WELLINGTON

South Shore Boulevard
Wastewater Forcemain Route Study

PA# B6704.50

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Prepared By:

MOCK • ROOS

CONSULTING ENGINEERS

Executive Summary

The Village of Wellington owns and operates a wastewater transmission system that includes a Water Reclamation Facility, over 100 lift stations, and 60 miles of forcemain piping. The Village desires to upgrade its existing forcemain in South Shore Boulevard due to its age and substandard material, provide redundancy in the system, and accommodate future growth. The Village contracted Mock•Roos to complete a Route Study for the pipeline replacement.

Mock•Roos was tasked with identifying, evaluating, and recommending a pipeline route within the South Shore Boulevard corridor for the proposed forcemain. The route evaluation included field reconnaissance, utility coordination, constructability, traffic impacts, pipe size analysis, and construction cost estimation. Two conceptual route alternatives were considered for South Shore. A comparison of the two routes was completed to determine the recommended route. The alignment along the south side of South Shore Boulevard was selected as the recommended route as depicted in Exhibit 3.

Since the South Shore forcemain requires replacement, there is an opportunity to provide additional capacity in the South Shore main to provide redundancy in the system and accommodate future growth. Mock•Roos developed a system map of the Village components (depicted in Exhibit 1) to review and discuss options with the Village. It was determined that a new forcemain could be constructed along the C-6 Canal, Pierson Road, and C-23 Canal rights-of-way to provide additional capacity for future growth and redundancy in the system. A phasing plan was developed for the pipeline routes, along with a cost analysis for each phase.

The overall cost for the four-mile long recommended route and system upgrades is $6.9 million dollars.

I. Introduction

A. Authorization

The Village of Wellington contracted Mock•Roos to complete a Route Study for replacement of the existing forcemain within South Shore Boulevard.

B. Background

The South Shore Boulevard forcemain was constructed in the 1980s and was constructed of PVC Class 160 pipe, which is inferior to typical construction materials used today. The pipeline is reaching 40 years of age and nearing the end of its useful life. The forcemain requires replacement due to its age and substandard material. Replacement of the pipeline will also allow the Village to provide redundancy in the system and accommodate future growth.

C. Scope of Services

Mock•Roos was selected to identify, evaluate, and recommend a pipeline route for a new forcemain in South Shore Boulevard. The scope of services was expanded to also include evaluation of an additional forcemain route to the Water Reclamation Facility to provide system redundancy and accommodate growth. The recommended routes were to be based on an in-depth analysis of the South Shore Boulevard corridor, the C-6 Canal right-of-way, and the Pierson Road corridor considering the following factors:

- Existing field conditions
- Existing and anticipated future Village of Wellington utilities
- Locations of existing infrastructure owned by other utilities (FPL, AT&T, Comcast Cable, FPU, etc.)
- Permitting
- Constructability
- Pipe Size
- Project Costs

The Village provided the following record information for its existing utilities to assist with the evaluation:

- Record drawings
- GIS shapefiles of the wastewater collection and transmission system
- GIS shapefiles of the potable, reclaimed and raw water transmission systems

A recommended pipe route was developed along with a construction phasing plan. A conceptual opinion of probable costs was also completed for each construction phase.

II. Route Evaluation

Several parameters were taken into consideration for replacing the existing forcemain in South Shore Boulevard and reviewing additional routes to provide redundancy and accommodate future growth in the system. A review was completed considering the existing pipe routing, field conditions, existing utilities, permitting, constructability, and traffic impacts. Coordination meetings were also held with Village staff to obtain their input on route selection.

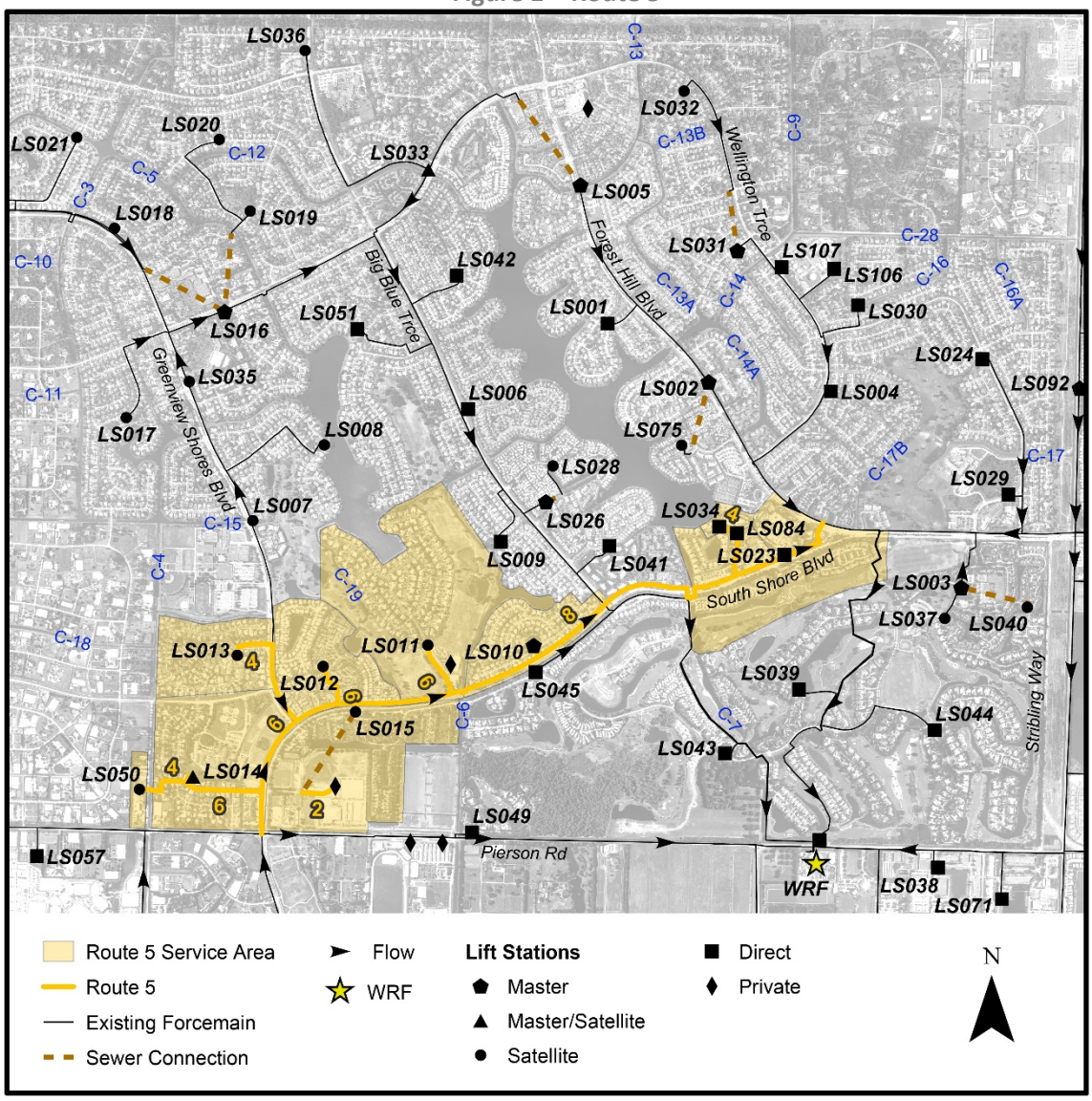
A. Existing System

The Village provided GIS data and as-built drawings of the wastewater system. This information was reviewed to gain an understanding of the forcemain network. A map of the existing system and flow pattern is depicted in Exhibit 1. The forcemains were delineated into several routes for identification and discussion.

