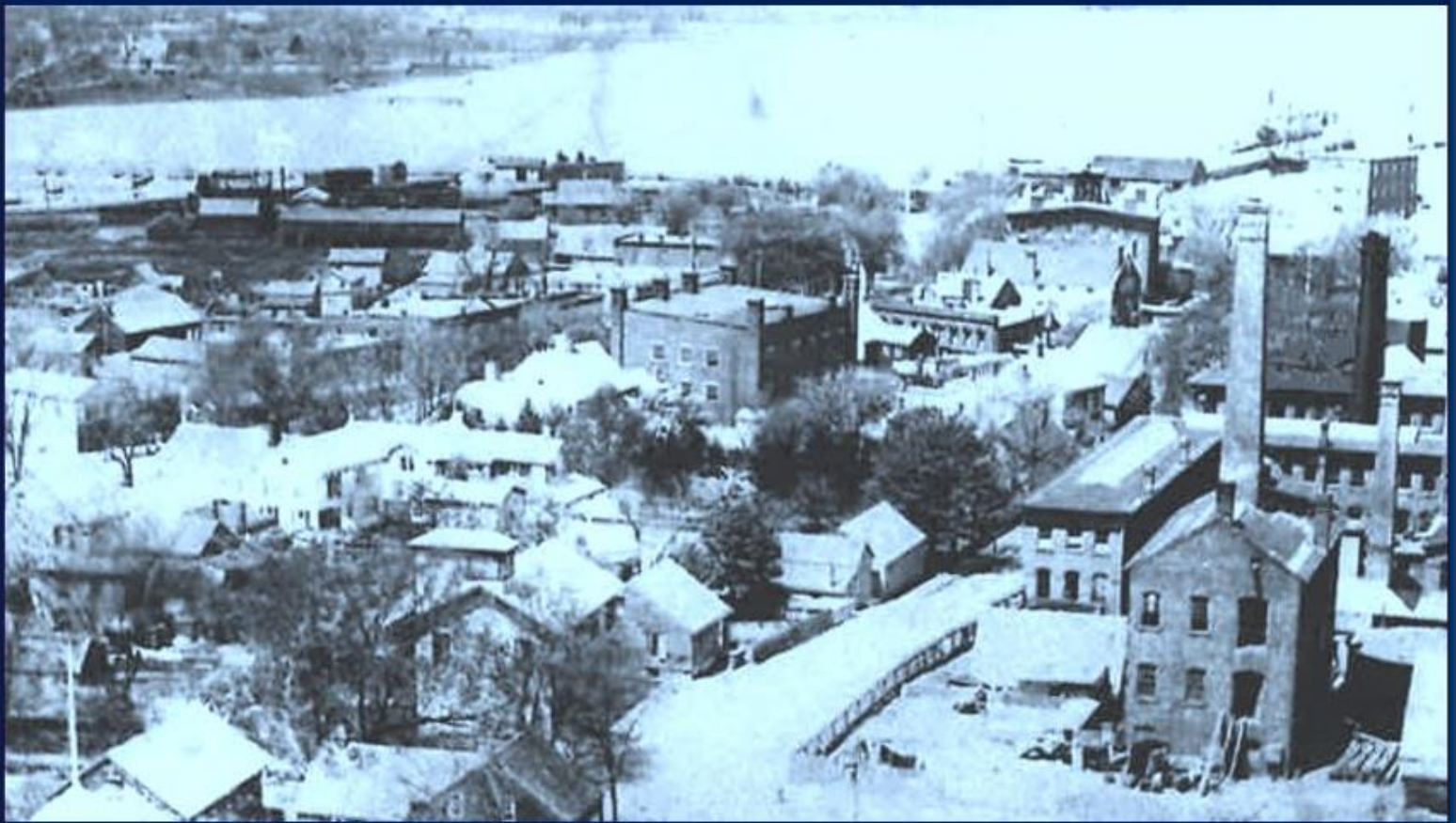


SEWER SERVICE EXPANSION AREA
SEWERSHED "K"
ENGINEERING REPORT

Prepared for:

**Village of
Sag Harbor**



Prepared by:



**CAMERON
ENGINEERING**



April 2022



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY.....1
2. PROJECT BACKGROUND AND HISTORY5
2.1. OVERVIEW & SITE INFORMATION5
2.2. OWNERSHIP AND SERVICE AREA.....5
2.3. EXISTING FACILITIES AND PRESENT CONDITION6
2.4. DEFINITION OF THE PROBLEM7
2.5. FINANCIAL STATUS8
3. PROJECT SCOPE.....8
3.1. PROPOSED UPDATED SEWERSHED “K” SERVICE AREA8
3.2. TOPOGRAPHY AND GROUNDWATER DEPTH11
4. SEWER AVAILABILITY13
4.1. EXISTING WASTEWATER TREATMENT PLANT CAPACITY13
4.2. PROJECTED WASTEWATER FLOWS AND NITROGEN LOADING14
5. COLLECTION AND CONVEYANCE SYSTEM17
5.1. OVERVIEW17
5.2. LOW PRESSURE SEWER COLLECTION SYSTEM17
6. ENVIRONMENTAL CONSIDERATIONS22
6.1. STATE AND LOCAL AGENCIES22
7. COST CONSIDERATIONS23
7.1. COST ESTIMATE23
8. ALTERNATIVES ANALYSIS25
8.1. NO ACTION25
8.2. INNOVATIVE & ALTERNATIVE (I&A) TREATMENT SYSTEM.....26
8.3. COMMUNAL WASTEWATER TREATMENT SYSTEMS.....26
9. PROJECT SCHEDULE27
10. APPENDIX A, B, C AND D.....28

TABLES

Table 1 – Land Use Summary9
Table 2 – Facility Maximum Average Daily Flow Summary.....13
Table 3 – Nitrogen Loading Per Land Use15
Table 4 - Capital Cost Estimate – Construction and Soft Costs25
Table 5 – Project Schedule27

FIGURES

Figure 1 – Village of Sag Harbor and Original Sewershed “K” Boundary3
Figure 2 - Updated Sewershed “K” and Existing Sewer Service Area.....4
Figure 3 - Potential Environmental Justice Areas Shown as Purple Polygon.....6
Figure 4 - Zoning for Sewershed "K" and Vicinity10
Figure 5 - Land Uses for Sewershed "K" and Vicinity11
Figure 6 - Topographic Map.....12
Figure 7 - Depth to Groundwater.....13
Figure 8 - Sewershed "K" with Proposed Low Pressure Sewers16
Figure 9 - Preliminary Low Pressure Sewer Zones for Sewershed "K"21



CAMERON ENGINEERING
& ASSOCIATES, LLP

SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT

April 2022

APPENDICES

Appendix A – Engineer’s Report Certification

Appendix B – Detailed Construction Cost Estimate

Appendix C – SEQR - Environmental Assessment Form & State Historic Preservation Office

Appendix D – Catalog Cuts and Technical Data for Grinder Pump Stations/Control Panel



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

1. Executive Summary

This Engineering Report has been prepared to provide the necessary details to expand the sewer service area within the Village of Sag Harbor, Suffolk County, NY. The purpose of expanding sewer service to unsewered areas are based on several important reasons. First, the Village of Sag Harbor is surrounded by marine waters that have a rich history dating back centuries. These waters fuel a robust tourism business that greatly assists the economics of the Village. In addition to the trade from the seasonal visitors, recreational and commercial activities within the Village rely on these waterways being in a healthy environmental state. The Village owns and operates a wastewater treatment facility (WWTF) that serves as the front line of defense of the Village’s waterways. This asset currently receives sewage flow from a relatively small portion (13%) of the parcels located within the Village’s boundaries. The balance of the parcels located in the Village utilize cesspools and septic tanks for the treatment of wastewater. These onsite wastewater treatment systems (OWTS) have limited capabilities to reduce pollutants to levels that are not harmful to the Village’s marine waters. The Facility performs well in removing nitrogen from the wastewater to significantly lower levels than OWTS. Nitrogen on Long Island has been declared public enemy number one by Suffolk County Executive because of various water quality issue it causes such as harmful algae bloom, wetland loss, shellfish bed closures and fish kills. Studies performed by Dr. Christopher Gobler of Stony Brook University’s Center for Clean Water Technology on the Village’s waterways has confirmed these conditions can be present on occasion. To further reduce the impact of nitrogen in the local waterways, the Village is proposing to extend sewers to take advantage of approximately 90,000 gpd of excess capacity. Connecting parcels now on OWTS to the sewer system will significantly reduce the amount of nitrogen leaching into the Village’s receiving waters.



CAMERON ENGINEERING
& ASSOCIATES, LLP

SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT

April 2022

The Village of Sag Harbor’s Sewer Master Plan has identified several sewersheds within the Village that were ranked as highly critical with respect to their impact on the Village’s waterways. Sewershed “K” has been identified and ranked as the No. 1 most critical sewershed due to its proximity to the harbor, density of parcels, and short travel time of OWTS effluent to the Sag Harbor Cove. Sewershed “K” is adjacent to existing sewer service which enhances its ranking for consideration of a sewer extension. Low pressure sewer is recommended for Sewershed “K” because of topographic and groundwater depth conditions. The topography in Sewershed “K” is relatively flat; this feature, coupled with a high groundwater table that ranges from 0 foot to 8 feet below the ground surface, is better suited for a low pressure sewer system than gravity sewers. The details of the proposed sewerage of Sewershed “K” are provided in this Engineering Report. The Village boundary, as well as all the original sewershed boundaries are shown on Figure 1. Figure 2 shows an aerial exhibit for Sewershed “K”. The draft Master Plan originally identified a total of forty-four (44) parcels for sewerage and this remains unchanged as of this writing. The final boundaries are to be confirmed in the Map & Plan document when it is accepted and approved by the Village for the sewerage project.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

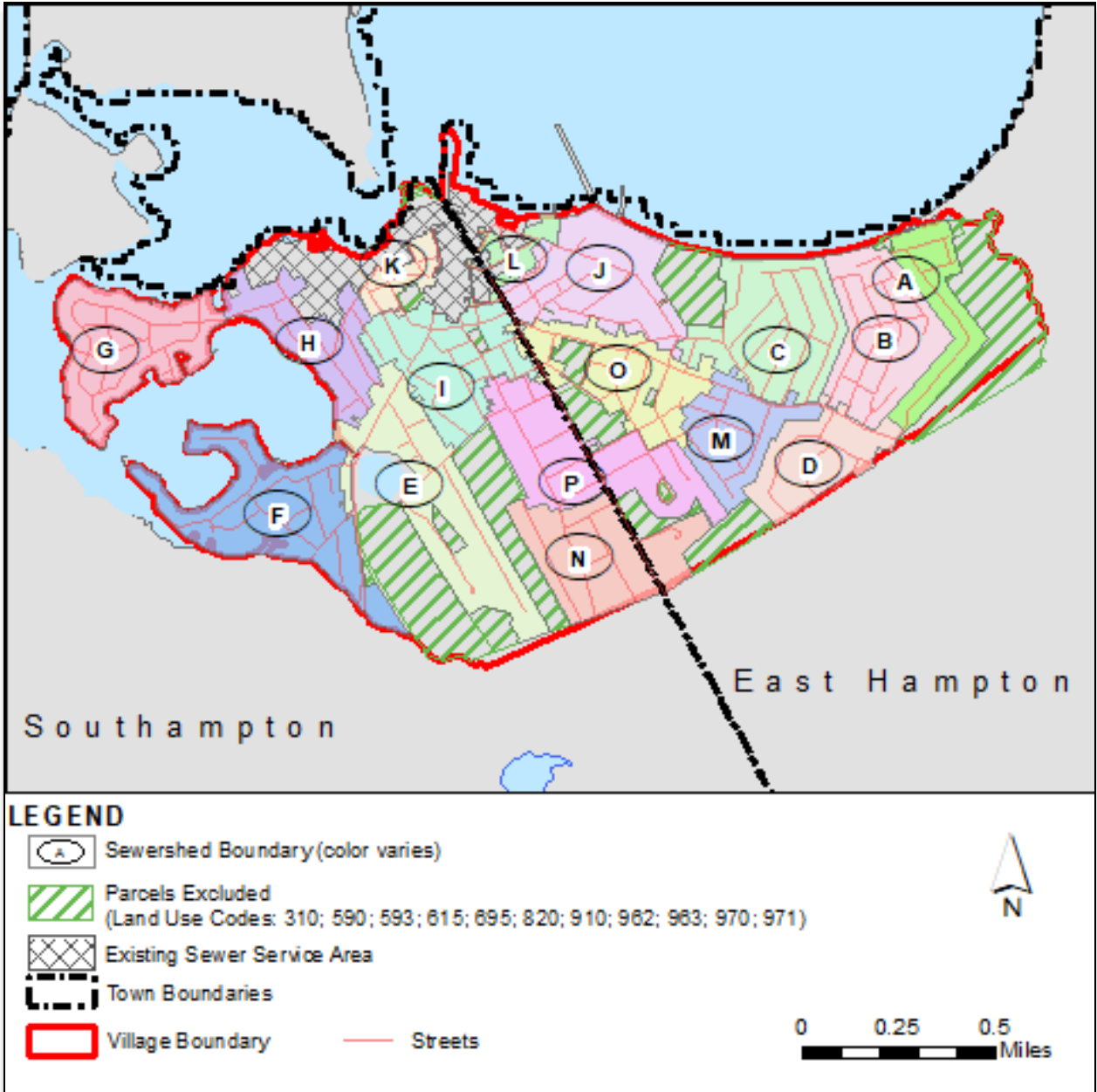


Figure 1 – Village of Sag Harbor and Original Sewershed “K” Boundary



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

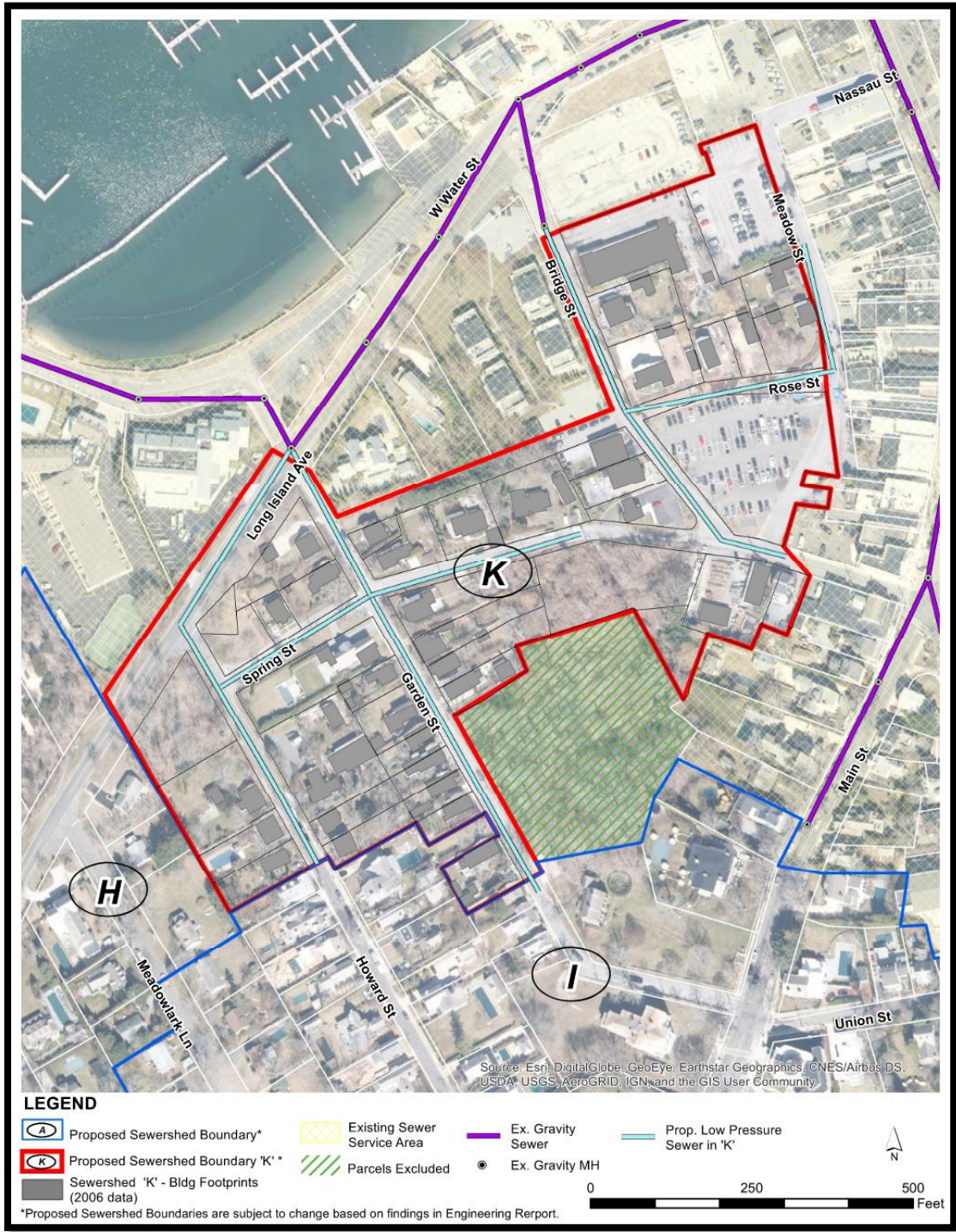


Figure 2 - Updated Sewershed “K” and Existing Sewer Service Area



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

2. Project Background and History

2.1. Overview & Site Information

The Village of Sag Harbor has commissioned a Sewer Master Plan to determine how best to manage wastewater generated within its boundary to protect local water bodies. The draft final Sewer Master Plan (Plan), has recently (January 2022) been submitted to the Village for its review. The Plan is to provide guidance to the Village on the management of wastewater generated by its residents and its downtown commercial district to protect local receiving waters from wastewater pollutants such as nitrogen, pathogens, and oxygen demanding organics. Presently, approximately 13% of the parcels within the Village are sewered, with the remaining parcels utilizing on-site wastewater treatment systems (OWTS).

2.2. Ownership and Service Area

The Village’s boundary lies within the Town of Southampton and Town of East Hampton. The Village owns and operates the Sag Harbor Wastewater Treatment Plant (WWTP) which discharges into Sag Harbor Bay. There are 2,180 parcels within the Village of Sag Harbor. Approximately 55% are located within the Town of Southampton and approximately 45% are located within the Town of East Hampton. As previously noted, the vast majority of the parcels within the Village are unsewered and rely on OWTS such as cesspools and septic tanks for wastewater treatment.

Potential Environmental Justice Areas are U.S. Census block groups of 250 to 500 households each that, in the Census, had populations that met or exceeded at least one of the following statistical thresholds:

1. At least 52.42% of the population in an urban area reported themselves to be members of minority groups; or
2. At least 26.28% of the population in a rural area reported themselves to be members of minority groups; or



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

3. At least 22.82% of the population in an urban or rural area had household incomes below the federal poverty level.

Based on current information from the New York State Department of Environmental Conservation, which is shown on Figure 3, there are no potential Environmental Justice areas (shown as purple polygon) located within the Village.

