



SESD

Wastewater Treatment
For a Cleaner Environment



Annual Report

2025



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Welcome

Board Members

Michael R. Parsons, P.E. | Chairman

Michael P. Collins, P.E. | Director of Engineering, City of Beverly

Stephen M. King Jr., P.E. | Representative of the Town of Danvers

Amy S. McHugh | Representative of the Town of Marblehead

Robert J. Langley, P.E. | Director of Engineering, City of Peabody

Deborah L. Duhamel, P.E. | City Engineer, City of Salem



SESD | We Keep the Environment Clean
Providing Wastewater Management & Treatment Services Since 1925

Proper wastewater treatment protects where you live, work, and play.

Water flushed or sent down the drain in homes, businesses, and commercial buildings must be cleaned. If not properly treated, the chemicals, human waste, and other contaminants end up in our waterways. At SESD, we serve local municipal sewer departments by collecting and treating wastewater containing contaminants.

In support of this essential community service, we:

PROCESS

25

**Million Gallons of
Wastewater a Day**

MAINTAIN

29

**Miles of Interceptor &
Force Main Pipes**

SERVE

190k

**Residents &
Businesses**



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*A Report from the
Executive Director*

The South Essex Sewerage District (SESD) turned 100 years old this year! Originally formed by a Massachusetts Legislative Act in 1925 to provide wastewater conveyance and treatment in southern Essex County, SESD is proud to celebrate this significant anniversary. We joined our staff, Board, and retirees over lunch this summer and enjoyed treats from an ice cream truck. You have to love summers in New England!

Anniversaries notwithstanding, our primary focus of 2025 was planning for the future. We completed five key planning reports in 2025, which together make up the Centennial Plan, named in honor of our 100th anniversary. The reports include an assessment of the treatment plant and pump stations, an assessment of the SESD-owned collection system assets, an evaluation of financial approaches to fund the work, a Comprehensive Wastewater Management Plan that compiles the needs and documented the alternatives analyses we conducted, and a Capital Improvement Plan that provides a high-level summary of the District's overall needs. The Centennial Plan provides a road map to resolve the needs identified in order for SESD to provide reliable and sustainable wastewater conveyance and treatment for the next 100 years.

Technical assessments and report writing were some components of our planning work. The other more challenging side is making sure we have a viable and affordable financial plan. Specifically, we have been strategizing a method to be able to pay for the upgrades identified in the Centennial Plan as well as for a projected significant increase in operating costs in FY 2028 associated with residuals disposal due to PFAS, which is also known as the "forever chemical." Together, these funding needs cannot be accommodated under the current constraints of Proposition 2 ½. SESD has been working with our city and town leaders, as well as State representatives and senators, to develop an approach that is satisfactory to all.

In addition, we have proactively increased our outreach to inform the public about the importance of wastewater treatment. This includes participating in Salem Sound Coastwatch's annual lecture series, tabling at the Salem Sustainability and Resiliency fair, participating in the Department of Marine Fisheries' *Marine Quest* festival, and hosting public tours at SESD to show our neighbors what we do behind-the-fence at the plant. This outreach and public exposure is the cornerstone of gaining and maintaining the public's trust as we communicate our need to re-invest in our infrastructure.

In 2026, the goals are to resolve the necessary funding challenges associated with Proposition 2 ½ for both our operating cost constraints and for the Centennial Plan, to investigate and apply for funding to complete the initial phases of work, and to begin designing critical projects. All of us at SESD work hard to keep the environment clean while positioning SESD for a sustainable future.

A handwritten signature in blue ink, appearing to read "David Michelsen".

