

COUNCIL WORKSHOP MEETING

A G E N D A

TOWN OF CHINCOTEAGUE

March 17, 2011, 5:00 P.M. - Council Chambers - Town Hall

CALL TO ORDER

INVOCATION BY COUNCILMAN T. HOWARD

PLEDGE OF ALLEGIANCE

AGENDA ADDITIONS/DELETIONS AND ADOPTION:

1. Introduction – Virginia Tourism Corporation/Tourism Specialist Lynne Lochen
2. Presentation – Sanitary Sewer System/Preliminary Engineering Report
 - a) Presentation by consultant Clark/Nexsen
 - b) Consideration of next steps
3. Action Items from previous Council Meeting
 - a) Possible donation for Hi-Y expenses to Model General Assembly field trip
4. Closed Meeting in Accordance with Section 2.2-3711(A) (1) of the Code of Virginia.
 - a) Personnel Matters

ADJOURN:



Preliminary Engineering Report Sanitary Sewer System Phase 1 Chincoteague, Virginia

March 2011



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Chincoteague, Va.

General

The Town of Chincoteague is an eight (8) square mile island located on the Atlantic Ocean side on the Eastern Shore of Virginia near the Maryland Border. The town is predominately a tourist community with an approximate 4,300 permanent residences but the town also supports the local Coast Guard Base and several small fisheries. The town is notably known for the annual Pony Penning of the Assateague ponies each summer. The town has only one access to the Island via the John B. Whealton Causeway (State Route 175).

The majority of the properties within the Town are currently using a conventional septic tank and leaching system to handle wastewater treatment and disposal except for eight locations (only 4 are online) that have permitted wastewater treatment facility (WWTF) that discharge into the surrounding waters. See the map contained in the “White Paper” in Appendix G for WWTF locations. The aging septic systems along with a high water table are potentially leaching contaminants into surrounding waters, and causing expensive pump and haul operations for waste disposal. Also there is evidence of contamination to the shellfish beds and fishing surrounding the island. The Virginia Department of Health (VDH) has recognized the possible threat of untreated waste contamination to the surrounding waters of Chincoteague Island and has condemned shellfish harvesting in several areas adjacent to the island. See Appendix J for VDH Condemnation documents and mapping.

As a result the Town is proposing the installation of a central sanitary sewer system to minimize further contamination and promote the improvement of the surrounding waters. The quality of the environment and particularly the waters surrounding the island is of paramount concern to the Town, as the very livelihood of the residents depends on it.

Project Planning Area

Location

The proposed project is Phase 1 of a multi-phased approach to providing a complete sanitary sewer system for the Town. Phase 1 will involve the construction of a low pressure sewer collection system with approximately 12,000 linear feet of force main along Main Street from the high school to the Waterside Inn. Also a low pressure system with approximately 7,600 linear feet of force main along Maddox Boulevard from the intersection of Main Street terminating approximately at the Chincoteague Museum, before the crossing to Assateague Island. A branch of the low pressure system will be extended down Deep Hole Road, from Maddox Blvd. to the Municipal Center with approximately 1,800 linear feet of force main. The three systems will converge and discharge into a central pump station located on the southwest corner of Smith Street and School Street. The central pump station will discharge the sewage through approximately 10 miles of 10 inch force main to be constructed along the Route 175 corridor to the proposed wastewater treatment facility (WWTF) on the mainland. Future expansion along these corridors will be limited due to the existing build out.

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Environmental Resources Present

Environmental resources are plentiful in the vicinity of the project. The Town is surrounded by wetlands, shellfish beds, and National Wildlife Refuge. The proposed force main alignment to the mainland follows the road along the causeway which crosses approximately 5 miles of marshy wetlands. A full environmental report will be prepared by the Town under separate cover.

Growth Area and Population Trends

The Town's current population is approximate 4,300 permanent residents, per the 2000 census (2010 census data is not yet available) with a seasonal tourist population from May to late August of approximately 15,000 per the *White Paper* dated December 2007, with a potential spike to 30,000 in July for the Independence Day holiday and 50,000 for the Pony Penning event per the "*Proposed Sewer System, Town of Chincoteague, Preliminary Engineering Study*" dated April 1988, see Appendix E for the 1988 Sewer Study and Appendix G for the White paper. The projected population estimated in the "*Town of Chincoteague Water Supply Plan*" for the year 2010 is 4,710 and the projected population for the year 2030 is 5,438. This equates to a projected permanent residential population growth of approximately 13% for the next 20 years. For details of projected future growth see the Town's "*Development and Redevelopment Potential Town of Chincoteague*" (Appendix H) and "*Town of Chincoteague Water Supply Plan*" (Appendix F).

