

LOCAL CHARACTERISTICS: East Marion in the Peconic Estuary

East Marion is a small hamlet with its business center along Route 25, while houses on small lots line its shores. As a result impairment is increasing on confined water bodies. Thirty-two percent of the buildings are sited on shallow depths to groundwater; 11.3% buildings are in flood zones; 35.5% of its buildings are in SLOSH zones; and 21.2% are sited on soils that drain excessively. Sixty-five percent of the lots are nonconforming, being less than 20,000 SF. Thirty-six percent (221) parcels are less than one-quarter acre in size, making lot size a pressing factor for the consideration of clustered treatment. Seventy-seven percent of the buildings are in the 0-2 year influence zone, meaning the impacts of enhanced treatment will be quickly realized. While civic engagement is high, East Marion is pursuing a consensus approach to the issue in an attempt to maintain strong community solidarity.

Proposed areas suitable for collective treatment were initially identified by Peconic Green Growth based on maps depicting lot size, prioritized need, setbacks and proximity. (Figure 5-3) Due to its impact on the impaired Gull Pond and fresh water Marion Lake, PGG chose Sub-district 1 as a priority. After mapping 200-foot setbacks buffers around existing buildings to comply with clearances required for treatment plants and identifying potential sites for collective treatment, PGG selected site number 4 in Figure 5-5 as the preferred site, as there is potential for eventual reuse of the effluent for the irrigation of the Island's End Golf Course. If a truly integrated approach were taken, the treatment plant could vary the rates of nitrogen so that effluent could replace fertilizer applications to grass. This could reduce costs for both the treatment and golf course operations during warm months. Other locations considered for collective treatment are either limited in size or have use limitations due to conservation easements or proximity to a public supply well. Originally, sub-district four was considered for potential hook-up to Greenport's Sewer District, but due to the location of the preferred site, this area could possibly be combined with sub-district 1. Subsequent to the development of the maps, the Town of Southold indicated that lots that were counted as open space as part of a subdivision that did not use public moneys, could also be used as sites for collective wastewater treatment if sensitively placed using predominantly in-ground components.

Figure 5-3 Initially Proposed Collective Districts for East Marion

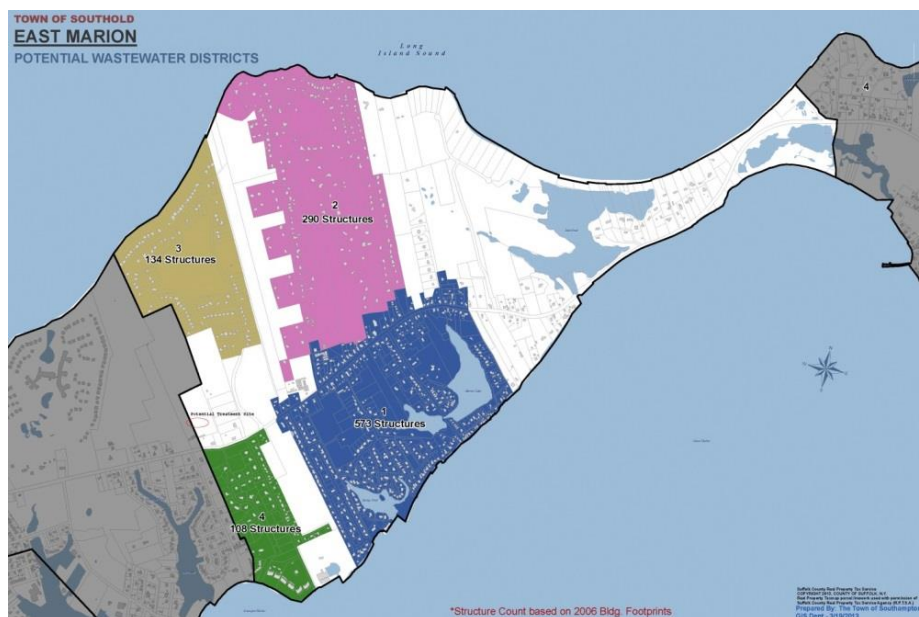
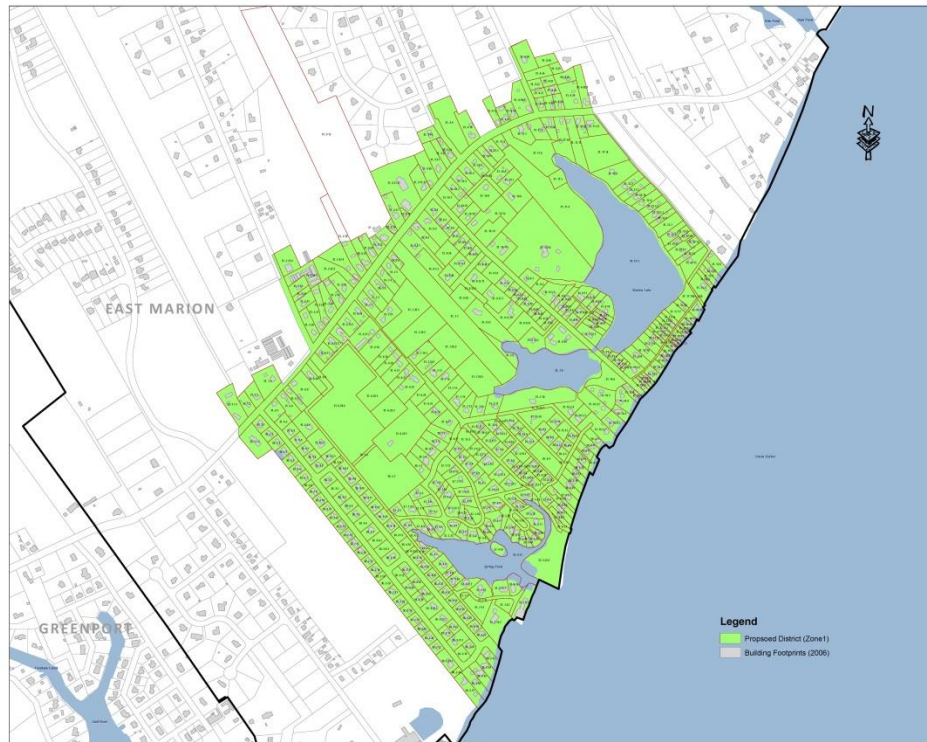


