of this concept.

Alternative 2 is shown on attached Figure 3. As noted on the figure, a new pumping station would be installed near the intersection of Milwaukee Street and Esterly Street. The new pumping station would be designed low enough to eliminate the Clay Street and North Street pumping stations as well as correct the flat, sagging sewer on Newcomb Street. To avoid double pumping, the sanitary sewer on Milwaukee Street in the vicinity of the new pumping station would be replaced but would bypass the pumping station. The opinion of probable cost for Alternative 2 is summarized in Table 3. Detailed cost breakdowns are provided in the Appendix.

Milwaukee Street Sanitary Sewer	\$700,000
Milwaukee Street and Newcomb Street Sanitary Sewer (Esterly Street to East Main Street)	\$200,000
New Milwaukee Street Pumping Station	\$390,000
Esterly Street Sanitary Sewer (Abandon Clay Street PS)	\$120,000
Milwaukee Street to North Street Sanitary Sewer (Abandon North Street PS)	\$200,000
Total	\$1,610,000

Table 3 Alternative 2 Opinion of Probable Cost

C. Alternative 3—Slightly Deeper Sanitary Sewer on Milwaukee Street and Replace Clay Street and North Street Pumping Stations

This alternative includes installation of approximately 2,200 linear feet of new 12-inch sanitary sewer on Milwaukee Street from Wisconsin Street east to Esterly Street. New manholes and sanitary sewer laterals would be installed. The new sewer would be installed 1 to 2 feet deeper than the existing sewer. The new sewer would be just deep enough to address the sagging sanitary sewer on Newcomb Street.

Alternative 3 would address all but two of the deficiencies previously discussed, either as part of the project or as part of a future project. The Oak Street pumping station generator and Dann Street storm sewer conflict would not be addressed as part of this alternative.

Alternative 3 is shown on attached Figure 4. As noted on the figure, the existing pumping stations and force main on Clay Street and North Street would be replaced with new submersible type-pumping stations. The opinion of probable cost for Alternative 3 is summarized in Table 4. Detailed cost estimates are provided in the Appendix.

Milwaukee Street Sanitary Sewer	\$720,000
Milwaukee Street and Newcomb Street Sanitary Sewer (Esterly Street to East Main Street)	\$200,000
New Clay Street Pumping Station and Force Main	\$350,000
New North Street Pumping Station and Force Main	\$400,000
Total	\$1,670,000

Table 4 Alternative 3 Opinion of Probable Cost

D. Summary of Alternatives

Table 5 summarizes the advantages, disadvantages, and costs of the three alternatives evaluated.

Alternative	Advantages	Disadvantages	Cost
1	Allows for elimination of two pumping stations. Allows for correction of sagging sewer at railroad. Allows for elimination of Dann Street storm sewer conflict. Addresses Milwaukee Street sanitary sewer issues.	Results in deeper sanitary sewer.	\$1,340,000
2	Consolidates two pumping stations into one. Allows for correction of sagging sewer at railroad. Addresses Milwaukee Street sanitary sewer issues.	Requires continued O&M of one pumping station.	\$1,610,000
3	Minimizes additional sanitary sewer depth. Allows for elimination of sagging sewer at railroad. Addresses Milwaukee Street sanitary sewer issues.	Requires continued O&M of two pumping stations.	\$1,670,000