Existing Facilities

The Town of Chincoteague existing sanitary sewage disposal method is predominantly by septic tank and leaching system except for eight locations (only 4 currently in operation) that have permitted wastewater treatment plants which discharge treated effluent directly into the surrounding waters. The aging septic systems along with a high water table are potentially leaching contaminants into surrounding waters, and causing expensive pump and haul operations for waste disposal. There currently is no central sanitary sewer collection or treatment system for the island.

Project Need

Since the Town relies on individual septic systems and private wastewater plants to treat the existing wastewater on the island, the Town has identified the need for a central sewer system for ecological and health reasons. The 1988 Sewer Study and the VDH shellfish condemnation documents have identified that due to high ground water tables and saturated soils many drain fields are ineffective making septic tanks into holding tanks where many of the residents rely on pumping and hauling the sewage off the island for a fee or are leaching into the surrounding waterways causing a potential pollution issue for the shellfish beds and fishing. See the document *1988 Sewer Study* in Appendix E. Phase 1 of the project will install a low pressure sewer system within the Main Street, Maddox Boulevard and Deep Hole Road right-of-ways to convey the flows to the main pump station on the Southwest corner of Smith Street and School Street. This will provide the backbone for connecting the rest of the town in future phases and

Chincoteague, Va.

provide a safer and cleaner environment for the town's people and the shellfish beds surrounding the island.

Alternatives Considered

A number of sewage collection and treatment alternatives were discussed in the 1988 Sewer Study by Bradbury & Drenning and the "White Paper" prepared by WWMI in 2007. The alternatives included those listed below:

WWTF on Chincoteague with direct effluent discharge into Chincoteague Bay

WWTF on Chincoteague with direct effluent discharge into Fowling Gut

WWTF on Chincoteague; pump effluent to Assateague Island; spray irrigate wetlands

WWTF on Chincoteague; island-wide beneficial reuse with both surface and subsurface disposal

WWTF on Chincoteague; pump effluent to Atlantic Ocean outfall

WWTF on Chincoteague with Island based deep well injection of effluent

Collect sewage on the island and pump to the NASA WWTF

The previous studies determined that many of these alternatives were not considered feasible and all alternatives required relatively high startup costs. See the full text of these reports in the appendices for details of the alternatives. The majority of the options presented in the 1988 Sewer Study were either to discharge to surrounding waters or to land apply the treated waters on Chincoteague or Assateague Islands. These options were not favorable solutions with respect to potential environmental impact. One of the primary goals of the Town is to provide a solution to help revitalize and protect the surrounding waters so they can be reopened up to shellfish harvesting, shellfish seed beds, and recreational fishing.

The option for using the NASA WWTF has been discussed since the 1988 Sewer Study was completed, and it was decided that it will not be allowed by the federal government, so is no longer a valid option. However, a recent opportunity to connect to a proposed WWTF at a new development on the mainland of Accomack County has presented a similar alternative for treatment of the Town's wastewater.

Selection of Alternative

The Town desires to generally follow the recommendation of the 1988 Sewer Study to install a low pressure sewer collection system on the island. The Town desires to take advantage of the opportunity for wastewater treatment to be provided by pumping the collected sewage from the island to the proposed WWTF on the mainland. This alternative was selected to provide a low impact design to the local environment without directly discharging any WWTF effluent into the waters surrounding the Island.

The selection of the alternative to pump to the mainland WWTF is also cooperative with Accomack County, to provide a possible wastewater solution to neighboring communities on the mainland by providing the needed flows to help make the mainland WWTF viable.

Chincoteague, Va.

Implementation of Phase 1 will help eliminate some of the septic systems that are suspected of leaching into the adjacent waters and will eliminate the existing and future wastewater plants that discharge treated effluent into the Chincoteague channel. This would be a step forward in the revitalization process for the shellfish and fishing areas identified by VDH Condemnation.

