

Low Pressure Sewer Service Area Orleans, MA

Property Owner's Grinder Pump Guidebook

**Locally Supported by:
F. R. Mahony & Associates, Inc.**

**Service Hot Line
508-765-0051**

www.frmahony.com

www.eone.com

Environment One Corporation - Extreme Series Grinder Pump

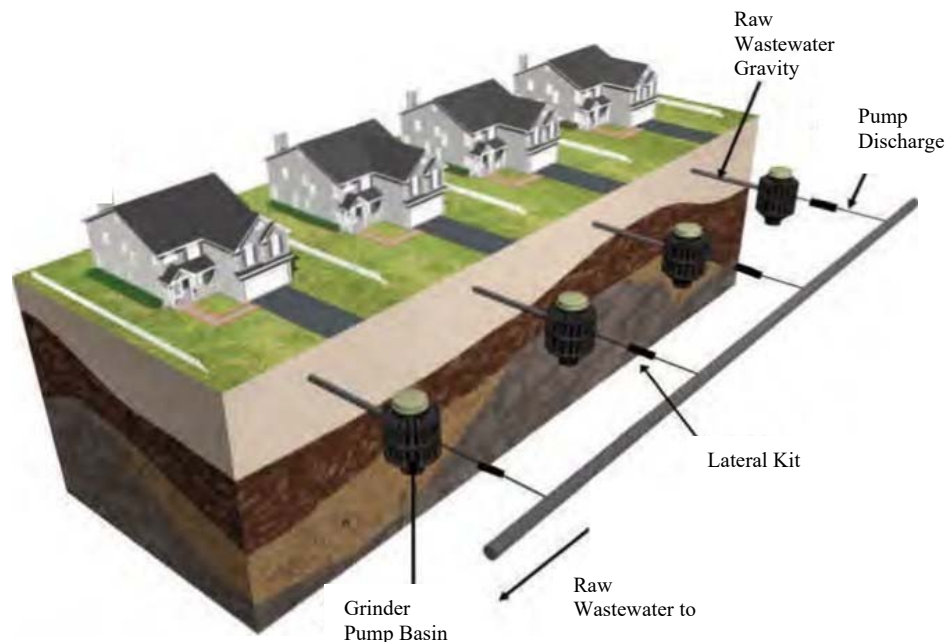
A. About Environment One Corporation

Environment One Corporation (E/One) is an operating company of Precision Castparts Corp. (NYSE: PCP), a worldwide manufacturer of complex metal parts and industrial products. With corporate headquarters in New York and regional offices and distribution throughout the industrialized world, E/One is a manufacturer and provider of products and services for the disposal of residential sanitary waste and utility systems for the protection and performance optimization of electric utility assets.

B. Low Pressure Sewer System

A pressure sewer system is used in certain areas because of the unsuitability and/or cost of a conventional sewer system. The pressure sewer system consists of a pumping unit installed on your property which is connected to a network of pipes from other pumping units in your area or directly into a gravity sewer. These pipes transfer wastewater to the wastewater collection system.

The systems installed are E/One grinder pump stations and are very reliable and robust. There is not much you need to do and very little that can go wrong.



E/One Extreme Series Grinder Pump (Simplex Basin Shown. Other Options are available)

A. Background

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 E/One has 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.

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 revolutions per minute (rpm) and highest quality components, E/One experiences 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.