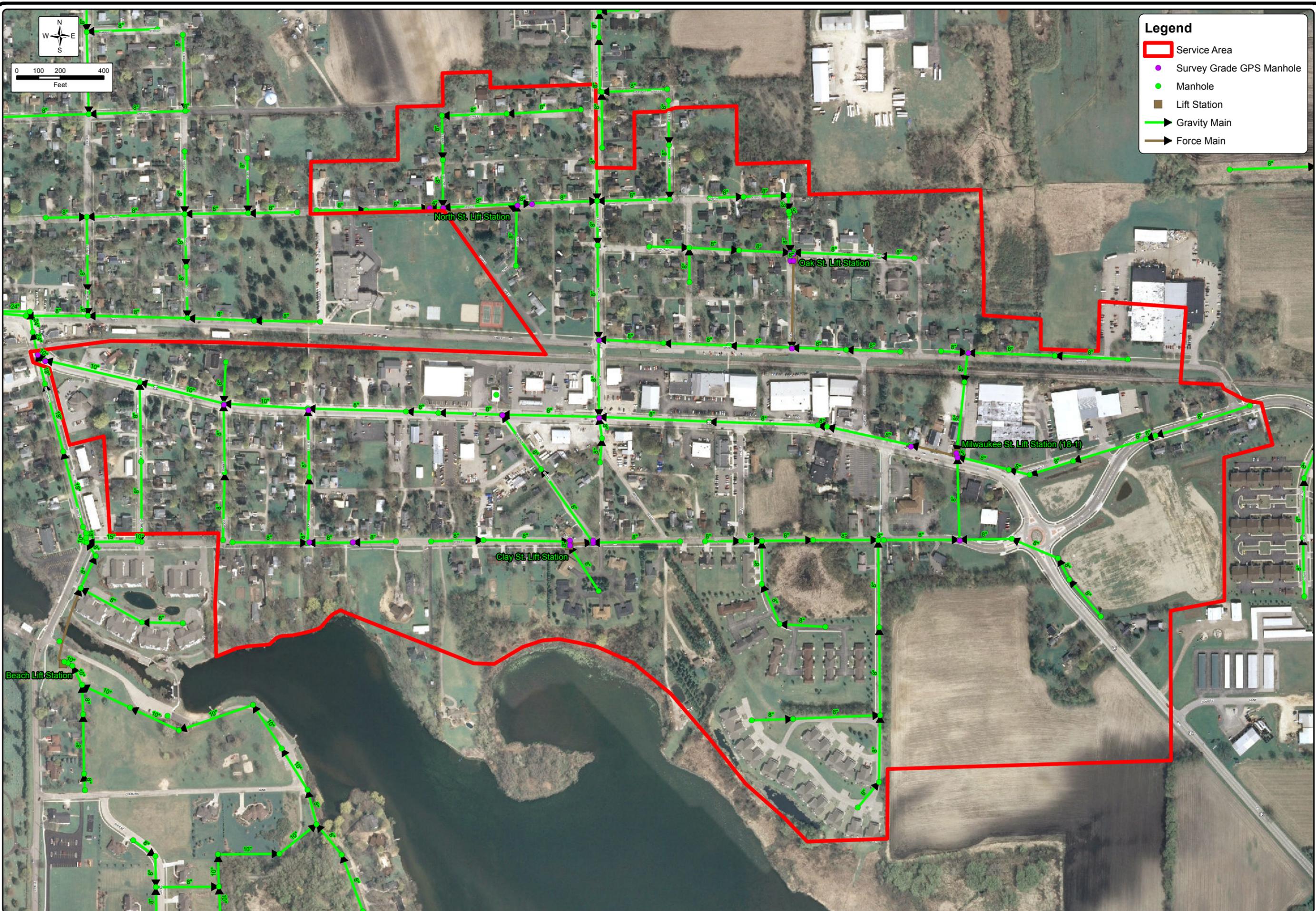
Table 5 Summary of Alternatives

RECOMMENDATIONS

Alternative 1 has the lowest cost of the alternatives considered, and we recommend the City consider its implementation. Alternatives 2 and 3 include pumping stations, which have on-going operation and maintenance costs that are not included in the above costs. If these costs had been included in the analysis, the relative cost of Alternative 1 would be even lower. Implementation of Alternative 1 also addresses more deficiencies in the system than the other alternatives.

If Alternative 1 is implemented, the Clay Street pumping station will likely soon be eliminated since Clay Street reconstruction is currently scheduled in the CIP. We suggest the City add the Milwaukee Street-to-North Street sanitary sewer project to the CIP. Alternative 1 would also allow abandonment of the North Street pumping station, which currently presents a significant system back-up risk in the event of pumping system failure. We also suggest the City, at a minimum, make provisions at the Oak Street pumping station for connection of a portable standby generator. This will provide the City some operational flexibility if a power failure occurs.

Additional details for Alternative 1 are shown on Figure 5, including preliminary sewer lengths, slopes, depths, and evaluations. This information, as well as constructability and staging considerations, should be reviewed and confirmed during preliminary engineering of the new facilities.



Legend

- Service Area
- Survey Grade GPS Manhole
- Manhole
- Lift Station
- Gravity Main
- Force Main

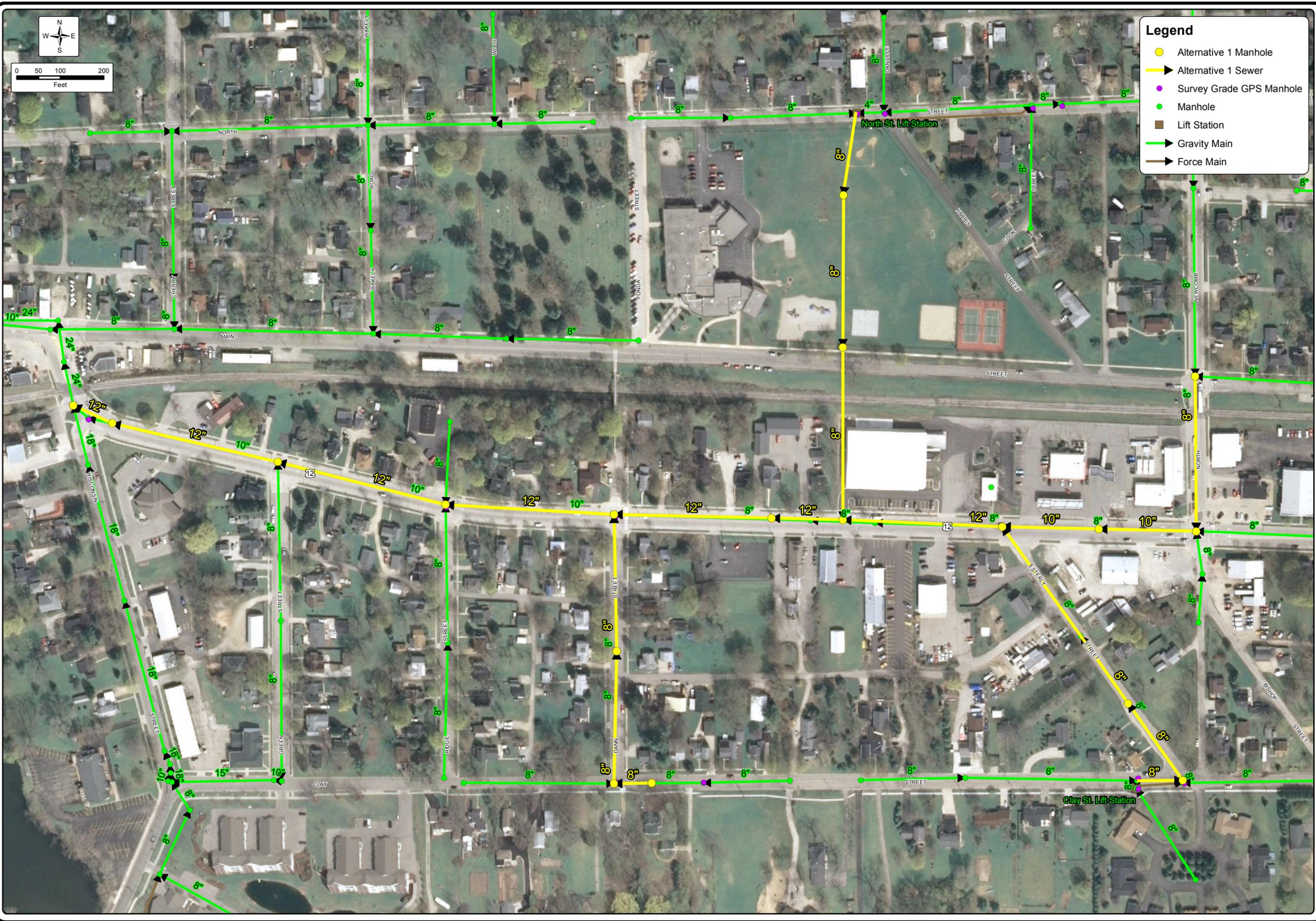
**EAST SIDE SANITARY SEWER STUDY
STUDY AREA**