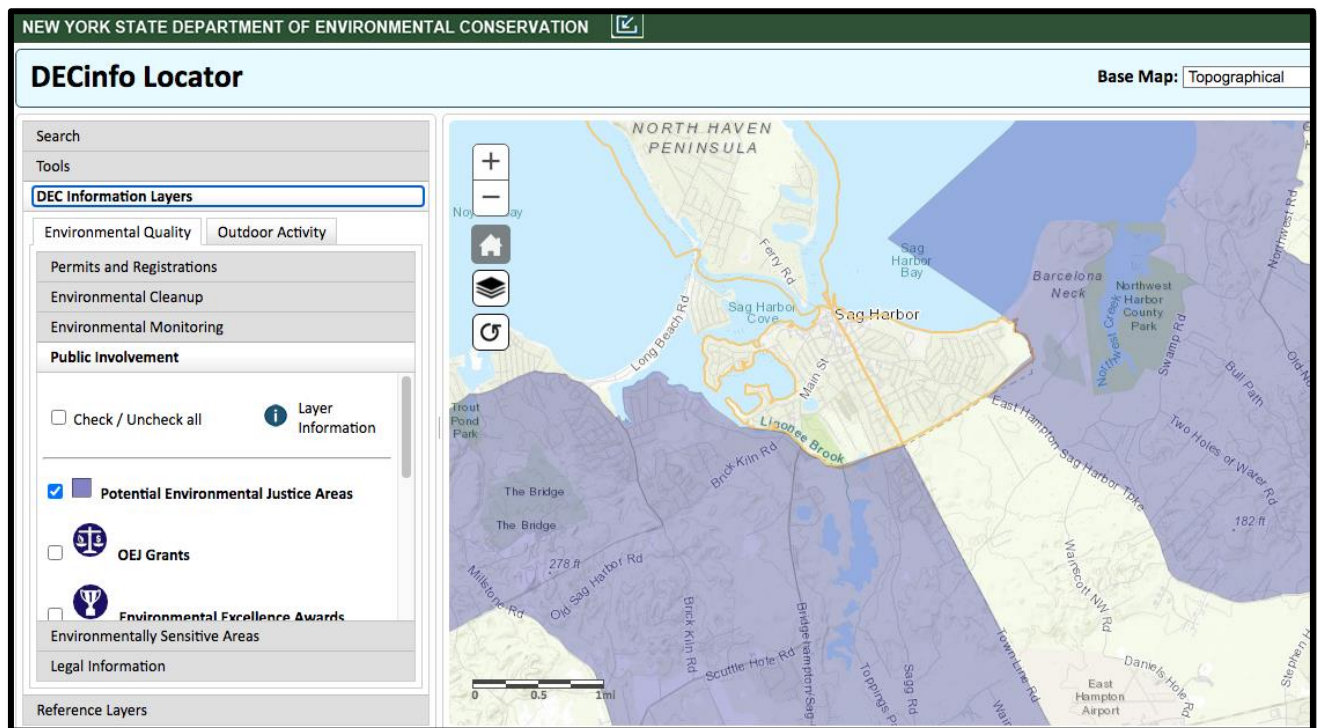


Figure 3 - Potential Environmental Justice Areas Shown as Purple Polygon

(Source : NYS DEC Info Locator, <https://gisservices.dec.ny.gov/gis/dil/>)

2.3. Existing Facilities and Present Condition

The Village recognizes that the health of the Village’s vibrancy and economy is tied directly to the quality of the local surface waters including the inland embayments and the Harbor area. The Plan will be important in identifying management measures to protect these waterbodies.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

The Village’s Wastewater Treatment Facility (WWTF) is a critical asset and plays a significant role in determining where and when the Village should consider extending sewers or creating alternative treatment capacity. In the early 2000’s, the WWTF was upgraded to tertiary treatment with the addition of biological nitrogen removal process which is designed to meet an annual average of 8 mg/l concentration of total nitrogen. The WWTF has an estimated 88,500 to 90,000 gallons per day (gpd) of available excess capacity. This benchmark serves as a cap for connecting new sewage flows to the WWTF. Once this benchmark is reached, there would be no further connections, unless the WWTF is expanded or application(s) of new treatment technologies within the existing WWTF footprint can provide additional treatment capacity are installed.

2.4. Definition of the Problem

The environmental impact from the discharge from onsite wastewater treatment systems (OWTS) is well documented. According to Suffolk County Subwatershed Wastewater Plan, while the source of nitrogen to individual water bodies varies, it is estimated that 63.6 percent of the nitrogen reaching groundwater in Suffolk County subwatersheds originates from on-site wastewater treatment systems (OWTS). A recent water quality report for 2021 by Dr. Gobler of the School of Marine and Atmospheric Sciences at the Stony Brook University indicated greater than 70% of nitrogen loading to Sag Harbor Cove came from septic tanks and cesspools.

In addition to the harm to the Villages local surface waters, inland embayments and the harbor area noted in the prior section, the few existing commercial properties located within the proposed Sewershed “K” Service Area are limited to discharging wastewater volumes in accordance with Suffolk County Department of Health Services (SCDHS). Proposed Sewershed “K” Service is located in Suffolk County Groundwater Management Zone IV, therefore SCDHS maximum allowable flow is 600 gallons per day (gpd) per acre. It is also completely located in the 0-2 year groundwater



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

contribution area, which means the discharge from existing onsite wastewater treatment systems (OWTS) on each property reaches receiving waters in less than 2 years. Access to a low pressure sewer that would collect, and transfer wastewater generated within the proposed Sewershed “K” Service Area to the Village’s existing WWTF would have a significant positive effect on environmental conditions to both the health and quality of groundwater and receiving waters.

2.5. Financial Status

As a small Village with limited annual operating budget, financial assistance will be sought to undertake the project. Sewer expansion is costly, and no single source of revenue, grants or loans will be sufficient to fund the project. The Village will actively pursue available grants and loans at the appropriate time which will include the local Community Preservation Fund, the New York State Water Quality Improvement Project Program, the Suffolk County Water Quality Protection and Restoration Program, and loans (low or no interest loan) and grants from the New York State Environmental Facilities Corporation.

3. Project Scope

3.1. Proposed Updated Sewershed “K” Service Area

The proposed Sewershed “K” Service Area is presented in Figure 2; and focuses on expanding the existing sewer service within the Village to improve the quality of the local groundwater and surface waters, inland embayments and Harbor area. Physical characteristics, such as property lines, streets, soil characteristics, groundwater travel time, topography, and depth-to-groundwater guided the boundary of Sewershed “K”. The proposed Sewershed “K” Service Area is currently unsewered and relies on onsite wastewater treatment systems (OWTS) such as cesspools and septic tanks. Those systems are not designed to meet NSF/ANSI 245 (residential wastewater treatment



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

system standard capable of removing 50% of the nitrogen) standards. As the efficacy of conventional septic and cesspool system are limited on removal of nitrogen from the wastewater, excessive nitrogen leaching into the groundwater from OWTS is the number one source of excess nitrogen loading into the Villages local surface waters, inland embayments and harbor area located to the north of the proposed Service Area. This results in eutrophication of Sag Harbor Cove and other local waters and caused hypoxia and harmful dinoflagellate blooms as reported by Dr. Gobler of the Stony Brook University.

As of this writing, there are very few Innovative/Alternative (I/A) on-site systems either installed or permitted for installation within Sewershed “K” service area. We are aware of one unit recently being installed within the sewershed.

Sewershed “K” is located in proximity to existing sewer service areas “H” and “L” and shares common factors of smaller parcel size (increased building/wastewater density), high groundwater and short travel time (<2 years) to the surface waters.

As indicated in the Table 1 (Land Use Summary) below, the Sewershed “K” Service Area currently includes 44 parcels with 29 parcels (68%) being residential (Medium or High Density). Currently, the land use in Sewershed “K” is predominantly single-family homes.

Table 1 – Land Use Summary

Land Use Categories	Parcel Count	Area (acres)
Commercial	10	3.6699
Recreation and Open Space	5	1.3793
Residential (Medium Density)	7	2.1120
Residential (High Density)	22	3.4630
TOTALS:	44	10.6242



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

From Table 1, the proposed Sewershed “K” is comprised of approximately 10.6242 acres of land and are all located in the Town of Southampton. The zoning classifications are R20 (Residence), VB (Village Business) and OD (Office District). Zoning and land use within the proposed Sewershed “K” Service Area are shown on Figures 4 and 5, respectively.

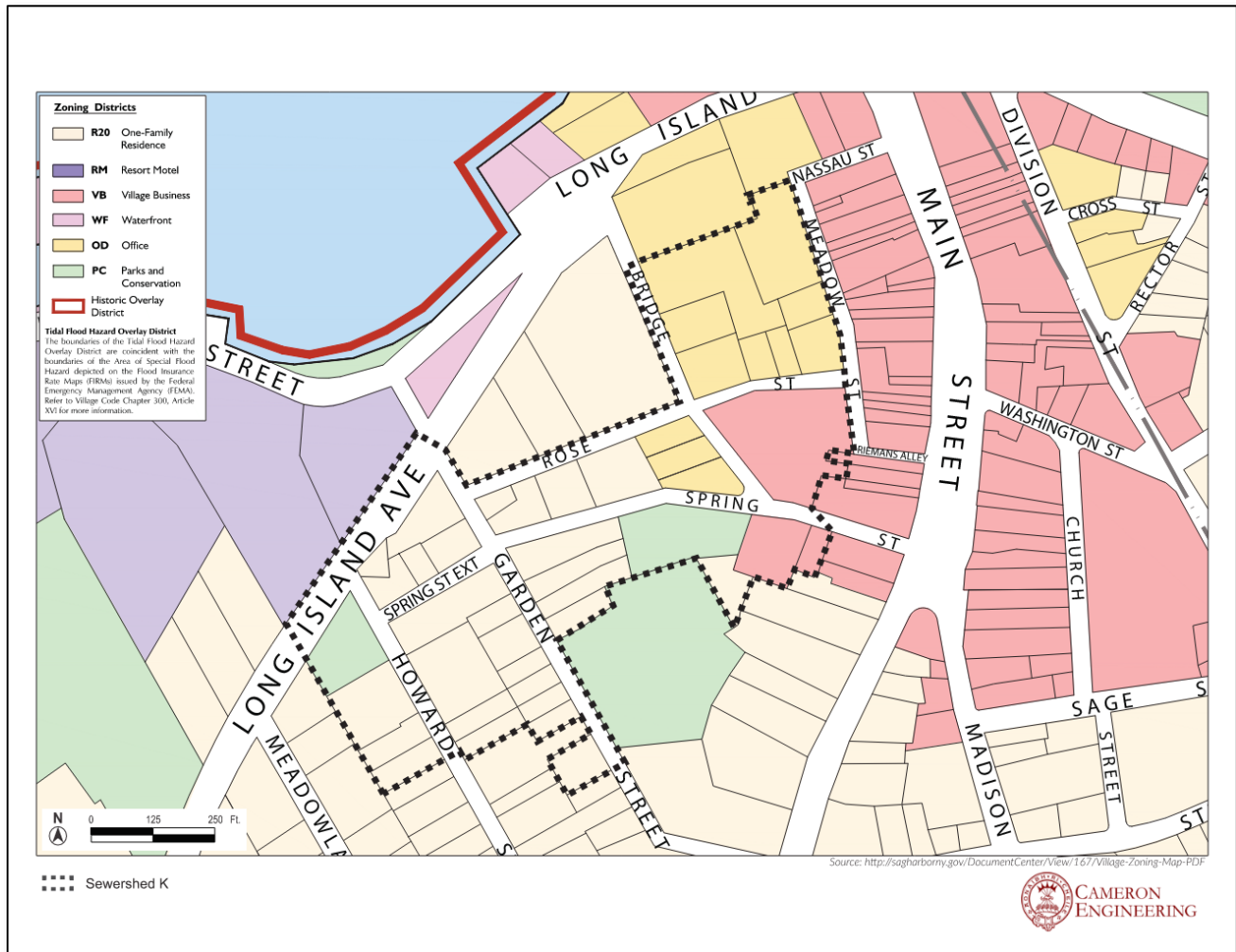


Figure 4 - Zoning for Sewershed "K" and Vicinity



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

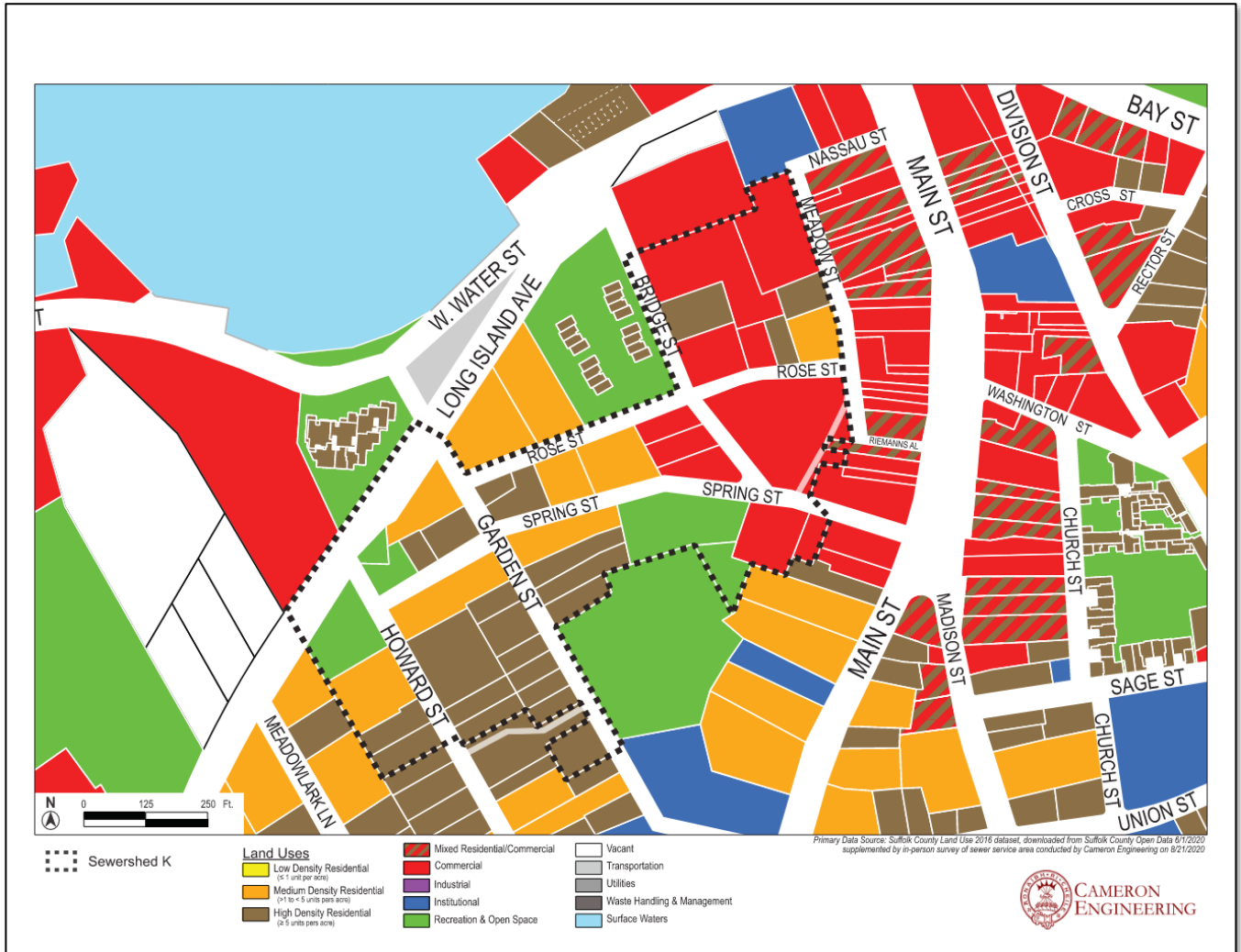


Figure 5 - Land Uses for Sewershed "K" and Vicinity

3.2. Topography and Groundwater Depth

As shown on Figure 6, the topography within Sewershed “K” slopes down to the northwest from Main Street to Long Island Avenue toward Sag Harbor Cove. The Village’s existing collection system is adjacent to Sewershed “K”, along Long Island Avenue and Bridge Street, which is conducive and logical for receiving the sewage generated from the proposed expansion of sewer service to the area.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

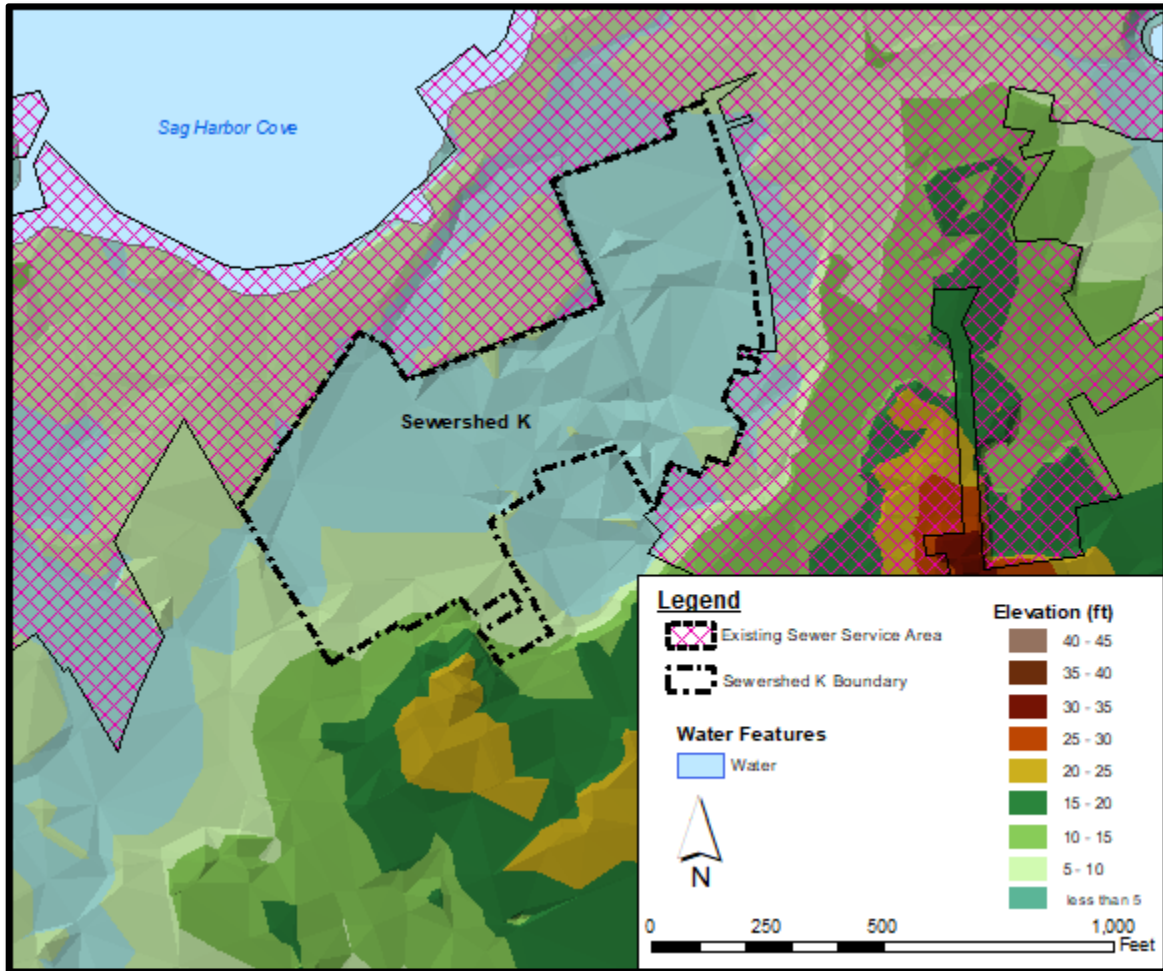


Figure 6 - Topographic Map

Depth to groundwater within Sewershed “K” is based on United States geological Survey (USGS) data as presented in an interactive map for Long Island. As shown on Figure 7, the minimum and maximum depths to groundwater within Sewershed “K” are 0 foot and 8 feet below surface elevation, respectively. The depth to groundwater loosely coincides with the topography of the area, that is, the closer you are to surface water the shallower the groundwater depth from the surface. General groundwater flow direction within Sewershed “K” is northwest toward Sag Harbor Cove.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

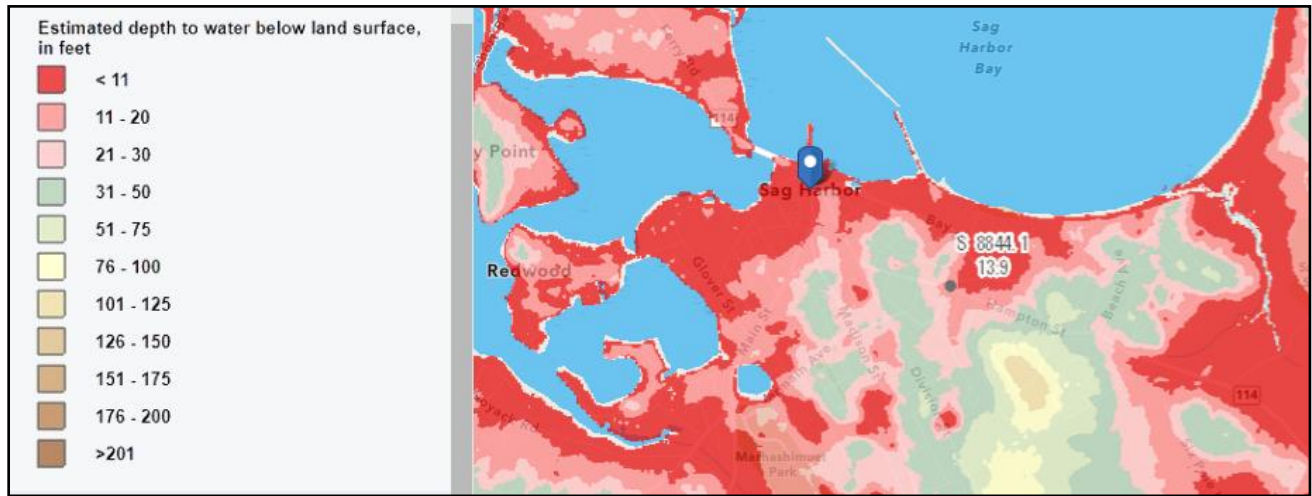


Figure 7 - Depth to Groundwater

(Source: USGS <https://ny.water.usgs.gov/maps/li-dtw/>)

4. Sewer Availability

4.1. Existing Wastewater Treatment Plant Capacity

The Village’s Wastewater Treatment Facility (Facility) has a design capacity of 250,000 gallons per day (gpd). In accordance with New York State Department of Environmental Conservation (NYSDEC) requirements, a Facility Plan will be required once the annual average flow at the Facility reaches 95% of its design capacity, which would equal 237,500 gpd. Peak daily flows in prior high summer seasons have ranged from 137,000 to 149,000 gpd (refer to table below). Due to the COVID-19 pandemic, peak flows in 2020 were lower than prior years, so the data for 2020 will not be used for peak flow analysis.