B. Key Advantages

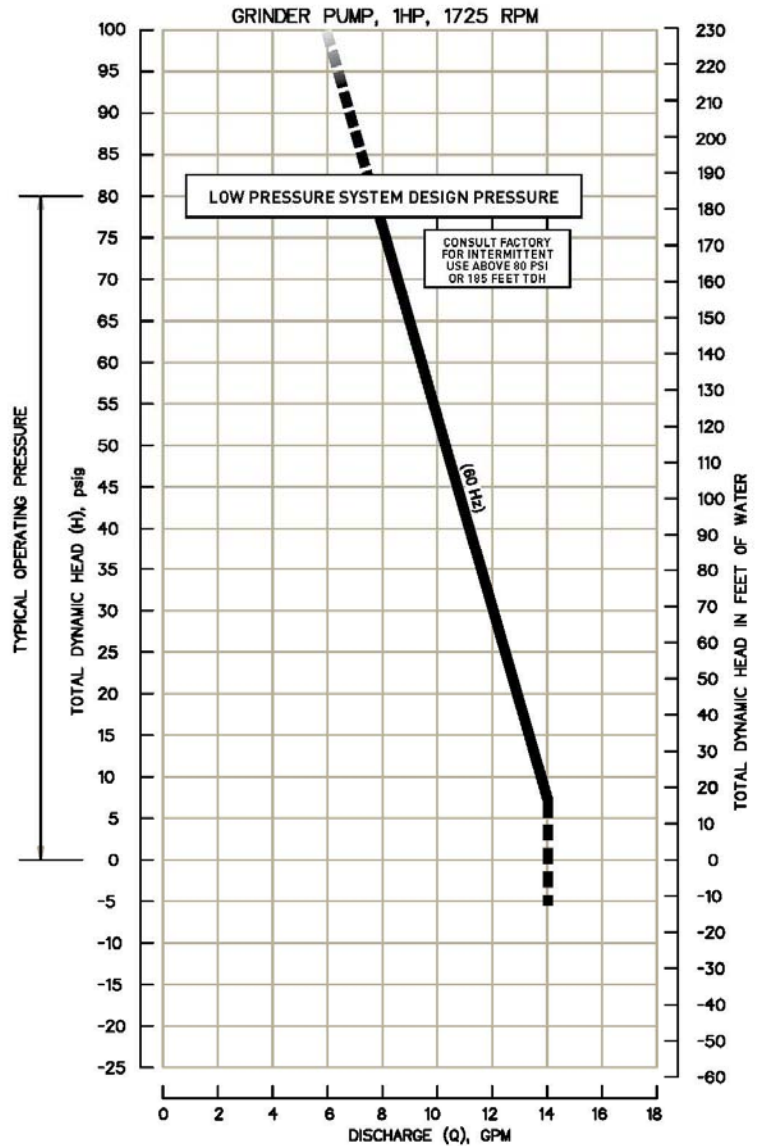
- **High Heads/Negative Heads** - Reliable operation from negative head to 185 feet of total head for continuous duty reduces the number of lift stations and pipe sizes. This cuts costs – both initially and in long-term operation and maintenance.
- **Constant Flow** - The system pressures to be overcome 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** - This 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 the 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 the 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.
- **Provide 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** - The unique core design eliminates the need for in-field troubleshooting and pump servicing. This means lower maintenance costs and minimum homeowner inconvenience.

C. Performance 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.
- E/One's semi-positive displacement, progressing cavity pump has a nearly vertical H-Q curve. It provides a predictable flow over the full range of typical system pressures - strengths critical in a large-scale, low pressure sewer.
- E/One's high head capability allows a system with few, if any, lift stations. It easily accommodates additional future connections without compromising system performance.