South Shore Boulevard Forcemain - Route 5

The existing South Shore Boulevard forcemain is on the north side of the road from Pierson Road to Forest Hill Boulevard. It is an 8" forcemain that collects sewage from eleven (11) lift stations. The forcemain has three alternative discharge points: a 12" main at Pierson Road (Route 1); an 18" main at Big Blue Trace (Route 4); and, a 16" main at Forest Hill Boulevard (Route 7). The forcemain currently discharges at two of these points. The eight (8) lift stations west of Big Blue Trace discharge to Route 4. The remaining three (3) lift stations to the east discharge to Route 7. The contributing service area and lift stations for the South Shore forcemain are depicted in Figure 1.

Figure 1 – Route 5

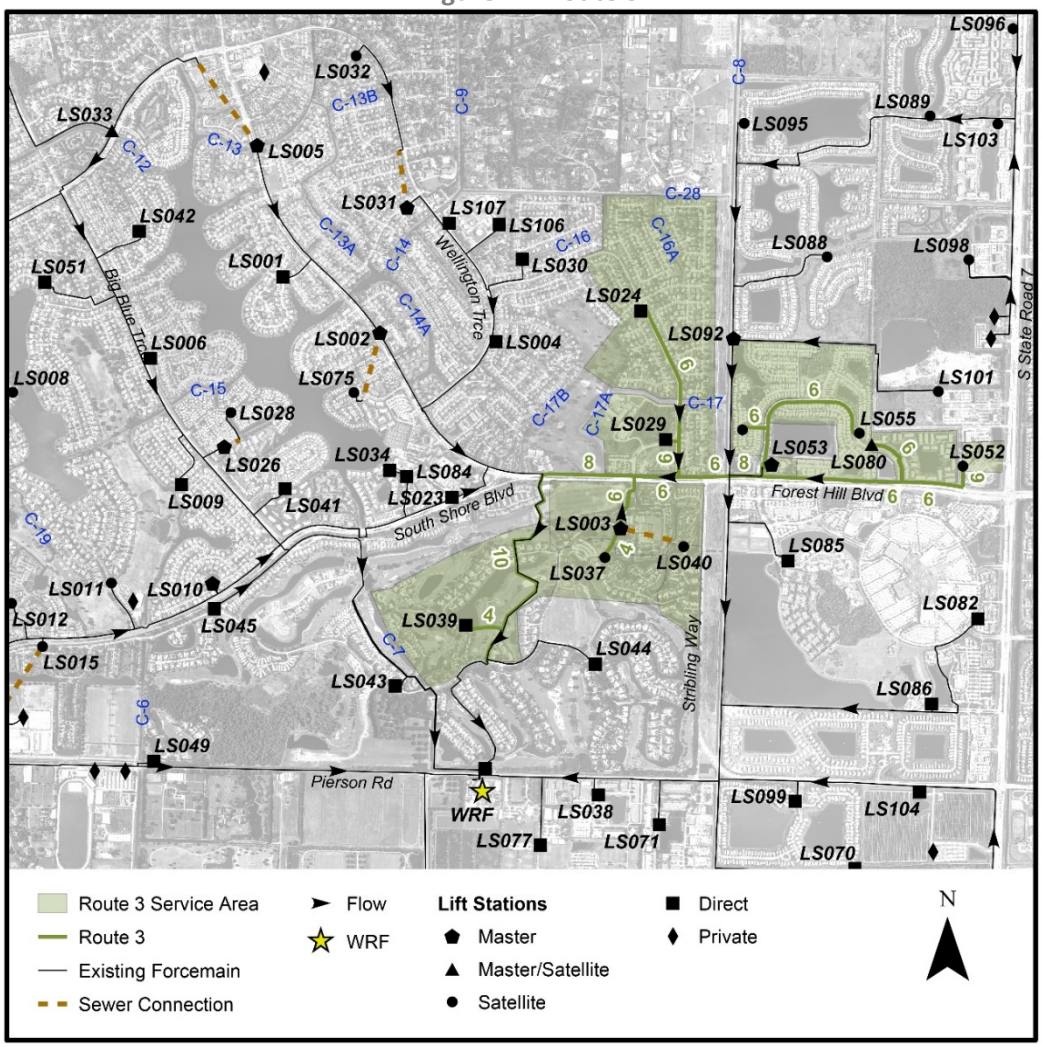


Polo Club Development Forcemain - Routes 3, 4, 7, and 8

A significant portion of the Village's wastewater flow is routed through forcemains in the Polo Club development including Routes 3, 4, 7 and 8. There is also an existing forcemain that is not in use within this area. Village staff believes this main requires repair before it could be placed into service. The portions of Routes 3 and 7 through Polo Club lie parallel to each other from Forest Hill Boulevard to their convergence at Route 8. Route 8 continues from this point to the Water Reclamation Facility. The portion of Route 4 through Polo Club runs from Big Blue Trace and then along the C-7 Canal to the Water Reclamation Facility. A map of the forcemains through Polo Club is depicted in Exhibit 2. It would be advantageous to the Village to have the ability to re-direct flow around the Polo Club area to provide future maintenance and upgrades to those existing pipelines.