Table 2 – Facility Maximum Average Daily Flow Summary

Year	Maximum Average Daily Flows (gpd)
2017	137,000
2018	149,000
2019	138,000
2020	121,000



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

The wastewater treatment plant's excess capacity is 88,500 gpd. The Village is planning to expand the service area to Sewershed “L”. An Engineering Report was submitted to the Village in March 2022, allocating an estimated flow to “L” based on existing uses. By taking into account this allocated capacity of 14,662 gpd to Sewershed “L”, 73,838 gpd (88,500 gpd excess – 14,662 gpd for “L” = 73,838 gpd available) of new flow could be allocated before the 237,500 gpd benchmark flow would be reached whereby a Facility Plan would need to be prepared. Utilizing the Suffolk County Department of Health Services sewage flow factor of 300 gpd for a Single-Family Residence (SFR), the available or excess capacity is equivalent to approximately 246 single-family homes (i.e., 73,838 gpd ÷ 300 gpd/SFR).

The discussion of the WWTP capacity presumes that the operability of the Village's wastewater treatment plant may become more challenging once the flow level increases and approaches the facility's design capacity. Presently at the reduced flow levels, the WWTP often has two and at times three tanks offline during the off-season low flow period. This provides the operations staff with flexibility to divert flow to an empty tank to allow to perform scheduled maintenance work on piping, valves, aeration headers and air diffusers. Having an empty tank or two also provides the flexibility to operations staff to take a tank offline for unscheduled maintenance or an emergency event(s). This operational flexibility is significantly reduced once peak flows increase and more or all of the process tanks are on line 100% of the time. This condition will be monitored as flow increases towards the design capacity.

4.2. Projected Wastewater Flows and Nitrogen Loading

The estimated sewage flows in gallons per day, and nitrogen loadings in pounds per day and pounds per year within the proposed Sewershed “K” are summarized as follows:



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

Table 3 – Nitrogen Loading Per Land Use

Land Use Categories	Est. Sewage Flows (gpd)	Est. Nitrogen Loading (lbs/day)	Est. Annual Nitrogen Loading (lbs/yr)
Residential	10,500	5.692	2,078
Non-Residential	1,846	1.000	365
TOTALS:	12,346	6.692	2,443

As shown in the table above, an estimated 2,443 lbs/year of nitrogen loading is currently being discharged to the groundwater. This amount of nitrogen will be reduced by 2,180 lbs/yr (89%) should the parcels in Sewershed “K” be connected to the new sewer system once completed.

The estimated wastewater generation rate within the proposed Sewershed “K” Service Area is approximately 12,346 gpd. Based on the available excess capacity at the Village’s treatment plant (i.e., 73,838 gpd), the Facility will be capable of accepting and treating the additional wastewater flows from the proposed Sewershed “K” Service Area.

Based on branch analysis, DR11 HDPE piping with diameter ranging from 1.5 inches to 3.0 inches is proposed within the Sewershed “K” Service Area with connection to existing 8-inch diameter gravity sewers. Low pressure sewer relies on grinder pump stations and piping to delivery wastewater from individual parcels to the 8-inch diameter gravity sewer on Bridge Street, and Long Island Avenue. LPS pipe sizing has been performed to ensure total dynamic head as well as accumulated retention time are within the low pressure sewer design criteria.

The Village of Sag Harbor has reported no problems experienced with the existing 8, 10 and 12-inch diameter connecting sewers in the vicinity of the proposed Sewershed “K” Service Area.



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

The proposed low pressure sewers within proposed Sewershed “K” Service Area are presented on Figure 8 and will be designed in accordance with standards cited in Section 5.2 and will connect to existing gravity sewer infrastructure on Long Island Avenue and Bridge Street for proper conveyance and treatment at the WWTP.

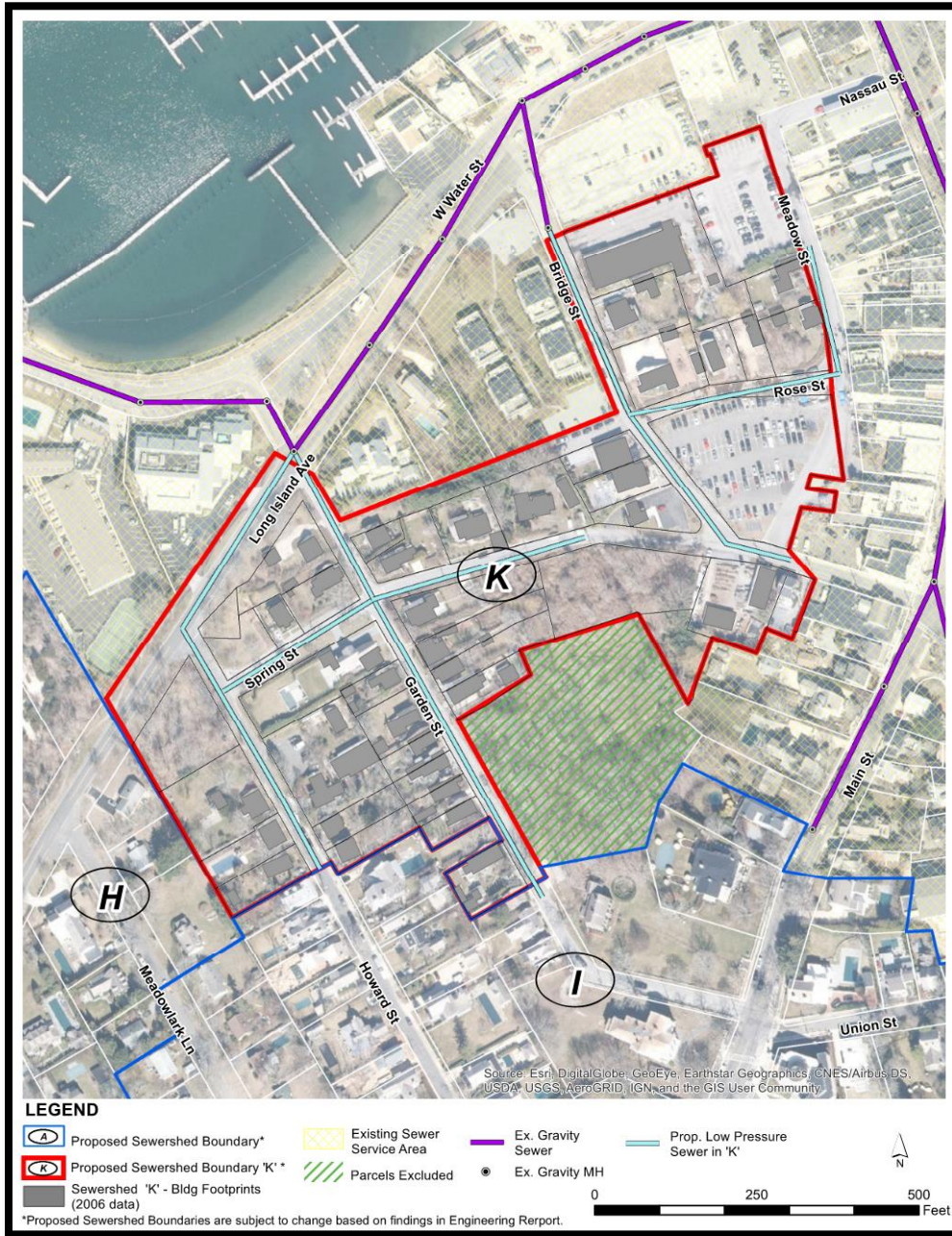


Figure 8 - Sewershed "K" with Proposed Low Pressure Sewers



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

5. Collection and Conveyance System

5.1. Overview

Gravity sewers are the most widely used method of collecting and transporting wastewater. Gravity sewers are also the most common method of sewage collection throughout Suffolk County, however, because of the relatively flat topography and high groundwater table in Sewershed “K”, Low Pressure Sewer (LPS) System is recommended to provide wastewater collection and transfer in this area.

5.2. Low Pressure Sewer Collection System

Low pressure sewer systems have become feasible and widely accepted with the improvement in grinder pump technology. Low Pressure Sewer collection system components include small diameter plastic pipe such as polyvinyl chloride (PVC) or high-density polyethylene (HDPE), cleanouts, isolation valves, air release valves, various types of pipe fittings and appurtenances. Additionally, a grinder pump station is required to be installed within the boundaries of each parcel to transfer the collected sewage into the LPS main. A connection point will be provided in the ROW for each parcel’s grinder station force main to connect. Each grinder pump station will be equipped with a grinder pump to process the wastewater from the dwelling and a control panel mounted on the dwelling/structure. Power for the grinder pump station will be provided by the parcel’s electrical distribution panel. Grinder pumps may be installed indoors or outdoors, above or below grade. Grinder pumps are capable of processing typical domestic sanitary wastewater that may contain various bits of solid material such as plastic, rubber, light metal objects, eggshells and wood. The resultant fine slurry is discharged at a typical pumping rate of about 11-gpm at a pressure of 40 psig.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

There are no standards outlined in Ten State’s Standards for Low Pressure Sewer (LPS) Systems; however, two design documents contain standards for LPS that provide acceptable design standards for municipal systems of any size. The New England Interstate Water Pollution Control Commission prepared and published a document titled TR-16, Guides for the Design of Wastewater Treatment Works, 1998 Edition (TR-16). The standards for LPS are outlined in Chapter 2.9 Alternative Collection System. Likewise, the New York State Department of Environmental Conservation published in March 2014, the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems (Intermediate Standards). The LPS standards are outlined in Section C.6.a.

A brief description of each component to a LPS collection system follows:

- (1) Piping – typically High-Density Polyethylene (HDPE) or Polyvinyl Chloride (PVC) ranging from 1” to 3” inches in diameter.
- (2) Isolation Valves – for section maintenance and repair without shutting the entire collection system down.
- (3) Cleanouts - every 500-600 feet, at changes in pipe size, direction, and junctions to allow for high pressure cleaning and clearing of blockages.
- (4) Air release valves – located on system high points, manual or automatic operation.
- (5) Pipe fittings – tees, saddles, and isolation and check valves needed to make connections.
- (6) Appurtenances – valve boxes (plastic, cast iron, concrete), vaults, pressure monitoring station and flow meters.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

- (7) Pump station – consists of a receiving station (vault or pit) with 24-hour or more storage volume, centrifugal or positive displacement (progressive cavity) grinder pump(s) – simplex, duplex, or triplex, level floats, and pump control panel. Typically, the receiving station is located on the front yards near the road with electrical supply from the residence or business being served. Some stations come as a pre-packaged unit (e.g., E-One). Pumps are typically designed in the 10-gpm capacity range.
- (8) Control Panel – typically mounted on the exterior wall and consists of pump control with visual and/or audible alarm.
- (9) As the grinder station is powered by the parcel owner’s electrical distribution panel, in the event of a power failure, the grinder pump will not operate. Each pumping unit has an approximate storage volume of 70 gallons.

Figure 9 provided a schematic of the proposed LPS layout in twelve (12) distinct zones for the Low Pressure Sewer collection system. The first zone is designated starting with the farthest pump from the discharge point and additional zones are added toward the discharge point. Based on statistical analysis of an LPS system with more than 58,000 pumps, and additional analysis extended for larger systems by application of probability theory, not all pumps within the same zone will be operating simultaneously. Based on this information, pipe sizes are calculated based on static and dynamic head losses, as subsequent downstream zones are added to the LPS system to ensure that flow velocity in the system is adequate as well as within the maximum design criteria of 185 feet of Total dynamic head (80 psig).

LPS piping for Sewershed “K” will consist of 1.25 inch diameter building service laterals and approximately 3,231 linear feet of DR 11 HDPE low pressure sewer main ranging in diameter from 1.5 inches to 3 inches. System will feature air release valves at



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

changes in grade of 20 to 25 feet or more, or at interval of 2,000 to 2,500 linear feet, and cleanouts at intervals of approximately 1,000 feet and at branch ends and junctions, along with isolation valves at branch junctions. To accommodate the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems:

- Velocity – a minimum of two to five feet per second achieved at least once and preferable several times a day.
- Building Lateral - Minimum 1.25-inch diameter building service laterals.
- Isolation valves and check valves - at each building connection.
- Isolation valves – at each intersection or junction.
- Cleanouts – at 500 to 1,000 foot intervals.
- Air release valves – installed at high points.
- Pipe –
 - wall smoothness – high Hazen-Williams coefficient (120 or higher)
 - Corrosion resistance
 - Ability to withstand high pressure
 - Durability
- Infiltration – negligible infiltration.
- Grinder pump station – watertight vault with 24-hour storage volume.



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

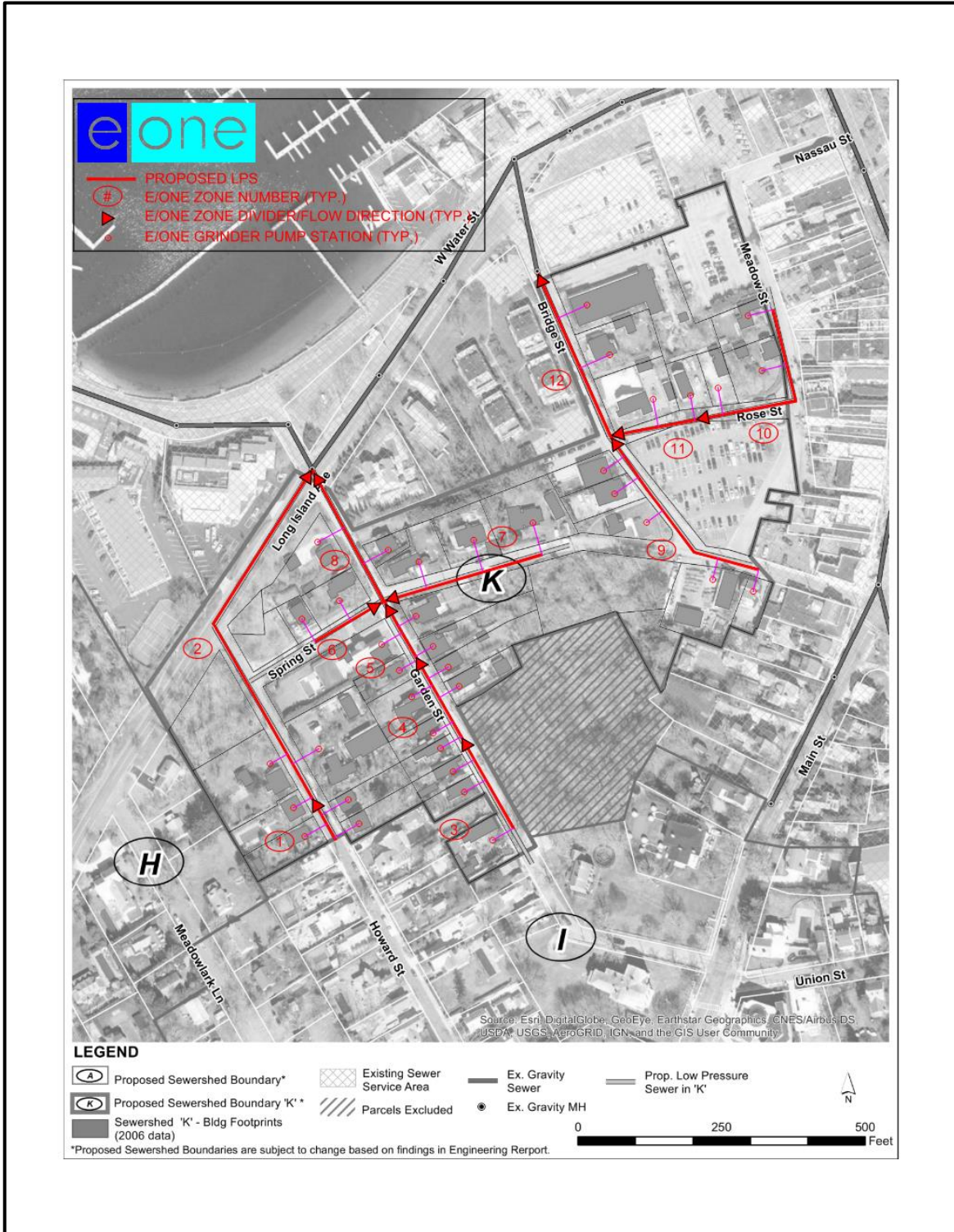


Figure 9 - Preliminary Low Pressure Sewer Zones for Sewershed "K"



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

Spurs and building connection laterals will be installed within the existing roadway right of way and up to the connecting parcel property line for each parcel included within the Sewershed “K” Service Area. The LPS piping will follow the general contour of the topography. The location at each business, house trap, exterior sanitary piping, and existing onsite wastewater treatment system (OWTS), including cesspools and septic tanks, will need to be verified. Existing sanitary piping exiting the rear of a building will likely require routing inside the building structure to exit the front or, in the rear alleyways, to the side street to connect to the new LPS sewer main located in the street.

6. Environmental Considerations

6.1. State and Local Agencies

An action is subject to review under the State Environmental Quality Review Act (SEQR) if any state or local agency has the authority to issue a discretionary permit, license, or other type of approval for that action. The proposed action (sewer extension) does not appear to meet or exceed threshold established under Type I and is not on the list of Type II actions. Hence, a coordinated review by local and state involved agencies including the Village of Sag Harbor (as Lead Agency), Suffolk County Department of Health Services, Town of Southampton, and NYSDEC will be required. A completed environmental review in the form of an Environmental Assessment Form (EAF) and supporting documentation will likely designate the Project as an Unlisted Action and the passing of a Negative Declaration is expected. A copy of the Short Environmental Assessment Form is provided in the Appendix C.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

7. Cost Considerations

A Map & Plan will be prepared for the sewerage of the proposed Sewershed “K” Service Area. The Map & Plan is used in establishing the boundaries of the service area and developing the costs of sewers (debt service and O&M) that the users will be assessed for the proposed Sewershed “K” Service Area sewer project.