E/ONE SPD PUMP PERFORMANCE CURVE



D. The Inside Story on the E/One Grinder Pump Station (See next page)

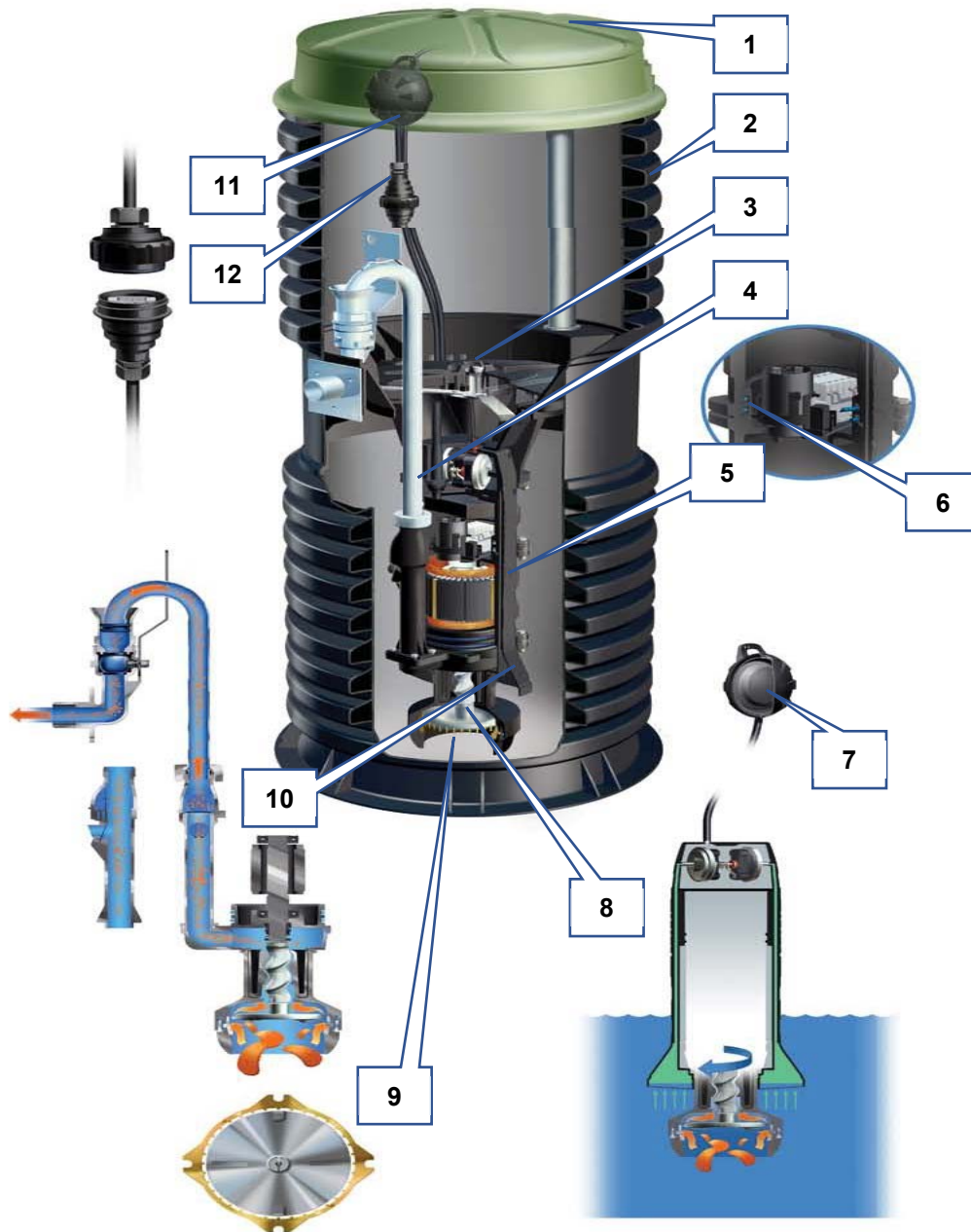
- 1 **Low-Profile Cover** - Provides easy access for service while blending with surroundings.
- 2 **High-density Polyethylene Tank** - Double-wall construction of high-density thermoplastic for rugged reliability. Factory pressure tested for infiltration and exfiltration free installation.
- 3 **Quick-Release Core Latch** - All stainless mechanism secures core in place and can be easily released from ground level.
- 4 **Stainless Steel Piping and Hardware** - E/One's stainless-steel 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.
- 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.

General Information

In order to provide you with suitable wastewater disposal, your home is serviced by a low-pressure sewer system.