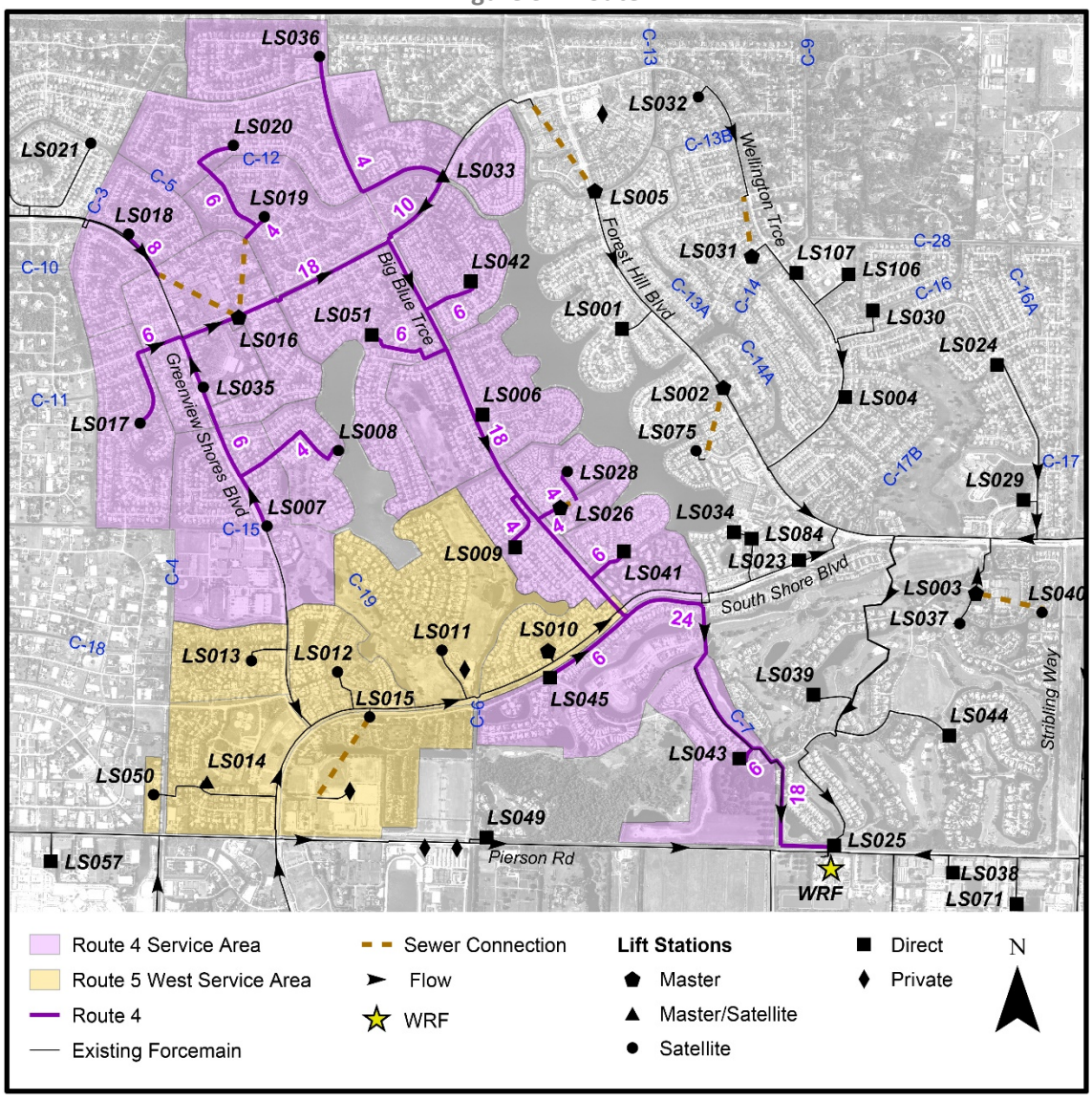
Route 3 collects sewage from eleven (11) lift stations. It is a 10" forcemain through Polo Club before its convergence with Route 7. The contributing service area and lift stations for Route 3 are depicted below.

Figure 2 – Route 3



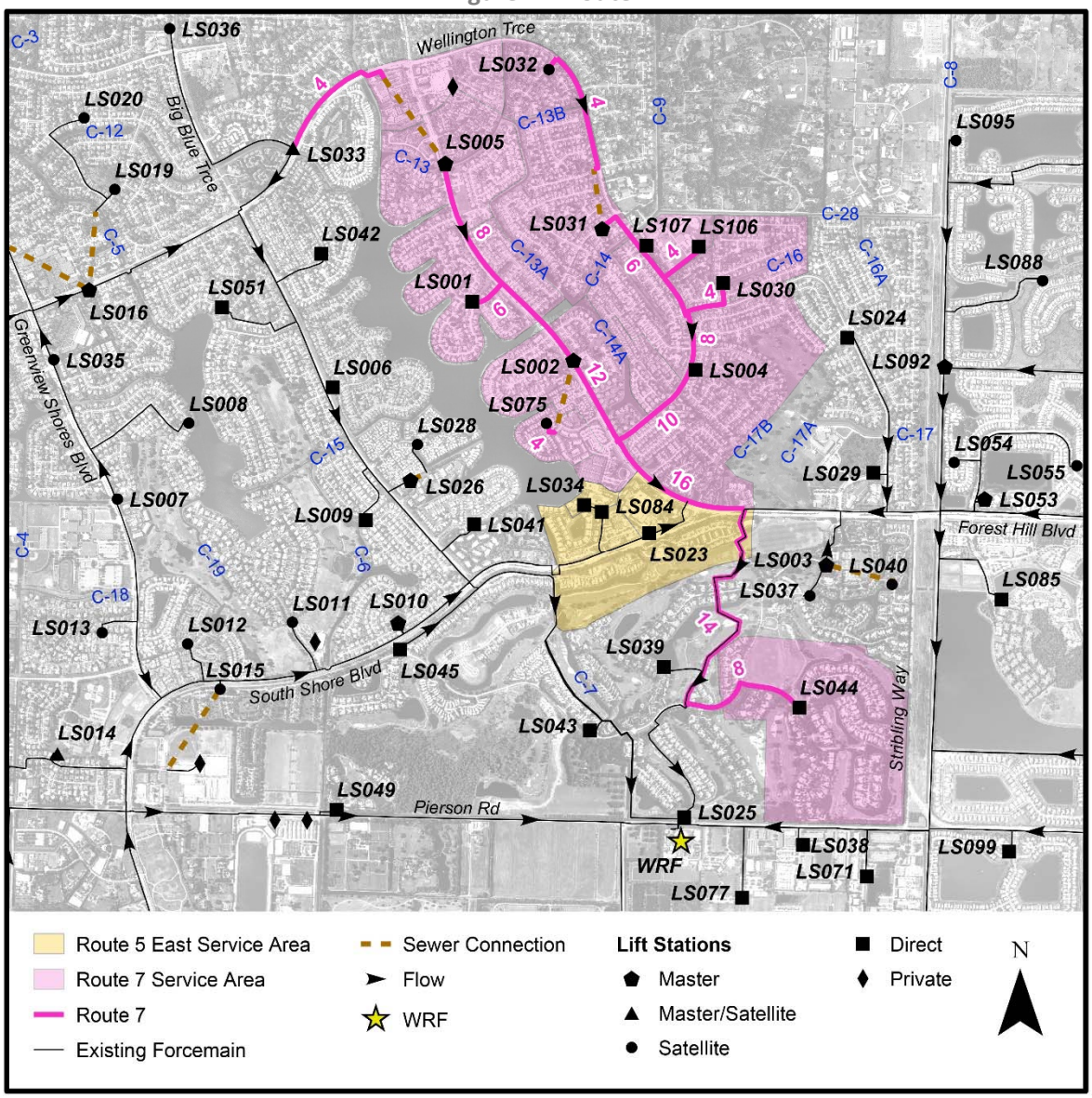
Route 4 collects sewage from the western portion of Route 5 and nineteen (19) other lift stations. It varies from an 18" to 24" main through Polo Club. The forcemain connects to Route 8 before discharging to the Water Reclamation Facility through a 16" main at Pierson Road. The contributing service area and lift stations for Route 4 are depicted below.