7.1. Cost Estimate

Several assumptions were made to complete the cost estimate. These assumptions do not represent a final design but provide approximate budgetary costs to assess the feasibility of the Project and to assist the Village in pursuing grants and other financing avenues. The assumptions include the following:

- Collection and Conveyance System: low pressure sewer, DR 11 HDPE piping, with appropriate air release valves, cleanouts, fittings and appurtenances, is recommended for the proposed Sewershed “K” Service Area. The cost estimate assumes a 4-foot trench plus one foot pavement restoration on either side, where the new low pressure sewer force mains are installed. Should the Village require a full “curb to curb” roadway restoration, the cost would increase.
- Costs for on-site wastewater treatment system (OWTS) abandonment and individual property owners’ connections are provided. The property’s existing sanitary piping (i.e., building connection) will need to be rerouted to the LPS pump station that will be located in the most practical spot on the parcel.
- Hazardous materials abatement (soil and groundwater) is not included.
- Legal and administrative costs to establish the proposed Sewershed “K” Service Area are provided on a percentage (5%) of projected capital costs.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

- Groundwater dewatering is anticipated based on the limited data reviewed regarding subsurface conditions and available USGS well information. A subsurface investigation is needed to confirm assumptions. This task (soil borings) will be completed during the detailed design phase. Note that any dewatering operation that requires treatment because of contaminants found in the groundwater will increase dewatering costs based on the level of treatment required.
- A 10 percent design contingency was added to the construction cost along with reasonable and customary soft costs (i.e., engineering and construction management).
- The cost has been escalated to the year 2023 in anticipation of the midpoint of construction for a one-year construction period starting in mid-2023.
- A detailed ROW site survey and utility investigation was conducted to properly estimate the potential costs for utility relocations and potential conflicts with the LPS system. The completion of the detailed design will reflect an analysis of utility interferences.

As shown on Table 4 below, the total estimated cost for the LPS sewer infrastructure (without parcel connection cost) constructed in the Village ROW, is estimated at \$1.523M. Construction costs include full depth sewer trench restoration and pavement overlay. These costs do not include pavement striping, traffic signal loops and sidewalk/curb restoration.

Soft costs associated with survey, utility markout, soil borings and detailed engineering including engineering report and contract document preparation is \$235,000. Please note that the engineering design costs were covered by a Town of Southampton grant. Construction administration and construction management are estimated at 15% of total construction cost for a total of \$168,106.

Also shown on Table 4 below, the total estimated cost for parcel connection (building/house connections) to the new low pressure sewer system is \$1,804,818 and includes engineering design costs of \$242,000 for parcel survey, utility



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

markout and parcel connection design. Construction administration and construction management are estimated at 10% of total construction cost. It is noted that the parcel connection surveys, utility markouts and engineering design were covered by a grant from the Town of Southampton.

Table 4 - Capital Cost Estimate – Construction and Soft Costs

Description	Cost
Total Construction Costs (not including parcel connection cost): (inc. Labor, Material, Equipment, General Conditions, Escalation 2023, Contractor Overhead & Profit, 20% Design Contingency, Contractor Bonds & Insurance, and Contract Allowances & Unit Prices)	\$1,120,709
Engineering Design	\$235,000
Construction Administration & Construction Inspection	\$168,106
TOTAL CONSTRUCTION COST IN ROW	\$1,523,815
Total Parcel Connection Cost: (inc. grinder pump units, Concrete Ballast, Lateral Connection Kits, Lateral Sewer Pipe, Excavation and Backfill, and Dewatering)	1,804,818
GRAND TOTAL	\$3,328,633

8. Alternatives Analysis

The alternatives to sewerage the proposed Sewershed “K” Service Area as defined in this document include a No Action option, individual Innovative & Alternative (I&A) treatment systems option and a communal/Intermediate sized sewerage treatment system option. A discussion of each option is provided in the following sections.

8.1. No Action

Under this option, parcels currently located in the unsewered proposed Sewershed “K” Service Area would continue to have their sanitary wastewater treated by their respective existing onsite wastewater treatment systems (OWTS). The efficacy of these systems is limited with respect to overall reduction of pollutants and does not provide protection of the Village’s waterways. Eutrophication and hypoxic conditions in the local waters will continue; therefore, the no action alternative is not a viable option.



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

8.2. Innovative & Alternative (I&A) Treatment System

For small flow parcels, new development or significant redevelopment of existing structures, parcel Owner's would install an approved Innovative & Alternative (I&A) treatment system. These systems are currently designed to treat residential wastewater up to approximately 500 gpd. The capital cost and operation and maintenance costs of individual I&A treatment systems for each parcel are extensive, and the systems can achieve treatment standard of no less than 19 mg/l of total nitrogen versus 8 mg/l of total nitrogen by Sag Harbor Wastewater Treatment Plant. Beside less effective nitrogen removal, other pollutant removal such as BOD and TSS are less than what can be achieved at the Village's WWTP. With high groundwater conditions existing in portions of Sewershed "K", the efficacy of I/A systems is questionable. If the Village is not capable of funding the sewerage of Sewershed "K" then the limited use of I/A systems should be considered on a lot by lot basis. If the Village is committed to funding and providing an expansion of sewers into Sewershed "K" then individual I&A treatment systems are not viable option for providing sewer service for the long term for the proposed Sewershed "K" Service Area. If the timeline for the new sewers is extensive, the use of I/A may be required in the short term if an OWTS fails and requires replacement.

8.3. Communal Wastewater Treatment Systems

Communal/Intermediate sized wastewater treatment systems are typically sized between 15,000 and 30,000 gallons per day (gpd) although smaller capacity systems can be considered as an alternative to individual I/A systems. Communal/Intermediate sized wastewater treatment systems include packaged treatment plants or other types of treatment systems (i.e., constructed treatment wetland). As previously noted, the projected flow of approximately 12,346 gpd from the proposed Sewershed "K" Service Area is below the typically communal/Intermediate sized wastewater



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

treatment system where efficiency can be realized. In addition, the capital cost, permitting, and logistics of managing the operation and maintenance (O&M) of these treatment facilities is difficult. As a result, the Communal/Intermediate Sized wastewater treatment system alternative does not appear to be a viable option for providing sewer service for the proposed Sewershed “K” Service Area.

It is important to note that the Village’s existing WWTF will be capable of treating the additional wastewater flow (i.e., excess capacity) of 12,346 gpd from the proposed Sewershed “K” Service Area. In addition, the Village Sewer Code requires parcel owners to connect to gravity sewers should they become available within a predefined time period specified by the Village Board. As a result, a low pressure sewer system appears to be the most viable alternative for sewerage of the proposed Sewershed “K” Service Area.

9. Project Schedule

The following table provides a theoretical schedule for this project. The schedule would be subject to the time frames for the Sewer Extension processes. The bid and award of the construction contract would not start until the sewer extension area has been formally established.

Table 5 – Project Schedule

Task	Date
Engineering Design Completed	May 2022
Draft Map & Plan	July 2022
SEQRA Finalized	August 2022
Public Meetings	June 2022 – September 2022
Final Map & Plan	October – December 2022
Project Financing	June 2022 – May 2023
Permits	May 2023
Bid & Award	September 2023 - November 2023
Construction NTP	December 2023
Construction Completion	January 2024 - January 2025



CAMERON ENGINEERING
& ASSOCIATES, LLP

**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

10. Appendix A, B, C and D

As per requirements for the Preliminary Engineering Report, the following forms and information have been provided:

Appendix A – Engineer’s Report Certification

Appendix B – Detailed Construction Cost Estimate

Appendix C – SEQR Short Form EAF & State Historic Preservation Office
Determination Letter

Appendix D – Catalog Cuts and Technical Data for Grinder Pump
Stations/Control Panel



CAMERON ENGINEERING
& ASSOCIATES, LLP

**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

APPENDIX A

Engineer’s Report Certification



CAMERON ENGINEERING
& ASSOCIATES, LLP

**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

Engineering Report Certification

To Be Provided by the Professional Engineer Preparing the Report

During the preparation of this Engineering Report, I have studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is being sought from the New York State Clean Water State Revolving Fund. In my professional opinion, I have recommended for selection, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account the cost of constructing the project or activity, the cost of operating and maintaining the project or activity over the life of the project or activity, and the cost of replacing the project and activity.

Title of Engineering Report: Sag Harbor Sewer Service Expansion Area – Sewershed “K”
Engineering Report

Date of Report: April 12, 2022

Professional Engineer’s Name: Stephen Hadjiyane, P.E., BCEE, Associate Partner

Signature:

Effective:





CAMERON ENGINEERING
& ASSOCIATES, LLP

SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT

April 2022

APPENDIX B

Detailed Construction Cost Estimate



SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT

April 2022

Village of Sag Harbor, NY
Sewer Service Expansion Area - Sewershed "K"
Probable Construction Cost Estimate
Residential Area with Low Pressure Sewers (LPS)

LPS CONSTRUCTION COSTS IN ROW

Date: 3/18/2022

Item No.	Item Description	Unit	Quantity	Material Cost		Labor Cost		Total Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
1	1.50" Dia. HDPE SDR-11 Low Pressure Sewer Pipe	LF	1,205	\$3.40	\$4,097	\$20	\$24,100	\$28,197
2	2" Dia. HDPE SDR-11 Low Pressure Sewer Pipe	LF	1,005	\$3.70	\$3,719	\$30	\$30,150	\$33,869
3	2.50" Dia. HDPE SDR-11 Low Pressure Sewer Pipe	LF	655	\$5.40	\$3,537	\$30	\$19,650	\$23,187
4	3" Dia. HDPE SDR-11 Low Pressure Sewer Pipe	LF	366	\$7.10	\$2,599	\$40	\$14,640	\$17,239
5	Air Release Valves	Ea	1	\$7,000	\$7,000	\$3,500	\$3,500	\$10,500
6	Clean Out/Drain Assemblies	Ea	10	\$1,500	\$15,000	\$2,250	\$22,500	\$37,500
7	Sawcut Roadway	LF	5,730	-	-	\$5	\$28,650	\$28,650
8	Excavation and Backfill	CY	1,915	-	-	\$61	\$116,316	\$116,316
9	Unsuitable Backfill (hauling & disposal)	CY	191	-	-	\$42	\$8,042	\$8,042
10	Dewatering	Days	11	-	-	\$15,750	\$169,628	\$169,628
11	Utility Relocation	LS	1	-	-	-	-	\$25,000
12	Maintenance and Protection of Traffic	LS	1	-	-	-	-	\$17,000
13	6-inch Aggregate Base Course (assumes 4' wide trench)	CY	240	\$25	\$6,000	\$25	\$6,000	\$12,000
14	4-inch Asphalt Binder Course	Tons	328	\$150	\$49,200	\$150	\$49,200	\$98,400
15	2-inch Asphalt Top Course	Tons	164	\$150	\$24,600	\$150	\$24,600	\$49,200
16	Temporary Asphalt	Tons	164	\$25	\$4,100	\$25	\$4,100	\$8,200
17	Sediment & Erosion Control	LS	1	-	-	-	-	\$25,000
18	Pavement Milling (4' trench)	SY	1,436	-	-	\$12	\$17,232	\$17,232
19	1.5-inch Milled Overlay (4' trench)	Tons	123	\$150	\$18,450	\$150	\$18,450	\$36,900

Subtotal \$762,058

Estimate basis is as follows:

- References such as Means, plus cost adjustment factor for Tri-State Area.
- Vendor quotes for materials/equipment.
- Previous unit costs from similar contracts completed.
- Items 13 thru 16 for trench restoration only. Items 18 and 19 for curb-to-curb mill and paving.
- Does not include pavement striping, traffic signal loops and sidewalk/curb restoration.

Insurance 3% **\$22,862**

Subtotal \$784,920

Overhead 10% \$78,492

Profit 11% **\$86,341**

Subtotal \$949,753

Design Contingency 10% \$94,975

Escalation to Midpoint of Construction 3% \$28,493

Division 1 General Conditions 5% **\$47,488**

LPS Construction Cost in ROW \$1,120,709

Engineering Design LS \$235,000

Construction Management 15% **\$168,106**

LPS TOTAL PROBABLE CONSTRUCTION COST IN ROW \$1,523,815

COST PER PARCEL \$41,184

\$235,000 Funded by
Town CPF for design



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

LPS CONSTRUCTION COST ON PRIVATE PROPERTY

Item No.	Item Description	Unit	Quantity	Material Cost		Labor Cost		Total Cost
				Unit Cost	Total Cost	Unit Cost	Total Cost	
1	DH071-93 Grinder Pump Units (i.e., Residential Parcel)	Ea	30	\$7,000	\$210,000	\$9,000	\$270,000	\$480,000
2	DH152-93 Grinder Pump Units (i.e., Commercial Parcel)	Ea	5	\$14,000	\$70,000	\$9,000	\$45,000	\$115,000
3	DH152-93 Grinder Pump Units (i.e., Institutional Parcel)	Ea	2	\$14,000	\$28,000	\$9,000	\$18,000	\$46,000
5	Lateral (Boundary) Kits (i.e., 1 kit/parcel)	Ea	37	\$300	\$11,100	\$1,000	\$37,000	\$48,100
6	1.25" Dia. HDPE Lateral Sewer Pipe (i.e., 60 lf/parcel)	Ea	2,220	\$2.60	\$5,772	\$20	\$44,400	\$50,172
7	Concrete Ballast (1.3 cy per DH071-93 Unit)	CY	39	\$250	\$9,750	\$250	\$9,750	\$19,500
8	Concrete Ballast (2.2 cy per DH152-93 Unit)	CY	15	\$250	\$3,850	\$250	\$3,850	\$7,700
9	Abandonment of existing onsite system	Ea	37	\$585	\$21,645	\$1,000	\$37,000	\$58,645
10	6" gravity sewer (50 lf/house waste line to grinder pump)	LF	1,850	\$50	\$92,500	\$15	\$27,750	\$120,250
11	Excavation and Backfill (i.e., 50 lf of LPS piping/parcel)	CY	740	-	-	\$61	\$44,955	\$44,955
12	Dewatering (per parcel)	Ea	37	-	-	\$500	\$18,500	\$18,500

Subtotal \$1,008,822

Insurance 3% \$30,265

Subtotal \$1,039,087

Overhead 10% \$103,909

Profit 11% \$114,300

Subtotal \$1,257,295

Design Contingency 5% \$62,865

Escalation to Midpoint of Construction 3% \$37,719

Division 1 General Conditions 5% \$62,865

LPS Construction Cost Private Parcels \$1,420,743

Engineering Design LS \$242,000

Construction Management 10% \$142,074

LPS TOTAL PROBABLE CONSTRUCTION COST ON PRIVATE PROPERTY \$1,804,818

COST PER PARCEL \$48,778.85

GRAND TOTAL (PROBABLE LPS CONSTRUCTION COST IN ROW AND PRIVATE PROPERTY) \$3,328,633

TOTAL COST PER PARCEL \$89,963

\$242,000 Funded by
Town CPF for design



CAMERON ENGINEERING
& ASSOCIATES, LLP

**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

APPENDIX C

SEQR Short Form Assessment Form

&

State Historic Preservation Office Determination Letter



DRAFT SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

Short Environmental Assessment Form Part 1 - Project Information

Instructions for Completing

Part 1 – Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Form with sections: Part 1 – Project and Sponsor Information, Village of Sag Harbor, Suffolk County, New York; Name of Action or Project: Sewer Service Expansion Area - Sewershed "K"; Project Location; Brief Description of Proposed Action; Name of Applicant or Sponsor; Telephone; E-Mail; Address; City/PO; State; Zip Code; and numbered questions regarding legislative adoption, permits, acreage, and land uses.



**DRAFT
SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

5. Is the proposed action,	NO	YES	N/A
a. <u>A permitted use under the zoning regulations?</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. <u>Consistent with the adopted comprehensive plan?</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. <u>Is the proposed action consistent with the predominant character of the existing built or natural landscape?</u>	NO	YES	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7. <u>Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area?</u>	NO	YES	
If Yes, identify: <u>Special Groundwater Protection Area (South Fork) CEA, Long Pond CEA, Peconic Bay and Environs CEA</u> <u>Name: Peconic Bay and Environs, Reason: Protect public health, water, vegetation, & scenic beauty,</u> <u>Agency: Suffolk County, Date: 7-12-88</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8. a. <u>Will the proposed action result in a substantial increase in traffic above present levels?</u>	NO	YES	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
b. <u>Are public transportation services available at or near the site of the proposed action?</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c. <u>Are any pedestrian accommodations or bicycle routes available on or near the site of the proposed action?</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9. <u>Does the proposed action meet or exceed the state energy code requirements?</u>	NO	YES	
If the proposed action will exceed requirements, describe design features and technologies: <u>Not Applicable</u>	<input type="checkbox"/>	<input type="checkbox"/>	
10. <u>Will the proposed action connect to an existing public/private water supply?</u>	NO	YES	
If No, describe method for providing potable water: _____ <u>Parcels are already connected to existing potable water supply.</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11. <u>Will the proposed action connect to existing wastewater utilities?</u>	NO	YES	
If No, describe method for providing wastewater treatment: _____	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
12. a. <u>Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places?</u>	NO	YES	
<u>Sag Harbor Village Historic District; Sag Harbor Hills; Azurest & Ninevah Subdivisions</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b. <u>Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory?</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13. a. <u>Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?</u>	NO	YES	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b. <u>Would the proposed action physically alter, or encroach into, any existing wetland or waterbody?</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____			



DRAFT SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:

Shoreline Forest Agricultural/grasslands Early mid-successional

Wetland Urban Suburban

15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered? Northern Long-eared Bat, Rare Dragonflies, and Damselflies listed as Endangered or Threatened.	NO	YES
	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16. Is the project site located in the 100-year flood plan?	NO	YES
	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	NO	YES
	<input checked="" type="checkbox"/>	<input type="checkbox"/>
a. Will storm water discharges flow to adjacent properties?	<input type="checkbox"/>	<input type="checkbox"/>
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe:	<input type="checkbox"/>	<input type="checkbox"/>

18. Does the proposed action include construction or other activities that would result in the impoundment of water or other liquids (e.g., retention pond, waste lagoon, dam)? If Yes, explain the purpose and size of the impoundment:	NO	YES
	<input checked="" type="checkbox"/>	<input type="checkbox"/>

19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe:	NO	YES
	<input checked="" type="checkbox"/>	<input type="checkbox"/>

20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe:	NO	YES
	<input checked="" type="checkbox"/>	<input type="checkbox"/>

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor/name: H. AIDAN CORISH Date: 04.12.2022

Signature: [Signature] Title: MRUSP

PRINT FORM



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

State Historic Preservation Office Determination Letter



KATHY HOCHUL
Governor

**Parks, Recreation,
and Historic Preservation**

ERIK KULLESEID
Commissioner

January 12, 2022

Mark Rauber
Engineering Director
Cameron Engineering & Assoc.
177 Crossways Park Drive
Woodbury, NY 11797

Re: DEC
Installation of New Sanitary Sewers
Sag Harbor, Suffolk Co.
21PR08434

Dear Mark Rauber:

Thank you for requesting the comments of the Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the submitted materials in accordance with the New York State Historic Preservation Act of 1980 (section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8) and its implementing regulations (6NYCRR Part 617).

The project consists of sewer service area expansion. The project area is entirely within the National Register Listed Sag Harbor Historic District and is adjacent to an eligible boundary expansion. Because of this, and because ground disturbance is proposed, we have reviewed the project.

It is the opinion of OPRHP that the project will have No Adverse Impact on historic resources.

If you have any questions, I can be reached at sloane.bullough@parks.ny.

Sincerely,

Sloane Bullough
Historic Sites Restoration Coordinator by email only



CAMERON ENGINEERING
& ASSOCIATES, LLP

**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

Appendix D

Catalog Cuts and Technical Data for Grinder Pump Stations & Control Panel



CAMERON ENGINEERING
& ASSOCIATES, LLP

**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022



**ENGINEERED
TO DO ONE JOB
PERFECTLY**

E/ONE
EXTREME
SERIES

**PRESSURE
SEWER
SYSTEMS**

Appendix D



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

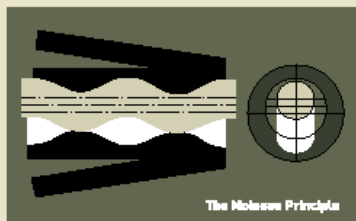
April 2022

ENGINEERED TO DO ONE JOB PERFECTLY

At the heart of the E/One Sewer System is the toughest, hardest working pump in the industry. The new standard in excellence, durability, and longevity, the E/One Extreme Series Grinder Pump. Its evolution reflects everything we've learned in 40 years as the originator and leader in the category of low pressure sewer systems.

The pump stations incorporate the grinder pump, motor controls and level sensing device integrated into a compact unit, easily removable for servicing when necessary.

