



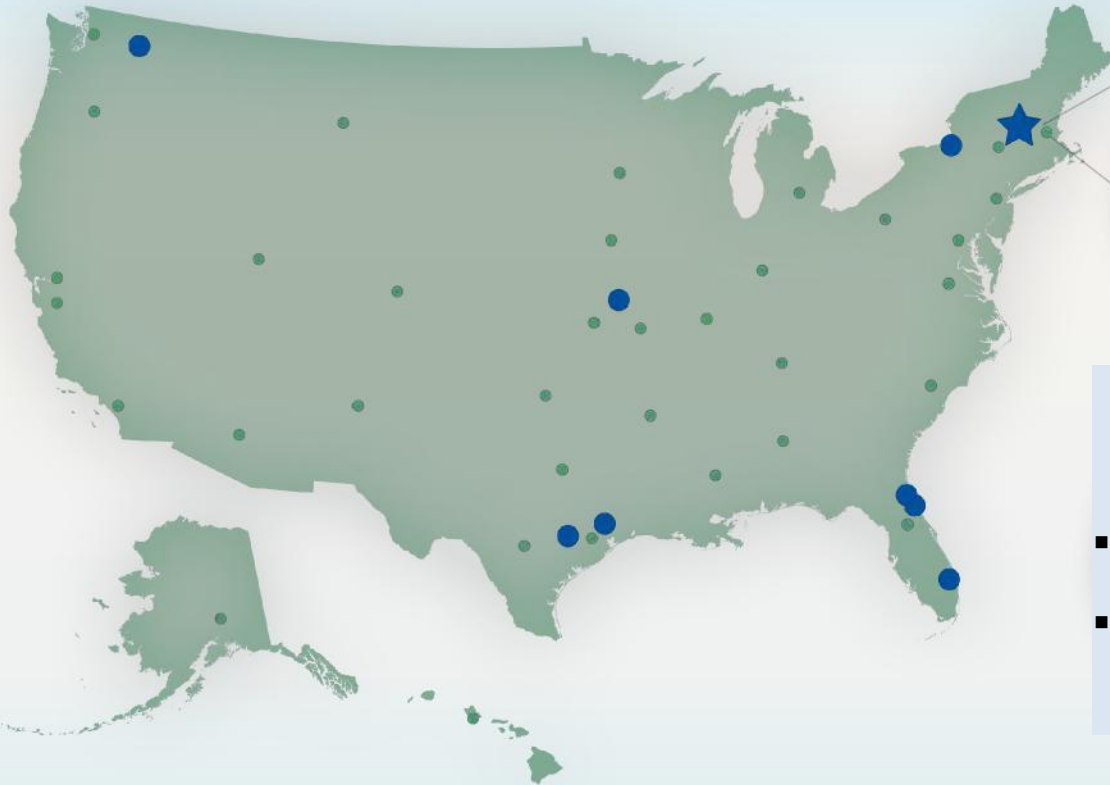
All About Low Pressure Sewer System

Presented To City of Portsmouth, New Hampshire
Sagamore Avenue Area Sewer Extension Public Meeting
August 26, 2020 at 6:30 PM

Henry Albro – F. R. Mahony & Associates, Inc.

- 20 Years FRMA Senior Application and Sales Engineer
 - Design support and training for countless installations in New England
- Licensed Wastewater Operator
- 22 Years as Sewer Superintendent for Towns of Pepperell & Groton, MA
- Contributor to NH DES Regulations ENV-WQ 700 Pressure Sewer Standards
- Associates Degree in Civil Engineering – Vermont Technical College

E/One: Over 50 Years Strong



Headquarters

Niskayuna, New York, USA

7,000 m² / 75,000

ft²140+ employees

Installation Statistics

- + 700k Manufactured and Installed, Globally
- + 2.5M Users Served Daily

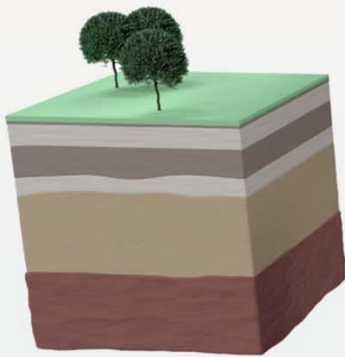
Our History & Experience

F. R. Mahony – 56 years New England – 42 Years with E/One

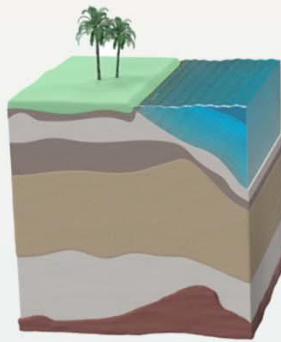
- Full design, sales and service provider
- Installed base > 50,000 units in New England
- Full Support Warranty and Service from 2 locations
 - Rockland, MA
 - Southbridge, MA 508-765-0051 Call Line.
- On the road- certified field technicians with fully stocked parts and loaners