Figure 3 – Route 4



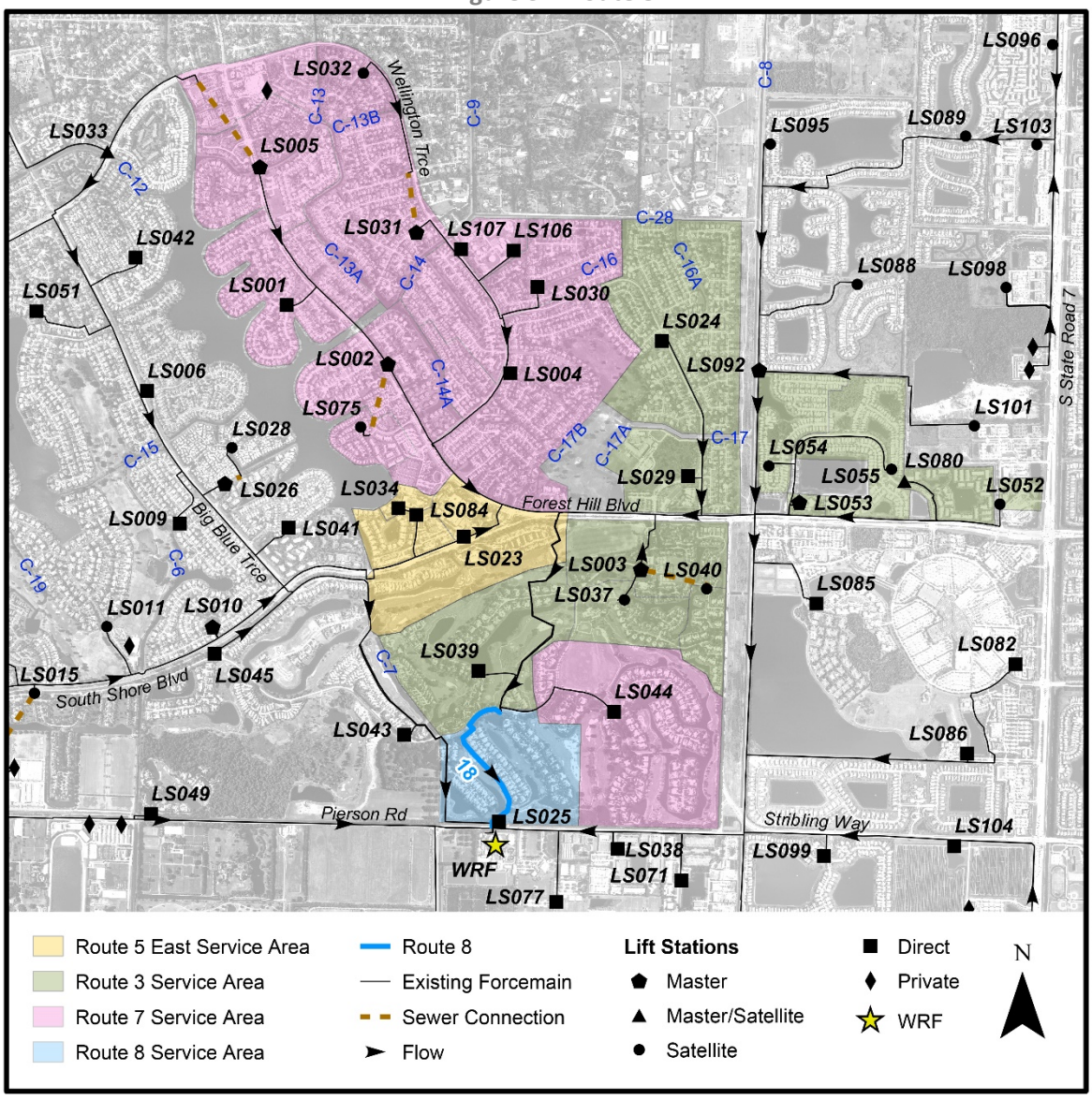
Route 7 collects sewage from the eastern portion of Route 5 and twelve (12) other lift stations. It is a 14" forcemain through Polo Club. The contributing service area and lift stations for Route 7 are depicted below.

Figure 4 – Route 7



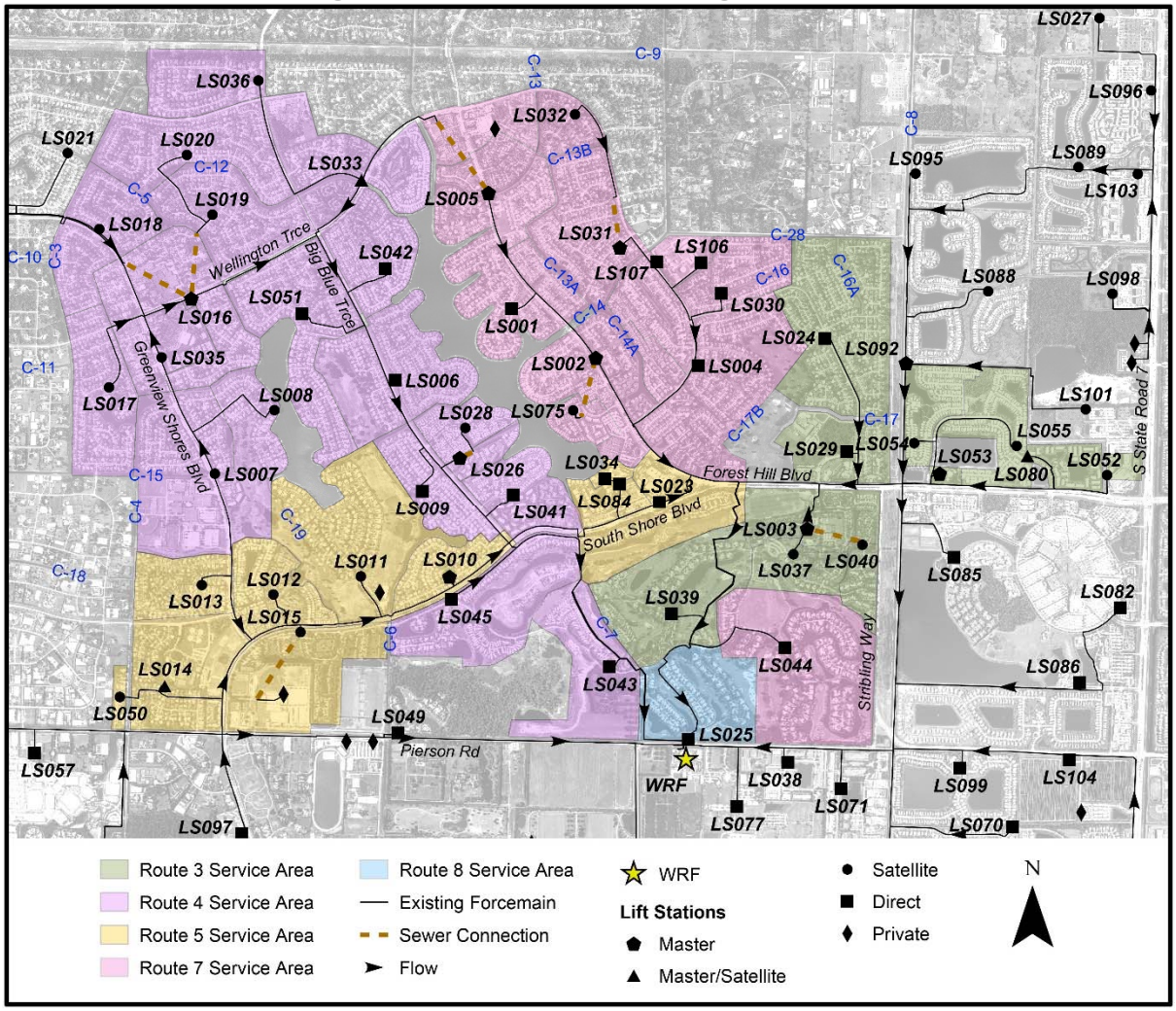
Route 8 collects sewage from Routes 3 and 7 and one (1) additional lift station. It is an 18" main through Polo Club. The forcemain connects with Route 4 before discharging to the Water Reclamation Facility through a 16" main at Pierson Road. The contributing service area and lift stations for Route 8 are depicted below.

