What Happens When the Lights Go Out?

As the world leader in low-pressure sewer technology, we get asked a lot of questions. Usually the first question is; what happens when the lights go out? In most cases the answer is that nothing much changes and typically the power failure is relatively short in duration and that power is restored and normal household activities continue without incident. Environment One grinder pump stations have adequate excess holding capacity to provide wastewater storage during electrical power outages. Data from the Federal Power Commission on national electric power outages has been compared to actual water usage during power failures and has demonstrated that the average family of four persons has adequate storage in a Model DH071 basin to meet up to 97% of the Nations' Outages.

What usually occurs is the natural forced water conservation that results from power failures. All appliances such as washing machines and dishwashers are rendered inoperable. Furnaces and water heaters are off line thus reducing the ability to use hot water for bathing and dishwashing. Homes on private wells experience the natural forced conservation that is usually limited to the size of the home's well tank. Actual water consumption has been measured during a one-year period at the Albany Demonstration Project and found that the average flow of 1.54 gallons per hour per person was generated during power outages. This is further supported by the following table of average household flow shown below.

Table -1 Water Consumption during Power Outages

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

*Natural unforced water conservation during power failure due to lack of hot water, heat and appliances
** Source of fixture use from sump and sewage manufacturers association, Massachusetts State Plumbing Code 248 CMR Section 2.15 Table 1

The table above shows the average actual water use under "Normal" conditions to be approximately 180 gallons per day. Under an "Emergency" condition, the use of common appliances is eliminated and water fixture uses such as water closets and lavatories are reduced by as much as 50% due to the loss of hot water production. Homeowners who are aware of this situation will tend to conserve water use to preserve hot water for essential use.

If we assume that residents of the home use most of the average water during waking hours, then we can expect that flow would occur over a 12-hour day. The table below shows this flow rate and the effective storage that can be expected with our standard simplex basins.

Table-2 Storage Time Available in Simplex Basins

	Model DH071	Model IH091-IDU	Model DH151	Model WH231
Flow (gallons) From Table-1	37.5	37.5	37.5	37.5
Effective Storage (gallons)	38	43	66	169▪
***Effective Storage Days	**1.01**	**1.15**	**1.76**	**4.5**

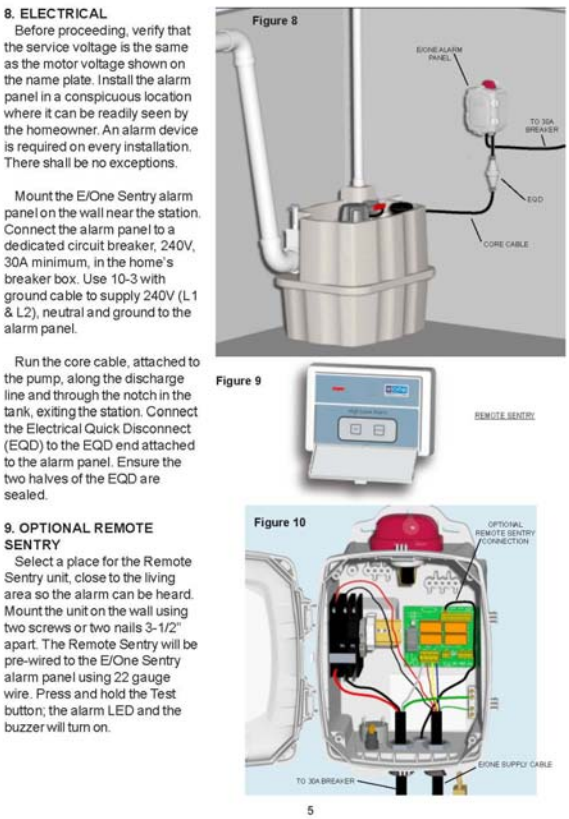
*Storage based on 12-hour effective usage in 24-hour day***Based on storage in basin above pump 'run' setting at water rates shown in Table 1. ▪With accessway inlet @ 28.2 inches from grade.*

From these demonstrations it is fairly clear to see that the predominate number of low-pressure sewer customers are well served by the standard available pump models offered by Environment One Corporation.

So, how do you know when the basin is getting full?

Environment One Corporation provides several options with each basin that can be useful in monitoring the status of the grinder pump system.

INDOOR UNIT (IH091-IDU)



8. ELECTRICAL

Before proceeding, verify that the service voltage is the same as the motor voltage shown on the name plate. Install the alarm panel in a conspicuous location where it can be readily seen by the homeowner. An alarm device is required on every installation. There shall be no exceptions.

Mount the E/One Sentry alarm panel on the wall near the station. Connect the alarm panel to a dedicated circuit breaker, 240V, 30A minimum, in the home's breaker box. Use 10-3 with ground cable to supply 240V (L1 & L2), neutral and ground to the alarm panel.

Run the core cable, attached to the pump, along the discharge line and through the notch in the tank, exiting the station. Connect the Electrical Quick Disconnect (EQD) to the EQD end attached to the alarm panel. Ensure the two halves of the EQD are sealed.