David Michelsen, P.E.
Executive Director



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*Our
History*

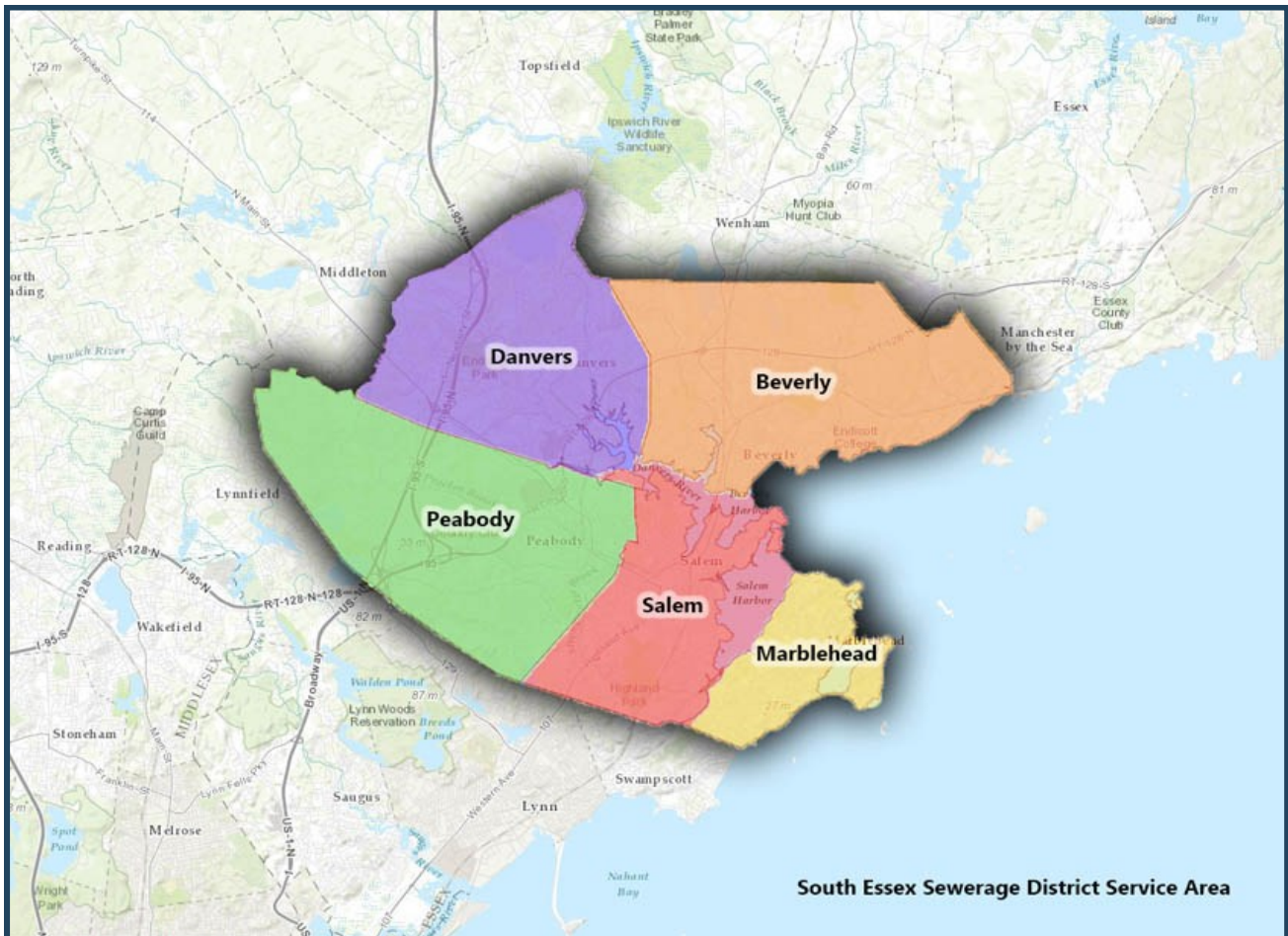
Over 100 Years of Wastewater Experience and Innovation

SESD was established in 1925 to build, maintain, and operate a sewerage system to collect, convey, treat, and dispose of residential, commercial, and industrial wastewater.

Our wastewater collection and conveyance system includes 29 miles of interceptor and force main pipelines, pumping stations, and associated metering and sampling facilities. In addition to homes and businesses, we serve approximately twenty significant industrial users (SIUs) that discharge to the sewer system.