Figure 5-4 – District 1, East Marion



Orenco, a company manufacturing products for both single and collective wastewater treatment, as well as distribution technology, offered to evaluate the collection system cost as the firm is testing new planning and management software called Virtual Utility, which uses Google Maps Engine. This was applied to Sub-district 1, which has 392 developed parcels with an estimated flow of 120,888 gpd. Adding a few parcels along the distribution route if site 4 is chosen, a total of 136,750 gpd is needed. (See Appendix C2). There are 64 undeveloped lots in the district.

The proposed project uses a Septic Tank Effluent Pump (STEP) System with AdvanTex, a packed bed filtration system, recirculation with carbon feed for denitrification, and dispersal to ground. Figures 5-7 through 5-9 illustrate this process. PGG wanted to evaluate this option due to the success of the STEP installation at Hillsdale, NY, which is designed for 130 dwelling units and has low operating and life-cycle costs. The collection system works well with irregular topography and high groundwater tables. The installation also has minimal impact on existing roads during construction, as directional drilling and narrow trenches are used. By retaining septic tanks as part of the system, the treatment of solids is as currently serviced, using existing scavenger plants, thereby focusing funds on secondary and tertiary levels of treatment and maintaining the current infrastructure/employment structure. The tanks also provide 24 hours of emergency storage during electrical outages. Roughly one acre is needed for the treatment area, excluding dispersal and setbacks. A small building roughly 14'x 14' is needed to house controls and chemical feed. All other components are either subsurface or roughly flush to the ground surface. The estimated costs serving the equivalent of 450 dwelling units are roughly \$11,750,000 at a cost of \$26,100 per household. (Table 5-1) Evaluating monthly costs with a range of financing and subsidy options, monthly costs could range from \$36 to \$150 per household. (Table 5-2) It is estimated that the financing costs for loans may be even lower (0-2%) if obtained from the NYS Environmental Facilities Corporation.

