

SARASOTA COUNTY GOVERNMENT

Public Works

DESIGN TECHNICAL MEMORANDUM

TO: Area N Phase 3 Project File

FROM: Gregory Rouse, P.E., Design Resource Manager, Public Works
Steven Lyday, P.E., Project Manager, Public Works

DATE: December 18, 2012

SUBJECT: Area N Phase 3 Alternate Sewer System Comparison

Background

In April 1997, the Sarasota County Board of County Commissioners (BOCC) found that septic systems and small package wastewater treatment plants were contributing to the pollution in Phillippi Creek. The BOCC directed County staff to initiate a program to replace or upgrade septic systems in the Phillippi Creek area. The first phase of this program is known as the Sarasota County Phillippi Creek Septic System Tank Replacement Program. The final report for the program was delivered by a combined team of independent consultants, Hazen and Sawyer and Ayres Associates, to Sarasota County on October 10, 2000. The program consists of sixteen identified Wastewater Project Improvement Areas (WPIA) and these areas are alphabetically denoted as areas A through Q (excluding L). The program Area is identified in Exhibit 1. The report is the master plan for the backbone collection system and transmission requirements for the various areas within the program. The report examined various sewer alternatives, technology benefits and limitations, costs, and recommended central sewer technologies to be used within the program. The program uses a combination of various sewer technologies including gravity, vacuum, and low pressure sewer. These technologies are used both exclusively and in combination within project areas.

Area N Phase 3 of the Phillippi Creek Septic System Replacement Program consists of approximately 200 residential homes and is located East of Tuttle Avenue, North of Bee Ridge Road, South of Webber Street, and West of Lockwood Ridge Road. The project area is graphically depicted in Exhibit 2. As with all areas within the central sewer program, the project area presents unique challenges in providing centralized sewer. Specifically, Phase 3 of Area N is in an isolated sewer area surrounded on three sides by existing County owned and operated central gravity sewer service and Phillippi Creek on the remaining side. Currently, the proposed sewer technology for this area is low pressure based on a number of factors: the area's topography, an existing collection system surrounding the project area capable of receiving additional flow, a limited number of

possible connections to financially support alternative technologies, the necessity to span bridges or large drainage conveyances obstructing system continuity, surrounding gravity sewer with insufficient depth to accommodate further extension into the project area, lack of vacant lots for pumpstations or equipment, and the presence of a private water supply utility (Pluris) that would be greatly affected by heavy construction within the area based on the systems age and materials of construction. The design of the project is on hold pending further direction from the Board of County Commissioners based on requests from the Community.

On July 26, 2012, County staff met with a group of interested citizens that reside within the project area to discuss the history of the program, costs, various sewer technologies and the sewer technology proposed for the project area. At the time, County staff indicated that the County had not created a detailed cost analysis for this area comparing multiple sewer technologies based on capital or operating costs. Staff stated at that meeting that the decision to use low pressure sewer was based on the geographic area, surrounding infrastructure, engineering and cost experiences in previous program areas, and the information contained within the Phillippi Creek Septic System Replacement Program Final Report. While all three technologies recognized within the program are applicable and could be used to serve this area, it was discussed that vacuum sewer and gravity technologies were not cost effective as both would require either a vacuum pump station (VPS) or liftstations, respectively, within the project area.

During the same meeting, it was discussed that County staff would prepare a cost analysis to be performed for the three types of sewer technologies employed throughout the program to include a 20-year present worth cost for operation and maintenance. These results were presented to the residents of the entire project area on August 30, 2012. Based on the brief analysis considering both the capital outlay and the associated operation and maintenance costs, the results indicated that the low pressure technology was shown to be the most cost effective technology for use in Area N3. County staff stated they would collect and present costs for the three different sewer technologies and provide them to interested residents, along with a technical memorandum stating the assumptions made and further summarizing the findings. Based on concerns from the residents, the BOCC elected to place this project temporarily "on-hold" to have ample time to review the costs associated with the three sewer technologies and a discussion can be had with the BOCC. This meeting is scheduled for the February 13, 2013, BOCC meeting. The project has been placed on-hold by the BOCC and design, bidding or construction will not proceed unless directed so by same.

This report summarizes and documents findings of both County engineering staff and of the County's independent Engineer of Record for the program, Giffels Webster Engineers (GWE).

Capital Costs

As a result of community discussions, opinions of probable construction cost have been prepared for the three technologies identified and utilized within the master plan. While the capital cost results have been slightly refined and modified from those presented at the public meeting, the summary results remain similar to those previously presented. The low pressure design plan sets were the foundation of all the cost estimates as they included detailed topographic and distance information which was used to evaluate the alternative systems. Of the three systems evaluated, the low pressure

system data should be considered the most accurate as the advance condition of the design allowed unit quantity items and data, or “take-offs”, to be taken directly from the plan sets. Vacuum and gravity system planning level costs were based off the low pressure design drawing topography and estimated line lengths. Gravity and vacuum designs are based on plan view estimates and did not include profile information. Each parcel was considered to contain one single-family residence. In addition, where necessary, average daily flow (ADF) from each residence was calculated at 200 gallons per day (gpd) based on the Sarasota County Uniform Water, Wastewater, and Reuse Systems Code.