CITY OF WHITEWATER
WALWORTH COUNTY, WISCONSIN



FIGURE 1
1407.701

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Legend

- Alternative 1 Manhole
- ▶ Alternative 1 Sewer
- Survey Grade GPS Manhole
- Manhole
- Lift Station
- ▶ Gravity Main
- ▶ Force Main

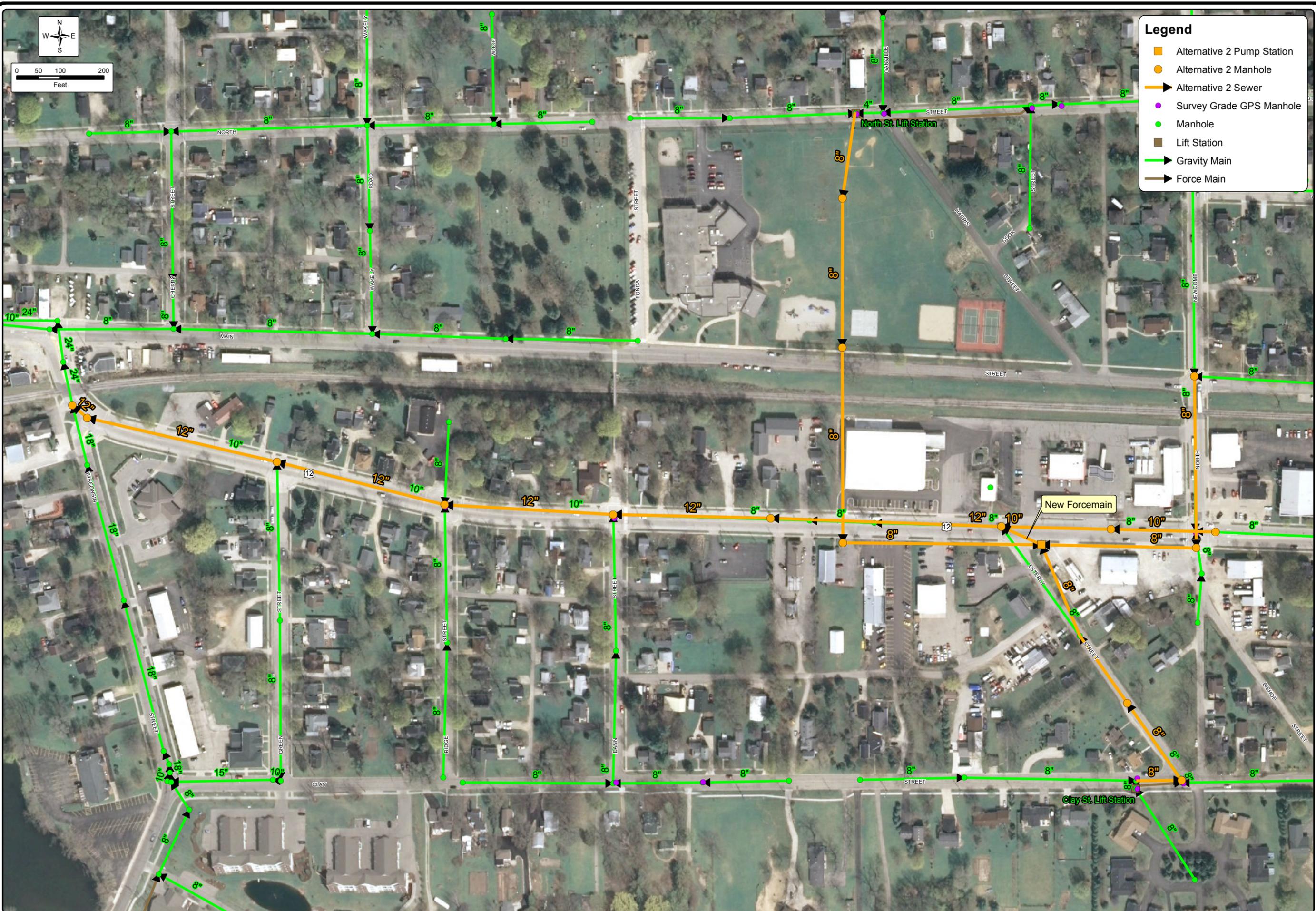
**EAST SIDE SANITARY SEWER STUDY
ALTERNATIVE 1**