Proposed Project

Project Design

Phase 1 of the central sanitary sewer system will install a system consisting of grinder pump stations and low pressure force mains ranging in size from 1 1/2 inch to 8 inch PVC with a central pump station located at Smith Street and School Street. There generally will be one grinder pump station for every property on the Island. However, with the refinement of the design the number of grinder stations could be reduced by having one pump station serve multiple buildings. See Figure 1 for typical grinder pump connection detail. The grinder pump stations in this type of system typically have an electrical service provided from one of the buildings being served, but could be served by providing individual meters at each grinder station. The flow from the grinder stations will then converge and convey the collected flow via force mains to the central pump station.

The sewage conveyed to the central pump station through the low pressure force main collection system will be discharged from the island by approximately 10 miles of 10 inch force main within the Route 175 causeway to the mainland. The force main will be installed using horizontal directional drilling from Chincoteague to Marsh Island paralleling the existing water pipeline, then installed under the eastbound lane of Route 175 roadway to traverse the marshland between the Island and the mainland and would be supported under the bridges when crossing the channels. The force main will continue along Route 175 to Atlantic Road, then along Atlantic Road, finally terminating at the mainland WWTF.

The central pump station will ultimately have four pumps to handle the seasonal and non-seasonal flows from the ultimate build out of the central sewer system. For Phase 1 the pump station structure will be designed to accommodate the flows for the ultimate build out of the entire town, but will be fitted with two pumps to accommodate Phase 1 both seasonal and non-seasonal flows. The station should have capacity for two future sewer phases with modification to the pumps. The central pump station will have variable frequency drives to adjust the speed of the pumps to match the peak and non-peak flows for all seasonal scenarios. The central pump station will be a conventional wet well/dry well configuration below grade. The pump station will have an above grade structure to house all the equipment required to operate the pumps and an emergency generator. The pumps will operate in a lead/lag scenario and each pump will have the full capacity for the calculated flows for the seasonal and non-seasonal conditions.

Preliminary calculations indicate the Phase 1 seasonal flow to be approximately 342,000 gallons per day (GPD), and the non-seasonal flow to be approximately 114,000 GPD. This relates to pumping rates of 750 gpm and 250 gpm respectively. Preliminary calculations are included in Appendix B. See schematic drawings for the central pump station in Appendix A. All design will be in accordance with the DEQ Sewage Collection and Treatment (SCAT) Regulation 9 VAC 25-790.