Typically, a planning level estimate would be a Class “4” Cost Estimate based on standards detailed by the Association for the Advancement of Cost Engineering (AACE). AACE International Recommended Practices and Standards states that Class “4” estimates are generally prepared based on limited information and subsequently have fairly wide accuracy ranges. Typically, engineering is 10% to 40% complete and these estimates are usually used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. Virtually all Class “4” estimates use stochastic estimating methods such as cost curves, capacity factors, and other parametric techniques. Expected accuracy ranges are from –15% to –30% on the low side and +20% to +50% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. AACE International Recommended Practices and Standards states this level estimate can have as little as 20 hours or less preparation to perhaps more than 300 hours typically spent preparing the estimate depending on the project and estimating methodology.

Gravity Sewer

The gravity sewer had an estimated capital cost of \$4.1M and was cost conservative with the assumption that the area could be served by two rather than three receiving lift stations. Estimated unit quantities and unit prices are presented for review in Exhibit 3. Unit prices are based on examination of current and traditional estimated costs for gravity construction. Considerable disruption, deep trench excavation, earth moving, roadway restoration and material storage are required for this type of construction and result in higher construction costs. While geotechnical information was gathered for the project area, additional deeper depth soil sampling would be necessary to confirm liftstation site use and to further refine collection system costs. Crossing water bodies and drainage conveyances in this area adds additional challenges to the design of a gravity system. With major earthwork anticipated for deep trench gravity sewer excavation, estimates for complete road restoration have been included.

Other general design assumptions for gravity sewer include:

- A minimum gravity pipe slope of 0.4-feet per 100-feet was used for 8-inch diameter gravity sewers.
- Manholes spaced at a maximum distance of 400-feet or at junction points or changes in direction based on Sarasota County Code.
- It is assumed that subsurface conditions are free of extensive conflicts (stormwater drainage piping, telecommunications conduit, etc.) that would be difficult to

construct around.

- A maximum wetwell depth of no greater than 18 feet for lift stations was assumed.
- A maximum run of approximately 2,500 linear feet of 8-inch diameter gravity sewer was allowed.
- No back-up generators have been provided for the liftstations.

It is assumed that a property can be obtained for the location of the liftstation sites either directly within the project area or the surrounding community. For cost purposes, generic liftstation project sites located each within two thousand feet of the new Lockwood Ridge Road forcemain was assumed. Crossing water bodies and drainage conveyances adds additional challenges to the design of a gravity system. It is assumed that either an aerial crossing of discharge forcemains or sub-surface tunneling (e.g., jack and bore technology) of the gravity collection system can be achieved.

Considerable additional cost for gravity installation is expected due to the high probability of disturbing the aging and out-dated materials of the existing water lines that are not owned by Sarasota County. Based on experiences with gravity sewer construction and familiarity with similar systems, it is assumed the water lines within the project area would need to be replaced as a part of the sewer project. Upgrades to meet current water codes, additional restoration items, permitting, record information and future liabilities all contribute to expected high cost of watermain replacement in this area. The additional cost would be expected to be approximately \$1.0 M based on the size of the project area. As mentioned in the public meeting, the water line cost was not included in the planning level estimate and would be considered additional to the stated sewer project costs. A more detailed analysis would need to be performed to further refine this cost as well as discussions with the utility owner to discuss the feasibility, scope, and interest in proceeding.

Vacuum Sewer

The vacuum sewer had an estimated capital cost of \$3.4 M. The cost includes both the collection system and vacuum pump station costs. Estimated unit quantities and unit prices are presented for review in Exhibit 4. Unit prices are based on examinations of current bid tabulated ("bid tab") prices from other project areas within Phillippi Creek (specifically, Areas N Phases 1 and 2). For vacuum systems, adjustments of some equipment unit prices has been made as Sarasota County pre-procures some major equipment and materials separate from the procurement of construction services to install those services. For instance, a current bid tab taken for valve pit installation from a similar project area is adjusted to include the owner procured and provided pit, control valve, and other necessary appurtenances. Vacuum valves were assumed to serve more than one single-family residence. On the average, one vacuum valve was utilized for every two connections. Laterals from vacuum pits parallel to property lines are based on typical lengths as seen throughout the entire program. With minor earthwork anticipated for shallow trench vacuum sewer excavation, estimates for partial road restoration have been included.

It is assumed that a property can be secured for the location of the vacuum pump station (VPS) site either directly within the project area or the immediate surrounding community. No suitable County owned property is available. For cost purposes, a generic vacuum pump station project site located within one thousand feet of the new Lockwood Ridge forcemain was assumed. The location close to

the new forcemain is not required and it does not exclude examination of other potential sites, but acts to identify the cost of connecting the VPS to a transmission main. Crossing water bodies and drainage conveyances in this area adds additional challenges to the design of a vacuum system by increasing the available vacuum required to traverse those obstacles and possibly increasing the capacity, size and energy consumption of that system. It could turn out that the most economical location for a vacuum station could be located outside of the N phase 3 boundary which could limit the depth and severity of the drainage system conveyance obstacles and provide a more centralized location for the station. It is assumed that a standard back-up generator can be provided with self-contained fuel supply and noise attenuating enclosure suitable for close proximity to neighbors. While geotechnical information was gathered for the project area, additional deeper depth soil sampling would be necessary to confirm any vacuum pump station site use and to further refine vacuum pump station costs. Previously collected geotechnical data is sufficient to estimate collection system costs.

