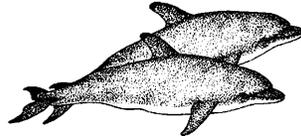


**Please respond to this straw poll by April 7:**

- Online at <https://www.surveymonkey.com/r/TVYK2LD>
- Send emails to [captivacommunitypanel@gmail.com](mailto:captivacommunitypanel@gmail.com)  
or send faxes to (239) 362-9771.
- Send mail to Captiva Community Panel, P.O. Box 72, Captiva, FL 33924
  - Email Wastewater Committee chair Jay Brown  
with questions at [jaybrown1@icloud.com](mailto:jaybrown1@icloud.com).



**CAPTIVA COMMUNITY PANEL**

***Captiva wastewater alternatives:  
Report of Wastewater Committee findings***

MARCH 2020

Much of Captiva relies upon conventional septic systems to treat and dispose of wastewater from Captiva's homes and businesses. In public outreach efforts, the Captiva Community Panel has found that significant numbers of property owners have concerns about Captiva's reliance on conventional septic systems. Captiva is a low-elevation barrier island with porous soils in an environmentally sensitive area. Septic systems are intended to be used primarily in more rural areas where central sewer service is not available and groundwater is far below the surface. The Panel formed a Wastewater Committee to investigate the possible impacts of conventional septic systems and to evaluate alternative methods of wastewater disposal. This document will summarize the Wastewater Committee's findings to date.

**RESEARCH COMPLETED**

Most of the information contained in this document was developed by two Panel-sponsored research projects. TKW Consulting Engineers, a leading Fort Myers-based engineering firm, completed an extensive review of Captiva's existing wastewater practices, evaluated alternative strategies for Captiva and provided preliminary cost estimates for each strategy including a possible extension of Sanibel's central sewer system to all areas of Captiva now using conventional septic systems.

Secondly, David Tomasko, Ph.D. was retained to evaluate the environmental and human health impacts of Captiva's reliance on conventional septic systems. Dr. Tomasko, a leading expert on water quality issues in Southwest Florida, is a consultant with Environmental Science Associates, a 500+ member environmental consulting firm. Both the TKW study and the Tomasko study are posted on the Panel website ([www.captivacommunitypanel.com](http://www.captivacommunitypanel.com)) for public review.

## **EXISTING WASTEWATER PRACTICES**

According to TKW, there are 1,019<sup>1</sup> parcels of developed land on Captiva. Of these, 553 parcels are in the South Seas Resort area which is served by a Florida Governmental Utility Authority (FGUA) central wastewater treatment facility and collection system. The FGUA plant is operating near captivity and is located in a wetlands area inside the resort.

The “Village” area of Captiva is comprised of 307 parcels; 219 of these parcels utilize septic systems, most of which are of the “conventional” type (do not have in-tank treatment of wastewater prior to drainfield dispersal). The remaining properties (88) are those in Sunset Captiva and Captiva Shores, both of which use “package plants” which are small central wastewater processing facilities.

The “Tween Waters Stretch” area has 47 parcels (all using septic systems) plus the Tween Waters Resort which operates a package plant. The “Gold Coast” and Roosevelt Channel areas have 112 parcels, all of which use septic systems.

In total there are 378 septic systems on Captiva and the large majority of them are conventional septic systems that do not provide in tank processing of the waste prior to dispersal via the drain field. Conventional septic systems rely upon natural soil processing of the effluent before the effluent reaches the underlying water table. The septic systems on Captiva in total process about 35%-40% of the total wastewater generated.

## **GENERAL WASTEWATER CONCERNS**

Improperly treated wastewater can be a hazard to both human health and the environment. Central sewer systems process wastewater to differing standards, varying from simple removal of pathogens to high levels of nutrient removal to ensure the effluent does not promote growth of unwanted organisms such as algae in coastal waters. It is not always enough to just have a central sewer system. The level of effluent treatment and the method of post-treatment effluent disposal must be considered.

Properly used, septic systems can be a highly effective method of wastewater treatment and disposal. The chief potential concern with septic systems is the possibility that the soil between the drain field and the underlying water table will not properly remove pathogens and nutrients before the effluent reaches the water table below the topsoil. In this event, the water table can spread improperly treated effluent widely and into coastal waters.

As a response to this possibility, “performance-based” septic systems have been developed to provide varying levels of in-tank processing before the effluent flows into the drain field. Performance-based systems are considerably more expensive than conventional systems and require periodic inspection regimens monitored by regulatory authorities. Performance-based systems need to be used regularly and are less appropriate in circumstances where there are either long periods of property absence or short periods of high water usage.