CITY OF WHITEWATER
WALWORTH COUNTY, WISCONSIN



FIGURE 2
1407.701

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Legend

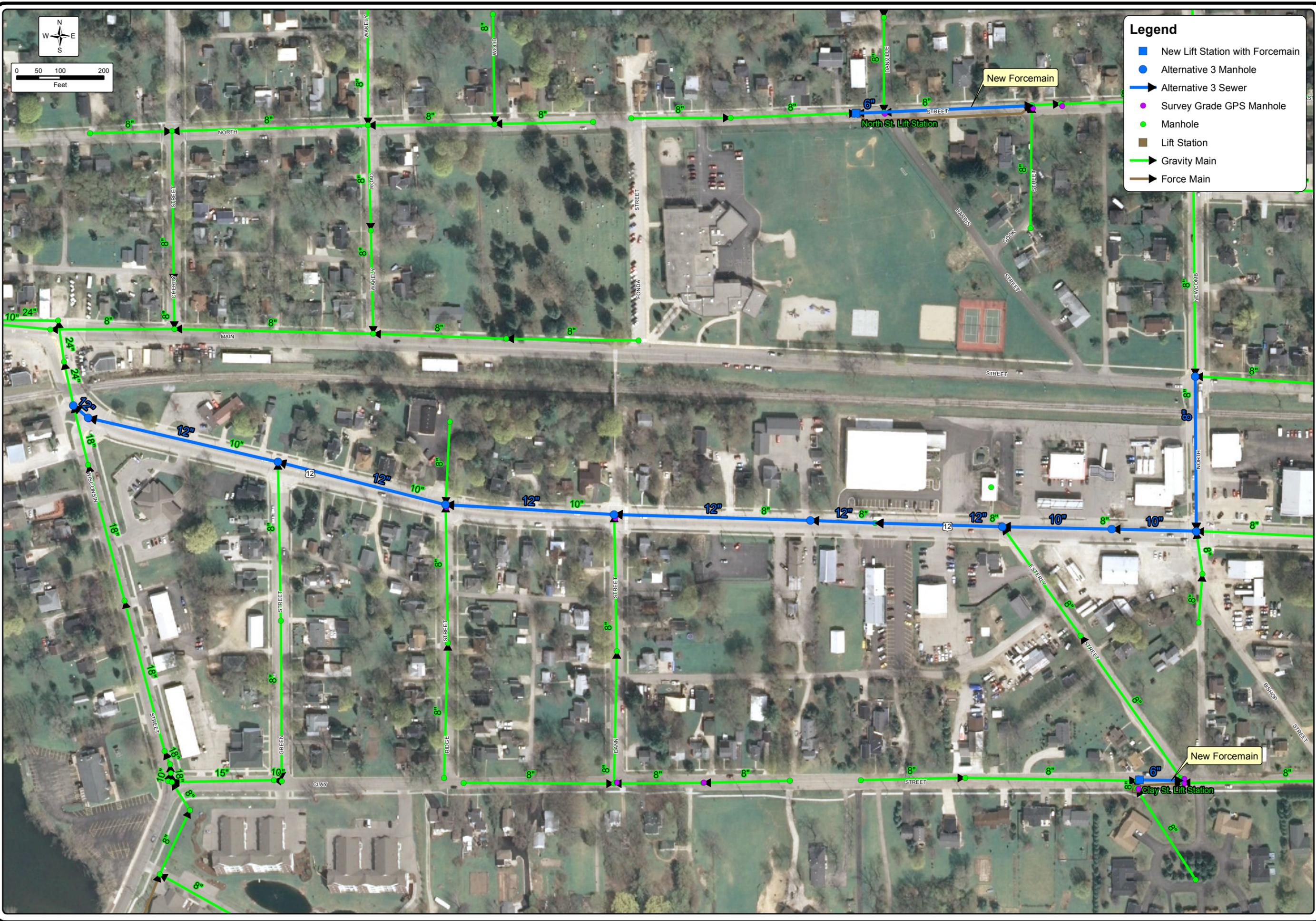
- Alternative 2 Pump Station
- Alternative 2 Manhole
- Alternative 2 Sewer
- Survey Grade GPS Manhole
- Manhole
- Lift Station
- Gravity Main
- Force Main

**EAST SIDE SANITARY SEWER STUDY
ALTERNATIVE 2**
CITY OF WHITEWATER
WALWORTH COUNTY, WISCONSIN



FIGURE 3
1407.701

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Legend

- New Lift Station with Forcemain
- Alternative 3 Manhole
- Alternative 3 Sewer
- Survey Grade GPS Manhole
- Manhole
- Lift Station
- Gravity Main
- Forcemain

EAST SIDE SANITARY SEWER STUDY
ALTERNATIVE 3
 CITY OF WHITEWATER
 WALWORTH COUNTY, WISCONSIN



FIGURE 4
1407.701



Legend

- Alternative 1 Manhole
- ➔ Alternative 1 Sewer
- Survey Grade GPS Manhole
- Manhole
- Lift Station
- ➔ Gravity Main
- ➔ Force Main