Figure 5-5 200' Buffers to Existing Buildings, East Marion

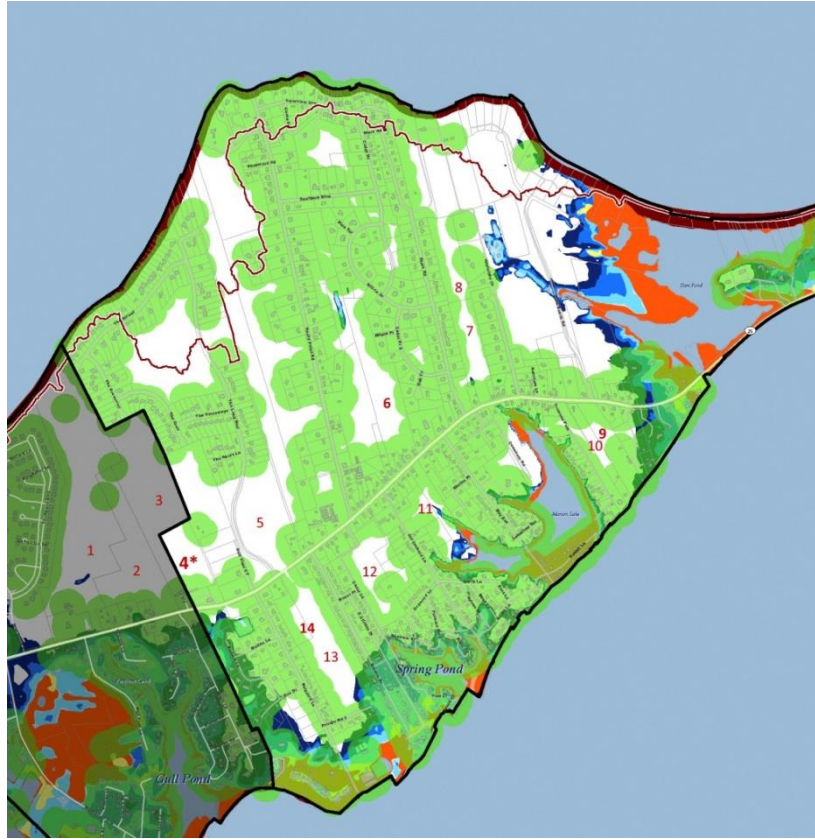


Figure 5-6 Proposed Collection System for Sub-District 1



Table 5-1: East Marion Cost Estimate for STEP system

| Cost Estimate: East Marion STEP system | | | | | | | |
|---|---------------------------------|---|----------------------------|------------------------|-------------|--------------------------------|------------------------------|
| <i>Capital Cost Summary</i> | | | | | | | |
| | <i>Onlot Costs ¹</i> | <i>Submains for each property</i> | <i>Treatment/ unit</i> | <i>Subtotal \$/EDU</i> | <i># DU</i> | <i>\$/Subtotal</i> | <i>Alternative Dispersal</i> |
| Per Lot | \$9,500 | \$1,800 | \$7,500 | \$18,800 | 450 | \$8,460,000 | |
| | | | | | | | |
| <i>Collection Costs</i> | <i>Dia.</i> | <i>Total Length</i> | <i>Price per foot (\$)</i> | <i>Estimated Cost</i> | | | |
| Pipe Summary | 2" green | 8770 feet | \$15 | \$131,550 | | | |
| | 3" yellow | 16296 feet | \$18 | \$293,328 | | | |
| Design | 4" purple | 7045 feet | \$26 | \$183,170 | | | |
| Contingency | 6" lt. blue | 3425 feet | \$34 | \$116,450 | | | |
| | | | | | | \$724,498 | |
| | | | | | | | |
| <i>Dispersal with Leaching Pits</i> | | # | | | | | |
| capacity 6000g ea | 10'dia x 12'd | 23 | \$3,600 | \$82,800 | | | |
| (500'lf) | | | | | | | |
| Additional costs | | | | \$95,000 | | | |
| | | | | | | \$177,800 | |
| | | | | | | | |
| | | | | | | Subtotal | \$9,362,298 |
| | | | | | | Engineering costs 12% | \$1,123,476 |
| | | | | | | Contingency 10% | \$936,230 |
| | | | | | | Subtotal | \$11,422,004 |
| | | | | | | Land purchase/lease | \$300,000 |
| | | | | | | Fencing -assume 565' x \$30/ft | \$16,950 |
| | | | | | | Subtotal | \$11,738,954 |
| | | | | | | Cost/DU | \$26,086.56 |
| | | | | | | | |
| Operations Cost | \$17.59 | Includes | | | | | |
| | | Excludes repair/replacement for the plant, administration, overhead | | | | | |
| Chemical feed (5-10%) | \$1.76 | | | | | | |
| | \$19.35 | Per DU | | | | | |

Table 5-2 Rate Analysis for East Marion

Includes all costs referenced above except the repair and replacement of the STP.

