

On-Site Sewage Disposal Systems and Water Quality Impacts in St. Tammany Parish, Louisiana

Prepared by:

St. Tammany Parish Department of Environmental Services

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1 Introduction

St. Tammany Parish faces significant environmental and economic challenges due to poor water quality in its rivers and bayous. With approximately 36,000 on-site sewage disposal systems (OSDS) in use across the parish, the untreated or poorly treated effluent from these systems contributes to the degradation of local waterbodies. The Louisiana Department of Environmental Quality (LDEQ) has designated most waterbodies in the Parish as impaired due to low dissolved oxygen, high numbers of bacteriological pathogens, or both. This impairment not only threatens the environment, public health, and contributes to mosquito production, but also restricts economic development and, as the LDEQ may not issue additional discharge permits to impaired waterbodies. This paper examines the impact of OSDS on water quality in St. Tammany Parish, outlines the environmental, public health, and economic concerns, reviews pilot program data, proposes a new ordinance to address these issues, and underscores the need for improved wastewater management strategies.

2 Background

2.1 On-Site Sewage Disposal Systems in St. Tammany Parish

On-site sewage disposal systems (OSDS) are widely used in St. Tammany Parish to manage household wastewater in areas not served by centralized sewer systems. Approximately 36,000 OSDS are currently operational, serving a significant portion of the parish population. These systems include conventional septic tanks, which consist of a septic tank and a drainfield designed to treat and disperse wastewater into the soil, and aerobic treatment units (ATUs), which use oxygen and microbial processes to provide enhanced treatment before discharging effluent. While ATUs can offer improved treatment compared to conventional septic tanks, both systems

require proper design, installation, and maintenance to function effectively. These requirements are often not met in parts of the parish, leading to environmental concerns.

2.2 Water Quality Issues

The effluent from OSDS, if untreated or inadequately treated, introduces pollutants such as nitrogen, phosphorus, and fecal bacteria into nearby waterbodies. These contaminants contribute to two primary water quality impairments identified by the LDEQ: low dissolved oxygen and elevated levels of bacteriological pathogens. Low dissolved oxygen leads to hypoxic conditions that harm aquatic life. Bacteriological pathogens, such as fecal coliforms and enterococcus, pose risks to human health, particularly for recreational water use and shellfish harvesting. Drainage ditches receiving OSDS effluent are the primary larval mosquito habitat of the West Nile virus vector, *Culex quinquefasciatus*, due to inhabitability of these aquatic environments for larvivorous fish. Even ATUs, which are designed to provide better treatment, can fail to meet water quality standards if not properly maintained.

2.3 LDEQ Waterbody Impairment Designations

The LDEQ has conducted water quality assessments under the Clean Water Act, identifying most rivers and bayous in St. Tammany Parish as impaired. Impaired waterbodies fail to meet state water quality standards for designated uses, such as fishing and/or swimming. The primary causes of impairment in the parish are low dissolved oxygen, which disrupts aquatic ecosystems, and bacteriological pathogens, which indicate fecal contamination. These designations have significant implications, as the LDEQ may not issue additional discharge permits for impaired waterbodies, limiting new industrial, commercial, or residential developments that will require a wastewater discharge. This restriction creates an adverse economic development impact, hindering growth and investment in the parish.

3 Proposed Ordinance for OSDS Inspections

To address the environmental and economic impacts of OSDS in St. Tammany Parish, a new ordinance is proposed to require regular inspections of all OSDS every three years. The ordinance, as proposed, requires the St. Tammany Department of Environmental Services (DES) to administer the inspection program, focusing on evaluating the functionality of the OSDS. The inspections will assess critical components, including the integrity of septic tanks and the operational status of ATUs, to ensure systems are effectively treating wastewater. The ordinance includes provisions for exemptions based on inspection outcomes. Systems that demonstrate no off-site discharge—meaning the disposal of wastewater is fully realized within the boundaries of the property—will be exempt from further inspections. This exemption aims to reduce the regulatory burden on property owners with properly functioning systems while prioritizing oversight of systems that pose a risk to water quality.

3.1 Pilot Program Results

In 2024, the DES conducted an OSDS inspection pilot program where 1,000 homes were inspected in participating Council Districts. The systems were inspected to determine if they were functioning and how many would qualify for exemptions under the proposed OSDS ordinance.