EAST SIDE SANITARY SEWER STUDY
ALTERNATIVE 1 - DETAILS
 CITY OF WHITEWATER
 WALWORTH COUNTY, WISCONSIN



FIGURE 5
1407.701

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**APPENDIX
ALTERNATIVE 1 COST BREAKDOWNS**

MILWAUKEE STREET SANITARY SEWER
(Wisconsin Street to Esterly Street-Deep Installation)
CITY OF WHITEWATER, WISCONSIN

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	12-IN DIA Sanitary Sewer (<15 feet deep)	950	LF	\$ 80.00	\$ 76,000
2.	12-IN DIA Sanitary Sewer (15 feet to 20 feet deep)	550	LF	\$ 100.00	\$ 55,000
3.	12-IN DIA Sanitary Sewer (20 feet to 25 feet deep) (Ductile Iron Pipe)	300	LF	\$ 150.00	\$ 45,000
4.	12-IN DIA Sanitary Sewer (25 feet to 30 feet deep) (Ductile Iron Pipe)	400	LF	\$ 220.00	\$ 88,000
5.	10-IN DIA Sanitary Sewer (<15 feet deep)	100	LF	\$ 65.00	\$ 6,500
6.	8-IN DIA Sanitary Sewer (<15 feet deep)	400	LF	\$ 60.00	\$ 24,000
7.	4-FT DIA Sanitary Sewer Manhole	8	EA	\$ 3,500.00	\$ 28,000
8.	Wye Fitting With Riser	42	EA	\$ 500.00	\$ 21,000
9.	4-IN Sewer Lateral	1,500	LF	\$ 50.00	\$ 75,000
10.	Granular Backfill	12,000	T	\$ 8.00	\$ 96,000
11.	Abandon Existing Sanitary Sewer and Manholes	1	LS	\$ 5,000.00	\$ 5,000
12.	Rock Excavation	4,200	LF	\$ 30.00	\$ 126,000
Miscellaneous					
13.	Bypass Pumping	1	LS	\$ 30,000.00	\$ 30,000
14.	Traffic Control and Detour	1	LS	\$ 5,000.00	\$ 5,000
15.	Erosion Control	1	LS	\$ 3,000.00	\$ 3,000
Subtotal					\$ 683,500
25% Contingencies and Technical Services					\$ 170,875
TOTAL PROJECT COST					\$ 854,375

MILWAUKEE STREET AND NEWCOMB STREET SANITARY SEWER
(Esterly St to Newcomb St on Milwaukee St, Milwaukee St to East Main St on Newcomb St)
CITY OF WHITEWATER, WISCONSIN

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	10-IN DIA Sanitary Sewer (<15 feet deep)	350	LF	\$ 70.00	\$ 24,500
2.	8-IN DIA Sanitary Sewer (<15 feet deep)	350	LF	\$ 65.00	\$ 22,750
3.	4-FT DIA Sanitary Sewer Manhole	3	EA	\$ 3,000.00	\$ 9,000
4.	Wye Fitting With Riser	6	EA	\$ 300.00	\$ 1,800
5.	4-IN Sewer Lateral	200	LF	\$ 60.00	\$ 12,000
6.	Granular Backfill	3,000	T	\$ 8.00	\$ 24,000
7.	Abandon Existing Sanitary Sewer and Manholes	1	LS	\$ 5,000.00	\$ 5,000
8.	Bore and Jack Railroad Crossing (Solid Rock)	60	LF	\$ 500.00	\$ 30,000
9.	Rock Excavation	900	LF	\$ 25.00	\$ 22,500
Miscellaneous					
10.	Traffic Control and Detour	1	LS	\$ 4,000.00	\$ 4,000
11.	Erosion Control	1	LS	\$ 2,000.00	\$ 2,000
Subtotal					\$ 157,550
25% Contingencies and Technical Services					\$ 39,388
TOTAL PROJECT COST					\$ 196,938

Esterly Street Sanitary Sewer Extension to Eliminate Clay Street Pumping Station
(Milwaukee Street to Clay Street Pumping Station)
CITY OF WHITEWATER, WISCONSIN
OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer:					
1.	8-IN Sanitary Sewer (10' to 13' deep)	750	LF	\$ 60.00	\$ 45,000.00
2.	4-FT DIA Sanitary Sewer Manhole	2	EA	\$ 2,500.00	\$ 5,000.00
3.	8-IN by 4-IN Wye	4	ea	\$ 150.00	\$ 600.00
4.	4-IN Sanitary Sewer Lateral	120	LF	\$ 40.00	\$ 4,800.00
5.	Rock Excavation	900	LF	\$ 25.00	\$ 22,500.00
6.	Hauled-In Granular Backfill	2,000	T	\$ 8.00	\$ 16,000.00
Miscellaneous:					
7.	Erosion Control	1	LS	\$ 1,500.00	\$ 1,500.00
8.	Traffic Control	1	LS	\$ 1,000.00	\$ 1,000.00
SUBTOTAL					\$ 96,400.00
25% ALLOWANCE FOR CONTINGENCIES AND TECHNICAL SERVICES					\$ 24,100.00
TOTAL					\$ 120,500.00