Figure 5 – Route 8



The contributing area and lift stations for the forcemains routed through the Polo Club development are depicted below.

Figure 6 – Forcemain Routes through Polo Club



B. Proposed System

Route 5 will be replaced within the South Shore Boulevard corridor from Sheffield Street to Forest Hill Boulevard. In discussions with the Village, it was noted that Route 5 does not discharge to Route 1 at Pierson Road, due to existing capacity constraints within Route 1. The connection to Route 1 is not considered to be advantageous for the system. Therefore, this connection will not be included in the recommended pipe alignment.

The Village wishes to be able to redirect the flow from Routes 3, 4, 7, and 8 around the Polo Club development to provide system redundancy. Routes 4 and 7 currently interconnect with Route 5. Since the Village plans to replace Route 5, it is logical to take this opportunity to provide redundancy and plan for additional capacity for future growth. Route 5 would become a primary collector main. A new discharge pipeline from Route 5 is necessary to redirect flow around the Polo Club development to the Water Reclamation Facility. The existing forcemain in Pierson Road does not have adequate capacity. A new forcemain may be routed from South Shore Boulevard to the C-6 Canal right-of-way and then along Pierson Road to the Water Reclamation Facility. This alignment will be evaluated for the proposed forcemain.

An additional route to provide redundancy for Route 3 and additional capacity for future growth may be provided in a future utility project. A possible alignment for a future forcemain could be along Stribling Way.

C. Utility Coordination

Potential conflicts with existing utilities is a major factor in the evaluation of the pipeline route. Maps were sent to utility companies requesting information on the location of their existing and/or future utilities in the proposed project area.

FPL, FPU, Comcast, and Extenet provided utility data for their facilities. Palm Beach County Traffic Operations responded that that they did not have utilities in the area. AT&T did not provide utility data for their facilities, but limited information on those utilities was obtained through visual observations during field review.

Existing utility data obtained from field observations and utility company responses was mapped for consideration during the evaluation.

D. Field Reconnaissance

A field review of the South Shore Boulevard, Pierson Road, and the C-6 and C-23 Canal rights-of-way was performed to determine physical constraints and constructability issues along the routes. Existing utility data mapped in the office was verified and additional utility data was obtained during field reconnaissance. Photos were taken to document field conditions.

E. Permitting

The pipe routes are proposed to be located primarily within Village-owned road or canal rights-of-way. The Village and FDEP have permitting jurisdiction in these areas. The permitting process for the proposed forcemains should be straight-forward, requiring submittal of design documents and applicable fees.

F. Rights-of-Way and Easements

The new pipeline routes will require adequate space for construction. Limited research was conducted to determine right-of-way limits and existing easements. Plats for the areas and the Palm Beach County GIS parcel map were used as guides for right-of-way and easement limits. The estimated right-of-way and easement limits are depicted in detailed mapping of the routes in the Appendices.

The proposed route is primarily within existing public road and canal rights-of-way. Routing of the pipeline through private property was limited to minimize the need for easements. It would be desirable to obtain at least twenty-foot permanent easements for maintenance access. Temporary construction easements may be necessary in some locations.

Detailed research of property records for exact rights-of-way and easements was beyond the scope of this evaluation, but the data assembled for the evaluation provides a good estimate of this information. Field surveys should be conducted prior to design to provide exact locations.

G. Constructability

An important factor in selecting the route is the feasibility of constructing the pipeline in the chosen alignment. The ease of construction, traffic impacts and conflicts were considered in selection of the routes.

South Shore Boulevard

South Shore Boulevard is a four-lane road with landscaped and concrete medians, swales, sidewalks and curbs in a 120-foot right-of-way. South Shore has an extensive storm water network with multiple crossings of the roadway. A reclaimed watermain runs along the northern sidewalk from Pierson Road to Greenview Shores Boulevard. The existing forcemain is also along the north side, adjacent to the reclaimed watermain, but continues to Forest Hill Boulevard. There is an existing watermain running along the south sidewalk with multiple crossings of the roadway. A gas main crosses the road from Chancellor Drive to the south shoulder of the road and continues within the shoulder to Forest Hill Boulevard. The numerous existing utilities will pose challenges during construction.

South Shore is a major thoroughfare within Wellington. Construction within the lanes of the roadway would have significant impact on traffic. It is desirable to construct a new pipeline outside of the travel lanes to minimize impacts to traffic flow.

Two optional routes were considered along South Shore. Option 1 is on the north side of the right-of-way in close proximity to the existing forcemain. Option 2 is on the south side of the right-of-way adjacent to the existing watermain. Detailed mapping of the two route options is included in Appendix A – Option 1 and Appendix B – Option 2.

C-6 Canal

The portion of the C-6 Canal right-of-way being considered extends from Polo Club Road to Pierson Road. The small area between South Shore Boulevard and the C-6 Canal is privately owned and would require an easement for the new pipeline. There is an existing landscape berm, fencing and a private road that the route would be required to cross. This could be accomplished by horizontal directional drilling (HDD) to minimize impacts to existing features and traffic. This method of construction would also facilitate crossing the existing watermain in Polo Club Road. The west bank of the canal within the canal right-of-way is an open grassed area. There are two locations where a hedge and fence encroach into the canal right-of-way, and these would need to be removed for construction. Most of the east bank is heavily landscaped and narrows by 20 feet to accommodate Hurlington Drive for a portion of its length. The west bank of the canal would provide the least challenges for construction of the forcemain.

Pierson Road

The Pierson Road corridor is a 100-foot wide right-of-way containing the road on the south and the C-23 Canal on the north. There is guard rail separating the road and canal for the entire length of the proposed route. There is an existing forcemain on the north side of the road, a watermain on the south side of the road for approximately 800 feet east of the C-6 Canal, and multiple storm pipes crossing the road. There is a grass swale along the south side of the road. The canal bank on the north varies from 15 to 20 feet in width. There is an existing forcemain and a watermain that are along that bank from the C-6 Canal to approximately 200 feet east. There is also a large water transmission main that runs from the C-6 Canal to 120th Avenue South. That watermain was installed by HDD from the C-7 Canal to approximately 1,300 feet east. This area has a significant amount of vegetation. There are no utilities along the south bank of the canal because it is too narrow to facilitate construction.