Low Pressure Sewer

The low pressure system has an estimated capital cost of \$2.1 M. As stated previously, the low pressure system capital cost estimates should be considered the most accurate given the current level of design. The lower accuracy of the cost estimates for the gravity and vacuum systems has been accounted for in the conservative nature of those estimates. Estimated unit quantities and unit prices are presented for review in Exhibit 5. Unit prices are based on examinations of recent bid tabulated prices from other project areas within the Phillippi Creek program (specifically, Area D). Each single-family residence is served by a single grinder pump tank to avoid problems that would arise from sharing power costs if several residences were served. A minimum flow velocity of two feet per second in force mains was assumed using a Hazen-Williams "C" factor of 150 and an SDR 11 high density polyethylene pipe. With the use of horizontal direction drill ("trenchless technology") anticipated for low pressure sewer installation within the right-of-way, estimates for minimal road restoration have been included.

As with vacuum systems, adjustments for some equipment unit prices has been made as Sarasota County pre-procures some major equipment and materials separate from the procurement of construction services to install those services. For instance, a bid tab taken for a low pressure pump valve pit installation is adjusted to include the owner procured, provided, and installed pump and pit assembly and other necessary appurtenances.

The estimated high level probable capital construction costs as shown in the attachments are rounded to the nearest thousand and summarized in the following table:

Technology	Probable Capital Cost
Gravity	\$4,104,000
Vacuum	\$3,363,000
Low Pressure	\$2,114,000

Operating Costs

Technical Memorandum Number 7 of the Sarasota County Phillippi Creek Septic System Tank Replacement Program final report as authored by Hazen and Sawyer and Ayres Associates documents the process used to evaluate capital and operating costs for various sewer technologies within the program. The process used for evaluating WPIA technologies with respect to both capital and operational costs was to use geographic information system (GIS) data to select three areas within the program based on land density and the number of connections. For select areas an analysis of both design and operational costs was performed and those results were applied program wide for the purposes of evaluating potential sewer technologies. The capital costs for Area N Phase 3 have been detailed in the budgetary estimates previously mentioned. The program's final report data are used to evaluate operational costs.

Three areas were selected for evaluation (Areas F, K, and J) within the final report. High level preliminary design was completed and operational costs associated with each design was tabulated and reviewed. As was discussed in the public meeting on August 30th, the same process was used for Area N and presented to the community. The data associated with operation and maintenance as collected from Area J was used for the purposes of evaluating Area N Phase 3.

While Area J has a low lot density with an average lot size of 0.93 acres, the listed number of connections at 226 is similar to the project area and is applicable for comparison sake. The cost analysis evaluated energy costs, maintenance costs for both pipeline and mechanical equipment, and anticipated replacement costs for gravity, low pressure, and sewer. Itemized and detailed cost breakdowns are provided within the appendices of the program's final report. With the proprietary nature of the vacuum sewer, estimated costs were collected from only one manufacturer. The costs for low pressure sewer evaluated cost of two leading manufacturers and averaged the costs to arrive at a blended rate per connection. In general, the report shows that for low pressure and vacuum sewer, O&M costs are dependent on number of connections and not lot size or length of pipe installed. Gravity sewer operational costs are dependent both on length of pipeline (directly correlating to lot size) and number of connections.

The report shows that the O&M costs for vacuum and gravity exhibit an economy of scale and decrease as the average connection count increases. As more people are connected to a vacuum or gravity system the more an economy of scale benefits the technology by sharing those costs over a larger pool of individuals. Operational cost for low pressure is independent of the number of connections and remains constant despite increasing customer base. For the analysis presented to the community on August 30th, the yearly operational costs were calculated to be \$190 per connection for low pressure, \$140 per connection for vacuum, and \$90 per connection for gravity. These costs would largely be the responsibility of Sarasota County with the exception of power costs for the low pressure pump units. While included in the above-referenced costs for comparison, the power for the low pressure pumps is paid for by the homeowner and is estimated to be about \$16 per year.

A present worth analysis is necessary to see the cost impact that annual operating and maintenance costs have compared to the present day capital dollars associated with each sewer technology.

Present worth calculations are widely used in engineering and business to provide a means to compare cash flows at different times on a meaningful "like to like" basis. The present worth is the total monetary amount that a series of future payments is worth in today's dollars based on a given interest rate and time period. Payments are in the future, they are discounted to reflect the time value of money and other factors such as investment risk. If they are in the past, their value is correspondingly enhanced to reflect that those payments have been (or could have been) earning interest in the intervening time.

The estimated high level probable operating and maintenance costs are rounded to the nearest thousand and summarized in the following table:

Technology	Yearly Probable O&M Cost (per connection)	Total Present Worth
Gravity	\$90	\$191,000
Vacuum	\$140	\$297,000
Low Pressure	\$190	\$403,000

Assumptions:

1. The area contains 200 connections
2. The probable O&M cost is an annual expenditure
3. Present Worth Analysis was performed based on the original report assumption of a 7% discount rate over a 20 year period

Summary

The information contained within this technical memorandum summarizes the information, assumptions, and costs associated with the capital and operating costs presented to the Area N Phase 3 community on August 30, 2012. Gravity, vacuum, and low pressure sewers technologies can function successfully for the Area N Phase 3 project area though there are different capital and operating costs associated with each of the different sewer technologies.