The following table summarizes the pilot program results by council district:

Table 1: Results of the 2024 OSDS Pilot Inspection Program in St. Tammany Parish

Results	CD1	CD2	CD4	CD5	CD7	CD11	CD13	Totals	%
Exempt	8	42	1	11	22	39	6	129	12.9%
Failed	13	29	10	12	49	69	33	215	21.5%
Failed-Denied Access	0	1	1	0	3	5	0	10	1.0%
Failed-No Access	5	14	0	11	22	21	17	90	9.0%
Passed	37	87	15	46	82	132	56	455	45.5%
Vacant	4	15	3	10	28	26	15	101	10.1%
Totals	67	188	30	90	206	292	127	1000	100.0%

Exempt indicates that the system was inspected by DES and determined to have no off-site discharge. The disposal of the sewage effluent is realized within the boundaries of the property. Examples are field beds, spray irrigation, and overland flow systems.

Failed indicates that inspection by DES determined that the homeowner will need to take some action to bring the system into compliance. These could include one or more of the following: system pump-out, aerator repair/replacement, structural repair, system replacement. Of the 215 systems that failed as part of the pilot program, 105 (49%) required a new aerator, 82 (38%) required a complete system replacement, 14 (7%) needed electrical repairs, and 10 (5%) required repairs to the air line.

Failed-Denied Access indicates homeowners who refused to allow DES inspectors on their property.

Failed-No Access indicates that DES inspectors were not able to access the OSDS for inspection and were not able to arrange access with the homeowner.

In conjunction with the DES pilot program, St. Tammany Mosquito Abatement District (STMAD) personnel followed the OSDS inspections and assessed the water quality in the receiving ditches. Statistically significant associations were observed between failing OSDS and water quality, and larval mosquito presence. Ditches associated with failing OSDS inspections were high in Total Dissolved Solids (TDS), low in Oxidative Reductive Potential (ORP), and low in Optical Dissolved Oxygen (ODO). These associations were all in the expected direction with regards to poor water quality and were linked to increased larval mosquito presence and decreased predatory mosquitofish presence.

3.2 Financial Assistance

The proposed program will utilize existing funding sources to aid qualifying residents with the required repairs and/or replacements of failing systems. The DES is actively working with the LDEQ to secure a State Revolving Fund loan to help residents who do

not qualify for other funding sources and who need assistance to make the repairs/replacements.

4 Discussion

The widespread use of OSDS in St. Tammany Parish presents significant environmental, public health, quality of life, and economic challenges. Poorly functioning systems, aging infrastructure, and inadequate maintenance exacerbate the release of untreated or inadequately treated effluent into the environment, contributing to water quality impairments and increased risk of West Nile virus vectors. While ATUs can reduce contaminant loads compared to conventional septic tanks, their performance is highly dependent on regular maintenance and proper operation, which is often lacking. The LDEQ's designation of impaired waterbodies limits the issuance of new discharge permits, creating barriers to economic development by restricting new industrial, commercial, or residential projects. The proposed ordinance for triennial inspections by the DES, supported by the findings of the 2024 pilot program, represents a proactive step toward ensuring OSDS functionality and mitigating water quality impacts. The pilot program's results, with 21.5% of systems failing and requiring repairs or replacement, underscore the prevalence of malfunctioning OSDS and the need for regular inspections. By identifying and addressing failing systems while exempting those with no off-site discharge, the ordinance balances environmental protection with practical considerations for property owners. High population growth in the parish has increased reliance on OSDS, particularly in rural and suburban areas, further straining water quality and economic potential. The LDEQ's impairment designations serve as a call to action for local and state authorities to implement solutions, such as the proposed inspection program and the expansion of centralized sewer infrastructure where feasible.

5 Conclusion

The 36,000 on-site sewage disposal systems in St. Tammany Parish are a significant contributor to water quality degradation in local rivers and bayous, with cascading effects on public health and economic development. The LDEQ's designation of most parish waterbodies as impaired for low dissolved oxygen, bacteriological pathogens, or both, coupled with restrictions on new discharge permits, underscores the urgency of addressing OSDS-related pollution. The proposed ordinance requiring triennial inspections by the DES, with exemptions for systems with no off-site discharge, offers a targeted approach to improving OSDS performance and protecting water quality. Additional measures such as public education on proper maintenance and continuing to seek funding for expansion of central sewer services, are essential. By prioritizing water quality improvements, St. Tammany Parish can protect its natural resources, safeguard public health, and foster sustainable economic growth for its residents.