In the areas where the north bank of the canal is wide and has open grassed areas, it is ideal for the forcemain route. However, the variation in the bank's width and the existing utilities does not allow

adequate space for construction along the entire route. Construction adjacent to and within the roadway will impact traffic flow, but it appears to be the option that has adequate space for construction.

H. Pipe Sizing Analysis

A simple pipe sizing analysis was completed to provide adequate capacity for redirecting flow around the Polo Club development. The pipe size is based on lift station design flows and pipe velocities. The additional proposed capacity in the forcemain will also support future growth in the system. Pipe sizes are indicated in the detailed maps in the Appendices.

I. Route Selection

The two options along South Shore Boulevard both have adequate space for construction of a new forcemain. Both routes also indicate numerous conflicts with existing utilities. The north route has more impacts to sidewalks, curbs, driveways and local roads than the south route requiring additional maintenance of traffic and restoration. There are also walls adjacent to residential properties along the north route that could possibly be impacted during construction. Along the south route there is significant vegetation in some areas requiring clearing and restoration. There are more needed pipe crossings of South Shore Boulevard from the south route to connect to existing forcemains. Both routes pose challenges for construction of a new forcemain. The parameters evaluated for the two route options for South Shore Boulevard are presented in Table 1 for a comparative analysis.

Table 1
South Shore Boulevard Route Selection

Route	Option 1 – North Alignment	Option 2 – South Alignment
Field Observation	▪ Open grass areas along about half of the alignment ▪ The ROW is adjacent to walls along residential communities	▪ Open grass areas for most of the alignment ▪ Heavy landscaping for 3,000 feet ▪ There is a large landscape buffer between the ROW and residential communities
ROW and Easements	▪ +/- 10’ wide grass area along about 5,000’ of north ROW ▪ 12’ utility easement adjacent to north ROW from Pierson Road to C-7 Canal ▪ 10’ utility easement adjacent to north ROW from C-7 Canal to Forest Hill Boulevard	▪ +/- 10’ wide grass area along most of south ROW ▪ 12’ utility easement adjacent to south ROW from Pierson Road to C-7 Canal ▪ 12’ Bellsouth easement adjacent to south ROW from C-7 Canal to Forest Hill Boulevard
Potential Conflicts	▪ 67 utility conflicts ▪ 2 HDDs	▪ 65 utility conflicts ▪ 10 HDDs
Traffic Impacts	▪ 10 road intersections ▪ 8 residential and commercial driveways ▪ Pedestrian traffic impacts for 5,000 feet of sidewalk construction	▪ 5 road intersections ▪ 6 residential and commercial driveways

Since both routes have many challenges and conflicts, a cost analysis was completed for each route. Conceptual level opinion of probable construction costs for each option are included in Tables 2 and 3. After reviewing the costs for each option, Option 2 was selected as the recommended route.

From South Shore the route continues to the C-6 Canal right-of-way. The pipe route is proposed to enter private property crossing an existing fence, hedge and private road (Polo Club Road) to continue to the C-6 right-of-way. Traffic impacts could be minimized in this location by installing the pipeline using HDD. There is

an existing watermain on the west bank of the C-6 Canal that crosses in this same location. There is likely an existing utility easement within this private area for the watermain that could possibly be utilized for the forcemain, depending on its width. The west bank has a large +/- 25' wide grassed area with minor landscaping in select areas within the C-6 Canal right-of-way. The west bank is the obvious choice for the pipe alignment. A selection matrix was not necessary for the selection of the pipe alignment in this area.

The route continues to the Water Reclamation Facility along Pierson Road. The road provides adequate space for construction; therefore, it was selected for the pipe alignment.

J. Probable Construction Methods

There are several methods of construction for the installation of new pipelines. The probable methods for construction of the forcemain considered were open-cut and horizontal directional drilling (HDD). Open-cut construction is the traditional method for constructing pipelines and is generally less expensive than other methods. HDD is a newer construction method generally used to minimize impacts to traffic or in situations where there are numerous conflicts.

South Shore Boulevard

South Shore Boulevard is a four-lane road with landscaped and concrete medians, swales, sidewalks and curbs, and an extensive storm sewer network. It is probable that the pipeline would be constructed primarily by open-cut in the swale areas. There would likely also be limited open-cut construction at tie-in locations on side roads. Where the forcemain crosses South Shore Boulevard, construction using HDD methods would provide the least impact to traffic and facilitate crossing the existing utilities. Detailed mapping of the proposed route is included in Appendix A, Exhibit 6. The pipeline construction is open-cut in areas not delineated as HDD.

C-6 Canal

The west bank of the C-6 Canal has a large green space area with minor landscaping encroaching within the right-of-way. It is probable that the pipeline would be constructed by open-cut in this area. The route crosses an existing landscape berm, fencing and Polo Club Road to enter the C-6 Canal right-of-way from South Shore Boulevard. It is likely that HDD would be used at this crossing. Detailed mapping of the proposed route is included in Appendix C.

Pierson Road

Pierson Road is a two-lane road with guard rail on the north, a small grass strip on the south, an existing forcemain on the north, and multiple storm sewer crossings along the proposed route. It is probable that the

pipeline would be constructed primarily by open-cut, but a significant portion of the construction would likely be by HDD. Where adequate space is available along this route, the construction method would be by open-cut. Where the road right-of-way narrows the pipe would be constructed by HDD. The HDD method would also be used to cross the road for connection to existing forcemains and for a new discharge pipe into the Water Reclamation Facility.

K. Lift Station Modifications

Lift station modifications may be necessary to redirect flow through the South Shore Boulevard forcemain via the C-6 Canal to the Water Reclamation Facility. The lift stations upstream of LS 010 will no longer have the benefit of being repumped by LS 010. These stations (LS 011, 012, 013, 014, and 015) may require new pumps to enable them to pump flow directly to the Water Reclamation Facility. Depending on the size of the pumps required, the existing electrical service and control panels at the stations may also require upgrades. An allowance for these improvements were included in the Phase 3 costs.

III. Recommendations and Next Steps

The recommended route and contributing service area are shown in Exhibit 3. A construction phasing plan was developed for the route to establish a manageable scope of work that can be implemented in the Village's capital improvement plan. Phase 1 includes construction of the forcemain from Sheffield Street to Big Blue Trace. Phase 2 includes construction of the forcemain from Big Blue Trace to Forest Hill Boulevard. Phase 3 includes construction of the forcemain from South Shore Boulevard via the C-6 Canal and Pierson Road to the Water Reclamation Facility. This phase also includes upgrades to lift stations LS 011, 012, 013, 014, and 015. A conceptual opinion of construction cost was also developed for each phase. The construction phasing plan is shown in Exhibit 4 and the costs are included in Tables 4-1 through 4-4.