TYPICAL LATERAL INSTALLATION

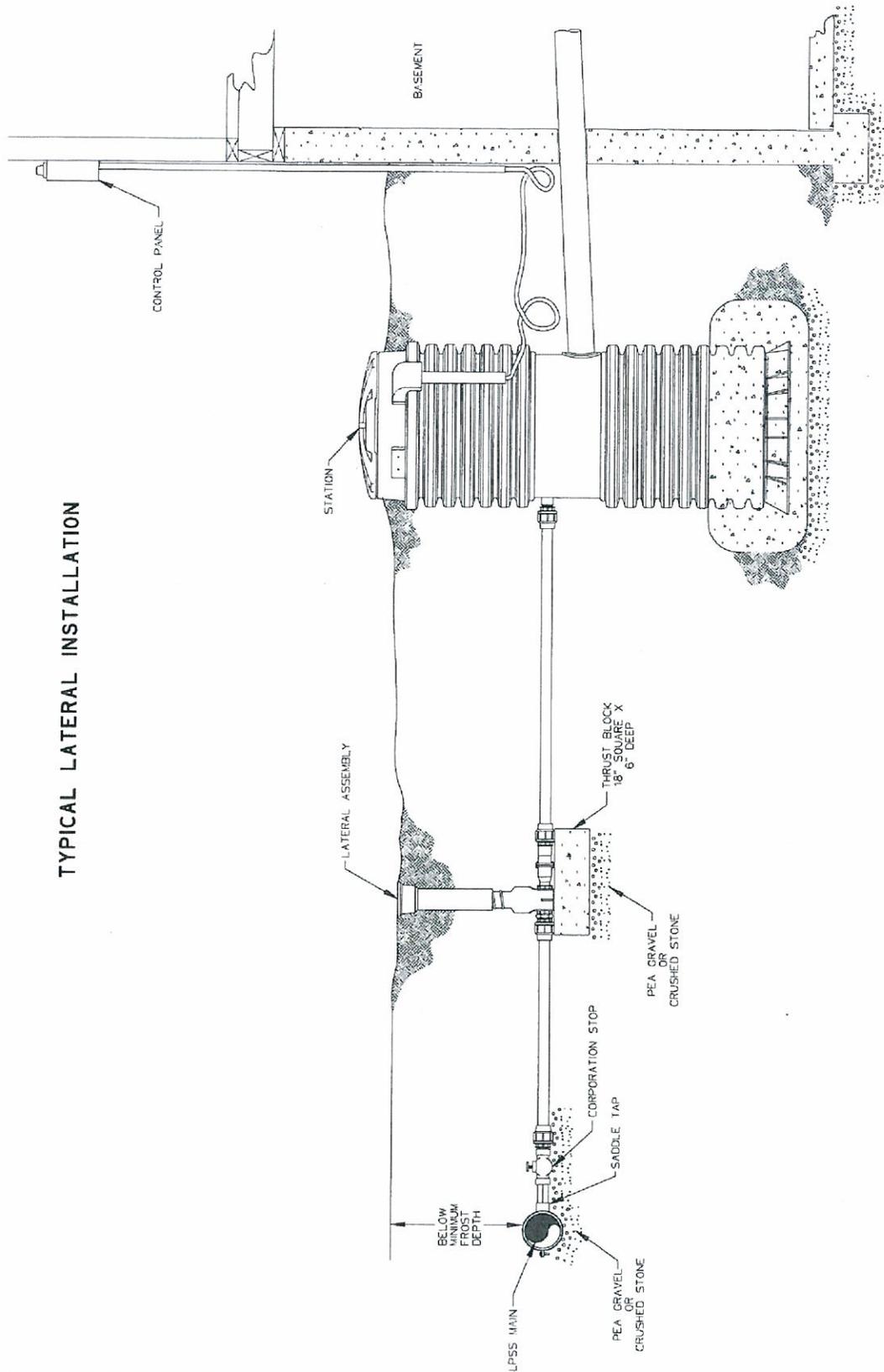


Figure 1

Chincoteague, Va.

Project Cost

The total estimated cost for Phase 1 of the Chincoteague sanitary sewer system is \$24,847,985. A breakdown of the estimated costs is included in Appendix C.

Annual Operating Budget

Income

Connection Fees

As an incentive to connect to the new sewer system, it is anticipated that the connection fee will be waived or significantly reduced for those customers that connect to Phase 1 at the time of the initial offering of service. Connection fees that are collected could be used to establish a fund for costs associated with operations and maintenance. It should be noted that customers who decline to connect at the initial offering will be charged an increased fee (perhaps \$3,000 - \$4,000) if they choose to connect to the system at a later date.

The initial connection fee for residential service could be set at \$200.00 as an incentive to connect. The initial connection fee for commercial customers could be set at \$500.00 and the fee for hotels will be set based on size of the facility.

\$200 X 230 residential connections =	\$46,000.00
\$500 X 60 commercial connections =	\$30,000.00
<u>\$10,000 average X 12 hotel connections =</u>	<u>\$120,000.00</u>
Total Initial Connection Fees	\$196,000.00

Cost of Service (User Rates)

The cost of service for Phase 1 can be estimated by dividing the total annual cost of the Phase 1 sanitary sewer system by the total estimated annual flow from Phase 1, to find an average cost per gallon. The average cost per gallon can be applied to the estimated flow from an average residence to obtain the estimated charge per residence needed to pay all of the Town's costs associated with the sewer system, including debt repayment, and operations and maintenance.

Phase 1 Estimated Annual Flow

Chincoteague Phase 1, yearly flow = 341,429 GPD(90 days) +112,672 GPD(275 days) = 61,713,410 gallons

Phase 1 Debt Service Calculation

Chincoteague Phase 1 Estimated Project Cost = \$24,850,000.
\$24,850,000 financed over 40 years @3.5% = \$96,259/month or \$1,155,106/year



Chincoteague, Va.

Phase 1 Estimated O&M Cost

Phase 1 Operations and Maintenance costs have been estimated in the following section of this report, with a total estimated cost of \$182,000/year.

Total Cost of Service

Total Annual Cost = Debt Service + O&M cost = \$1,155,106 + \$182,000 = \$1,337,106/year

User charge = Total Annual Cost/Annual Flow = \$1,337,106/62,026,405 gallons = \$0.022/gallon.