And, the geometry of the pump not only produces a near-vertical pump curve, but allows passage of ground solids without clogging. Because of the low rpm and highest quality components, we experience the lowest service call rate in the industry. An average mean time of 10 years between service calls is typical.



The progressing cavity pump itself is based on the Moineau principle. A rotor turns within a stator, creating a sequence of sealed chambers. The precision-cast and polished stainless steel rotor moves wastewater through these chambers at a nearly constant flow, over a wide range of conditions – from negative to abnormally high heads. Turning at just 1,725 rpm, the one-horsepower motor can pump fluid through more than two miles of small-diameter piping or elevation changes of over 185 feet.

SOME KEY ADVANTAGES:

- ♦ **HIGH HEADS/NEGATIVE HEADS.** Reliable operation from negative head to 185 feet of total head for continuous duty reduces the number of lift stations and pipe sizes. This cuts costs – both initially and in long-term operation and maintenance.
- ♦ **CONSTANT FLOW.** The system pressures to be overcome by any given grinder pump in a low pressure system vary dramatically over the course of a day. E/One's progressing cavity pump readily accommodates these pressure variations while maintaining a nearly constant flow without ever operating at "near shut off" – thus avoiding the wear and motor burn-out suffered by other pump types.
- ♦ **HIGH GRINDING TORQUE.** Our unique pump system, driven by a one-horsepower motor turning at 1725 rpm, produces grinding torque greater than a two-horsepower pump turning at twice the speed.
- ♦ **ENERGY EFFICIENT.** The pump is activated automatically and runs for short periods. Typical annual energy consumption is comparable to a 40-watt light bulb.
- ♦ **LOW MAINTENANCE SUBMERSIBLE MOTOR.** Low maintenance and long life are the hallmarks of our air-filled motor. Permanently lubricated ball bearings and Class F insulation eliminate the need for periodic oil changes and oil disposal costs required by oil-filled submersible motors.
- ♦ **LARGE-DIAMETER GRINDER ASSEMBLY.** Almost twice the diameter of most other types of grinder pumps, contributing to a dramatic reduction of inflow velocity for less wear and no blinding, clogging or jamming.
- ♦ **NO PREVENTIVE MAINTENANCE.** Non-fouling static level sensors require no preventive maintenance. Because of our unique, near constant discharge rate, no main line flushing is required in a properly designed system.
- ♦ **CORROSION RESISTANCE.** E/One's stainless steel ball-type discharge valve and piping won't corrode like copper or galvanized, and hold up years longer. No corrosion, no maintenance.
- ♦ **DEPENDABILITY.** E/One pumps typically run ten years between service calls with 40 years of in-ground experience.
- ♦ **PROVIDES FOR ENVIRONMENTALLY SOUND WASTEWATER MANAGEMENT.** The E/One Extreme Series grinds waste material into small particles. This enables the use of inexpensive, small-diameter pressure pipes, buried at shallow depths, to transport wastewater to a suitable processing site. Result: Ground water contamination from failing septic tanks can be eliminated.
- ♦ **SERVICEABILITY.** Our unique core design eliminates the need for in-field troubleshooting and pump servicing. This means lower maintenance costs and minimum homeowner inconvenience.



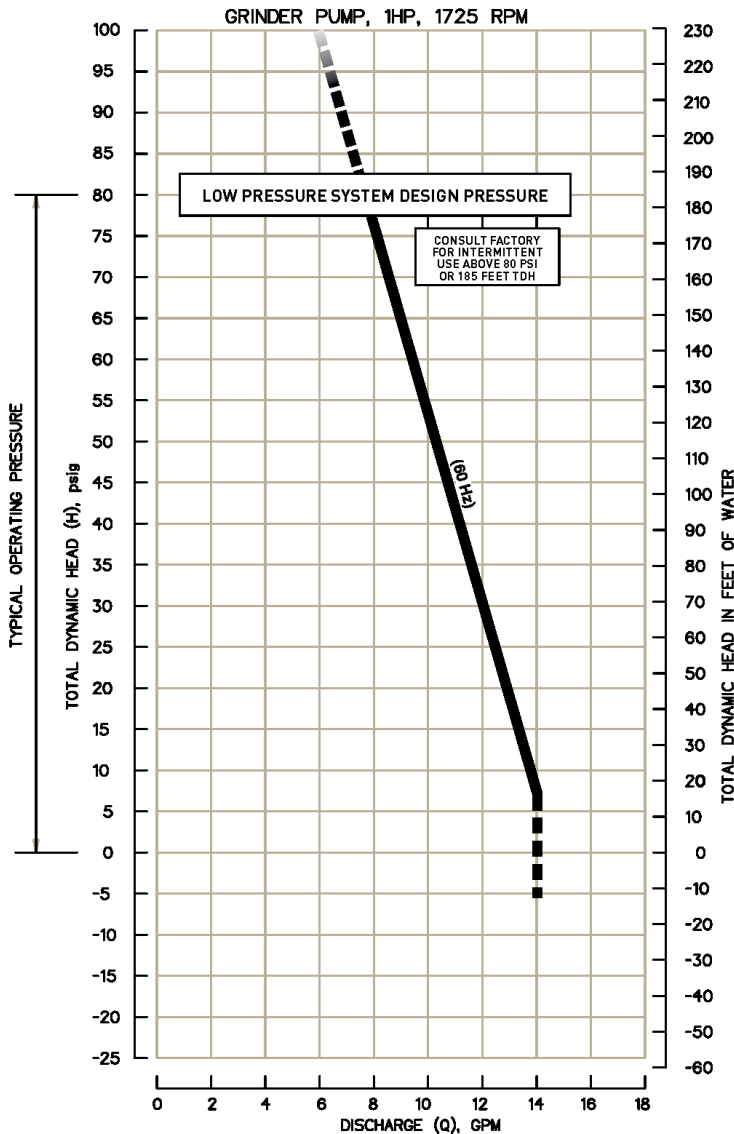
SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

GRAVITY SEWERS ARE NO LONGER THE RULE FOR SOLVING WASTEWATER PROBLEMS.

At the heart of the system is the E/One progressing cavity grinder pump – with high heads that can eliminate costly lift stations, and a robust, powerful design that translates into the industry’s highest levels of reliability, availability and maintainability.

E/ONE SPD PUMP PERFORMANCE CURVE



ENGINEERED LOW PRESSURE SYSTEMS

REPEALING THE LAW OF GRAVITY

NOBODY CAN TOUCH OUR CURVE.

In a low pressure system, constant, predictable pump output is the foundation for proper hydraulic design. It enables the engineer to minimize retention time, pump wear, and keep scouring action at effective levels.

Environment One’s semi-positive displacement, progressing cavity pump has a nearly vertical H-Q curve. It is by far the most “forgiving” pump design – providing predictable flow over the full range of typical system pressures; strengths critical in a large-scale, low pressure sewer.

E/One’s superior high head capability allows a system with few, if any, lift stations. And, it easily accommodates additional future connections without compromising system performance.

These E/One pump characteristics translate into:

- predictable hydraulic design
- lower collection system capital costs
- less maintenance
- lower operating costs



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

ANATOMY OF A LEADER: THE INSIDE STORY ON THE E/ONE GRINDER PUMP STATION.

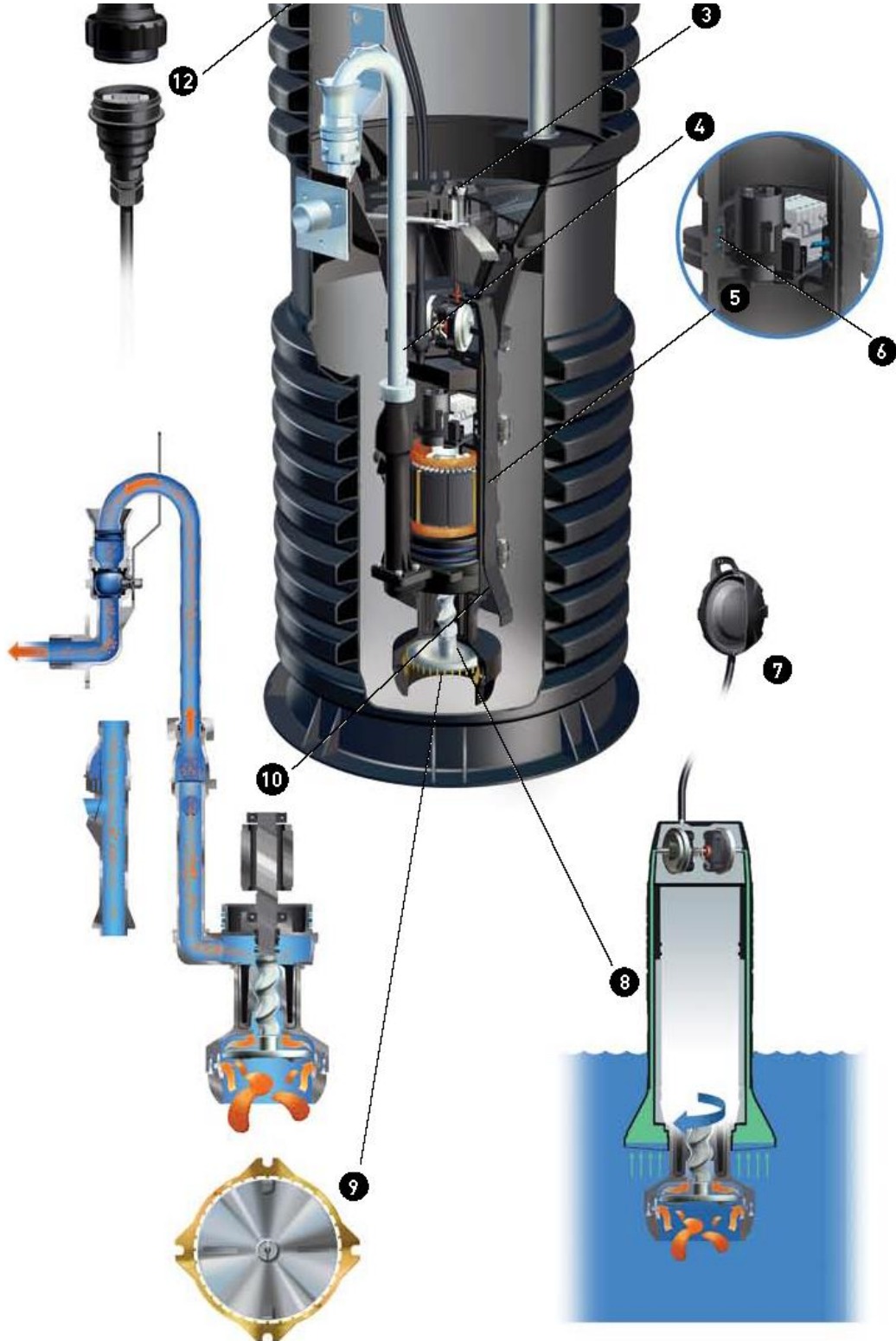
- 1** LOW-PROFILE COVER: Aesthetically pleasing. Provides easy access for service while blending with surroundings.
- 2** HIGH-DENSITY POLYETHYLENE TANK: Double-wall construction of high-density thermoplastic for rugged reliability. Factory pressure tested for infiltration and exfiltration free installation.
- 3** QUICK-RELEASE CORE LATCH: All stainless mechanism secures core in place and can be easily released from ground level.
- 4** STAINLESS STEEL PIPING & HARDWARE: E/One's SS discharge piping and ball valve won't corrode. No corrosion, no maintenance, no tools required.
- 5** UNIQUE CORE DESIGN: Eliminates the need for in-field troubleshooting and service. Modular controls simplify service.
- 6** DOUBLE O-RING SEALS: Make assemblies waterproof and novel joint geometry minimizes the effects of crevice corrosion.
- 7** E/ONE EQUALIZER: Compensates for fluctuations in atmospheric pressure to enable accurate level sensing while assuring the level sensing system is watertight.
- 8** PROGRESSING CAVITY PUMP: A deceptively simple design produces a nearly constant flow under a wide range of continuously varying conditions.
- 9** GRINDER WHEEL AND SHREDDER RING: Hardened corrosion-resistant cutter bars and teeth process sewage, grinding wastewater solids, as well as wood, plastic and cloth. Will not jam or clog!
- 10** PRESSURE SWITCH LEVEL CONTROL: Self-cleaning level sensors require no preventive maintenance.
- 11** DIRECT-BURY CABLE: For simple and inexpensive installation.
- 12** ELECTRICAL QUICK DISCONNECT: For safe and easy service. UL-listed, compatible with OSHA regulations for confined space entry.





**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022





SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

LEADING THE INDUSTRY WE INVENTED.

Environment One not only pioneered the low pressure sewer system, but consistently leads the industry both in system deployment and innovation. The company is dedicated to Total Quality, Continuous Improvement, and Customer Satisfaction, as evidenced by the E/One Extreme Series. Today, there are nearly a million end users worldwide.



SEWER ANYWHERE

Driven by the remarkable E/One Extreme grinder pump, E/One Sewers give engineers, developers, municipal sanitarians, and land planners unprecedented new freedom in land usage and septic tank replacement.

With a smaller footprint and a softer touch on the land, they're so much easier to install. Front-end costs can be reduced by as much as 80%. Total installed costs by half. And O&M costs by up to 75%.

The E/One Extreme grinder pump reduces all forms of sanitary waste to a non-clogging slurry and pumps it through a network of small-diameter pipes. Since gravity is replaced by the power of the pump, sewer systems need not run downhill nor require large-diameter pipes, deep trenches, multiple booster stations – or their associated costs.

A system powered by the E/One Extreme grinder pump converts formerly cost-prohibitive building sites into cost-effective reality. "Problem areas," with high ground water, elevation changes or impenetrable bedrock, are transformed into valuable, developable real estate.

Of course, E/One's low upfront cost advances apply to conventional building sites as well.

In addition, E/One units are easy to install and virtually maintenance-free – refined through 40 years of experience with the largest installed base in the industry.

SAVE THOUSANDS, VIRTUALLY SERVICE-FREE.

Contact your local distributor:



SEWER SYSTEMS

Environment One Corporation
2773 Balltown Road
Niskayuna, NY USA 12309-1090
Voice (01) 518.346.6161
Fax 518.346.6188
www.eone.com

A Precision Castparts Company
LM000364 Rev B





SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

THE D-SERIES

Wetwell/Drywell for Superior Serviceability

The E/One D-Series features a wetwell/drywell design that provides a dry accessway for ease of service. Plus a modular design and one-piece core that permits simple core replacement – should it ever become necessary. Available in both simplex and duplex grinder pump stations to fit a wide variety of applications, from single-family homes to light commercial applications to several homes in conjunction.

The tanks are made from tough, corrosion-resistant HDPE for long life and zero upkeep. Station capacities of 70 gallons to 500 gallons are available.



THE I-SERIES INDOOR UNIT

Self-Contained for Indoor Installation

More builders and municipalities are opting for the ease and convenience of the E/One Indoor Unit, which offers easy access along with all the benefits of the D-Series. An attractive self-contained unit, the I-Series fits unobtrusively into a basement or garage with a clean, contemporary design that feels right at home with other major appliances.

It can be used as part of a new E/One sewer system or retrofit into an existing low pressure or gravity sewer system.

With its quiet, energy-efficient pump and sound insulating properties, the I-Series is easy to live with.





SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

THE W-SERIES

Engineered for choice.

The W-Series is E/One's most versatile grinder pump station – a range of basins, covers, discharges, inlets and panels are available. Simplex through quadriplex stations work with single homes, light commercial applications, or several homes.

The W-Series allows you to choose integral components for optimal installation and performance for your site's conditions. Whatever tank size is needed, many features from discharge configuration to panel options can be adjusted to your specific needs. W-Series stations can have one pump or up to four pumps, depending on the tank chosen.

Simplex Stations

- HDPE or fiberglass (not shown) construction
- Station capacities of 100, 237 and 476 gallons available
- Various station heights available

Multiple-Pump Stations

- HDPE construction
- Station capacities of 476 and 486 gallons available
- 476-gallon tank allows for 1 or 2 pumps
- 486-gallon tank allows for 2, 3 or 4 pumps
- Various station heights available

The W-Series fiberglass tanks offer a multitude of station volumes and heights with diameters from 24 inches to 72 inches, and heights from 60 inches to 240 inches.

* Please visit www.eone.com for application and flow information



237 gal



100 gal



476 gal



486 gal

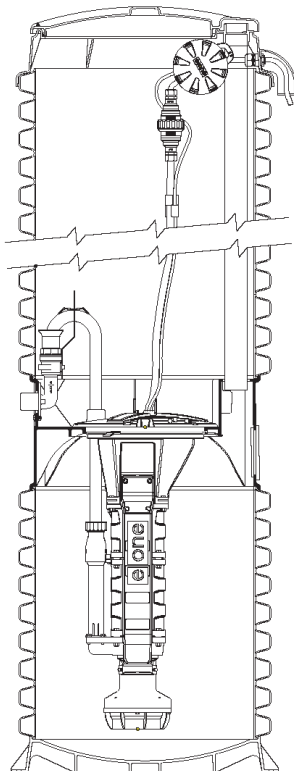


**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022



DH071/DR071



General Features

The model DH071 or DR071 grinder pump station is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank, controls, and alarm panel. A single DH071 or DR071 is a popular choice for one, average single-family home and can also be used for up to two average single-family homes where codes allow and with consent of the factory.

- Rated for flows of 700 gpd (2650 lpd)
- 70 gallons (265 liters) of capacity
- Indoor or outdoor installation
- Standard outdoor heights range from 61 inches to 160 inches

The DH071 is the “hardwired,” or “wired,” model where a cable connects the motor controls to the level controls through watertight penetrations.

The DR071 is the “radio frequency identification” (RFID), or “wireless,” model that uses wireless technology to communicate between the level controls and the motor controls.

Operational Information

Motor

1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections

4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections

Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

Discharge

15 gpm at 0 psig (0.95 lps at 0 m)
11 gpm at 40 psig (0.69 lps at 28 m)
7.8 gpm at 80 psig (0.49 lps at 56 m)

Accessories

E/One requires that the Uni-Lateral, E/One’s own stainless steel check valve, be installed between the grinder pump station and the street main for added protection against backflow.

Alarm panels are available with a variety of options, from basic monitoring to advanced notice of service requirements.

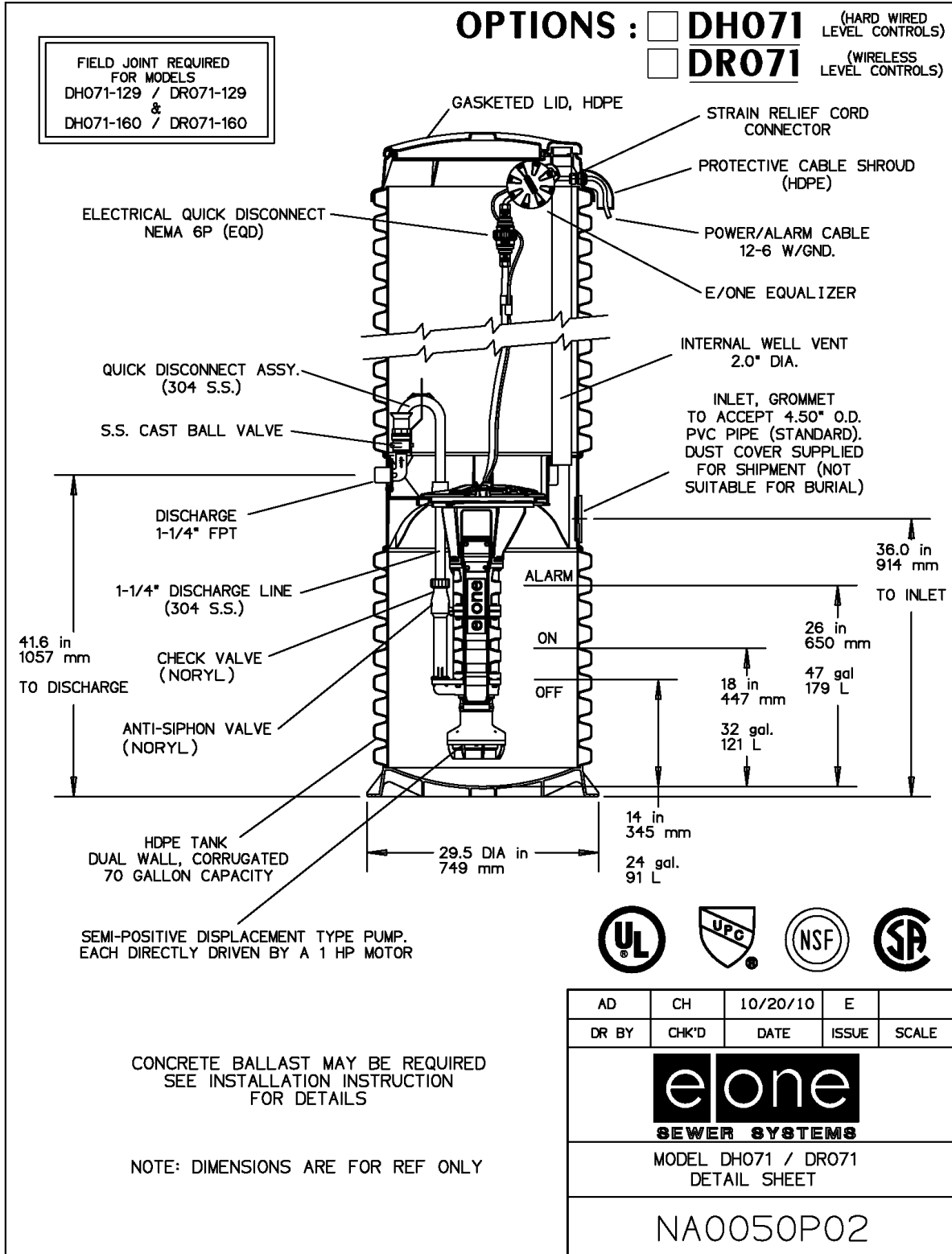
The Remote Sentry is ideal for installations where the alarm panel may be hidden from view.