The Village may use the recommendations in this study to implement a plan for design and construction of the proposed forcemain. The design should include subsurface utility exploration, surveying, permitting, development of construction documents, and obtaining temporary and permanent easements as necessary.

Table 2

Engineer's Conceptual Opinion of Probable Construction Cost

South Shore Blvd Forcemain Replacement

Option 1: North Side of South Shore Blvd

Item	Item Description	Quantity	Unit	Unit Price	Extended Price
A.	**General**				
1.	General Conditions	1	LS		$ 150,000.00
2.	Maintenance of Traffic	1	LS		$ 65,000.00
3.	Bonds and Insurance	1	LS		$ 50,000.00
4.	Clearing and Grubbing	1	LS		$ 15,000.00
5.	Video Taping of Existing Conditions	1	LS		$ 5,000.00
6.	Record Drawings	1	LS		$ 10,000.00
				Subtotal A	$ 295,000.00
B.	**Utilities**				
1.	4" PVC Forcemain	40	LF	$ 20.00	$ 800.00
2.	6" PVC Forcemain	100	LF	$ 25.00	$ 2,500.00
3.	8" PVC Forcemain	4,500	LF	$ 35.00	$ 157,500.00
4.	18" PVC Forcemain	7,300	LF	$ 175.00	$ 1,277,500.00
5.	24" HDPE Forcemain by HDD	400	LF	$ 300.00	$ 120,000.00
6.	24" PVC/PVC x HDPE Adapter	4	EA	$ 3,650.00	$ 14,600.00
7.	8" Gate Valve & Valve Box	4	EA	$ 1,500.00	$ 6,000.00
8.	18" Gate Valve & Valve Box	4	EA	$ 11,450.00	$ 45,800.00
9.	2" ARV W/MH for Forcemain	4	EA	$ 10,000.00	$ 40,000.00
10.	Connection to Existing Forcemain	9	EA	$ 3,500.00	$ 31,500.00
11.	Abandon Pipe in Place	12,900	LF	$ 12.00	$ 154,800.00
12.	Mill and Overlay	1,500	SY	$ 25.00	$ 37,500.00
13.	Concrete Sidewalk Removal & Restoration	3,300	SY	$ 50.00	$ 165,000.00
14.	Concrete Curb & Gutter Removal & Restoration	6,000	LF	$ 25.00	$ 150,000.00
15.	Sod Replacement	1	LS	$ 8,000.00	$ 8,000.00
				Subtotal B	$ 2,211,500.00
				Total A + B	***$ 2,506,500.00***
				Contingency (15%)	$ 375,975.00
				Total Construction	$ 2,882,475.00
				Rounded Total Construction	**$ 2,900,000.00**

Note: The above estimated costs are based on a conceptual layout. As such, they are subject to change depending on the final scope of the project that is designed and constructed as well as other factors.

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable cost.

Table 3

Engineer's Conceptual Opinion of Probable Construction Cost

South Shore Blvd Forcemain Replacement

Option 2: South Side of South Shore Blvd

Item	Item Description	Quantity	Unit	Unit Price	Extended Price
A.	**General**				
1.	General Conditions	1	LS		$ 150,000.00
2.	Maintenance of Traffic	1	LS		$ 50,000.00
3.	Bonds and Insurance	1	LS		$ 50,000.00
4.	Clearing and Grubbing	1	LS		$ 10,000.00
5.	Video Taping of Existing Conditions	1	LS		$ 5,000.00
6.	Record Drawings	1	LS		$ 10,000.00
				Subtotal A	$ 275,000.00
B.	**Utilities**				
1.	8" PVC Forcemain	4,250	LF	$ 35.00	$ 148,750.00
2.	18" PVC Forcemain	7,350	LF	$ 175.00	$ 1,286,250.00
3.	6" HDPE Forcemain by HDD	150	LF	$ 60.00	$ 9,000.00
4.	8" HDPE Forcemain by HDD	600	LF	$ 75.00	$ 45,000.00
5.	10" HDPE Forcemain by HDD	450	LF	$ 110.00	$ 49,500.00
6.	24" HDPE Forcemain by HDD	450	LF	$ 300.00	$ 135,000.00
7.	6" PVC x HDPE Adapter	2	EA	$ 500.00	$ 1,000.00
8.	8" PVC x HDPE Adapter	8	EA	$ 700.00	$ 5,600.00
9.	10" PVC x HDPE Adapter	2	EA	$ 900.00	$ 1,800.00
10.	24" PVC x HDPE Adapter	6	EA	$ 3,650.00	$ 21,900.00
11.	8" Gate Valve & Valve Box	4	EA	$ 1,500.00	$ 6,000.00
12.	18" Gate Valve & Valve Box	6	EA	$ 11,450.00	$ 68,700.00
13.	2" ARV W/MH for Forcemain	9	EA	$ 1,000.00	$ 9,000.00
14.	Connection to Existing Forcemain	9	EA	$ 3,500.00	$ 31,500.00
15.	Abandon Pipe in Place	12,900	LF	$ 12.00	$ 154,800.00
16.	Sod Replacement	1	LS	$ 20,000.00	$ 20,000.00
				Subtotal B	$ 1,993,800.00
				Total A + B	***$ 2,268,800.00***
				Contingency (15%)	$ 340,320.00
				Total Construction	$ 2,609,120.00
				Rounded Total Construction	**$ 2,700,000.00**

Note: The above estimated costs are based on a conceptual layout. As such, they are subject to change depending on the final scope of the project that is designed and constructed as well as other factors.

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Table 4-1

Engineer's Conceptual Opinion of Probable Construction Cost
Recommended Pipe Alignment
Summary of Construction Phases

Phase 1			
South Shore Forcemain from Sheffield Street to Big Blue Trace			
Forcemain Construction Cost (See Table 4-2)		$	1,400,000.00
Design Engineering		$	140,000.00
Construction Phase Engineering		$	115,000.00
Phase 1 Total Cost		**$**	**1,655,000.00**
Phase 2			
South Shore Forcemain from Big Blue Trace to Forest Hill Boulevard			
Forcemain Construction Cost (See Table 4-3)		$	1,400,000.00
Design Engineering		$	140,000.00
Construction Phase Engineering		$	105,000.00
Phase 2 Total Cost		**$**	**1,645,000.00**
Phase 3			
Forcemain from South Shore Blvd along C-6 Canal and Pierson Road to the WRF			
Forcemain Construction Cost (See Table 4-4)		$	2,600,000.00
Design Engineering		$	260,000.00
Construction Phase Engineering		$	210,000.00
	Subtotal	$	3,070,000.00
Lift Station Improvements			
LS 011, 012, 013, 014 and 015		$	450,000.00
Design Engineering		$	45,000.00
Construction Phase Engineering		$	35,000.00
	Subtotal	$	530,000.00
Phase 3 Total Cost		**$**	**3,600,000.00**
Rounded Total for Phases		**$**	**6,900,000.00**