Average residence assumed at 300 GPD = 109,500 gallons/year.

User charge for average residence = 109,500 gallons/yr x \$0.022/gallon = \$2,361/yr = \$197/month.
= \$21.76/1000 gallons

As could be expected, the initial implementation costs of the Chincoteague Sanitary Sewer System are high. Under the assumptions presented, it is estimated that the average user charge per customer in Chincoteague, in order to pay for all associated costs of the sewage collection system, would be \$192 per month. It should be noted that this includes only the fees for the Town's sewage collection system and does not include a fee for the sewage treatment, which will be charged by the owner/operator of the mainland WWTF.

The current water rates for the Town of Chincoteague provide for a minimum residential bill of \$28 per quarter, plus \$4.23/1,000 gallons over 6,000 gallons used. It is reported that the average water bill for residents is approximately \$35/month. It is anticipated that a sewer bill of approximately the same magnitude is the maximum that could be feasible. Research of sewer service rates for similarly sized towns indicates an average monthly rate between \$25 and \$30 for residential connections.

The rate of \$197/month, or \$21.76/1000 gallons, is not a feasible cost that can be borne by the existing residents of the Town, therefore assistance is needed in funding the sanitary sewer system. Funding sources and options such as grants and loans from USDA or the State Revolving Loan Fund, or additional taxes on "tourists" activities (restaurants, hotels, etc.) will need to be explored. It is estimated that the user fees collected will pay for little more than the O&M costs, requiring nearly 100% grant funding for the construction cost. Preliminary calculations indicate that a loan of approximately \$1,000,000 may be the maximum feasible loan amount. This will result in a monthly user rate of approximately \$34, or \$2.96/1000 gallons. Thus grant funding of approximately \$24,000,000 will need to be obtained.

Operations and Maintenance Costs**Salaries** (include benefits)

It is anticipated that Phase 1 will necessitate the hiring of two field operations staff at an estimated salary of \$45,000.00 each with cost of benefits, etc. included, for an annual cost of \$90,000.

Chincoteague, Va.**Management costs**

Management costs consisting of legal, accounting, auditing, office supplies, insurance, etc. are estimated to be approximately \$12,000.00 per year.

Electricity

Electricity consumption cost for the individual residential pump stations will be paid by the customer, as the electric service will be provided from the customer's electrical system after the meter.

Electricity consumption cost for the larger pump stations is estimated to be 120,000 kwh per year at an average cost of \$0.10 per kwh, for an annual cost of \$12,000.00.

Supplies

Supplies for this type of system typically consist of cleaning and deodorizing chemicals, gloves, paper towels, shop rags, grease and oil, etc. and are estimated to have an annual cost of approximately \$3,000.00.

Repairs

Repairs to pump stations and piping in the system are estimated to have an annual cost of \$53,000.

10 residential pump repairs	@ \$1,000.00	= \$10,000.
6 minor electrical repairs	@ \$500.00	= \$ 3,000.
2 excavated pipe repairs	@ \$10,000.00	= \$20,000.
1 major repairs	@ \$20,000.00	= \$20,000.
Total estimated repair cost		= \$53,000.

Equipment

It is anticipated that the hiring of a new crew will also require the purchase of a new crew truck at the estimated cost of \$40,000. The truck would be the largest equipment expense and expected to be replaced every 5 years. Along with tools, the estimated annual cost of equipment is approximately \$12,000.

The **total annual O&M cost** based on the estimates above is **\$182,000.00**.