SESD does not directly bill individual users. We annually assess costs to each municipal member based on their use of our treatment facility. So each community only pays for the cost of meeting their wastewater treatment needs.

SESD is governed by a six-member Board representing our member communities who set policy and oversee the management of a staff of sixty employees.





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Community
Outreach

Community-Centered Outreach

In 2025, SESD shared an insider’s view of wastewater treatment in our service area. We established Spring and Fall public tours at our facility, and attended local water quality events, K8 school programs, and conferences. SESD reached out to our community to further our mission of water quality stewardship. We hope to raise awareness about wastewater management by helping people better understand the process and their role in maintaining pipes, equipment, and treatment facilities. We hope through education and outreach we can teach our community about human behaviors that directly impact this essential service.

Celebrating 100 Years of Community Service

SESD staff, current and former, celebrated the Centennial Anniversary of our wastewater treatment plant in September. SESD has served local municipal sewer departments since 1925 and now process over 9 billion gallons of wastewater per year. What we do here is essential to maintaining water quality in our communities. We look forward to bringing our communities another century of clean water!

The Pipe Patrol

All water on Earth is the same – oceans, lakes, streams – even the water inside our own bodies. Plants, animals, you and me – we all need water to live! In an effort to help our community understand our relationship with this precious resource, SESD created **The Pipe Patrol**. Lead by Detective Phippen, Pipe Patrollers learn that what goes down our sinks, toilets, and tubs can harm the water we all share.

It’s important to know that human waste affects our water quality, and that household water/sewer bills go up when costly repairs are required due to people flushing things they shouldn’t. By stickering non-flushable items in your home or business, we hope to raise awareness that only the three P’s (Pee, Poop, and toilet Paper) should go down the drain and everything else is trash or possible compost – especially those so-called “flushable wipes” and food scraps.

Just because it can flush or drain, *doesn’t mean it should!*

**JOIN THE TEAM.
KEEP WATER
CLEAN!**



Join Phippen and help spread the word,
protecting where we live,
play,
and swim!





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*Division 2: Engineering
Project Highlights*

The **Engineering Department** consists of three full-time positions including the District Engineer, Engineer, and Environmental Health and Safety Coordinator. Engineering is responsible for providing technical support to the other divisions, overseeing SESD's engineering studies, capital projects, and health & safety. In 2025, the Engineering staff were responsible for three (3) capital construction projects and four (4) studies for a total of approximately \$3.5 million in work under construction and study. Several of the projects are highlighted below:

Contract No. 18-1: Primary Clarifier Concrete Restoration

Construction of this project was completed in April 2025 with the final engineering services to be completed in early 2026. Deteriorated concrete was restored in all seven (7) of the primary clarifiers; clarifier chains and flights have been replaced, and the clarifiers have been re-commissioned. This project was funded by a loan from the Massachusetts State Revolving Fund program. The cost of these capital improvements was approximately \$19.4 million.

Contract 22-1: Plant Water System Replacement Project

The new plant water system replaces the original one that had been in service since it was constructed 27 years ago in 1998. The new system, seen below, includes five (5) pumps with variable speed drives, an automatic backwash strainer, process piping upgrades, and new controls. Construction was completed in July 2025, and the system functions well. The project construction cost was \$2,337,677 with a \$200,000 grant provided by the MassDEP Clean Energy Program.



Contract 23-1: Danvers Pump Station Standby Generator Replacement Project

The Danvers Pump Station's standby diesel generator was replaced because it had reached the end of its useful life. The project also included the installation of a new automatic transfer switch and controls. As of December 2025, the contractor was completing final punch list items. The estimated cost of this project is approximately \$631,000.

You can learn more about ongoing Engineering projects on our website:

<https://www.sesd.com/projects/>



Wastewater Facilities Management Plan

This plan means to establish a road map for facilities upgrades at the SESD treatment plant and four pumping stations. This assessment identified approximately **42 projects** addressed in four phases. In addition, two studies were launched in response to this plan.