Where to use Pressure Sewer

- Undulating terrain
- Rocky soil conditions
- High groundwater table
- Flat terrain
- In conjunction with existing sewage collection systems to expand the service area



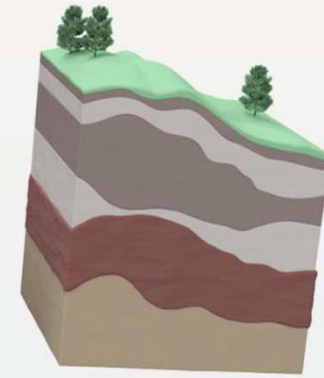
Flat



Wet



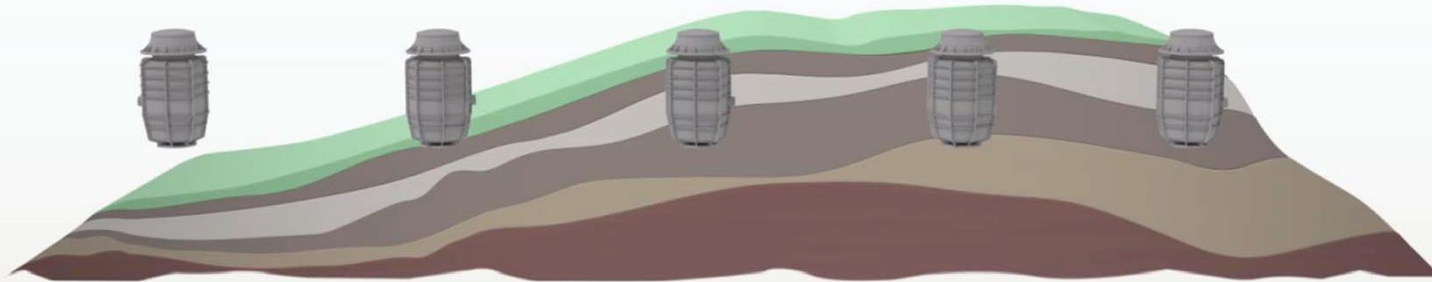
Rocky



Hilly

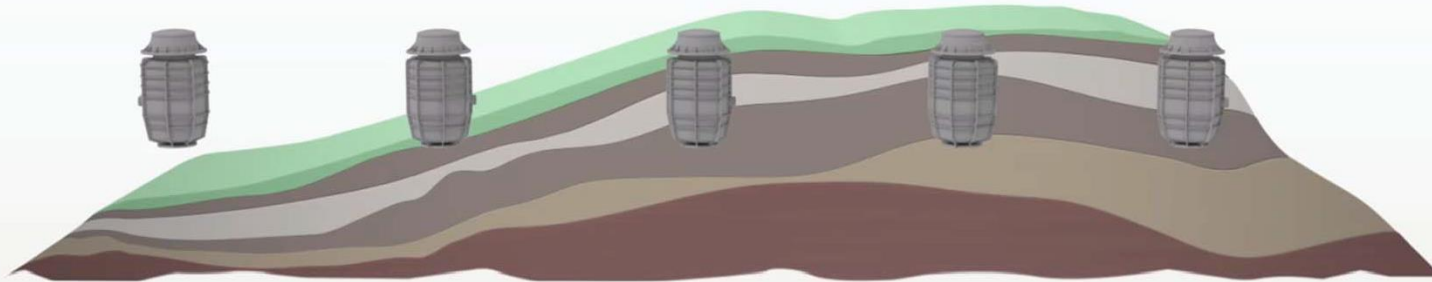
Why Pressure Sewer is Used

- Solids are macerated allowing small diameter pipes (2 to 4 inch) to be used
- Wastewater is pumped – no pipe slope required, pump uphill/downhill, shallow installation
- Network is fully sealed – resistant to storm water infiltration
- Simple installation – Shallower excavation with small diameter pipelines.