Sanitary Sewer Extension to Eliminate North Street Pumping Station
(Milwaukee Street to North Street Pumping Station)
CITY OF WHITEWATER, WISCONSIN
OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer:					
1.	8-IN Sanitary Sewer (along Frawley easement)	400	LF	\$ 70.00	\$ 28,000.00
2.	8-IN Sanitary Sewer (across school yard)	550	LF	\$ 50.00	\$ 27,500.00
3.	4-FT DIA Sanitary Sewer Manhole	3	EA	\$ 2,500.00	\$ 7,500.00
4.	Bore and Jack Railroad Crossing (solid rock)	60	LF	\$ 500.00	\$ 30,000.00
5.	Building Protection Allowance	1	LS	\$ 20,000.00	\$ 20,000.00
6.	Rock Excavation	950	LF	\$ 25.00	\$ 23,750.00
7.	Hauled-In Granular Backfill	400	T	\$ 8.00	\$ 3,200.00
Miscellaneous:					
8.	Turf Restoration -Topsoil, Seed, and Mulch	1	LS	\$ 10,000.00	\$ 10,000.00
9.	Pavement Restoration (street crossings and Frawley driveway)	1	ls	\$ 5,000.00	\$ 5,000.00
9.	Erosion Control	1	LS	\$ 2,000.00	\$ 2,000.00
10.	Traffic Control	1	LS	\$ 1,000.00	\$ 1,000.00
SUBTOTAL					\$ 157,950.00
25% ALLOWANCE FOR CONTINGENCIES AND TECHNICAL SERVICES					\$ 39,487.50
TOTAL					\$ 197,437.50

Sanitary Sewer Extension to Eliminate Clay Street/Dann Street Storm Sewer Conflict
(Dann Street from Milwaukee Street to Clay Street)
CITY OF WHITEWATER, WISCONSIN
OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer:					
1.	8-IN Sanitary Sewer (12' to 15' deep)	630	LF	\$ 60.00	\$ 37,800.00
2.	4-FT DIA Sanitary Sewer Manhole	3	EA	\$ 2,500.00	\$ 7,500.00
3.	8-IN by 4-IN Wye	9	ea	\$ 150.00	\$ 1,350.00
4.	4-IN Sanitary Sewer Lateral	270	LF	\$ 40.00	\$ 10,800.00
5.	Rock Excavation	900	LF	\$ 25.00	\$ 22,500.00
6.	Hauled-In Granular Backfill	2,500	T	\$ 8.00	\$ 20,000.00
Miscellaneous:					
7.	Erosion Control	1	LS	\$ 1,500.00	\$ 1,500.00
8.	Traffic Control	1	LS	\$ 1,000.00	\$ 1,000.00
SUBTOTAL					\$ 102,450.00
25% ALLOWANCE FOR CONTINGENCIES AND TECHNICAL SERVICES					\$ 25,612.50
TOTAL					\$ 128,062.50

**APPENDIX
ALTERNATIVE 2 COST BREAKDOWNS**

MILWAUKEE STREET SANITARY SEWER
(Wisconsin Street to Esterly Street-Replace at Existing Depth)
CITY OF WHITEWATER, WISCONSIN

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	12-IN DIA Sanitary Sewer (<15 feet deep)	1,300	LF	\$ 80.00	\$ 104,000
2.	12-IN DIA Sanitary Sewer (15 feet to 20 feet deep)	400	LF	\$ 100.00	\$ 40,000
3.	12-IN DIA Sanitary Sewer (20 feet to 25 feet deep) (Ductile Iron)	500	LF	\$ 150.00	\$ 75,000
4.	10-IN DIA Sanitary Sewer (<15 feet deep)	100	LF	\$ 65.00	\$ 6,500
5.	8-IN DIA Sanitary Sewer (<15 feet deep)	400	LF	\$ 60.00	\$ 24,000
6.	4-FT DIA Sanitary Sewer Manhole	8	EA	\$ 2,750.00	\$ 22,000
7.	Wye Fitting With Riser	42	EA	\$ 300.00	\$ 12,600
8.	4-IN Sewer Lateral	1,500	LF	\$ 50.00	\$ 75,000
9.	Granular Backfill	10,000	T	\$ 8.00	\$ 80,000
10.	Abandon Existing Sanitary Sewer and Manholes	1	LS	\$ 5,000.00	\$ 5,000
11.	Rock Excavation	4,200	LF	\$ 25.00	\$ 105,000
Miscellaneous					
12.	Bypass Pumping	1	LS	\$ 20,000.00	\$ 20,000
13.	Traffic Control and Detour	1	LS	\$ 5,000.00	\$ 5,000
14.	Erosion Control	1	LS	\$ 3,000.00	\$ 3,000
Subtotal					\$ 577,100
25% Contingencies and Technical Services					\$ 144,275
TOTAL PROJECT COST					\$ 721,375

MILWAUKEE STREET AND NEWCOMB STREET SANITARY SEWER
(Esterly St to Newcomb St on Milwaukee St, Milwaukee St to East Main St on Newcomb St)
CITY OF WHITEWATER, WISCONSIN