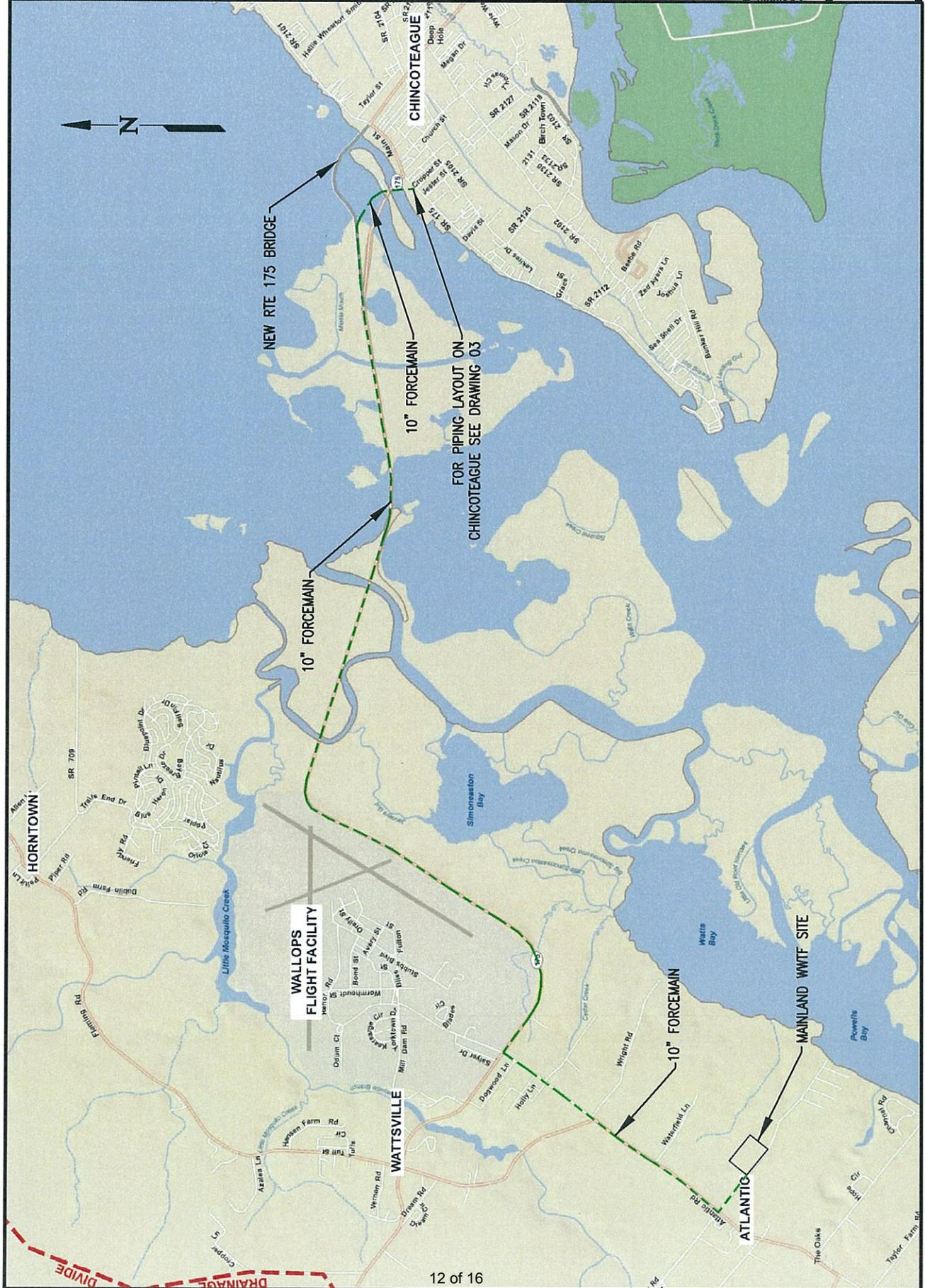
Debt Repayments

The Town has not arranged for any financing for this project. The intent of the Town is to request full funding from USDA RUS.

Reserves

Debt service reserve will be established at one-tenth of the annual debt repayment requirement.

Short-lived asset reserve has been included in the repair costs in the O&M section.



Appendix C

Preliminary Cost Estimate

Chincoteague Sewer Phase 1 PER Cost Estimate				
Description	Unit	Unit Cost	Quantity	Subtotal
Main St. (South) From Maddox Blvd. to Waterside Inn, Includes Smith St.				
1 1/2" PVC Force Main	LF	25	2295	\$57,375.00
4" C-900 PVC Force Main	LF	50	3300	\$165,000.00
6" C-900 PVC Force Main	LF	55	1200	\$66,000.00
8" C-900 PVC Force Main	LF	75	700	\$52,500.00
8" C-900 PVC Gravity	LF	85	100	\$8,500.00
48" Dia. Manhole 4 to 8 feet deep	EA	5000	2	\$10,000.00
Grinder Pump Stations	EA	8000	153	\$1,224,000.00
Pavement Replacement	LF	35	7595	\$265,825.00
Top Soil, Seeding & Fertilizer	SY	2.5	1275	\$3,187.50
Traffic Maintenance	LS	\$27,738.00	1	\$27,738.00
Subtotal				\$1,880,125.50
15% Contingency				\$282,018.83
Total Estimated Cost				\$2,162,144.33