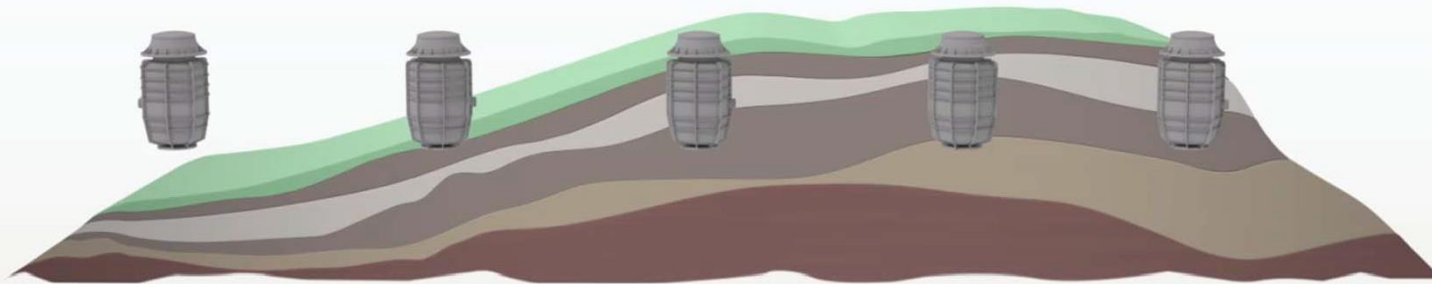
Advantages – Grinder Pumps

- Pumped systems with positive pressure to convey sewage to the point of discharge
- Grinder pump stations provide a level of emergency storage in the event of a power outage or equipment fault
- Grinder pumps in LPS systems actively process solids and debris with a grinder to allow for smaller pipelines that are easier to install and require less maintenance.



Advantages – LPS Systems

- LPS does not have any central critical infrastructure. A fault at one site will not affect the operation at other sites
- LPS systems have virtually zero storm water infiltration, which significantly reduces the burden on downstream infrastructure and prevents basement flooding that can occur in gravity sewers.



What Happens When the Lights Go Out?

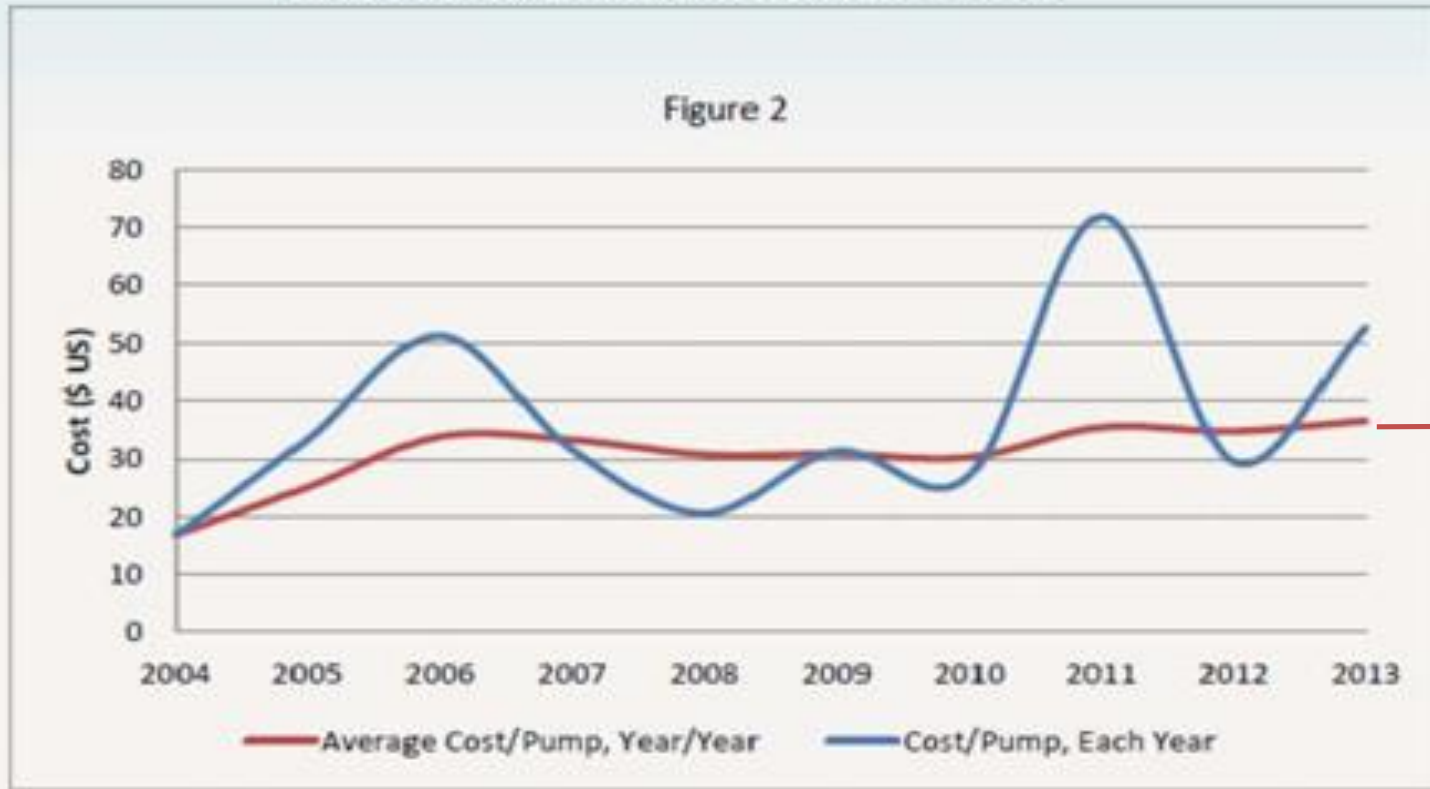
Table -1 Water Consumption during Power Outages