A *Secondary Process Optimization* study has the primary goal of improving performance during above average flows, and a *Dewatering Pilot* study aims to reduce water content in sludge generated and disposed away from SESD.

Collection System Capital Improvement Plan

SESD also prepared a Capital Improvement Plan (CIP) for the District's collection system infrastructure. The purpose of the plan is to identify, prioritize, and develop costs for replacing and rehabilitating collection system assets. Recommendations from three separate investigations are included in the CIP.

The three investigations include the **Danvers/Beverly Force Main Condition Assessment**, **Water Street Interceptor Condition Assessment**, and the **Peabody/Salem Interceptor Condition Assessment**. Overall, the Collection System CIP includes **14 projects** that have been prioritized into four phases based on criticality and consequence of failure. Planning-level capital costs have been estimated for each project.

Centennial Plan

The two planning studies described above, as well as the results of internal financial planning, have been integrated into a 20-year Comprehensive Wastewater Management Plan and District-wide Capital Improvement Plan, which is collectively called the **Centennial Plan**. This plan prioritizes and provides a roadmap to resolve the identified needs of the District in order for SESD to continue to provide reliable and sustainable wastewater conveyance, treatment, and disposal for our communities.



**Chemical Pump Room
Rehabilitation Project**



The **Laboratory and Monitoring/Enforcement Department** consists of six full-time positions: Supervisor, Industrial Pre-Treatment Inspector, Pre-Treatment Technician, Chief Lab Technician, and two Lab Technicians. Laboratory personnel collect samples throughout the plant and receive samples from the Operations and Monitoring/Enforcement departments. Results are used to control the treatment process and to verify that the plant is performing to meet our Federal and State discharge permit requirements and assure our discharge does not negatively impact the water quality of Salem Sound.

Industrial Users

In 2025, SESD held permits for **27 Class 1 and Class 2 industrial users**. Of these, 21 are *Significant Industrial Users* and 6 are *General Permitted Industries* required to comply with our pre-treatment guidelines. Personnel in Monitoring/Enforcement inspect and enforce restrictions on all industrial dischargers in our service area.

We currently maintain **490 industries** in our database and 413 Industrial Inspections were conducted in 2025. Monitoring/Enforcement personnel conducted 77 composite sample events at our permitted industries, and carried out grab sampling for PFAS, Cyanide, Flashpoints and Fats, Oils and Grease (FOG).

Three industries: Excelitas Technologies of Salem, Travel Leather Co. Inc. of Peabody, and Rousselot, Inc. of Peabody, ceased production last year and closed out their permits with SESD.

We also issued a permit for a new manufacturer. Bertolino Foods of Peabody is building a monitoring station to allow for pH and flow monitoring and a sampling location.

Testing Performed in 2025

<u>Description</u>	<u>Estimated # of Tests</u>
1. pH	5,200
2. Settleable Solids (Three locations in plant)	800
3. Settled Sludge Volume (Aeration tanks)	800
4. Dissolved Oxygen	1,200
5. Temperature	6,600
6. Chlorine Residual (Three locations in plant)	2,200
7. Bacteria (Fecal Coliform, Enterococci)	4,380
8. Total Solids (Process grab samples)	1,900
9. Total Suspended Solids (Process grab samples)	2,800
10. Total Suspended Solids (Community, process & industry samples)	2,400
11. Biochemical Oxygen Demand (Community, process & industry samples)	2,000



Protecting Beaches and Waterways

SESD’s effluent discharge is governed by a permit issued by the USEPA under the Clean Water Act (CWA) known as a National Pollutant Discharge Elimination System (NPDES). The permit contains limits on the quantity and quality of the water SESD can discharge, monitoring and reporting requirements, and other provisions to ensure that the discharge does not impair water quality or people's health. It provides a standard for how SESD should operate to maintain a safe discharge to protect the water quality of Salem Sound.