NA0050P01 Rev D



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

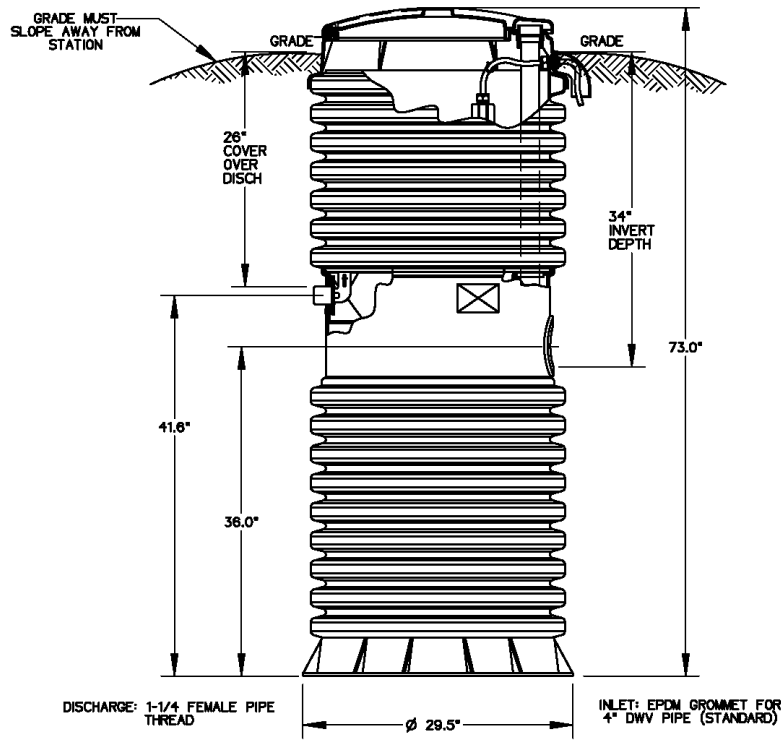




**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

OPTIONS : **DH071-74** (HARD WIRED LEVEL CONTROLS)
 DR071-74 (WIRELESS LEVEL CONTROLS)



CONCRETE BALLAST MAY BE REQUIRED
SEE INSTALLATION INSTRUCTIONS
FOR DETAILS

NOTE: DIMENSIONS ARE FOR REF ONLY



AD	CAH	07/12/07	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL DH071-74 / DR071-74

NA0050P05

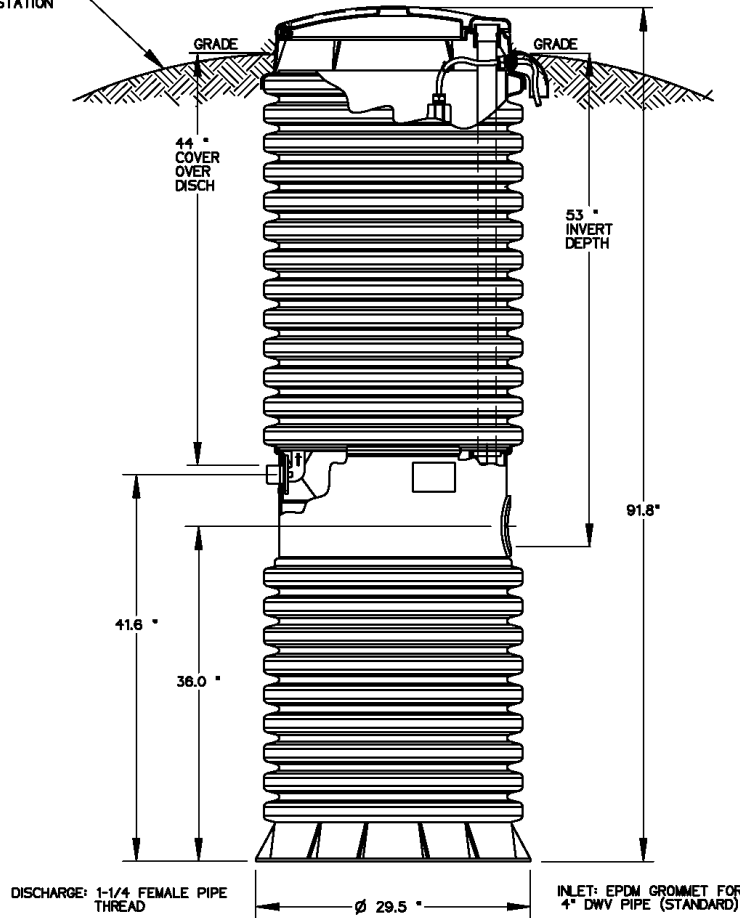


**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

OPTIONS : **DH071-93** (HARD WIRED LEVEL CONTROLS)
 DR071-93 (WIRELESS LEVEL CONTROLS)

GRADE MUST SLOPE AWAY FROM STATION



CONCRETE BALLAST MAY BE REQUIRED
SEE INSTALLATION INSTRUCTIONS
FOR DETAILS

NOTE: DIMENSIONS ARE FOR REF ONLY

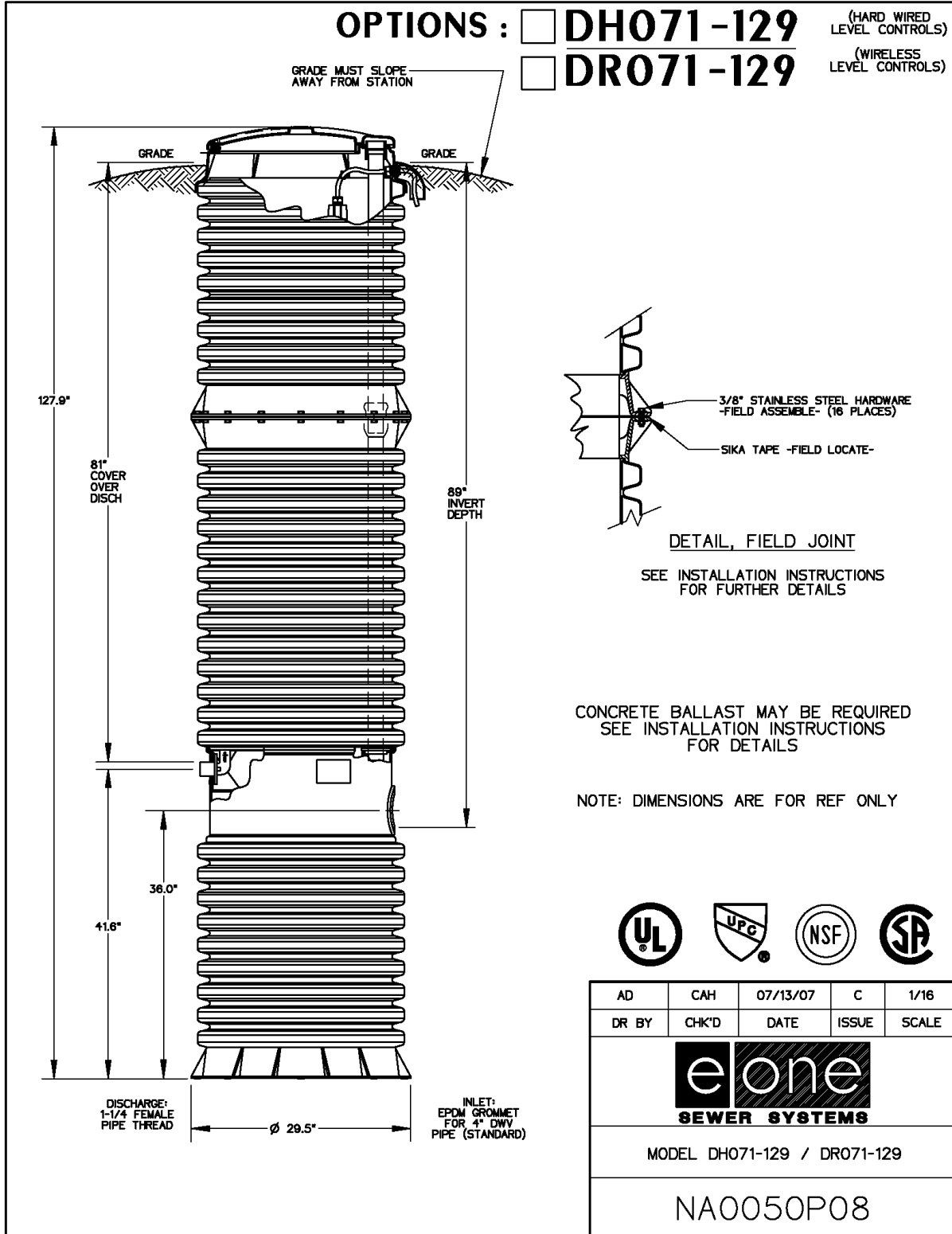


AD	CAH	07/12/07	B	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE
e one SEWER SYSTEMS				
MODEL DH071-93 / DR071-93				
NA0050P06				



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

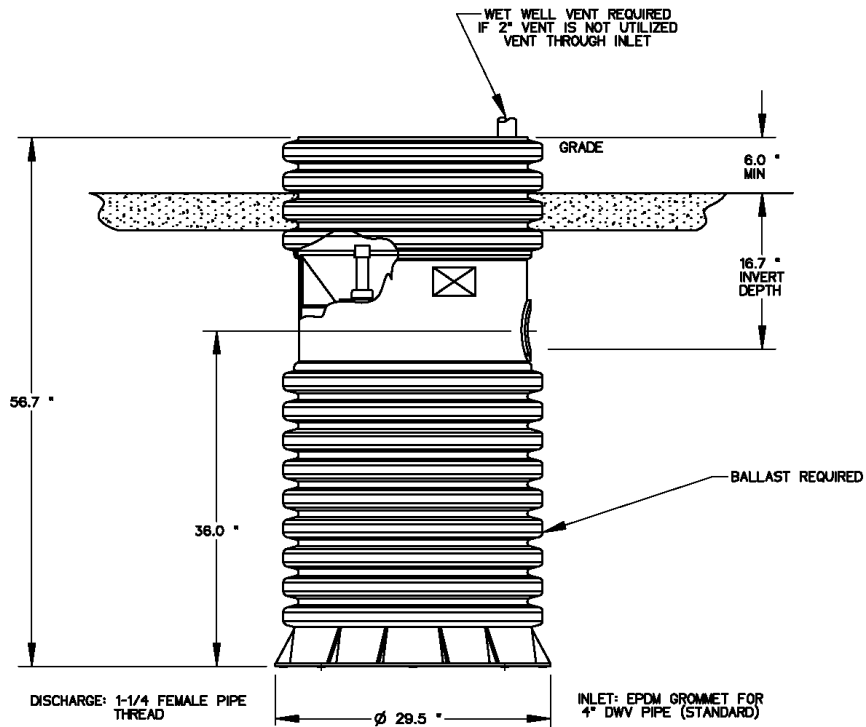




**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

**DH071-57
BUILDERS MODEL
STRAIGHT DISCHARGE**



NOTE: DIMENSIONS ARE FOR REF ONLY



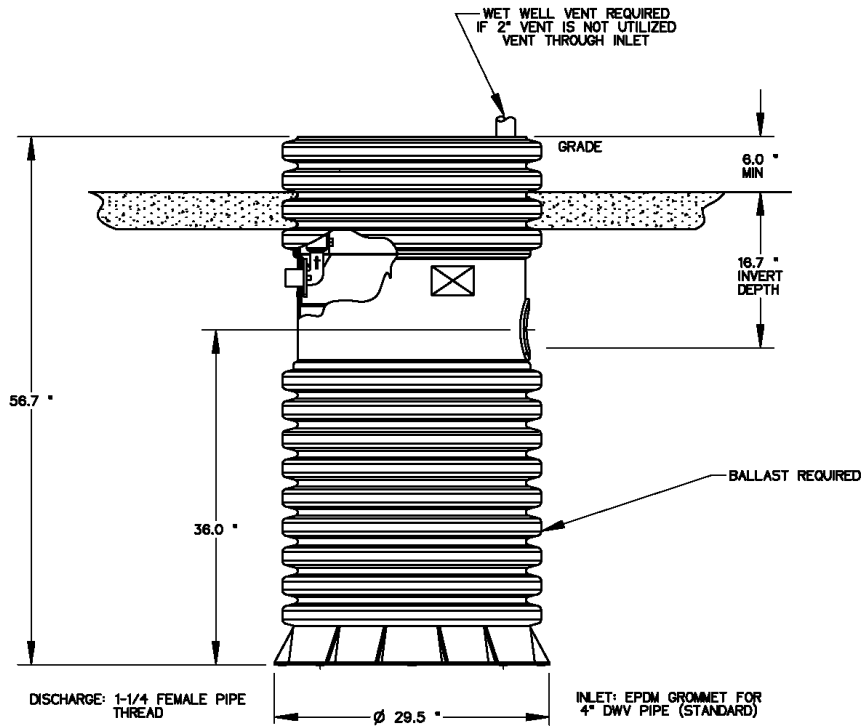
AD	CAH	04/26/07	B	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE
MODEL DH071-57 BUILDERS				
NA0050P11				



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

**DH071-57
BUILDERS MODEL
DISCHARGE VALVE**



NOTE: DIMENSIONS ARE FOR REF ONLY



AD	CAH	04/26/07	B	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL DH071-57
BUILDERS

NA0050P12



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022



DH151/DR151

General Features

The model DH151 or DR151 grinder pump station is a complete unit that includes: the grinder pump, check valve, polyethylene tank, controls, and alarm panel. A single DH151 or DR151 is a popular choice for up to two, average single-family homes and can also be used for up to six average single-family homes where codes allow and with consent of the factory.

- Rated for flows of 1500 gpd (5678 lpd)
- 150 gallons (568 liters) of capacity
- Indoor or outdoor installation
- Standard outdoor heights range from 63 inches to 160 inches

The DH151 is the “hardwired,” or “wired,” model where a cable connects the motor controls to the level controls through watertight penetrations.

The DR151 is the “radio frequency identification” (RFID), or “wireless,” model that uses wireless technology to communicate between the level controls and the motor controls.

Operational Information

Motor

1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections

4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections

Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

Discharge

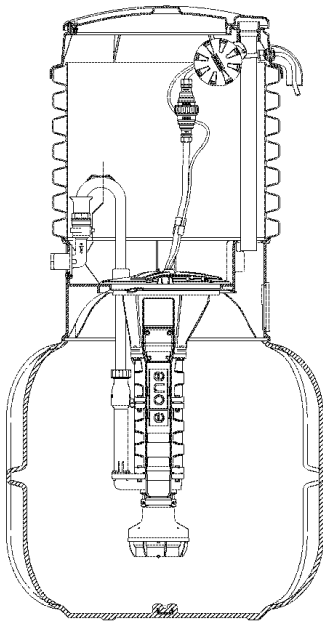
15 gpm at 0 psig (0.95 lps at 0 m)
11 gpm at 40 psig (0.69 lps at 28 m)
7.8 gpm at 80 psig (0.49 lps at 56 m)

Accessories

E/One requires that the Uni-Lateral, E/One’s own stainless steel check valve, be installed between the grinder pump station and the street main for added protection against backflow.

Alarm panels are available with a variety of options, from basic monitoring to advanced notice of service requirements.

The Remote Sentry is ideal for installations where the alarm panel may be hidden from view.

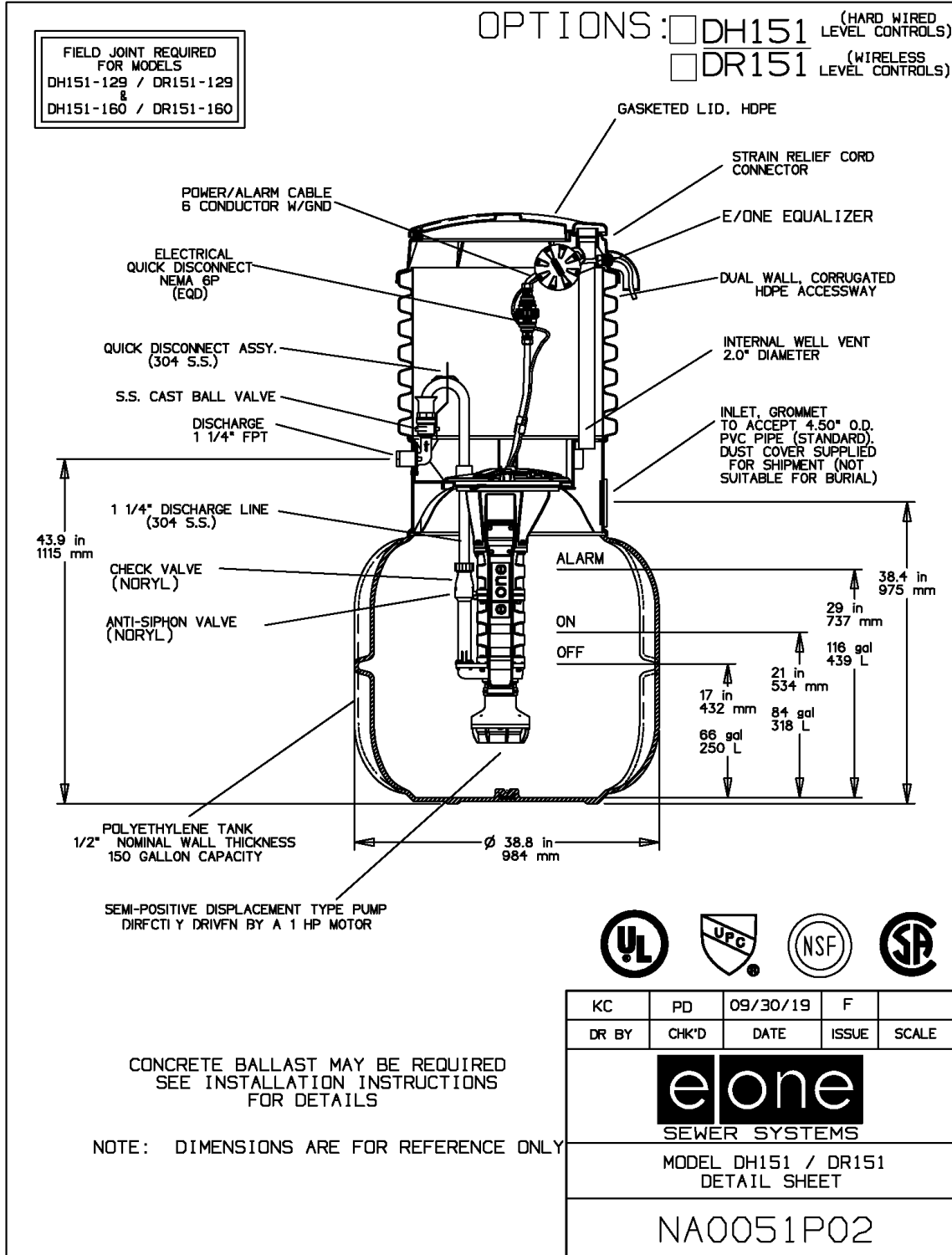


NA0051P01 Rev E



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

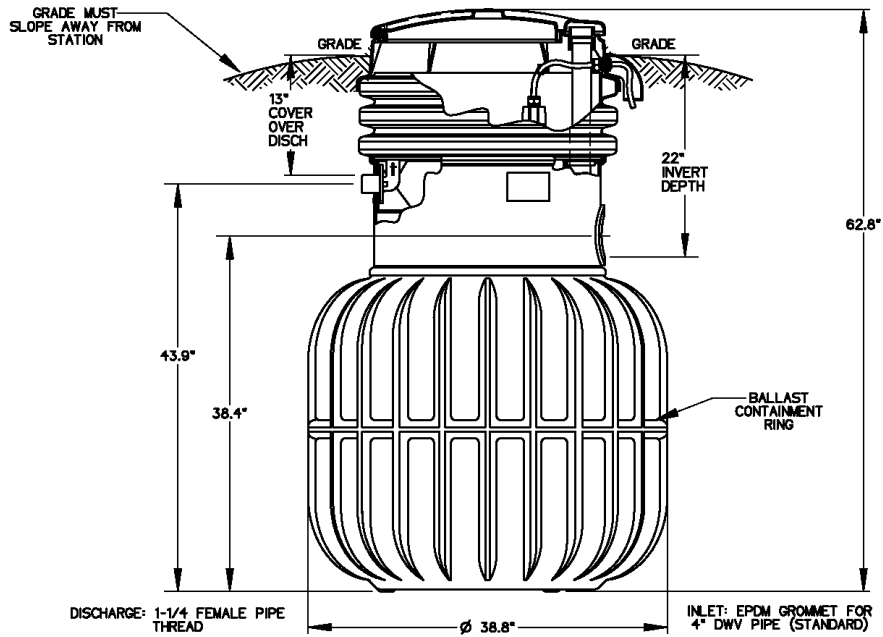




**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

OPTIONS : **DH151-63** (HARD WIRED LEVEL CONTROLS)
 DR151-63 (WIRELESS LEVEL CONTROLS)