Capital and Operating costs are presented in the following table on a present worth basis:

Technology	Probable Capital Cost	Present Worth Operating Cost	Total Capital and Operating Cost
Gravity	\$4,104,000	\$191,000	\$4,295,000
Vacuum	\$3,363,000	\$297,000	\$3,660,000
Low Pressure	\$2,114,000	\$403,000	\$2,517,000

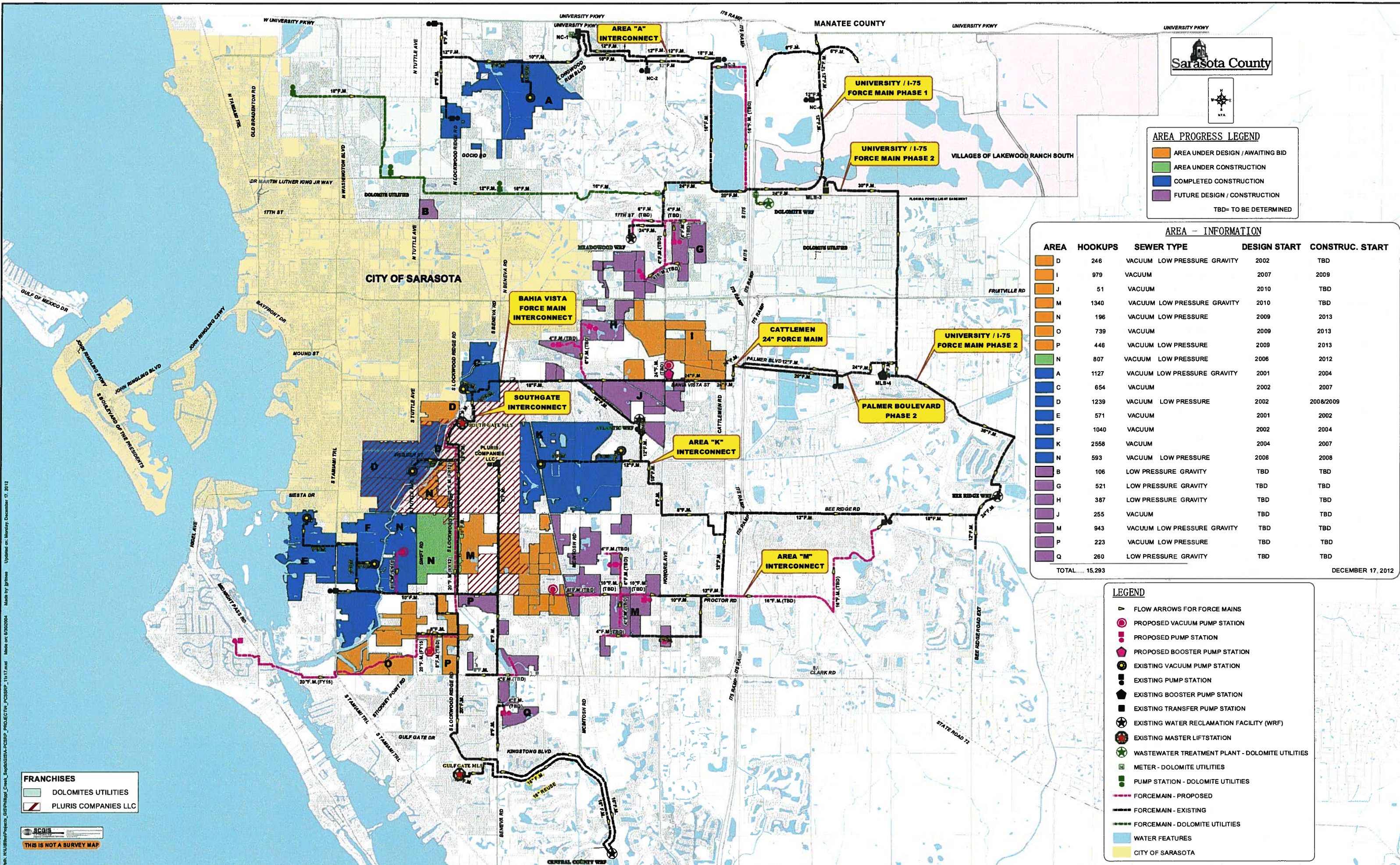
The low pressure design cost for this area is approximately \$200,000. The only costs to date incurred for this area are design and permitting expenses as the project has not been submitted for public bidding and there is no construction contract pending. Minor changes can be accommodated to the low pressure plans and specifications without significant cost impact. Changes in sewer technology would require redesign and will have a cost impact. The low pressure design cost estimate is for the engineering consultant alone and does not include other cumulative costs of various county staff and permitting agencies. The existing survey used in the low pressure design is salvageable at a value of

approximately \$50,000 and could be utilized should the decision be made to redesign this area with a different technology. The design of vacuum systems is considerably more labor intensive than the low pressure system design due to the increased complexity of the vacuum station equipment, station site design and permitting, and layout of the individual lifts in the piping network. These costs have not been included in the estimate provided in order to provide fair comparison of options as they would be at the onset of design.