Appliance	Number	Fixture Units	Normal	Emergency
Washing Machine	1	2	15	0
Water Closet	2	3	45	22.5
Bathtub	2	2	30	0
Dishwasher	1	2	15	0
Kitchen Sink	1	2	15	7.5
Shower Stall	2	3	45	0
Lavatory	2	1	15	7.5
Totals:	11	15	180	37.5

Based on emergency water use the pump system has about one day of storage capacity

Operation & Maintenance – 265 pump system

Jerusalem, NY Maintenance Costs

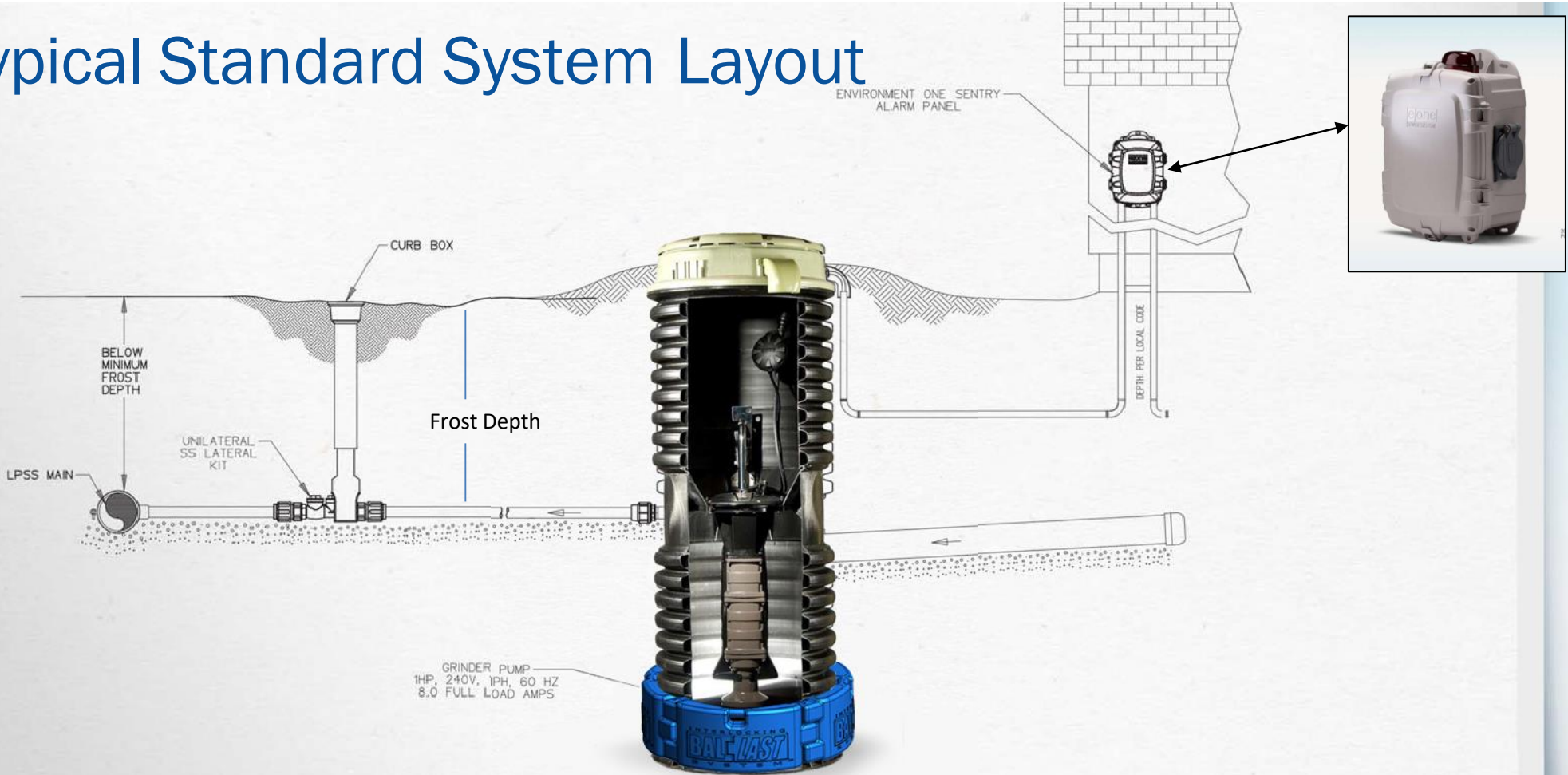


~\$35

Falmouth, MA

Period from	5/18/2018			
Period Ending	5/11/2020			
Time	1.984	Years		
Total Pumps Installed	671			
Total service calls	41			
Percent serviced/year	3%			
Breakdown of Calls	Number	Percent of calls Calls	Percent of All Pumps	Comments
Brown Out	7	17%	1.04%	Non-Pump Related Service vist at owner insistance
Power off at Breaker	3	7%	0.45%	Non-Pump Related
Electrical issue in Home	4	10%	0.60%	Non-Pump Related
Remote Sentry Batteries	1	2%	0.15%	Routine Owner Obligation
Plumbing clog before pump	3	7%	0.45%	Abuse
Broken Cord Grip	1	2%	0.15%	Installer issue
Water in Panel Back Penetration	1	2%	0.15%	Installer Issue
*Undetermined issue	2	5%	0.30%	Unknown at this time. Pumps are functioning well
Sensing Colum and Grease issue	4	10%	0.60%	Abuse. Owners notified
*Sensing Colum Recharge (Seasonal)	10	24%	1.49%	From long dormancy. Pumps pulled and reset
Total Service Expense	\$ 9,103.00			
Cost Per Call (Average)	\$ 222.02			
Cost Per Pump Installed	\$ 13.57			
*Pump Related Service Costs	\$ 2,664.29	Total		
Cost Per Pump Installed	\$ 3.97			

Typical Standard System Layout



Pump & Ballast

Station Design: Serviceability

- Core vs. individual components
- Electrical quick disconnect eliminates junction box
- Stainless steel discharge components