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<sup>1</sup> Note: Community statistics cited herein are from the TKW report; we assume they are accurate as stated.

## **STATE GUIDANCE FOR SEPTIC SYSTEMS**

The Florida Department of Health (FDOH) has the following criteria for permitting new conventional septic systems: (1) minimum 24-inch separation between drain field and seasonal high-water table, (2) minimum ½-acre lot size, and (3) minimum 75-foot setback from coastal water. Many water quality experts believe that the 24-inch minimum distance between drain field and water table is inadequate in areas that have porous soils such as Captiva. Many believe that 42 inches is more appropriate.

The Tomasko study reviewed conformance of Captiva’s septic systems to FDOH guidance. This included taking soil samples at over 40 locations throughout Captiva to determine the amount of drainfield and water table separation. Tomasko found widespread lack of conformance to all three FDOH criteria. 30% of the soil sample locations showed less than 24-inch separation between drain field and water table. Most lots in the Village area are less than ½ acre. Many septic systems in the Tween Waters and Roosevelt Channel areas likely have less than a 75-foot coastal water setback.

Captiva’s lack of conformance to FDOH guidance for proper septic system use suggests that Captiva may have significant issues with its reliance on conventional septic systems. Moreover, there may be issues in permitting new conventional septic systems. It is unlikely that permits would be denied based on lot size. However, maintenance of the 24” water table clearance will be mandatory resulting in the need to mound drain fields to achieve the minimum clearance.

## **PATHOGEN IMPACTS**

Tomasko evaluated water samples from the drainage areas near McCarthy’s Marina, the largest area on Captiva where stormwater runoff would accumulate. Although high levels of bacteria were present, none were human-source – which suggests Captiva’s septic systems are NOT currently yielding pathogens that threaten human health. The large presence of nonhuman-source bacteria, however, strongly indicates a need to better manage storm water runoff.

## **COASTAL WATER QUALITY IMPACTS**

Given the apparent lack of human health risk, the major potential threat of Captiva’s septic systems is potential “loading” of nutrients to Captiva’s coastal waters. Such nutrient loading could be a major factor in promoting growth of algae and other coastal water pollutants.

Determining the amount of nutrients such as nitrogen and ammonia that septic systems might be pushing into coastal waters is not an easy task. Such estimates require understanding the volume of wastewater put into septic tanks, estimating how much of the “nutrients” in the waste are eliminated by natural soil processing before reaching the water table and then estimating how much of the nutrient content will eventually reach coastal waters. This task requires sophisticated modeling techniques and making reasonable assumptions.

Scientists with the Sanibel-Captiva Conservation Foundation (SCCF) had made estimates of Captiva’s septic system nutrient loading in the past, and recently updated its modeling of septic system loading estimates for Captiva. Those scientists believe Captiva’s septic systems are a very significant source of nutrient loading to Captiva’s coastal waters, approximately equal to the impact of fertilizer use combined with stormwater runoff.

Although he acknowledges that the SCCF research is using modeling techniques widely accepted in the scientific community, Tomasko believes that model is significantly overstating the current nutrient impact of Captiva's septic systems. In its 2011 water quality study for Captiva, SCCF researchers collected numerous samples from Captiva's water table and evaluated the samples for presence of nutrients. The nutrient content of the water table samples was dramatically reduced from the nutrient content of waste in septic tanks.

This indicates to Tomasko that the natural processing by the soil in Captiva is removing most of the septic tank nutrients unlike the assumptions that are in SCCF's modeling. Tomasko's model of septic nutrient loading produces results far below SCCF's revised estimate and leads Tomasko to conclude that Captiva's septic systems today are not significant sources of coastal water pollution.

Although there is a difference of opinion between Tomasko and SCCF scientists about present day impacts, both believe that septic systems on Captiva are not viable long-term. Tomasko cites the present-day issues with inadequate separation between drain fields and the groundwater levels. As sea level rise progresses (which will raise groundwater levels as well), this separation will diminish further with the result (according to Tomasko's research) that nearly all Captiva septic systems will have less than 24" separation and a majority will have no separation. This will result in plumbing failures and widespread nutrient pollution of coastal waters. Given the long lead times to establish central sewer service, both SCCF and Dr. Tomasko believe that Captiva should begin efforts to develop central sewer service.