CONCRETE BALLAST MAY BE REQUIRED
SEE INSTALLATION INSTRUCTIONS
FOR DETAILS

NOTE: DIMENSIONS ARE FOR REFERENCE ONLY



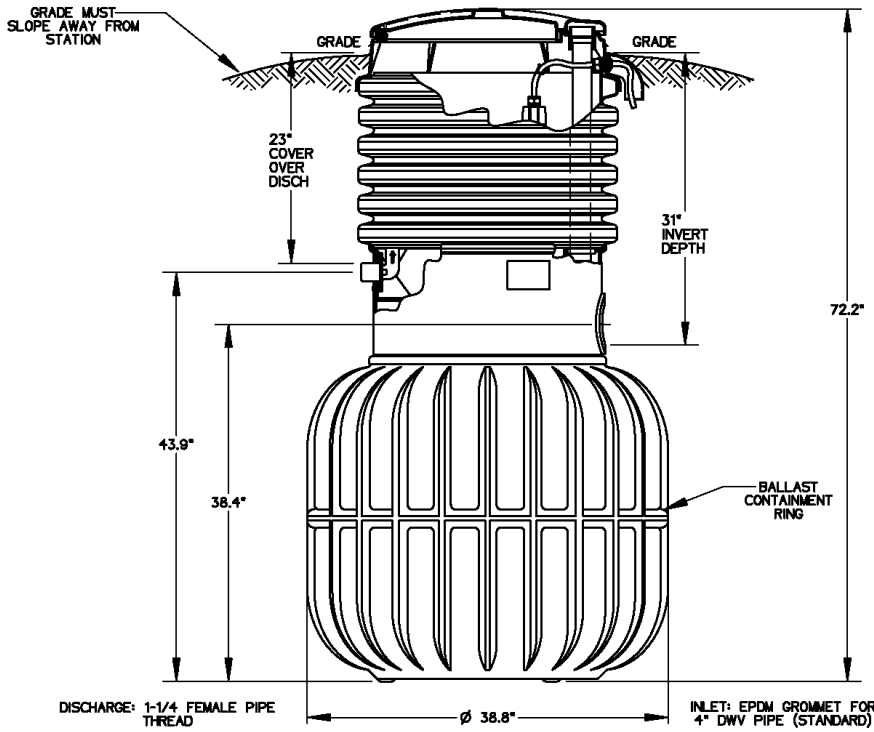
AD	CAH	07/13/07	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE
e one SEWER SYSTEMS				
MODEL DH151-63 / DR151-63				
NA0051P04				



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

OPTIONS : **DH151-74** (HARD WIRED LEVEL CONTROLS)
 DR151-74 (WIRELESS LEVEL CONTROLS)



CONCRETE BALLAST MAY BE REQUIRED
SEE INSTALLATION INSTRUCTIONS
FOR DETAILS

NOTE: DIMENSIONS ARE FOR REFERENCE ONLY



AD	CAH	07/13/07	D	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL DH151-74 / DR151-74

NA0051P05



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

OPTIONS : **DH151-93** (HARD WIRED LEVEL CONTROLS)
 DR151-93 (WIRELESS LEVEL CONTROLS)

CONCRETE BALLAST MAY BE REQUIRED
SEE INSTALLATION INSTRUCTIONS
FOR DETAILS

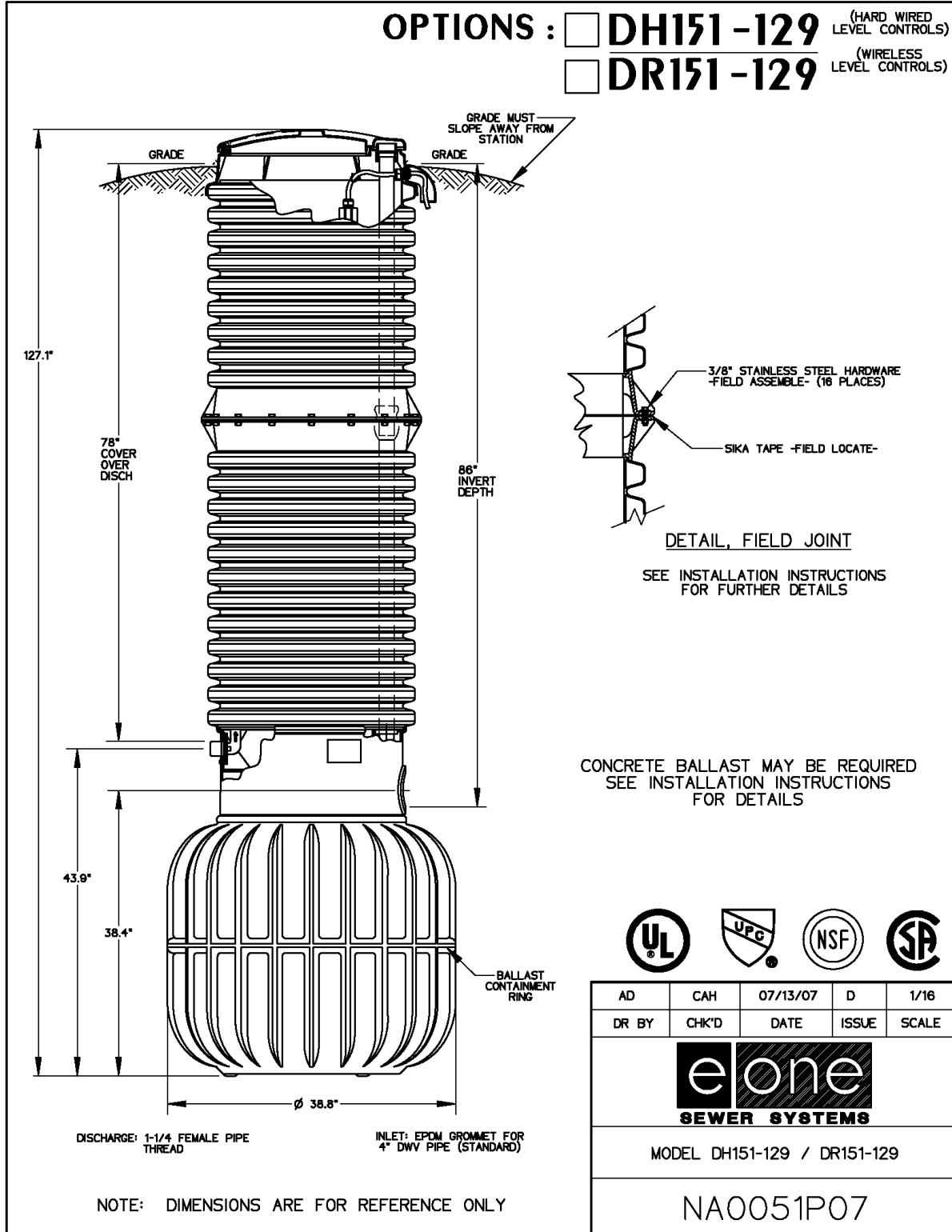
NOTE: DIMENSIONS ARE FOR REFERENCE ONLY

AD	CAH	7/13/07	D	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE
MODEL DH151-93 / DR151-93				
NA0051P06				



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

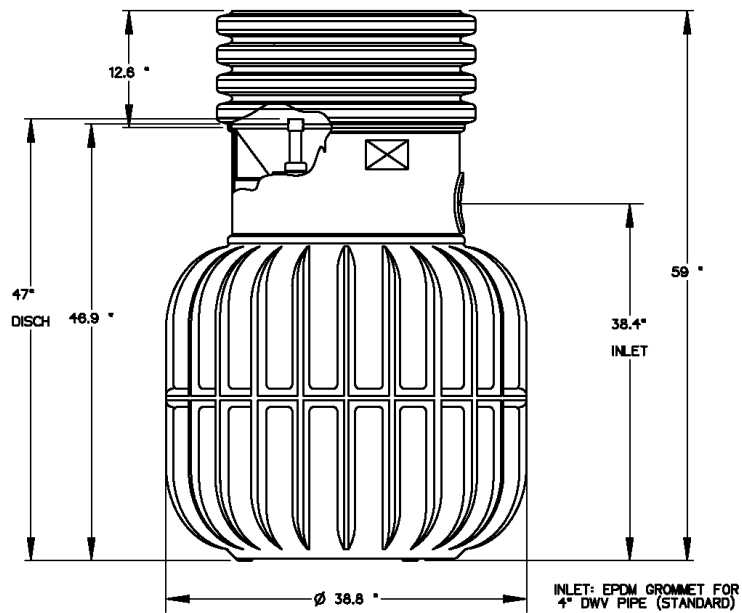




**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

**DH151-59
BUILDERS MODEL
STRAIGHT DISCHARGE**



AD	CAH	06/27/07	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL DH151-59
BUILDERS

NA0051P09

NOTE: DIMENSIONS ARE FOR REFERENCE ONLY

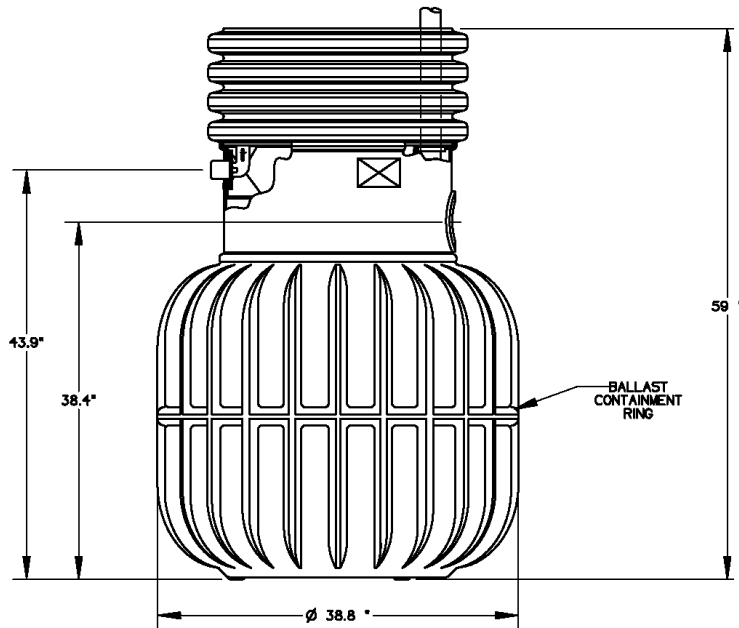


CAMERON ENGINEERING
& ASSOCIATES, LLP

**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

**DH151-59
BUILDERS MODEL
OUTSIDE TYPE DISCHARGE**



AD	CAH	06/27/07	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL DH151-59
BUILDERS

NA0051P10

NOTE: DIMENSIONS ARE FOR REFERENCE ONLY



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022



DH152/DR152

General Features

The model DH152 or DR152 grinder pump station is a complete unit that includes: two grinder pumps, check valve, polyethylene tank, controls, and alarm panel. A single DH152 or DR152 is ideal for up to four, average single-family homes and can also be used for up to 12 average single-family homes where codes allow and with consent of the factory.

- Rated for flows of 3000 gpd (11,356 lpd)
- 150 gallons (568 liters) of capacity
- Indoor or outdoor installation
- Standard outdoor heights range from 93 inches to 160 inches

The DH152 is the “hardwired,” or “wired,” model where a cable connects the motor controls to the level controls through watertight penetrations.

The DR152 is the “radio frequency identification” (RFID), or “wireless,” model that uses wireless technology to communicate between the level controls and the motor controls.

Operational Information

Motor

1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections

4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections

Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

Discharge

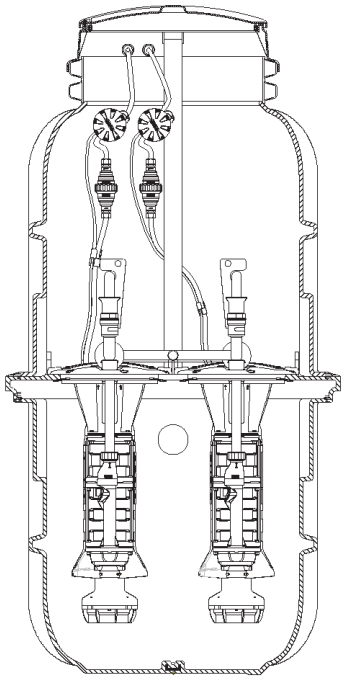
15 gpm at 0 psig (0.95 lps at 0 m)
11 gpm at 40 psig (0.69 lps at 28 m)
7.8 gpm at 80 psig (0.49 lps at 56 m)

Accessories

E/One requires that the Uni-Lateral, E/One’s own stainless steel check valve, be installed between the grinder pump station and the street main for added protection against backflow.

Alarm panels are available with a variety of options, from basic monitoring to advanced notice of service requirements.

The Remote Sentry is ideal for installations where the alarm panel may be hidden from view.