Attachments:

Exhibit 1	Phillippi Creek Septic System Replacement Program Overall Map
Exhibit 2	Phillippi Creek Septic System Replacement Program Area N Phase 3 Boundary
Exhibit 3	Gravity Collection System Opinion of Probable Cost
Exhibit 4	Vacuum Collection System Opinion of Probable Cost
Exhibit 5	Low Pressure Collection System Opinion of Probable Cost
DVD	Phillippi Creek Septic System Replacement Program Final Report

EXHIBIT 1 - PHILLIPPI CREEK SEPTIC SYSTEM REPLACEMENT PROGRAM



Sarasota County

AREA PROGRESS LEGEND

- AREA UNDER DESIGN / AWAITING BID
- AREA UNDER CONSTRUCTION
- COMPLETED CONSTRUCTION
- FUTURE DESIGN / CONSTRUCTION

TBD= TO BE DETERMINED

AREA - INFORMATION

AREA	HOOKUPS	SEWER TYPE	DESIGN START	CONSTRUC. START
D	246	VACUUM LOW PRESSURE GRAVITY	2002	TBD
I	979	VACUUM	2007	2009
J	51	VACUUM	2010	TBD
M	1340	VACUUM LOW PRESSURE GRAVITY	2010	TBD
N	196	VACUUM LOW PRESSURE	2009	2013
O	739	VACUUM	2009	2013
P	446	VACUUM LOW PRESSURE	2009	2013
N	807	VACUUM LOW PRESSURE	2006	2012
A	1127	VACUUM LOW PRESSURE GRAVITY	2001	2004
C	654	VACUUM	2002	2007
D	1239	VACUUM LOW PRESSURE	2002	2008/2009
E	571	VACUUM	2001	2002
F	1040	VACUUM	2002	2004
K	2558	VACUUM	2004	2007
N	593	VACUUM LOW PRESSURE	2006	2008
B	106	LOW PRESSURE GRAVITY	TBD	TBD
G	521	LOW PRESSURE GRAVITY	TBD	TBD
H	387	LOW PRESSURE GRAVITY	TBD	TBD
J	255	VACUUM	TBD	TBD
M	943	VACUUM LOW PRESSURE GRAVITY	TBD	TBD
P	223	VACUUM LOW PRESSURE	TBD	TBD
Q	260	LOW PRESSURE GRAVITY	TBD	TBD
TOTAL	15,293			

DECEMBER 17, 2012

LEGEND

- FLOW ARROWS FOR FORCE MAINS
- PROPOSED VACUUM PUMP STATION
- PROPOSED PUMP STATION
- PROPOSED BOOSTER PUMP STATION
- EXISTING VACUUM PUMP STATION
- EXISTING PUMP STATION
- EXISTING BOOSTER PUMP STATION
- EXISTING TRANSFER PUMP STATION
- EXISTING WATER RECLAMATION FACILITY (WRF)
- EXISTING MASTER LIFTSTATION
- WASTEWATER TREATMENT PLANT - DOLOMITE UTILITIES
- METER - DOLOMITE UTILITIES
- PUMP STATION - DOLOMITE UTILITIES
- FORCEMAIN - PROPOSED
- FORCEMAIN - EXISTING
- FORCEMAIN - DOLOMITE UTILITIES
- WATER FEATURES
- CITY OF SARASOTA