| Rate Analysis | |
|---------------|--|
|---------------|--|

| | |
|---------------|----------------------------|
| System | 1,500 gal STEP w/ AdvanTex |
|---------------|----------------------------|

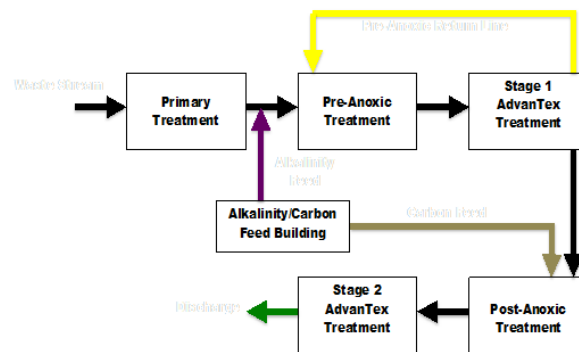
| Loan Option | Interest Rate (%) | Term (yrs) |
|---------------|-------------------|------------|
| Loan Option 1 | 3.00% | 40 |
| Loan Option 2 | 3.50% | 30 |
| Loan Option 3 | 5.00% | 20 |

| System, Loan Option 1 | | |
|---------------------------|--------------------------------|---------------------------------|
| % Grant or Connection Fee | Debt Retirement (\$/Month/EDU) | Total Debt & O&M (\$/Month/EDU) |
| 0% | \$70.37 | \$88.90 |
| 25% | \$52.78 | \$71.30 |
| 50% | \$35.18 | \$53.71 |
| 75% | \$17.59 | \$36.12 |

| System, Loan Option 2 | | |
|---------------------------|--------------------------------|---------------------------------|
| % Grant or Connection Fee | Debt Retirement (\$/Month/EDU) | Total Debt & O&M (\$/Month/EDU) |
| 0% | \$88.44 | \$106.97 |
| 25% | \$66.33 | \$84.86 |
| 50% | \$44.22 | \$62.75 |
| 75% | \$22.11 | \$40.64 |

| System, Loan Option 3 | | |
|---------------------------|--------------------------------|---------------------------------|
| % Grant or Connection Fee | Debt Retirement (\$/Month/EDU) | Total Debt & O&M (\$/Month/EDU) |
| 0% | \$130.52 | \$149.05 |
| 25% | \$97.89 | \$116.42 |
| 50% | \$65.26 | \$83.79 |
| 75% | \$32.63 | \$51.16 |

Figure 5-7 Conceptual Diagram of Proposed STEP Treatment to Obtain TN of Less than 10 mg/L
 Courtesy of Orenco Systems Inc.



Figures 5-8 and 5-9 Conceptual Illustration of Typical STEP system
 Courtesy of Orenco Systems Inc.

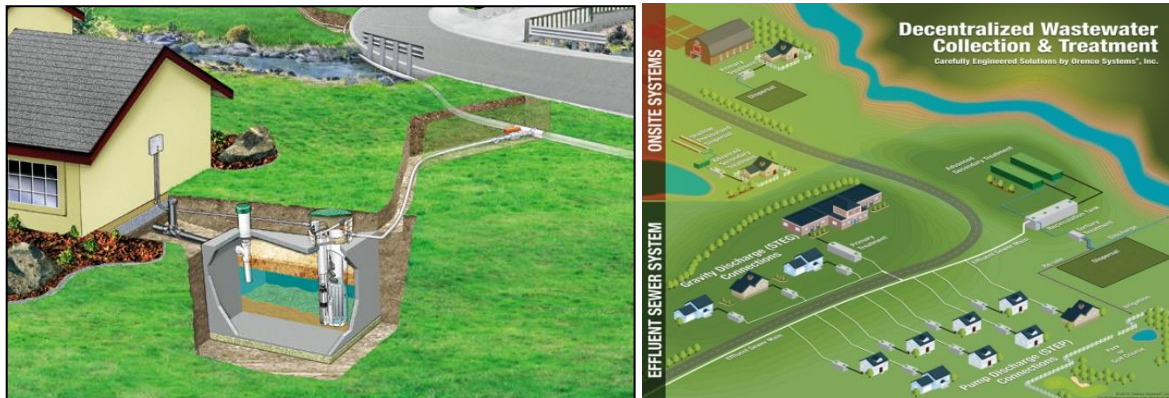


Figure 5-10 Sample of Components of a STEP System
 Courtesy of Orenco Systems, Inc.