### **CENTRAL SEWER SYSTEM CONCEPT AND COST**

TKW examined multiple central sewer alternatives for Captiva. At this time, the most likely scenario appears to be expansion of Sanibel's central sewer program to serve all of Captiva outside South Seas. South Seas currently has central sewer service provided by FGUA. Sanibel's wastewater processing is done at its Donax facility which is now undergoing a major improvement and expansion. When this project is completed, Sanibel will have ample capacity to serve all of Captiva and nutrient removal will be to Advanced Water Treatment (AWT) standards, the highest standard now in practice.

In order for Captiva properties to access the Donax facility, a main sewer line with lift stations would have to be constructed across the length of Captiva from Blind Pass to South Seas Resort. TKW estimates the cost of this project to be approximately \$16 million. The actual design of the sewer line and placement of lift stations would need to be determined by a rigorous engineering study, but TKW believes its \$16 million estimate is reasonable and can be used by Captiva for central sewer cost/benefit analyses and decision-making. This study will also give the community a better idea of where mains and lift stations would actually be located, since the TKW study only estimated locations and the number of stations needed for various alternatives.

Using data in the TKW study, it is estimated that 71% of Captiva wastewater is generated by residential properties and 29% of wastewater is generated by commercial properties. Thus, it is expected that 71% of the sewer line cost (\$11.4 million) would be paid by residential properties and 29% (\$4.6 million) would be paid by commercial properties.

In addition to the main sewer line project cost, Captiva property owners would need to connect their homes and structures to the new sewer line, pay an “access fee” to Sanibel for use of the Donax capacity and remove or remediate their existing septic systems. TKW estimates that these one-time costs will be approximately \$12,000 on average per Captiva residential property (based on \$5,000 for the main sewer line connection, a \$5,000 “access fee” for an average size residence and an average \$2,000 for septic removal). According to TKW, there are 447 residential properties on Captiva current served by septic systems. Thus, in aggregate, the one-time costs will total \$5.4 million for residential property owners (\$12,000 X 447). If these one-time costs are added to the \$11.4 million residential share of the sewer line project, the total project cost to establish central sewer service for 447 Captiva residential property owners outside South Seas is **\$16.8 million**.

In addition, there would be the costs for commercial property owners who would pay collectively \$4.6 million for the new sewer line plus their connection costs and “access fees” to Sanibel which would be based on the amount of wastewater processed. After completion of the new sewer system, all Captiva property owners outside South Seas would pay the same rate as Sanibel residents for ongoing waste processing. According to TKW the current rate is \$778 annually for an average size residence.

#### **FINANCING AND GOVERNMENT OVERSIGHT**

The central sewer system would be built and operated by Sanibel under an interlocal agreement between Lee County and Sanibel to protect the interests of Captiva property owners. Creation of a Municipal Services Taxing Unit (MSTU) likely would be required to pay for the new sewer line and, perhaps, all the one-time property owner costs. To create the new MSTU, a majority of property owners in the new central sewer service area would need to sign notarized petitions in support of the project. Once the taxing district was created, project funds would be borrowed and repaid over an extended time period by property owners within the taxing district.

Preliminary indications are that 30-year amortization and a 3.5% interest rate are reasonable assumptions for project financing. If all residential property owners shared equally in all total project costs (both sewer line construction costs and all one-time individual property owner costs), the cost per residential property owner would be approximately **\$2,000 annually** for the 30 years required to retire the project debt. Alternatively, only the new sewer line cost might be financed by the taxing authority. Individual property owner one-time costs would be the responsibility of the property owners and each property owner would pay his ACTUAL costs. The annualized cost of financing only the sewer line would be **approximately \$1,400**.

The estimates above assume that all residential property owners would share equally in the project costs. There are numerous other methods for project cost-sharing. For example, costs could be allocated on the basis of property values or projected volume of wastewater to be treated. While these are equally valid methods of cost sharing, the methodology above was chosen for simplicity and ease of understanding. The ACTUAL method of cost allocation to be used would be subject to community will and rate analyses by utility experts.

There is a possibility that public funding assistance might be available to reduce the cost of main sewer line installation. The State of Florida has set aside funds for septic-to-sewer conversions. Whether or not such assistance might be available will not be known until project engineering is advanced sufficiently to create the municipal taxing authority. The maximum assistance that might be available could be half the main sewer line cost. If this level of assistance was achieved, the annualized cost of the project would be reduced to \$700 for the sewer line and \$1,300 for the sewer line plus all one-time individual property owner costs.