FRANCHISES

- DOLOMITES UTILITIES
- PLURIS COMPANIES LLC

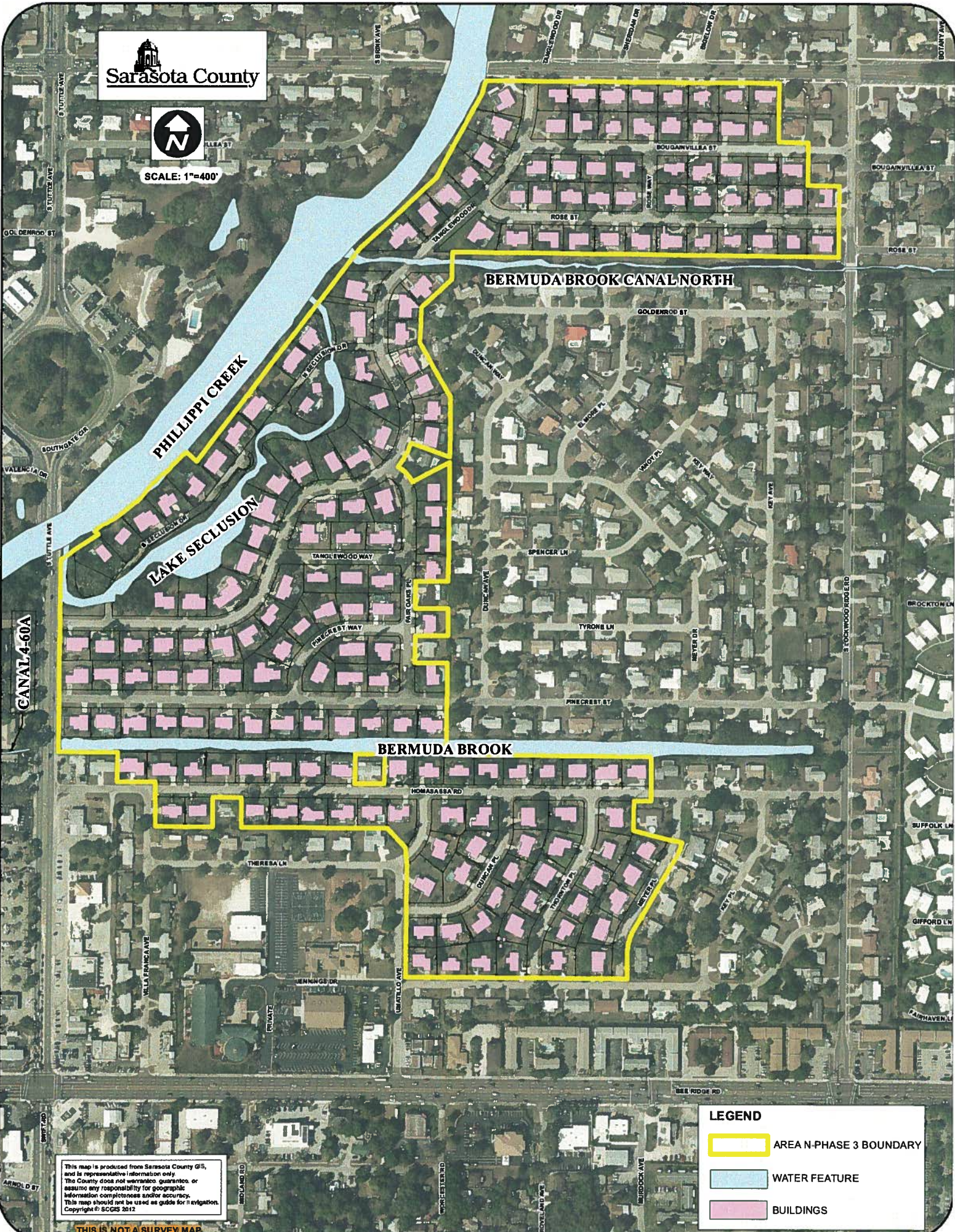
SCGIS
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 Made by: jprince Updated on: Monday, December 17, 2012

EXHIBIT 2 - AREA N PHASE-3



SCALE: 1"=400'



CANAL 4-60A

BERMUDA BROOK CANAL NORTH

BERMUDA BROOK

LEGEND

- AREA N-PHASE 3 BOUNDARY
- WATER FEATURE
- BUILDINGS

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EXHIBIT 3
SARASOTA COUNTY, FLORIDA
PHILLIPPI CREEK SEPTIC SYSTEM REPLACEMENT PROGRAM

AREA N - Phase 3
Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL AMOUNT
GRAVITY SEWER SYSTEM					
WASTEWATER COLLECTION SYSTEM					
1	Mobilization / Demobilization	LS	1	\$ 80,000.00	\$ 80,000.00
2	Prevention, Control & Abatement of Erosion & Water Pollution	LS	1	\$ 40,000.00	\$ 40,000.00
3	Project Signs	EA	2	\$ 1,200.00	\$ 2,400.00
4	8" Gravity Sewer Pipe	LF	14385	\$ 60.00	\$ 863,100.00
5	Sanitary Sewer Manholes	EA	60	\$ 3,200.00	\$ 192,000.00
6	4" Force Main	LF	4000	\$ 20.00	\$ 80,000.00
7	Duplex Lift Station	EA	2	\$180,000.00	\$ 360,000.00
8	Land Purchase (Purchase, Demolition, Disposal, Clear and Grub)	EA	2	\$250,000.00	\$ 500,000.00
9	Fencing	EA	2	\$ 20,000.00	\$ 40,000.00
10	Gravity Service Connections	EA	196	\$ 1,200.00	\$ 235,200.00
11	4" Gate Valve w/Riser	EA	6	\$ 900.00	\$ 5,400.00
12	4" Air Release Valve	EA	2	\$ 1,600.00	\$ 3,200.00
13	Bridge Crossing	LS	2	\$ 20,000.00	\$ 40,000.00
14	Sub Aqueous Crossing	LS	1	\$ 40,000.00	\$ 40,000.00
15	ROAD REPLACEMENT - Asphalt (Inc. Base, Sub-Base and Asphaltic Conc.)	SY	31,700	\$ 35.00	\$ 1,109,500.00
16	Driveway Replacement - Concrete	SY	1,500	\$ 38.00	\$ 57,000.00
17	Driveway Replacement - Asphalt	SY	80	\$ 25.00	\$ 2,000.00
18	Driveway Replacement - Shell / Dirt / Polly Pebble w/ 6" Base	SY	90	\$ 14.00	\$ 1,260.00
19	Pavers - Concrete w/ 6" Base	SY	115	\$ 45.00	\$ 5,175.00
20	Flowable Fill	CY	30	\$ 65.00	\$ 1,950.00
21	Curbing - All Types	LF	29,160	\$ 5.00	\$ 145,800.00
22	Sodding - All Types	SY	31,700	\$ 2.25	\$ 71,325.00
23	SUB - TOTAL ESTIMATED PRICE (Line Items 1 through 23)				\$ 3,875,310.00
24	5% Contingency of the Subtotal (line item 23)	LS	1	\$193,765.50	\$ 193,765.50
25	Permit Fee Allowance	LS	1	\$ 10,000.00	\$ 10,000.00
26	Testing Allowance	LS	1	\$ 25,000.00	\$ 25,000.00
27	TOTAL ESTIMATED PRICE (Line Items 24, 25, 26, 27)				\$ 4,104,075.50