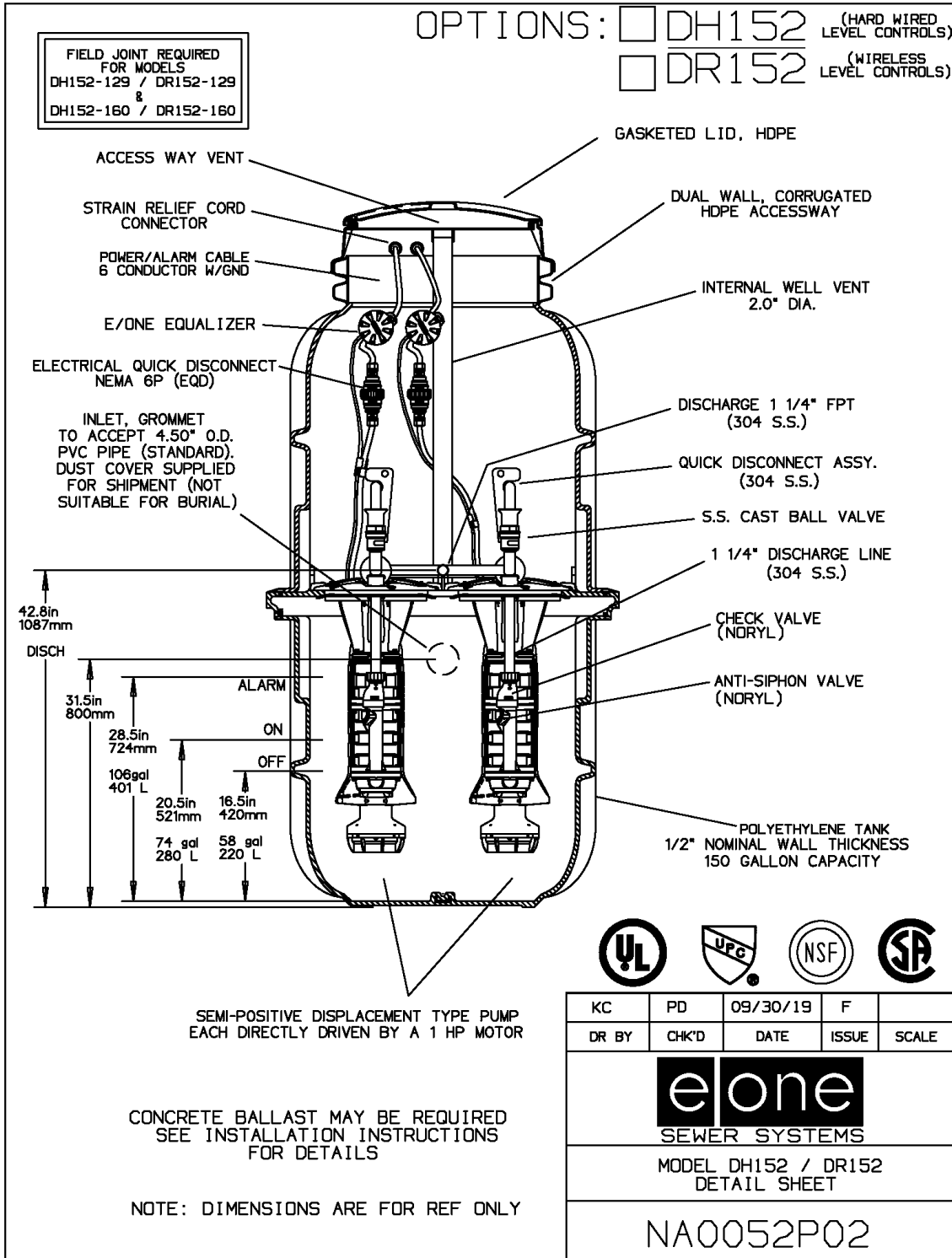


NA0052P01 Rev E



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

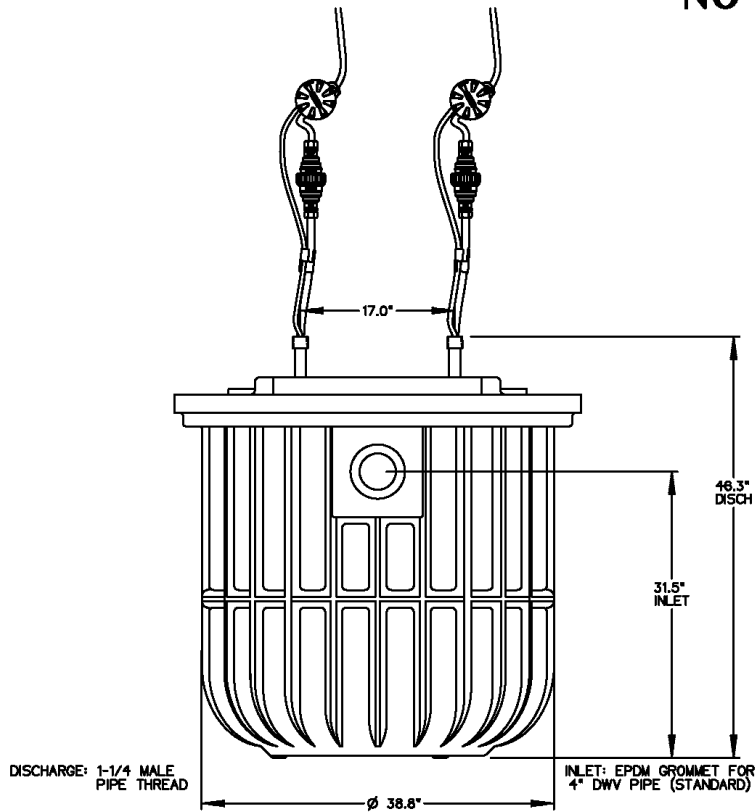




**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

**DH152-38
NO BAFFLE**



NOTE: DIMENSIONS ARE FOR REF ONLY



CTT	CH	10/19/12	D	
DR BY	CHK'D	DATE	ISSUE	SCALE



MODEL DH152-38, NO BAFFLE

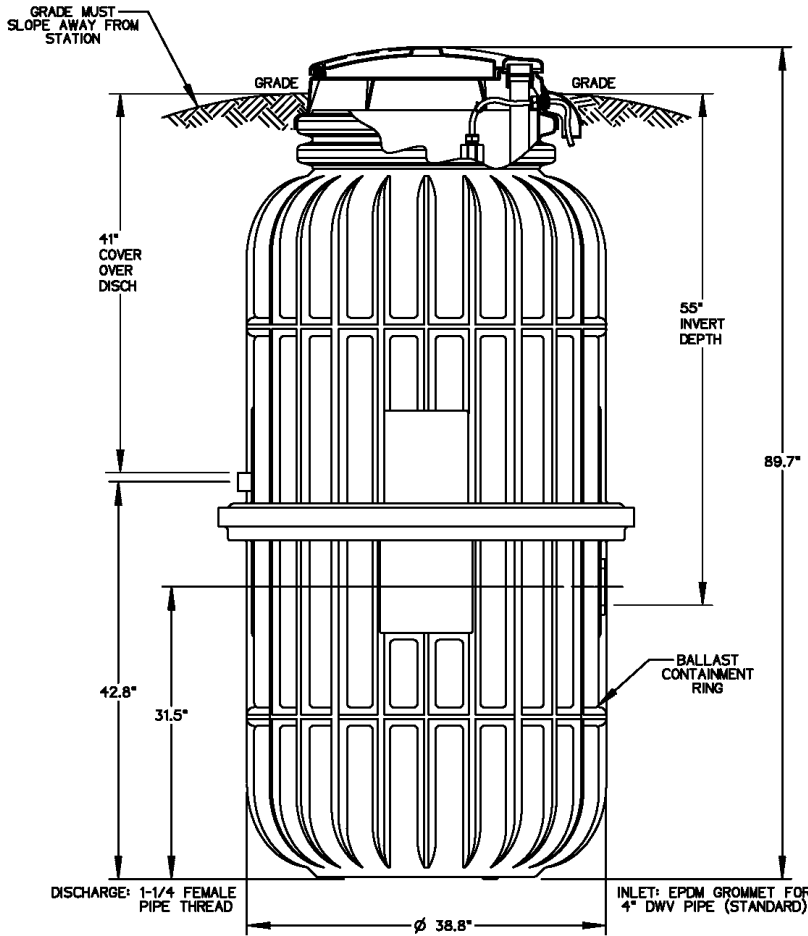
NA0052P03



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

OPTIONS : **DH152 -93** (HARD WIRED LEVEL CONTROLS)
 DR152 -93 (WIRELESS LEVEL CONTROLS)



CONCRETE BALLAST MAY BE REQUIRED
SEE INSTALLATION INSTRUCTIONS
FOR DETAILS

NOTE: DIMENSIONS ARE FOR REF ONLY



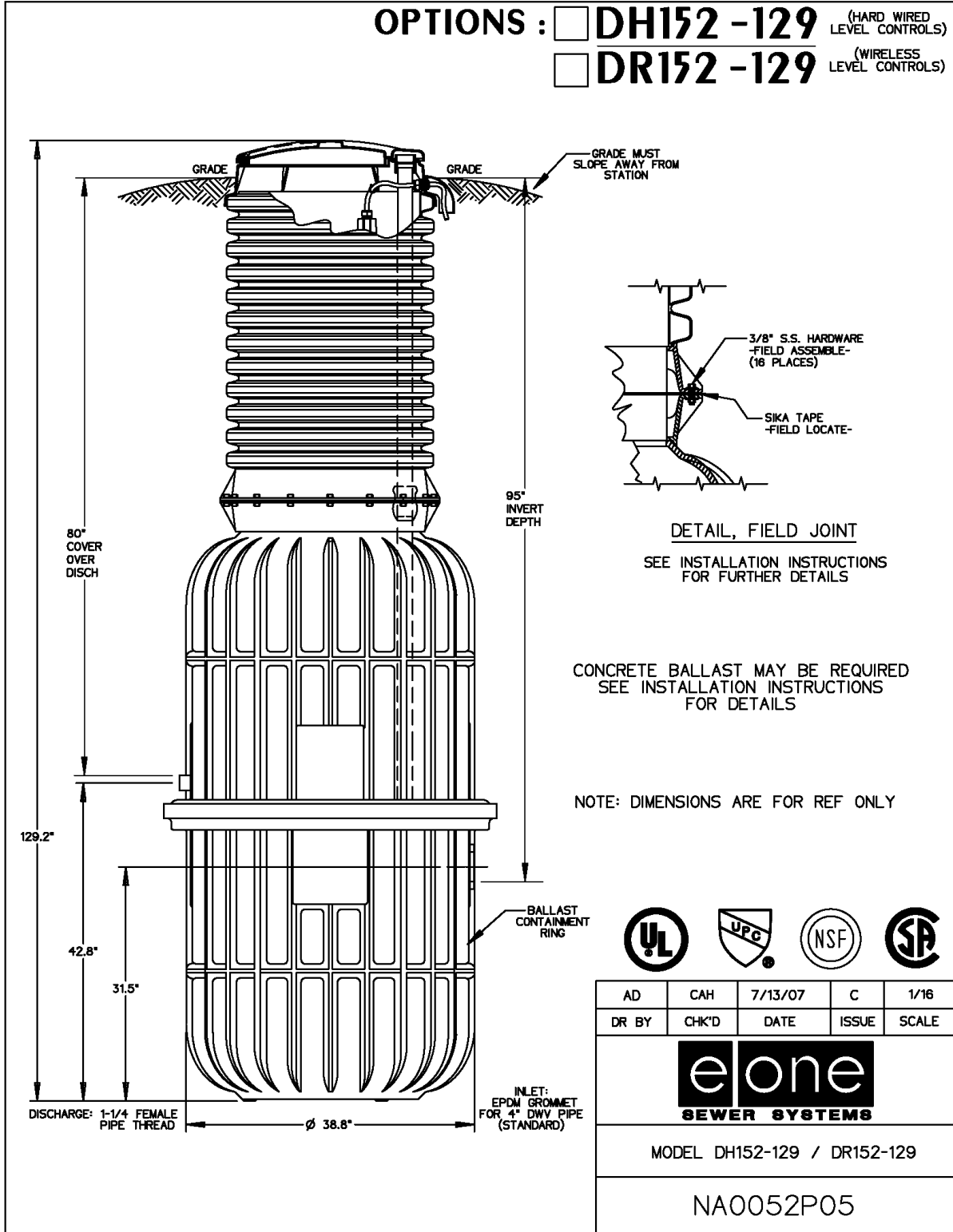
AD	CAH	7/13/07	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE
eone SEWER SYSTEMS				
MODEL DH152-93 / DR152-93				
NA0052P04				



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

OPTIONS : **DH152 -129** (HARD WIRED LEVEL CONTROLS)
 DR152 -129 (WIRELESS LEVEL CONTROLS)

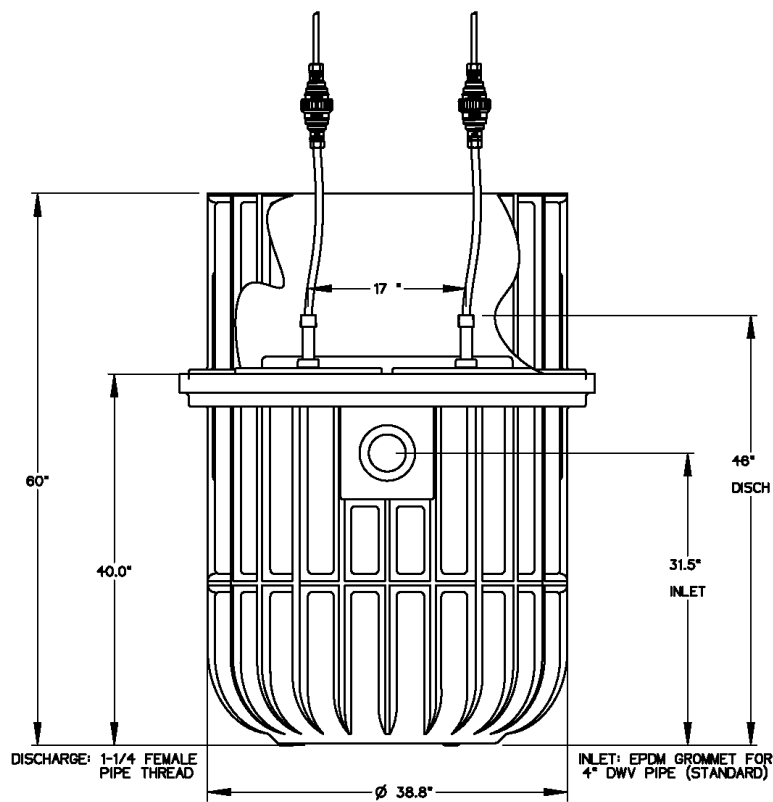





**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

**DH152 -57
BUILDERS MODEL
STRAIGHT DISCHARGE**



NOTE: DIMENSIONS ARE FOR REF ONLY

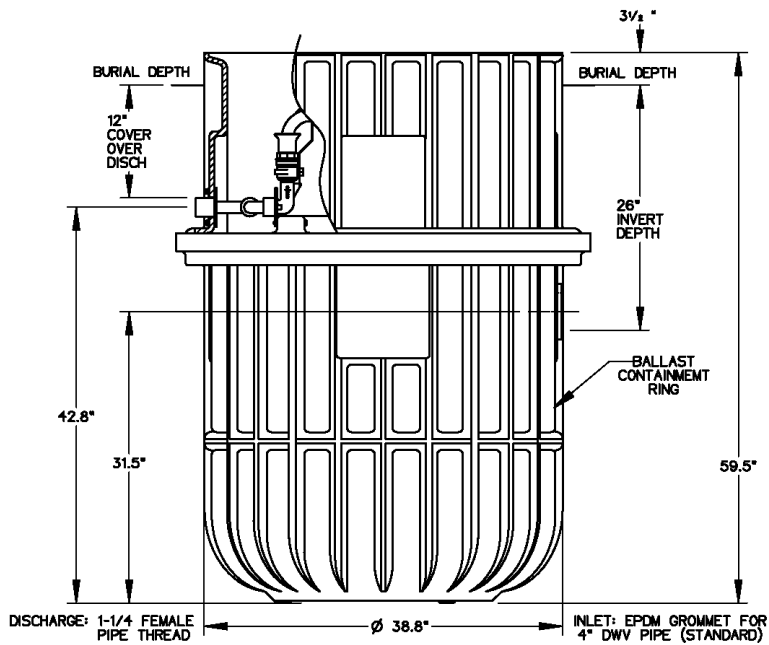
AD	CAH	06-27-07	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE
 eone SEWER SYSTEMS				
MODEL DH152-57 BUILDERS				
NA0052P07				



**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

**DH152 -57
BUILDERS MODEL
DISCHARGE VALVE**



AD	CAH	06/27/07	C	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

NOTE: DIMENSIONS ARE FOR REF ONLY



MODEL DH152-57
BUILDERS

NA0052P08



CAMERON ENGINEERING
& ASSOCIATES, LLP

**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

e/one
sentry

ALARM PANELS

for E/One Low Pressure
Sewer Systems



**The World’s Best Low Pressure
Sewer System Sets The Standard
in Reliability and Convenience**





**SAG HARBOR
SEWER SERVICE EXPANSION AREA – SEWERSHED “K”
ENGINEERING REPORT**

April 2022

E/ONE SENTRY

The Sentry line of alarm panels is designed for use with E/One grinder pump systems. The alarm panels are configured to provide functions ranging from basic alarm indication to advanced warning of pending service requirements. In between, there are numerous features available including an event counter; run-time meter; service disconnect capability; and remote alarm indication.

Like the E/One grinder pump station, all panels are UL listed and most are CSA certified and meet all applicable NEC and NFPA codes and standards. Furthermore, all E/One Sentry alarm panels are housed in NEMA 4X lockable enclosures, suitable for mounting on a wall or a post.



The E/One Sentry panels provide a range of features essential to any installation in these options:

E/ONE SENTRY PANEL RANGE	BASIC	PROTECT PLUS	E/ONE SENTRY ADVISOR
High Level Visual/Audible Alarm	✓	✓	✓
Manual Run Button	✓	✓	✓
Start on High Level Alarm	✓	✓	✓
Pump Running Indicator	✓	✓	✓
Brownout Protection		✓	✓*
Overpressure Protection		✓	✓*
Run Dry Protection		✓	✓*
Real Time Operating Parameters		✓	✓*
Historic Operating Parameters		✓	✓*
Cycle Counter/Hour Meter		✓	✓*
Alarm Delay/Power On Delay		✓	✓*
Remote Monitoring			✓
Remote Alarm Notification			✓
Asset Mapping			✓
Performance Reporting			✓

* Functions vary based on panel



The E/One Remote Sentry Display Module

provides visual and audible indication when the water level inside the grinder pump tank reaches a predetermined “high” level during normal operation, or in the event of a power outage (with hard-wired version of *Extreme* core and optional contacts in panel). It is ideally suited for installations where the outdoor alarm panel location is obstructed from view, or where an Indoor Unit (IDU) installation is isolated in a utility room.



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

E/One Sentry Protect Plus

The E/One Sentry Protect Plus panel provides important protection from external conditions that could otherwise prove damaging to the E/One grinder pump station.

The Protect Plus option provides a Trouble indication and shuts down the pump temporarily in the event of an unacceptable operating condition.

Protect Plus provides monitoring of:

- Brownout conditions with the electrical power supply
- System over-pressure condition such as with a closed valve
- Run-dry operation of the pump



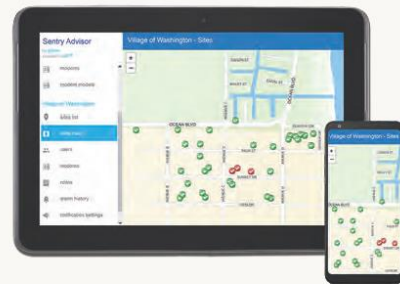
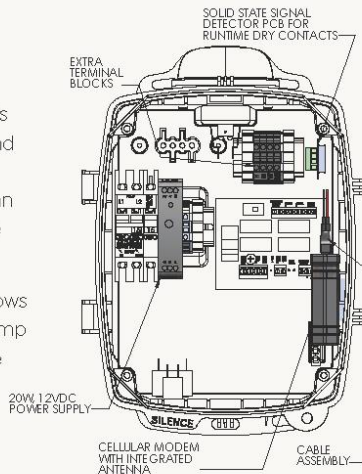
A diagnostics package provides advanced warning of pending service needs by monitoring major operating conditions and providing a Trouble indication when these conditions fall outside of normal ranges. Depending upon the severity of the abnormal condition, the grinder pump station may continue to operate.

E/One Sentry Advisor

E/One Sentry Advisor monitors pump performance and records every start, run time duration and stop of each grinder pump on the system. Alarm conditions can be sent automatically to service personnel.

The online mapping feature shows the location of each grinder pump in the system, whether there are a few stations or hundreds.

Use reports to review system performance and spot data trends such as frequent alarms or unusually long run times.



ABOVE: Pump performance data can be accessed from any web-enabled device. Generate reports to determine how your system is performing and identify potential trouble spots.

E/One offers a range of alarm panels for simplex, duplex and quadplex grinder pump stations. Learn more at www.eone.com/sewers.



SAG HARBOR SEWER SERVICE EXPANSION AREA – SEWERSHED “K” ENGINEERING REPORT

April 2022

THE FOLLOWING FEATURES ARE INCLUDED OR AVAILABLE

with the E/One Sentry Protect Plus to maximize reliability and convenience:

DISPLAY PANEL OPERATING INDICATORS

- Ready (AC Power) Indicator
- Pump Running Indicator
- Trouble Indicator
- High Level Alarm Indicator

LCD DISPLAY

- Manual Run Switch
- Menu Navigation Buttons: Scroll, Enter, Up, Down
- Trouble indications include:
 - Brown-out Condition
 - Run-dry Condition
 - System Over-pressure Condition
 - Run-time Limit Exceeded



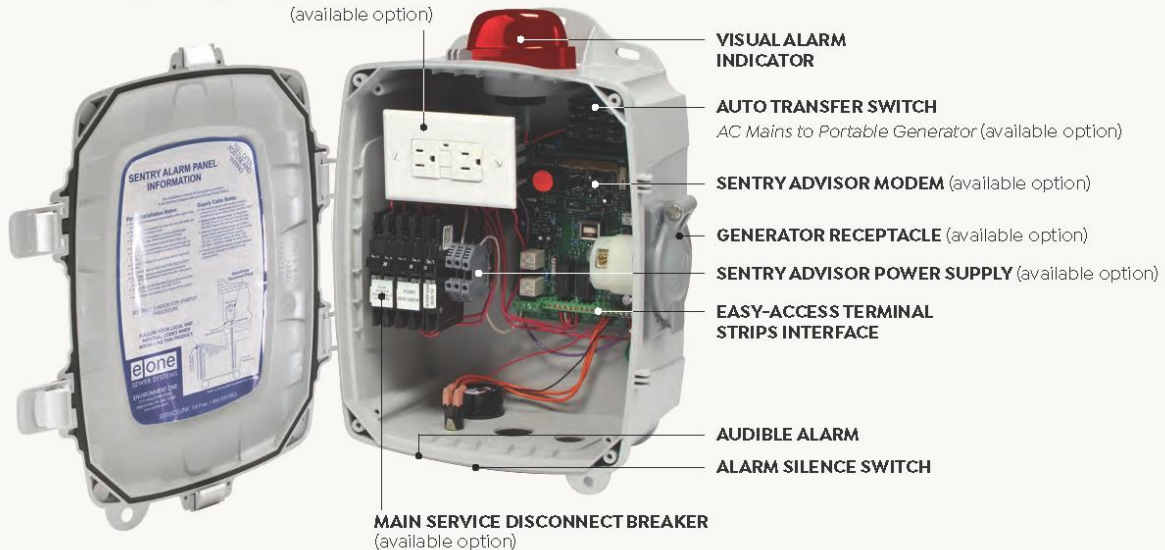
USER SELECTIONS

(For system setup/service)

- Diagnostic Mode
- Pump Performance provides access to performance statistics including:
 - Real-time Voltage
 - Real-time Amperage
 - Real-time Wattage
 - Min/Max/Average Volts
 - Min/Max/Average Amps
 - Min/Max/Average Watts
 - Minimum Run-time
 - Maximum Run-time
 - Average Run-time
 - Last Run-time
 - Cycle Counter
 - Hour Meter
- Initialize System
- Run Limit
- Alarm Delay
- Power Delay

GFCI RECEPTACLE

(2) 120-volt, 15 Amp GFCI receptacles (available option)



VISUAL ALARM INDICATOR

AUTO TRANSFER SWITCH

AC Mains to Portable Generator (available option)

SENTRY ADVISOR MODEM (available option)

GENERATOR RECEPTACLE (available option)

SENTRY ADVISOR POWER SUPPLY (available option)

EASY-ACCESS TERMINAL STRIPS INTERFACE

AUDIBLE ALARM

ALARM SILENCE SWITCH

MAIN SERVICE DISCONNECT BREAKER (available option)



ENVIRONMENT ONE CORPORATION 2773 Balltown Road, Niskayuna, NY USA 12309-1090
Voice (01) 518.346.6161 | Fax: 518.346.6188 | www.eone.com
A Precision Castparts Company | LM000323 Rev. G