### **OTHER WASTEWATER ALTERNATIVES**

Using the existing FGUA plant at South Seas instead of Sanibel's Donax facility for wastewater processing has been considered. Whereas ample capacity will exist at Donax, the FGUA plant would require a \$9 million plus expansion/improvement to meet the processing needs of Captiva properties outside South Seas, according to estimates by FGUA officials. The need for major investment to expand the capacity of the FGUA plant limits the desirability of using the plant.

There is a possible scenario where capacity could be expanded at FGUA to serve only the Village area. In this plan, the main sewer line would be much shorter than that required to serve all of Captiva. The annual cost per Village residential property served would be similar to the Sanibel partnership plan for all properties outside South Seas. This plan would be worthy of further development if Captiva wished to provide central sewer service only to the higher-density Village area, where the benefits of central sewer might be greatest.

TKW also considered the possibility of constructing a new processing plant on Captiva, but abandoned the idea due to lack of site availability and the high cost of constructing a new processing plant.

TKW reviewed the range of "performance-based" septic systems now available as an alternative to central sewer service. Such systems reduce the environmental risks of septic system pollution by processing waste in the septic system tank before discharge to the drain field. The costs of such systems, however, are similar to the per-property costs of providing central sewer service and do not entirely mitigate the risks of long-term sea level rise. Further, such systems require continuous use, which is not always the case on Captiva where occupancy is seasonally oriented.

### **POTENTIAL SOUTH SEAS PARTICIPATION**

There appears to be no widespread dissatisfaction today within South Seas regarding FGUA's central sewer service. However, the treatment plant is located in a wetlands area that could be highly vulnerable to sea level rise. Further, the plant does not process wastewater to the highest AWT standard as will Sanibel's Donax facility after completion of the expansion/improvement project now underway.

For these reasons, South Seas property owners might want to replace FGUA as its service provider. That is **not** being proposed in this discussion, and property owners inside South Seas will **not** be included in this straw poll. The poll intends to assess support from owners of properties outside the resort for moving forward to the next stage of feasibility and engineering toward an eventual vote on forming a taxing unit that does **not** include South Seas.

However, the potential of including properties now served by the FGUA plant has been raised in discussions about the various wastewater alternatives for Captiva – so we will mention it here.

Including South Seas in the Sanibel/Donax service area should not impact materially the overall project cost, as sewer lines are already in place throughout South Seas and Donax will have sufficient capacity to include South Seas in the service area. South Seas property owners would have to pay the “access fee” to utilize Donax capacity (estimated to be \$5,000 for a typical residential property). Further, property owners likely would be expected to share in the new sewer line project cost as South Seas would use it for transportation of wastewater to Donax. However, if South Seas participated in the project, the overall project costs per property would be reduced significantly.

FGUA management has stated the Authority intends to operate the present FGUA facility long-term and maintains that any future expenses necessary to “harden” the facility against climate change threats would not be charged wholly to existing South Seas customers. In addition, FGUA would require compensation for the revenues lost if the plant were to be shut down and replaced by the Donax facility. FGUA has made prior investments in the facility based on its agreement with Lee County and it may have exclusive rights to the South Seas service area.

From a broad and long-term cost perspective, it may not make sense to operate two wastewater processing facilities when there is ample capacity at a single facility, particularly when one of the facilities likely will require significant long term investment to maintain it in an environmentally sensitive area subject to climate change risks. However, there are multiple “entities” involved in making such a decision, and each will be guided by its own political and economic priorities which may at times seem to diverge from the best and most cost-effective solution for Captiva.

### **COST/BENEFIT DISCUSSION**

The overall cost of establishing a central sewer system for Captiva outside of South Seas is about \$2,000 annually per residential property owner for 30 years. In addition to this cost, property owners will pay the ongoing cost of processing their wastewater, currently about \$800 annually for a typical residential home. What are the potential benefits and/or unintended consequences?

Although David Tomasko and SCCF scientists have differing opinions about the present-day environmental impacts of Captiva’s septic systems, both agree that septic systems are not viable over the long run. Captiva is a barrier island in an environmentally sensitive area. The soils are porous and much of Captiva is only 2-3 feet above sea level. Many Captiva septic systems today do not have even the minimum 24 inches of separation needed from the underlying groundwater table. Septic systems are designed primarily for more sparsely populated areas and many of Captiva’s systems are located in the densely populated Village area where lot sizes are often less than a quarter-acre. As sea level (and thus groundwater level) rises, this lack of separation will intensify to the point that conventional septic systems may fail to operate properly, if at all.