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	10-IN DIA Sanitary Sewer (<15 feet deep)	350	LF	\$ 70.00	\$ 24,500
2.	8-IN DIA Sanitary Sewer (<15 feet deep)	350	LF	\$ 65.00	\$ 22,750
3.	4-FT DIA Sanitary Sewer Manhole	3	EA	\$ 3,000.00	\$ 9,000
4.	Wye Fitting With Riser	6	EA	\$ 300.00	\$ 1,800
5.	4-IN Sewer Lateral	200	LF	\$ 60.00	\$ 12,000
6.	Granular Backfill	3,000	T	\$ 8.00	\$ 24,000
7.	Abandon Existing Sanitary Sewer and Manholes	1	LS	\$ 5,000.00	\$ 5,000
8.	Bore and Jack Railroad Crossing (Solid Rock)	60	LF	\$ 500.00	\$ 30,000
9.	Rock Excavation	900	LF	\$ 25.00	\$ 22,500
Miscellaneous					
10.	Traffic Control and Detour	1	LS	\$ 4,000.00	\$ 4,000
11.	Erosion Control	1	LS	\$ 2,000.00	\$ 2,000
Subtotal					\$ 157,550
25% Contingencies and Technical Services					\$ 39,388
TOTAL PROJECT COST					\$ 196,938

Milwaukee Street Pumping Station No. 2
(Milwaukee Street Near Esterly Street)
CITY OF WHITEWATER, WISCONSIN

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	10-IN DIA Sanitary Sewer (<15 feet deep) (Parallel sewer to bypass PS)	500	LF	\$ 65.00	\$ 32,500
2.	6-IN Force Main	150	LF	\$ 75.00	\$ 11,250
3.	4-FT DIA Sanitary Sewer Manhole	3	EA	\$ 3,000.00	\$ 9,000
4.	Granular Backfill	1,000	T	\$ 8.00	\$ 8,000
5.	New Submersible Pumping Station with Valve Vault and Controls	1	LS	\$ 250,000.00	\$ 250,000
6.	Rock Excavation	200	LF	\$ 25.00	\$ 5,000
Miscellaneous					
7.	Traffic Control and Detour	1	LS	\$ 1,000.00	\$ 1,000
8.	Erosion Control	1	LS	\$ 500.00	\$ 500
Subtotal					\$ 317,250
25% Contingencies and Technical Services					\$ 79,313
TOTAL PROJECT COST					\$ 396,563

Esterly Street Sanitary Sewer Extension to Eliminate Clay Street Pumping Station
(Milwaukee Street to Clay Street Pumping Station)
CITY OF WHITEWATER, WISCONSIN
OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer:					
1.	8-IN Sanitary Sewer (10' to 13' deep)	750	LF	\$ 60.00	\$ 45,000.00
2.	4-FT DIA Sanitary Sewer Manhole	2	EA	\$ 2,500.00	\$ 5,000.00
3.	8-IN by 4-IN Wye	4	ea	\$ 150.00	\$ 600.00
4.	4-IN Sanitary Sewer Lateral	120	LF	\$ 40.00	\$ 4,800.00
5.	Rock Excavation	900	LF	\$ 25.00	\$ 22,500.00
6.	Hauled-In Granular Backfill	2,000	T	\$ 8.00	\$ 16,000.00
Miscellaneous:					
7.	Erosion Control	1	LS	\$ 1,500.00	\$ 1,500.00
8.	Traffic Control	1	LS	\$ 1,000.00	\$ 1,000.00
SUBTOTAL					\$ 96,400.00
25% ALLOWANCE FOR CONTINGENCIES AND TECHNICAL SERVICES					\$ 24,100.00
TOTAL					\$ 120,500.00

Sanitary Sewer Extension to Eliminate North Street Pumping Station
(Milwaukee Street to North Street Pumping Station)
CITY OF WHITEWATER, WISCONSIN
OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer:					
1.	8-IN Sanitary Sewer (along Frawley easement)	400	LF	\$ 70.00	\$ 28,000.00
2.	8-IN Sanitary Sewer (across school yard)	550	LF	\$ 50.00	\$ 27,500.00
3.	4-FT DIA Sanitary Sewer Manhole	3	EA	\$ 2,500.00	\$ 7,500.00
4.	Bore and Jack Railroad Crossing (solid rock)	60	LF	\$ 500.00	\$ 30,000.00
5.	Building Protection Allowance	1	LS	\$ 20,000.00	\$ 20,000.00
6.	Rock Excavation	950	LF	\$ 25.00	\$ 23,750.00
7.	Hauled-In Granular Backfill	400	T	\$ 8.00	\$ 3,200.00
Miscellaneous:					
8.	Turf Restoration -Topsoil, Seed, and Mulch	1	LS	\$ 10,000.00	\$ 10,000.00
9.	Pavement Restoration (street crossings and Frawley driveway)	1	ls	\$ 5,000.00	\$ 5,000.00
9.	Erosion Control	1	LS	\$ 2,000.00	\$ 2,000.00
10.	Traffic Control	1	LS	\$ 1,000.00	\$ 1,000.00
SUBTOTAL					\$ 157,950.00
25% ALLOWANCE FOR CONTINGENCIES AND TECHNICAL SERVICES					\$ 39,487.50
TOTAL					\$ 197,437.50