Chincoteague Sewer Phase 1 PER Cost Estimate				
Description	Unit	Unit Cost	Quantity	Subtotal
Main St. (North) From the High School to Maddox Blvd.				
1 1/2" PVC Force Main	LF	25	990	\$24,750.00
2 1/2" PVC Force Main	LF	30	3100	\$93,000.00
Grinder Pump Stations	EA	8000	66	\$528,000.00
Pavement Replacement	LF	35	4090	\$143,150.00
Top Soil, Seeding & Fertilizer	SY	2.5	550	\$1,375.00
Traffic Maintenance	LS	\$11,833.50	1	\$11,833.50
Subtotal				\$777,358.50
15% Contingency				\$116,603.78
Total Estimated Cost				\$893,962.28

Chincoteague Sewer Phase 1 PER Cost Estimate				
Description	Unit	Unit Cost	Quantity	Subtotal
Maddox Blvd. from Deep Hole Road to Main St.				
1 1/2" PVC Force Main	LF	25	570	\$14,250.00
6" C-900 PVC Force Main	LF	55	2100	\$115,500.00
Grinder Pump Stations	EA	8000	38	\$304,000.00
Pavement Replacement	LF	35	2670	\$93,450.00
Top Soil, Seeding & Fertilizer	SY	2.5	317	\$791.67
Traffic Maintenance	LS	\$7,908.00	1	\$7,908.00
				\$0.00
Subtotal				\$535,899.67
15% Contingency				\$80,384.95
Total Estimated Cost				\$616,284.62

Chincoteague Sewer Phase 1 PER Cost Estimate				
Description	Unit	Unit Cost	Quantity	Subtotal
Maddox Blvd. from Museum to Deep Hole Road				
1 1/2" PVC Force Main	LF	25	660	\$16,500.00
3" C-900 PVC Force Main	LF	45	1700	\$76,500.00
4" C-900 PVC Force Main	LF	50	2600	\$130,000.00
Grinder Pump Stations	EA	8000	44	\$352,000.00
Pavement Replacement	LF	35	4960	\$173,600.00
Top Soil, Seeding & Fertilizer	SY	2.5	367	\$916.67
Traffic Maintenance	LS	\$11,229.00	1	\$11,229.00
				\$0.00
Subtotal				\$760,745.67
15% Contingency				\$114,111.85
Total Estimated Cost				\$874,857.52

Chincoteague Sewer Phase 1 PER Cost Estimate				
Description	Unit	Unit Cost	Quantity	Subtotal
Deep Hole Road to Maddox Blvd.				
1 1/2" PVC Force Main	LF	25	23	\$575.00
2 1/2" PVC Force Main	LF	30	1800	\$54,000.00
Grinder Pump Stations	EA	8000	8	\$64,000.00
Pavement Replacement	LF	35	1823	\$63,805.00
Top Soil, Seeding & Fertilizer	SY	2.5	13	\$31.94
Traffic Maintenance	LS	\$2,735.70	1	\$2,735.70
Subtotal				\$185,147.64
15% Contingency				\$27,772.15
Total Estimated Cost				\$212,919.79

Chincoteague Sewer Phase 1 PER Cost Estimate				
Description	Unit	Unit Cost	Quantity	Subtotal
Central Pump Station and Force Main to Atlantic Town Center				
10" Ductile Iron Force Main	LF	180	50725	\$9,130,500.00
Main Pump Stations	EA	\$1,500,000.00	1	\$1,500,000.00
Directional Drilling	LF	150	600	\$90,000.00
Bridge Crossing - 10" FM	LF	225	2075	\$466,875.00
Pavement Replacement	LF	35	50725	\$1,775,375.00
Traffic Maintenance	LS	\$792.00	1	\$792.00
Subtotal				\$12,963,542.00
15% Contingency				\$1,944,531.30
Total Estimated Cost				\$14,908,073.30

Subtotal Construction Cost	\$19,668,241.82
Mobilization	\$1,013,412.09
TOTAL CONSTRUCTION COST	\$20,681,653.92
Land Acquisition	\$30,000.00
Engineering, Funding Applications, Construction Administration	\$4,136,330.78
Total Project Cost	\$24,847,984.70