Captiva is highly dependent upon on the quality of its coastal waters and many residents will wonder how Captiva credibly can advocate for water quality if the community is unwilling to make the investment needed to establish central sewer, arguably the island’s most appropriate means of treating its wastewater.

On the other hand, there is little evidence of an immediate “clear and present danger.” There is little threat that a regulatory agency today will find that Captiva’s coastal waters have been degraded to the point that action must be taken, as has happened in the Florida Keys. The future rate of sea level rise cannot be predicted with certainty, and Captiva’s possible mitigation responses are yet to be developed. Some may argue that acting now is not essential, and that acting later when more is known may result in wiser actions.

Operating and maintaining septic systems can be a nuisance. There can be unpleasant odors, emergency service calls and the need for periodic tank pumpouts. Drain fields often have to be mounded to achieve the required amount of separation from the groundwater. The mounds can be unsightly and interfere with landscape plans. There are often better alternative uses of the land that must be committed to drain fields. Although this document cites no solid evidence of it, many believe that the presence of septic systems has a negative impact on property values. Captiva property values are high and only a small favorable impact would be needed to offset the cost of establishing central sewer service. If a septic system must be replaced, there is considerable expense to do so. According to TKW, a new performance-based system is similar in cost to the per-property cost of a central sewer program.

In addition to the cost, the two “downsides” associated with establishing central sewer service are the possibility of creating incentives for unwanted density increases on Captiva and disruption of the community during installation of the main sewer line. The absence of a central sewer system creates a physical and economic barrier to new development projects where wastewater management can be cost-prohibitive. Captiva currently has strict zoning in place which prohibits density increases. However, it is possible that variances or zoning changes could be permitted by county officials at some time in the future.

As for the construction of a new central sewer system, the typical project involves installation of main sewer lines and lift stations in the public right-of-way – which on Captiva is under and beside Captiva Drive, and is very narrow in spots (often barely wider than the roadbed itself in the Village). TKW has explained that new techniques are available which eliminate the need for the open trenches typically used when installing main sewer lines. Nevertheless, there would be significant community disruption.

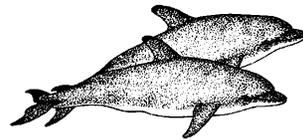
## **NEXT STEPS**

A strong showing of community support will be needed for further progress in developing a central sewer option for Captiva. Detailed and expensive engineering plans will be needed for an effort to create a municipal taxing authority to fund central sewer. Requests for government financial support will also require strong community support of such proposals.

To that end, the Captiva Community Panel is conducting a “straw poll” to determine the level of public support. The poll questions and a two-page summary will be mailed to all property owners outside South Seas Island Resort, with this expanded report on the committee’s research available online at the Panel website ([www.captivacommunitypanel.com](http://www.captivacommunitypanel.com)) along with the Tomasko and SCCF findings. An update on this poll will also be emailed to the Panel’s email list (which may include some South Seas owners, since we cannot distinguish email addresses by

property location), which will include a link to an online poll asking the same questions as the mailed version. Links to the various reports will also be included, and this email will be sent a number of times between when the straw poll is mailed and the planned April 7 deadline for response.

A summary of the poll results will be reported at the April 14 Panel meeting. The Panel will also review at a publicly noticed meeting whether or not it wishes to make a recommendation regarding central sewer. Public comment will be sought and will inform any decisions made by Panel members. It is hoped that a clear sense of direction can be identified prior to the end of the current season.



### **CAPTIVA COMMUNITY PANEL**

*Members: Antje Baumgarten • Mike Boris • Ann Brady • Jay Brown • John Jensen  
Mike Kelly • Mike Lanigan • Tony Lapi • David Mintz • Rene Miville • Mike Mullins*

REMEMBER:

### **Respond to this straw poll by April 7:**

- Online at <https://www.surveymonkey.com/r/TVYK2LD>
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- Send mail to Captiva Community Panel, P.O. Box 72, Captiva, FL 33924
  - Email Wastewater Committee chair Jay Brown  
with questions at [jaybrown1@icloud.com](mailto:jaybrown1@icloud.com).

If you're not receiving emails from the Captiva Community Panel already and want to get on the list, email your address to [captivacommunitypanel@gmail.com](mailto:captivacommunitypanel@gmail.com) to join!