**APPENDIX
ALTERNATIVE 3 COST BREAKDOWNS**

MILWAUKEE STREET SANITARY SEWER
(Wisconsin Street to Esterly Street-Replace at up to 2 feet Deeper than Existing Depth)
CITY OF WHITEWATER, WISCONSIN
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	12-IN DIA Sanitary Sewer (<15 feet deep)	1,300	LF	\$ 80.00	\$ 104,000
2.	12-IN DIA Sanitary Sewer (15 feet to 20 feet deep)	400	LF	\$ 100.00	\$ 40,000
3.	12-IN DIA Sanitary Sewer (20 feet to 25 feet deep) (Ductile Iron)	500	LF	\$ 150.00	\$ 75,000
4.	10-IN DIA Sanitary Sewer (<15 feet deep)	100	LF	\$ 70.00	\$ 7,000
5.	8-IN DIA Sanitary Sewer (<15 feet deep)	400	LF	\$ 60.00	\$ 24,000
6.	4-FT DIA Sanitary Sewer Manhole	8	EA	\$ 3,300.00	\$ 26,400
7.	Wye Fitting With Riser	42	EA	\$ 300.00	\$ 12,600
8.	4-IN Sewer Lateral	1,500	LF	\$ 50.00	\$ 75,000
9.	Granular Backfill	10,000	T	\$ 8.00	\$ 80,000
10.	Abandon Existing Sanitary Sewer and Manholes	1	LS	\$ 5,000.00	\$ 5,000
11.	Rock Excavation	4,200	LF	\$ 25.00	\$ 105,000
Miscellaneous					
12.	Bypass Pumping	1	LS	\$ 25,000.00	\$ 25,000
13.	Traffic Control and Detour	1	LS	\$ 5,000.00	\$ 5,000
14.	Erosion Control	1	LS	\$ 3,000.00	\$ 3,000
Subtotal					\$ 587,000
25% Contingencies and Technical Services					\$ 146,750
TOTAL PROJECT COST					\$ 733,750

MILWAUKEE STREET AND NEWCOMB STREET SANITARY SEWER
(Esterly St to Newcomb St on Milwaukee St, Milwaukee St to East Main St on Newcomb St)
CITY OF WHITEWATER, WISCONSIN

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	10-IN DIA Sanitary Sewer (<15 feet deep)	350	LF	\$ 70.00	\$ 24,500
2.	8-IN DIA Sanitary Sewer (<15 feet deep)	350	LF	\$ 65.00	\$ 22,750
3.	4-FT DIA Sanitary Sewer Manhole	3	EA	\$ 3,000.00	\$ 9,000
4.	Wye Fitting With Riser	6	EA	\$ 300.00	\$ 1,800
5.	4-IN Sewer Lateral	200	LF	\$ 60.00	\$ 12,000
6.	Granular Backfill	3,000	T	\$ 8.00	\$ 24,000
7.	Abandon Existing Sanitary Sewer and Manholes	1	LS	\$ 5,000.00	\$ 5,000
8.	Bore and Jack Railroad Crossing (Solid Rock)	60	LF	\$ 500.00	\$ 30,000
9.	Rock Excavation	900	LF	\$ 25.00	\$ 22,500
Miscellaneous					
10.	Traffic Control and Detour	1	LS	\$ 4,000.00	\$ 4,000
11.	Erosion Control	1	LS	\$ 2,000.00	\$ 2,000
Subtotal					\$ 157,550
25% Contingencies and Technical Services					\$ 39,388
TOTAL PROJECT COST					\$ 196,938

Clay Street Pumping Station Replacement
CITY OF WHITEWATER, WISCONSIN
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	8-IN DIA Sanitary Sewer (<15 feet deep)	50	LF	\$ 65.00	\$ 3,250
2.	4-IN Force Main	100	LF	\$ 60.00	\$ 6,000
3.	4-FT DIA Sanitary Sewer Manhole	1	EA	\$ 3,000.00	\$ 3,000
4.	Granular Backfill	1,000	T	\$ 8.00	\$ 8,000
5.	Abandon Existing Pumping Station	1	LS	\$ 3,000.00	\$ 3,000
6.	New Submersible Pumping Station with Valve Vault and Controls	1	LS	\$ 250,000.00	\$ 250,000
7.	Rock Excavation	150	LF	\$ 25.00	\$ 3,750
Miscellaneous					
8.	Traffic Control and Detour	1	LS	\$ 1,000.00	\$ 1,000
9.	Erosion Control	1	LS	\$ 500.00	\$ 500
Subtotal					\$ 278,500
25% Contingencies and Technical Services					\$ 69,625
TOTAL PROJECT COST					\$ 348,125

North Street Pumping Station Replacement
CITY OF WHITEWATER, WISCONSIN
PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

No.	Description	Quantity	Unit	Unit Price	Total Price
Sanitary Sewer					
1.	8-IN DIA Sanitary Sewer (<15 feet deep)	50	LF	\$ 65.00	\$ 3,250
2.	4-IN Force Main	400	LF	\$ 60.00	\$ 24,000
3.	4-FT DIA Sanitary Sewer Manhole	1	EA	\$ 3,000.00	\$ 3,000
4.	Asphalt Patch for Force Main	400	LF	\$ 25.00	\$ 10,000
5.	Granular Backfill	1,500	T	\$ 8.00	\$ 12,000
6.	Abandon Existing Pumping Station	1	LS	\$ 3,000.00	\$ 3,000
7.	New Submersible Pumping Station with Valve Vault and Controls	1	LS	\$ 250,000.00	\$ 250,000
8.	Rock Excavation	450	LF	\$ 25.00	\$ 11,250
Miscellaneous					
9.	Traffic Control and Detour	1	LS	\$ 1,000.00	\$ 1,000
10.	Erosion Control	1	LS	\$ 500.00	\$ 500
Subtotal					\$ 318,000
25% Contingencies and Technical Services					\$ 79,500
TOTAL PROJECT COST					\$ 397,500