EXHIBIT 4
SARASOTA COUNTY, FLORIDA
PHILLIPPI CREEK SEPTIC SYSTEM REPLACEMENT PROGRAM

AREA N - Phase 3
Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL AMOUNT
VACUUM SYSTEM					
WASTEWATER COLLECTION SYSTEM					
1	Mobilization / Demobilization	LS	1	\$ 65,000.00	\$ 65,000.00
2	Prevention, Control & Abatement of Erosion & Water Pollution	LS	1	\$ 30,000.00	\$ 30,000.00
3	Project Signs	EA	2	\$ 1,200.00	\$ 2,400.00
4	3" SDR-21 Vacuum Main (Open Cut)	LF	1000	\$ 20.00	\$ 20,000.00
5	3" SDR-11 Vacuum Main (Directional Drill)	LF	200	\$ 21.00	\$ 4,200.00
6	4" SDR-21 Vacuum Main (Open Cut)	LF	7900	\$ 22.00	\$ 173,800.00
7	4" SDR-11 Vacuum Main (Directional Drill)	LF	400	\$ 26.00	\$ 10,400.00
8	6" SDR-21 Vacuum Main (Open Cut)	LF	4485	\$ 30.00	\$ 134,550.00
9	6" SDR-11 Vacuum Main (Directional Drill)	LF	400	\$ 34.00	\$ 13,600.00
10	8" SDR-21 Vacuum Main (Open Cut)	LF	1200	\$ 40.00	\$ 48,000.00
11	6" PVC C-900 Dr-18 Force Main	LF	1000	\$ 30.00	\$ 30,000.00
12	4" PVC SDR-21 Gravity Lateral	LF	6200	\$ 23.00	\$ 142,600.00
13	6" PVC SDR-21 Gravity Lateral	LF	1200	\$ 26.00	\$ 31,200.00
14	Vacuum Pit Assembly	EA	98	\$ 5,500.00	\$ 539,000.00
15	6" Gate Valve w/Riser	EA	12	\$ 1,200.00	\$ 14,400.00
16	4" Gate Valve w/Riser	EA	19	\$ 1,000.00	\$ 19,000.00
17	FM Air Release Valve	EA	4	\$ 1,500.00	\$ 6,000.00
18	Connect 20" FM, Tee and Appurtenances	EA	1	\$ 20,000.00	\$ 20,000.00
19	Bridge Crossing - N. Seclusion Drive	LS	1	\$ 20,000.00	\$ 20,000.00
20	Bridge Crossing - S. Seclusion Drive	LS	1	\$ 20,000.00	\$ 20,000.00
21	Bridge Crossing - Tanglewood Drive	LS	1	\$ 20,000.00	\$ 20,000.00
22	Open Cut Trench Repair - Asphalt (Inc. Base, Sub-Base and Asphaltic Conc.)	LF	7,500	\$ 32.00	\$ 240,000.00
23	Asphalt Overlay Type III Asphaltic Concrete, 1.25" Thickness (Includes Bit.)	SY	3,750	\$ 7.50	\$ 28,125.00
24	Driveway Replacement - Concrete	SY	1,300	\$ 40.00	\$ 52,000.00
25	Driveway Replacement - Asphalt	SY	120	\$ 25.00	\$ 3,000.00
26	Driveway Replacement - Shell / Dirt / Polly Pebble w/ 6" Base	SY	90	\$ 14.00	\$ 1,260.00
27	Pavers - Concrete w/ 6" Base	SY	115	\$ 45.00	\$ 5,175.00
28	Flowable Fill	CY	30	\$ 65.00	\$ 1,950.00
29	Curbing - All Types	LF	2,450	\$ 5.00	\$ 12,250.00
30	Sodding - Bahia	SY	4,800	\$ 1.75	\$ 8,400.00
31	Sodding - St. Augustine	SY	3,200	\$ 2.50	\$ 8,000.00
32	VACUUM STATION				
33	Excavation, Dewatering and Backfill	LS	1	\$ 120,000.00	\$ 120,000.00
34	Structural (Foundation, Floors, Walls)	LS	1	\$ 135,000.00	\$ 135,000.00
35	Roof and Truss System	LS	1	\$ 30,000.00	\$ 30,000.00
36	Owner Purchased Equipment and Materials	LS	1	\$ 450,000.00	\$ 450,000.00
37	Install Owner Purchased Equipment and Materials	LS	1	\$ 58,000.00	\$ 58,000.00