Table 4-2

Engineer's Conceptual Opinion of Probable Construction Cost
South Shore Blvd Forcemain Replacement
Recommended Pipe Alignment
Phase 1: Sheffield Street to Big Blue Trace

Item	Item Description	Quantity	Unit	Unit Price	Extended Price
A.	**General**				
1.	General Conditions	1	LS		$ 75,000.00
2.	Maintenance of Traffic	1	LS		$ 30,000.00
3.	Bonds and Insurance	1	LS		$ 30,000.00
4.	Clearing and Grubbing	1	LS		$ 10,000.00
5.	Video Taping of Existing Conditions	1	LS		$ 3,000.00
6.	Record Drawings	1	LS		$ 7,500.00
				Subtotal A	$ 155,500.00
B.	**Utilities**				
1.	8" PVC Forcemain	4,250	LF	$ 35.00	$ 148,750.00
2.	18" PVC Forcemain	3,050	LF	$ 175.00	$ 533,750.00
3.	8" HDPE Forcemain by HDD	600	LF	$ 75.00	$ 45,000.00
4.	10" HDPE Forcemain by HDD	300	LF	$ 110.00	$ 33,000.00
5.	24" HDPE Forcemain by HDD	150	LF	$ 300.00	$ 45,000.00
6.	8" PVC x HDPE Adapter	8	EA	$ 700.00	$ 5,600.00
7.	10" PVC x HDPE Adapter	2	EA	$ 900.00	$ 1,800.00
8.	24" PVC x HDPE Adapter	2	EA	$ 3,650.00	$ 7,300.00
9.	8" Gate Valve & Valve Box	4	EA	$ 1,500.00	$ 6,000.00
10.	18" Gate Valve & Valve Box	4	EA	$ 11,450.00	$ 45,800.00
11.	2" ARV W/MH for Forcemain	5	EA	$ 1,000.00	$ 5,000.00
12.	Connection to Existing Forcemain	5	EA	$ 3,500.00	$ 17,500.00
13.	Abandon Pipe in Place	8,100	LF	$ 12.00	$ 97,200.00
14.	Sod Replacement	1	LS	$ 10,000.00	$ 10,000.00
				Subtotal B	$ 1,001,700.00
				Total A + B	***$ 1,157,200.00***
				Contingency (15%)	$ 173,580.00
				Total Construction	$ 1,330,780.00
				Rounded Total Construction	**$ 1,400,000.00**

Note: The above estimated costs are based on a conceptual layout. As such, they are subject to change depending on the final scope of the project that is designed and constructed as well as other factors.

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable cost.

Table 4-3

Engineer's Conceptual Opinion of Probable Construction Cost

Recommended Pipe Alignment

Phase 2: Big Blue Trace to Forest Hill Boulevard

Item	Item Description	Quantity	Unit	Unit Price	Extended Price
A.	**General**				
1.	General Conditions	1	LS		$ 70,000.00
2.	Maintenance of Traffic	1	LS		$ 25,000.00
3.	Bonds and Insurance	1	LS		$ 25,000.00
4.	Clearing and Grubbing	1	LS		$ 10,000.00
5.	Video Taping of Existing Conditions	1	LS		$ 3,000.00
6.	Record Drawings	1	LS		$ 5,000.00
				Subtotal A	$ 138,000.00
B.	**Utilities**				
1.	18" PVC Forcemain	4,300	LF	$ 175.00	$ 752,500.00
2.	6" HDPE Forcemain by HDD	150	LF	$ 60.00	$ 9,000.00
3.	10" HDPE Forcemain by HDD	150	LF	$ 110.00	$ 16,500.00
4.	24" HDPE Forcemain by HDD	300	LF	$ 300.00	$ 90,000.00
5.	6" PVC x HDPE Adapter	2	EA	$ 500.00	$ 1,000.00
6.	10" PVC x HDPE Adapter	2	EA	$ 900.00	$ 1,800.00
7.	24" PVC x HDPE Adapter	4	EA	$ 3,650.00	$ 14,600.00
8.	18" Gate Valve & Valve Box	2	EA	$ 11,450.00	$ 22,900.00
9.	2" ARV W/MH for Forcemain	4	EA	$ 1,000.00	$ 4,000.00
10.	Connection to Existing Forcemain	4	EA	$ 3,500.00	$ 14,000.00
11.	Abandon Pipe in Place	4,800	LF	$ 12.00	$ 57,600.00
12.	Sod Replacement	1	LS	$ 10,000.00	$ 10,000.00
				Subtotal B	$ 993,900.00
				Total A + B	***$ 1,131,900.00***
				Contingency (15%)	$ 169,785.00
				Total Construction	$ 1,301,685.00
				Rounded Total Construction	**$ 1,400,000.00**

Note: The above estimated costs are based on a conceptual layout. As such, they are subject to change depending on the final scope of the project that is designed and constructed as well as other factors.

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable cost.

Table 4-4

Engineer's Conceptual Opinion of Probable Construction Cost

Recommended Pipe Alignment

Phase 3: C-6 and Pierson Road to the Water Reclamation Facility

Item	Item Description	Quantity	Unit	Unit Price	Extended Price
A.	**General**				
1.	General Conditions	1	LS		$ 150,000.00
2.	Maintenance of Traffic	1	LS		$ 45,000.00
3.	Bonds and Insurance	1	LS		$ 40,000.00
4.	Clearing and Grubbing	1	LS		$ 5,000.00
5.	Video Taping of Existing Conditions	1	LS		$ 3,000.00
6.	Record Drawings	1	LS		$ 10,000.00
				Subtotal A	$ 253,000.00
B.	**Utilities**				
1.	12" PVC Forcemain	50	LF	$ 45.00	$ 2,250.00
2.	18" PVC Forcemain	5,700	LF	$ 175.00	$ 997,500.00
3.	24" PVC Forcemain	200	LF	$ 200.00	$ 40,000.00
4.	24" HDPE Forcemain by HDD	2,450	LF	$ 300.00	$ 735,000.00
5.	24" PVC x HDPE Adapter	6	EA	$ 3,650.00	$ 21,900.00
6.	12" Gate Valve & Valve Box	1	EA	$ 2,500.00	$ 2,500.00
7.	18" Gate Valve & Valve Box	4	EA	$ 11,450.00	$ 45,800.00
8.	24" Gate Valve & Valve Box	1	EA	$ 18,000.00	$ 18,000.00
9.	2" ARV W/MH for Forcemain	6	EA	$ 10,000.00	$ 60,000.00
10.	Connection to Existing Forcemain	3	EA	$ 3,500.00	$ 10,500.00
11.	Mill and Overlay	750	SY	$ 25.00	$ 18,750.00
12.	Sod Replacement	1	LS	$ 20,000.00	$ 20,000.00
				Subtotal B	$ 1,972,200.00
				Total A + B	***$ 2,225,200.00***
				Contingency (15%)	$ 333,780.00
				Total Construction	$ 2,558,980.00
				Rounded Total Construction	**$ 2,600,000.00**

Note: The above estimated costs are based on a conceptual layout. As such, they are subject to change depending on the final scope of the project that is designed and constructed as well as other factors.

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable cost.