The key element in this system is an E/One Grinder Pump. The tank collects all effluent from the house. The solid materials are then ground to a small size suitable for pumping as a slurry with the effluent water.

The Grinder Pump generates sufficient pressure to pump this slurry from your home to the wastewater treatment receiving line and/or disposal plant.



Operation and Maintenance Manual

A. General

With the proper care and by following a few simple guidelines, your E/One Grinder Pump will give you years of dependable service. The E/One Grinder Pump cannot dispose of wastewater without electrical power. If electrical power service is interrupted, keep water usage to a minimum. This user Operation and Maintenance Manual is for the E/One Grinder Pump.

B. Care and Use of Your Grinder Pump

The E/One Grinder Pump can accept and pump a wide range of materials. However, there are a few things you need to know to ensure the system runs smoothly. The system operates like a normal sewer system, taking waste liquids from your toilet, sink, shower, bath, dishwasher and washing machine and transferring it to the sewer system or treatment facility. To avoid blockages and damage to the pump, the following items should NOT be placed into any sewer system.

In addition, regulatory agencies advise the following items should not be introduced into any sewer.

- Glass Objects
- Diapers
- Personal Wipes and Other Products Marked "flushable" including Sanitary Napkins or Tampons
- Cloth including Socks, Rags and Wipes
- Swiffer Pads
- Plastic Objects (toys, utensils, etc.)
- Kitty Litter
- Metal Objects
- Abrasive Materials including Gravel, Sand, Aquarium Stone, and Coffee Grinds
- Stormwater Runoff or Sump Pumps
- Seafood Shells
- Excessive amounts of grease

In addition, you must NEVER introduce into any sewer:

- Explosives
- Gasoline or Diesel
- Strong Chemicals (paints and solvents)
- Lubricating Oil and/or Grease
- Flammable Material

In the event of a power outage, water usage should be limited as much as possible.



C. Warranty

Environment One Corporation offers a limited warranty that guarantees its product to be free of defects in material and factory workmanship for the duration of the warranty period, provided the product is properly installed, serviced and operated under normal conditions and according to manufacturer's instructions. Repair or parts replacement required as a result of such defect will be made free of charge during this period. Labor overtime rates may apply.

Manufacturer warrants the original purchaser its pump core assembly, basin, factory wiring and panel, including, but not limited to, grinder shredder ring, cutting impellers and monitoring devices against defects in workmanship and materials that may appear under normal and proper use. Obligation of this warranty will be to replace at no charge with a new or remanufactured part, FOB factory.

D. Maintenance

- E/One Pumps require no periodic lubrication or maintenance.
- Homeowners should follow all instructions for the proper operation of their Grinder Pump.
- Repair service should only be provided by an authorized factory trained professional.
- Interior Alarm Panels "Remote Sentry" should be tested for battery failure annually by pressing the "Test" button.

E. Periods of Disuse and Winterization

1. Outdoor Unit

a) If Power is to be left "On" to the Pump Control Panel

It is recommended that when possible to leave the power on the unit. There is a very small resistance heater in the pump core to keep moisture from becoming a problem.

**For Small Periods of Time
2 to 3 Weeks**

For an Entire Season

- Flush entire system with clean water. A couple of toilet flushes will do.
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**For Small Periods of Time
2 to 3 Weeks**

- Leave Power on to the unit.

For an Entire Season

- 10 gallons of “non-petroleum” food grade antifreeze (such as that obtained from a pool supply store) may be added to the pump chamber to prevent ice damage. Ethylene glycol or petroleum-based antifreeze will harm the pump.
- Leave Power on to the unit.

b) If Power is to be left “Off” to the Pump

**For Small Periods of Time
2 to 3 Weeks**

- Flush entire system with clean water. A couple of toilet flushes will do.

For an Entire Season

- Flush entire system with clean water. A couple of toilet flushes will do.
- 10 gallons of “non-petroleum” food grade antifreeze (such as that obtained from a pool supply store) may be added to the pump chamber to prevent ice damage. Ethylene glycol or petroleum-based antifreeze will harm the pump.