- No electricians necessary for service



In the case of any pump core issues, a temporary pump core is installed to minimize down time

Station Design: Reliability

- Mean Time Between Service Calls - 10 years
- 24/7 service to your door
- Easy service on your property
- Most Comprehensive Warranty in the industry
- Stainless steel discharge components for long life
- Purpose built and engineered for long life 20-25 years or more
- Systems tested rigorously under National Sanitation Foundation standards



UNI-LATERAL – REDUNDANT CHECK VALVE AT STREET

- Ball valve for isolation of grinder pump lateral from force main
- Check valve to prevent backflow
- Cleanout port
- 316 stainless steel construction
- Rated to working pressure of 235 psi
- Designed specifically for use in pressure sewer systems utilizing grinder pumps
- Required with installation of all E/One grinder pump stations



Grinder Pump Specifications

1 HP (0.75 kW), 240V, 1 Phase Power usage \$36/year at \$0.18/KW

Large Diameter, Robust Hardened Grinding Device

- Grinding Performance Independently Certified (NSF/ANSI 46)

High Head Capabilities (185 ft/56 m TDH)

Integrated Pressure Switch Level Control

- No contact with sewage

Interchangeable Pump Core

- Integrated design

Design life: 20-25+ years

- Average mean time between service calls: 10 years

Case Studies

- Environment One case studies are available at:
<https://eone.com/sewer-systems/case-studies> or
<https://www.youtube.com/eonesewersystems>
- Numerous projects similar to the Sagamore Avenue Area Sewer Extension Project

More than 50,000 units successfully installed and operating in New England



Thank You