The **Operations Division** consists of twenty-four full-time positions, twenty of whom are professionally licensed wastewater treatment Operators. The staff ensure continuous, safe operations of our secure wastewater treatment facility 24-hours per day, 365 days per year.

- Superintendent of Operations (Grade 7)
- Assistant Superintendent of Operations (Grade 7)
- 6 Chief Operators (Grade 7)
- 12 Operators (Grade 4+)
- 4 Operator’s Assistants

In 2025, 40.7 inches of rain fell which is slightly lower than normal. SESD treated **8.54 billion gallons** of wastewater flow, an average of 23.43 million gallons of flow per day, resulting in a 4.5% decrease in flow from last year. The District reported no (zero) NPDES permit violations for the year. Operations concentrated on odor control, scum removal, tank preventive maintenance and a continued focus on residuals reduction for disposal.

Learn more at <https://www.sesd.com/what-we-do/wastewater-treatment/>

Plant Performance Report - 2025

Influent TSS	204 mg/l	Average Per Day
Influent BOD	171 mg/l	Average Per Day
Effluent TSS	17 mg/l	Average Per Day
Effluent BOD	12 mg/l	Average Per Day
Effluent Flow	23.43	Million Gallons Per Day
Effluent Flow	8.54	Billion Gallons Total in 2025
Fecal Coliform	15 CFU / 100 ml	Average Per Day
Enterococci	10 Colonies / 100 ml	Average Per Day
Chlorine Residual	0.02 mg/l	Average Per Day
Sludge Daily	79.3 Tons	Average Per Day
Sludge Total	28,796	Tons in 2025



The **Maintenance Division** consists of twenty-two full-time positions:

- Superintendent of Maintenance
- Asst. Superintendent of Maintenance
- Scheduler, Planner, CMMS Administrator
- (2) Instrumentation/Electrical Specialists
- Lead Instrumentation/Electrical Technician
- Instrumentation/Electrical Technician
- Inventory Control Clerk
- Facilities Foreman
- HVAC Mechanical Technician
- Master Mechanic
- (3) Lead Mechanics
- (3) Mechanics
- Master Mechanic/Machinist
- Mechanic/Equipment Operator
- Mechanic Helper
- Maintenance Equipment Operator
- Maintenance Helper

Sludge Processing & Treatment Improvements

- Completed a rehabilitation project of the Chemical Disinfection System Pump Room, seen on page 6, consisting of an overhaul of pumps, installation of new motors and VFDs, and replacing all piping with associated components.
- Purchased and installed new drive chains in all Secondary Settling Tanks.
- Purchased and installed a new VFD for the Odor G No. 3 Carbon Fan.
- Purchased and installed new VFDs in the Odor A and Odor B Chemical Feed Systems.
- Purchased and installed a new HVAC Air Handling System for the Odor B Fan Control Room.
- Purchased and installed new LED Lighting Fixtures throughout all facilities for improved visibility and long-lasting bulb performance.

These projects were accomplished using our own labor force , resulting in significant cost savings for SESD.

Collection System Improvements

- Completed an overhaul of the Danvers No. 1 Sewage Pump.
- Purchased and installed new Variable Frequency Drives (VFDs) for the Beverly Pump Station No. 1 Sewage Pump.
- Completed the installation of a new Pump Station Controller at the Danvers Pump Station.
- Completed fabrication and installation of a new Wet Well Level Control System for the Danvers Pump Station.
- Purchased and installed two new VFDs for Sewage Pumps at the Peabody/Salem Influent Pump Station.
- Rebuilt the Peabody/Salem Influent Pump Station Conveyor.
- Completed an overhaul of the Marblehead Pump Station No. 4 Sewage Pump.
- Purchased and installed a new motor for the Marblehead Pump Station No. 4 Sewage Pump.
- Rebuilt the Salem Neck Pump Station No. 3 Sewage Pump and Motor.