2. Indoor Unit

a) If Power is to be left “On” to the Pump

It is recommended that when possible to leave the power on the unit. There is a very small resistance heater in the pump core to keep moisture from becoming a problem.

For Small Periods of Time 2 to 3 Weeks	For an Entire Season
<ul style="list-style-type: none"> • Flush entire system with clean water. A couple of toilet flushes will do. • Leave Power on to the unit. 	<ul style="list-style-type: none"> • Flush entire system with clean water. A couple of toilet flushes will do. • 10 gallons of “non-petroleum” food grade antifreeze (such as that obtained from a pool supply store) may be added to the pump chamber to prevent ice damage. Ethylene glycol or petroleum-based antifreeze will harm the pump. • Leave Power on to the unit.

b) If Power is to be left “Off” to the Pump

If power is to be left off, it is recommended to pump down the tank and making sure the discharge line inside the house is blown out of any water that will freeze.

F. Detailed Guidelines for Seasonal Shutdown

The following is suggested as a guideline for seasonal shutdown. Your local plumber or caretaker should be aware of the process needed to close a seasonal residence or commercial establishment for the season. Questions on any procedure should be directed to: F. R. Mahony and Associates Service Department at 508-765-0051

1. Flush entire system with clean water. The pump will pump 11 gallons per minute under average conditions. An example of pipe capacity will give you an idea of the run time to flush the system. A 150-foot service lateral of 1-1/4-inch pipe will hold 14 gallons of water. The Model 2010-IDU will hold 47 gallons below the “on” setting. It is recommended that the volume of water be changed 3 to 4 times. The pump should therefore be run for 5 to 7 minutes.

2. Holding the “Push to Run” button can manually pump the chamber down until the chamber is empty. An airline connection should be connected to the discharge line and air pressure can be used to blow the line out. Close the “curb stop” at the property line. Once these steps are complete, the discharge line can be left open and the pump core can be removed for storage (See details below).
3. All water to fixtures should be shut off to prevent leaks into the pump chamber. “Non-petroleum” food grade antifreeze (RV antifreeze) may be added to the pump chamber to prevent ice damage. Ethylene glycol or petroleum-based antifreeze will harm the pump.
4. Pump shut down after removal from the chamber should include a wash down of debris and then the unit should be drained of trapped water. The core will need to be inverted to drain water from discharge lines. Some water may be trapped above the check valve assembly. The pump core should be brought into a dry location for storage.

G. Important Contact Information

PUMP MANUFACTURER	LOCAL DISTRIBUTOR AND SERVICE
Environment One Corporation 2773 Balltown Road Niskayuna, New York 12309-1090	F. R. Mahony & Associates 273 Weymouth Street Rockland, MA 02370 Main Number: 800-791-6132 and 781-982-9300 24-Hour Emergency Service Number: 508-765-0051 http://www.frmahony.com/eone-service/

H. In Event of an Alarm

Turn off the sound of the alarm by pressing the silence button underneath the alarm panel. Limit water usage.

Additional service information and contacts can be found at <http://www.frmahony.com/eone-service/>

If the alarm light is still active after an hour, then call the 24-Hour Emergency Service phone number located above. If the alarm sounded and the system subsequently cleared itself, you should consider what caused this to happen. Examples: Did my power just come back on after an extended outage? Or was there an excessive amount of water sent to the house drain in a short period of time?

If you notice any irregularity with the unit, such as the alarm sounding frequently, then contact the 24-Hour Emergency Service phone number located above.