38	F&I Electrical Equipment and Materials	LS	1	\$ 100,000.00	\$ 100,000.00
39	F&I Mechanical Equipment and Materials	LS	1	\$ 50,000.00	\$ 50,000.00
40	Site Work (Including Paving, Grading and Drainage)	LS	1	\$ 45,000.00	\$ 45,000.00
41	Misc. (Handrails, Stairs, Drains, Doors, Louvers)	LS	1	\$ 65,000.00	\$ 65,000.00
42	Odor Control System	LS	1	\$ 27,500.00	\$ 27,500.00
43	Fencing	LS	1	\$ 30,000.00	\$ 30,000.00
44	Generator and Sound enclosure (Furnish, Install, and Test)	LS	1	\$ 85,000.00	\$ 85,000.00
45	Land Purchase (Purchase, Demolition and Removal, Clear and Grub)	LS	1	\$ 250,000.00	\$ 250,000.00
46	SUB - TOTAL ESTIMATED PRICE (Line Items 1 through 45)				\$ 3,169,810.00
47	5% Contingency of the Subtotal (line item 46)	LS	1	\$ 158,490.50	\$ 158,490.50
48	Permit Fee Allowance	LS	1	\$ 10,000.00	\$ 10,000.00
49	Testing Allowance	LS	1	\$ 25,000.00	\$ 25,000.00
50	TOTAL ESTIMATED PRICE (Line Items 46, 47, 48, and 49)				\$ 3,363,300.50

EXHIBIT 5
SARASOTA COUNTY, FLORIDA
PHILLIPPI CREEK SEPTIC SYSTEM REPLACEMENT PROGRAM

AREA N - Phase 3
Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL AMOUNT
LOW PRESSURE SYSTEM					
WASTEWATER COLLECTION SYSTEM					
1	Mobilization / Demobilization	LS	1	\$ 40,000.00	\$ 40,000.00
2	Prevention, Control & Abatement of Erosion & Water Pollution	LS	1	\$ 20,000.00	\$ 20,000.00
3	Project Signs	EA	2	\$ 1,200.00	\$ 2,400.00
4	3" SDR-11 HDPE FM (Open Cut)	LF	465	\$ 12.00	\$ 5,580.00
5	3" SDR-11 HDPE FM (Directional Drill)	LF	6,250	\$ 17.00	\$ 106,250.00
6	2" SDR-11 HDPE FM (Open Cut)	LF	720	\$ 11.00	\$ 7,920.00
7	2" SDR-11 HDPE FM (Directional Drill)	LF	6950	\$ 16.00	\$ 111,200.00
8	Single Short Side Connection	EA	93	\$ 1,000.00	\$ 93,000.00
9	Single Long Side Connection	EA	79	\$ 1,400.00	\$ 110,600.00
10	Double Short Side Connection	EA	1	\$ 1,400.00	\$ 1,400.00
11	Double Long Side Connection	EA	11	\$ 1,800.00	\$ 19,800.00
12	Low Pressure Pump & Pit Assembly	EA	196	\$ 6,000.00	\$ 1,176,000.00
13	3" Gate Valve w/Riser	EA	12	\$ 900.00	\$ 10,800.00
14	2" Gate Valve w/Riser	EA	19	\$ 750.00	\$ 14,250.00
15	Terminal Clean-outs	EA	15	\$ 700.00	\$ 10,500.00
16	In-Line Clean-outs	EA	27	\$ 600.00	\$ 16,200.00
17	3" Air Release Valve	EA	4	\$ 1,500.00	\$ 6,000.00
18	Convert ex. Manholes to Drop Manholes	EA	4	\$ 1,700.00	\$ 6,800.00
19	Bridge Crossing - N. Seclusion Drive	LS	1	\$ 20,000.00	\$ 20,000.00
20	Bridge Crossing - S. Seclusion Drive	LS	1	\$ 20,000.00	\$ 20,000.00
21	Bridge Crossing - Tanglewood Drive	LS	1	\$ 20,000.00	\$ 20,000.00
22	Open Cut Trench Repair - Asphalt (Inc. Base, Sub-Base and Asphaltic Conc.)	LF	2,675	\$ 32.00	\$ 85,600.00
23	Asphalt Overlay Type III Asphaltic Concrete, 1.25" Thickness (Includes Bit.)	SY	3,750	\$ 7.50	\$ 28,125.00
24	Driveway Replacement - Concrete	SY	215	\$ 38.00	\$ 8,170.00
25	Driveway Replacement - Asphalt	SY	80	\$ 25.00	\$ 2,000.00
26	Driveway Replacement - Shell / Dirt / Polly Pebble w/ 6" Base	SY	90	\$ 14.00	\$ 1,260.00
27	Pavers - Concrete w/ 6" Base	SY	115	\$ 45.00	\$ 5,175.00
28	Flowable Fill	CY	30	\$ 65.00	\$ 1,950.00
29	Curbing - All Types	LF	2,450	\$ 5.00	\$ 12,250.00
30	Sodding - Bahia	SY	4,800	\$ 1.75	\$ 8,400.00
31	Sodding - St. Augustine	SY	3,200	\$ 2.50	\$ 8,000.00
32	SUB - TOTAL ESTIMATED PRICE (Line Items 1 through 31)				\$ 1,979,630.00
33	5% Contingency of the Subtotal (line item 32)	LS	1	\$ 98,981.50	\$ 98,981.50
34	Permit Fee Allowance	LS	1	\$ 10,000.00	\$ 10,000.00
35	Testing Allowance	LS	1	\$ 25,000.00	\$ 25,000.00
36	TOTAL ESTIMATED PRICE (Line Items 32, 33, 34, 35)				\$ 2,113,611.50