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*Division 1: Administration
& Finance*

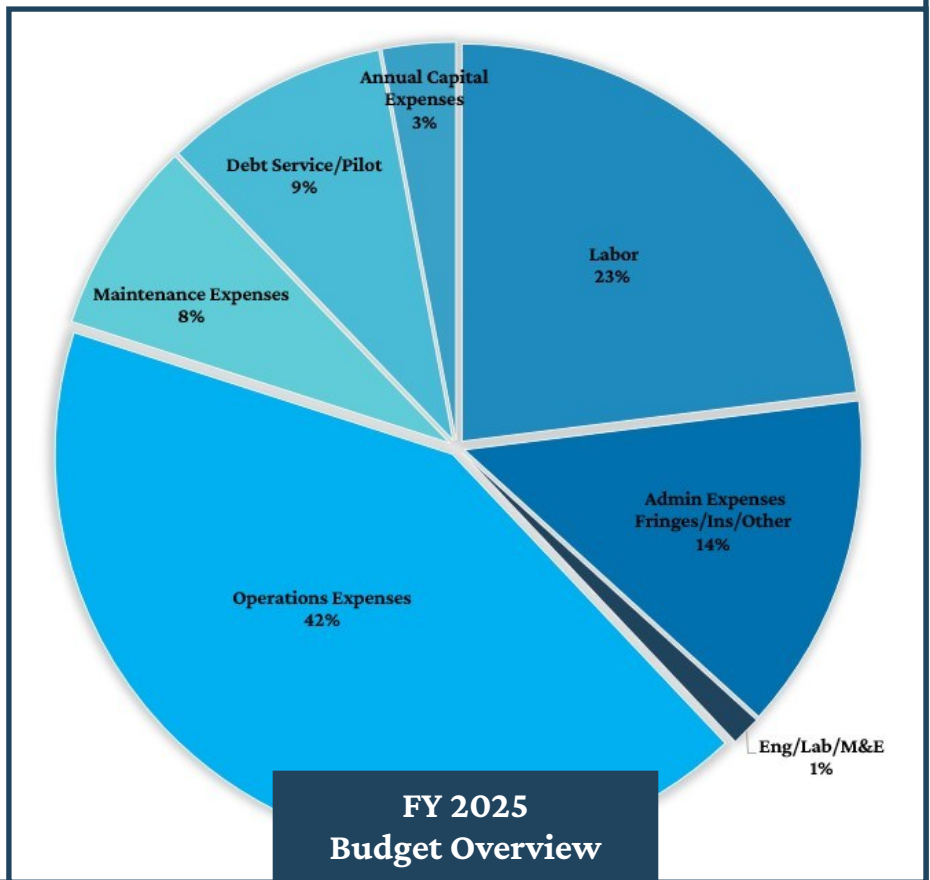
The Division consists of four full-time positions and one part-time position:

- Executive Director
- Manager of Administration and Finance (District Treasurer)
- Executive Assistant/Outreach Coordinator
- Staff Accountant (District Clerk)
- Part-Time Accounting Assistant

SESD's **Administration and Finance Division** is responsible for the administration, finance and overall operational direction of SESD. The division formulates and administers policies and procedures concerning all SESD functions. It also prepares the annual budget and member entity assessments based on their portion of flows and loads to SESD's treatment plant. The SESD Board is responsible

for reviewing and approving each fiscal year budget. A complete review of SESD's fiscal year financial performance may be found in SESD's Audited Financial Statements and Treasurer's Report. Some FY 2025 highlights include:

- Assets exceeded liabilities by \$171.0 million representing a decrease of \$233,000 from FY 2024. The largest portion of the net position, \$166.7 million, reflects SESD's investment in capital assets (excluding debt), such as the treatment plant.
- From FY 2011 through FY 2025, SESD appropriated \$20.65 million for the Capital Improvement Program as part of its annual budgets.
- FY 2025 member community assessments totaled \$26,073,432 representing a decrease of 2.10% from the FY 2024 budgeted amount of \$26,631,441.
- The Operations Division accounts for the majority of the fiscal operating budget as it is responsible for power, fuel, chemical, and residuals disposal expenditures.





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