DO NOT ATTEMPT TO REPAIR THE UNIT YOURSELF

- If a pump fails to come on, an alarm will activate on the control panel. The alarm will continue to exist until the problem is remedied.
- The alarm may be silenced by pushing the silence button located on the bottom of the alarm panel located on the side of the house on the outdoor unit or on the diagnostics center on the indoor unit. The alarm light will stay illuminated until the alarm condition clears.
- If the power is out and an alarm occurs, keep water use to a minimum. Once the power comes back on the alarm should clear within 5 to 10 minutes. If an alarm condition does not clear itself after 15 minutes, please call for service.
- The unit is also provided with an Alarm Sentry for remote mounting. This will provide for an alarm condition (high water in the tank) with or without power.
- The INDOOR unit also has a loss of power alarm. In the event of an alarm – check to see the unit is plugged in and that the circuit breaker is not tripped.
- Any intermittent alarms should be reported to service personnel. Do not open control panel, wait for service personnel.

I. On Your Property

Be aware ...

1. Do not touch the valves.
2. Do not turn off the power to the pump.
3. Do not block the vent on the pump station.
4. Do not cover the pump station lid.

Contact E/One or your local distributor if you are making modifications to your home which may affect the system, such as installing a spa or swimming pool or extending the house over or near the unit or discharge pipe. If you have a pool or want to install a pool or spa, contact your local distributor for further information.

Ensure access is always available to the pump station. Keep plant growth and other debris away from the unit.

If you go on vacation for a length of time, flush the system before you go away. Run clean water into the unit until the pump activates. Turn off the water and allow the grinder pump to run until it shuts off automatically. If you have a duplex unit (two pumps), special attention must be taken to ensure that both pumps turn on when water is added to the tank.

Take care when digging in the yard near the pump station or the discharge pipe. If you do accidentally break any pipeline, call the 24-Hour Emergency Service phone number located above immediately and minimize use of water in the house. Do not attempt to repair the system yourself. You will be responsible for the cost of these repairs.

J. Troubleshooting and Grinder Pump Service Request

The system is damaged and/or needs repair:

1. If the alarm sounds, follow the alarm procedure on the previous page.
2. If it is a water supply pipe, turn off your water supply and contact a plumber for repair.



Problem	Solution
<ul style="list-style-type: none"> • Odors coming from the grinder pump station? 	<ul style="list-style-type: none"> • When operating normally, there should be no noticeable odors coming from the unit. If there are odors, the unit may need flushing. Run clean water down your kitchen, laundry or bathroom sink for about 10 minutes. • If odors persist, call the phone numbers located in Section G - Important Contact Information.



Problem	Solution
<ul style="list-style-type: none"> You notice wet spots around the pumping unit or the discharge pipe? The alarm keeps going off when it rains? The neighbor's alarm goes off and they are away? There is a power failure? 	<ul style="list-style-type: none"> The pumping unit and discharge pipe are totally sealed. If you notice wet spots around the unit or pipe and there has not been any recent rain, call the phone numbers located in Section G - Important Contact Information. It means rainwater may be getting into your system and overloading it. Contact your plumber to investigate. Call the phone number located in Section G - Important Contact Information immediately and report the problem. Do not investigate the problem yourself. If there is a power failure, reduce water use where possible. The alarm may activate until the unit clears itself. If the alarm remains on for over an hour after the power has been restored, call the phone number located in Section G - Important Contact Information. Please note that the pump warrantee covers repairs and replacement of defective parts. It does not cover damage due to misuse or neglect. If service person is dispatched and it is found that it is not a warrantee situation, then the Owner will be notified and once verified, it will be billed.



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water supply and pollution control equipment

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info@frmahony.com

Before calling for a repair, have the following information available for the Service Coordinator.

- 1. Does an alarm condition exist? _____
 - 2. If so, for how long? _____
 - 3. Brief description of the problem. _____
 - 4. Is the unit indoors or outdoors? _____
 - 5. Please verify that there is power to the grinder pump unit. Check circuit breakers at the alarm panel and at the house panel. _____
 - 6. Please provide the following information: _____
- Date: _____
- Time: _____
- Person making request: _____
- Telephone Number: _____
- Address where pump is located: _____
- Homeowner Telephone Number: _____

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