9. OPTIONAL REMOTE SENTRY

Select a place for the Remote Sentry unit, close to the living area so the alarm can be heard. Mount the unit on the wall using two screws or two nails 3-1/2" apart. The Remote Sentry will be pre-wired to the E/One Sentry alarm panel using 22 gauge wire. Press and hold the Test button; the alarm LED and the buzzer will turn on.

Figure 8

Figure 9

Figure 10

5

The indoor unit is supplied with a redundant battery powered alarm that will sound an alarm during loss of power. The system will also indicate a power loss, signal a low battery, and sound a high level during normal power and under battery power. The IDU can be connected to the Remote Sentry panel (below right) and provide additional alarm notice upstairs in the home. This alarm is also battery powered to provide a redundant alarm system.

Remote Sentry Panel.
Also available for use with other alarm panels listed below.

Standard IDU Model Stations from F. R. Mahony & Associates, Inc. are furnished with Remote Sentry Alarm, 100 feet of alarm wire and connections for easy field wiring to the IDU alarm panel.

Configuration Number KWM02FD38MM
OUTDOOR UNITS

Models DH071 and DH151 simplex stations are furnished with a Sentry Alarm Panel. The Sentry panel can be customized to provide a vast number of features.

Standard configurations for stock orders from F. R. Mahony & Associates, Inc. will be panels with two levels of support during power loss.

- **(Standard Option) Alarm Activated Contacts for Remote Indoor Alarm Module –** Will work with or without power to the alarm panel and is designed to work with E/One's Remote Sentry (sold separately).

- **(Standard Option) Generator Receptacle and Auto Transfer –** The Alarm Panel shall include a 20 amp, 250 VAC generator receptacle with a spring-loaded, gasketed cover suitably mounted to provide access for connection of an external generator while maintaining a 4X rating. An automatic transfer switch shall be provided, which automatically switches from AC power to generator power during a power outage. The alarm board power shall be provided through the generator receptacle during a power outage. When AC power is restored, the panel is automatically switched back to the AC power mode

STANDARD 'SENTRY' OPTIONAL FEATURES also AVAILABLE FROM ENVIRONMENT ONE

(OPTIONAL) Alarm Contacts – Note: Included with Optional PreSTAT Feature
Alarm Activated Dry Contacts – Normally open relay contact closes upon alarm activation.
Alarm Activated Contacts for Remote Indoor Alarm Module – Will work with or without power to the alarm panel and is designed to work with E/One's Remote Sentry.
Alarm Activated Remote Powered Terminal – Normally open relay contact closes upon alarm activation supplying an output voltage which will be equal to the alarm circuit input supply voltage.

(OPTIONAL) Generator Receptacle and Auto Transfer – The Alarm Panel shall include a 20 amp, 250 VAC generator receptacle with a spring-loaded, gasketed cover suitably mounted to provide access for connection of an external generator while maintaining a 4X rating. An automatic transfer switch shall be provided, which automatically switches from AC power to generator power during a power outage. The alarm board power shall be provided through the generator receptacle during a power outage. When AC power is restored, the panel is automatically switched back to the AC power mode.

(OPTIONAL) Service Equipment/Main Service Disconnect Breaker – A separate, internal breaker rated and approved for use as "service equipment" and acts as a main service disconnect of the grinder pump station shall be provided.

(OPTIONAL) Remote Sentry Indoor Alarm Module – A separate, remote indoor alarm module shall be provided to indicate a high level alarm with or without AC power to the grinder pump station. The Remote Sentry indoor alarm module shall have an internal power source enabling its continued operation without AC power. The Remote Sentry shall have an audible alarm and a visual alarm, both of which shall automatically reset if the high level alarm condition is eliminated. The Remote Sentry indoor alarm module shall include a Silence switch for the audible alarm and a Test switch.

(OPTIONAL) Run-time/Hour Meter – A run-time or hour meter to display the total run-time or operation time for the pump core shall be provided.

(OPTIONAL) Event/Cycle Counter – An event or cycle counter to display the number of operations of the pump core shall be provided.

I live in an area that has "brown-outs", what can I do?

The SENTRY PRESTAT panels monitor line voltage along with extended run times and changes in motor amperage.

SENTRY PRESTAT PANELS

(OPTIONAL) PreSTAT Feature – The Alarm Panel shall include a module providing the following features:

- Viewable real time data: volts, amps, run time
- Predictive Status or Trouble indication for unacceptable voltages or amperages, and Extended Run-time of pump core, providing advanced warning of pending service requirements
- Audible and visual high level alarm indication
- Field-adjustable high level alarm delay between zero and 10 minutes
- Alarm-activated dry contacts. Normally open relay contact closes upon alarm activation.
- Alarm-activated Remote Sentry indoor alarm module contacts. Will work with or without power to the board and is designed to work with E/One's Remote Sentry.
- Alarm-activated remote powered terminal. Normally open relay contact closes upon alarm activation supplying an output voltage equal to the alarm circuit input supply voltage.
- 16-character, single row alpha numeric LCD
- Event/cycle counter
- Run-time/hour meter
- Power-up delay with low voltage/brown-out protection (optional)
- Communication capability utilizing built-in auto dialer. Features include: field-programmable reporting to two separate numbers; ability to recognize when the phone line is in use and retry until successful; report a Trouble or Alarm condition; and provide either a field-recorded voice message or tone signal

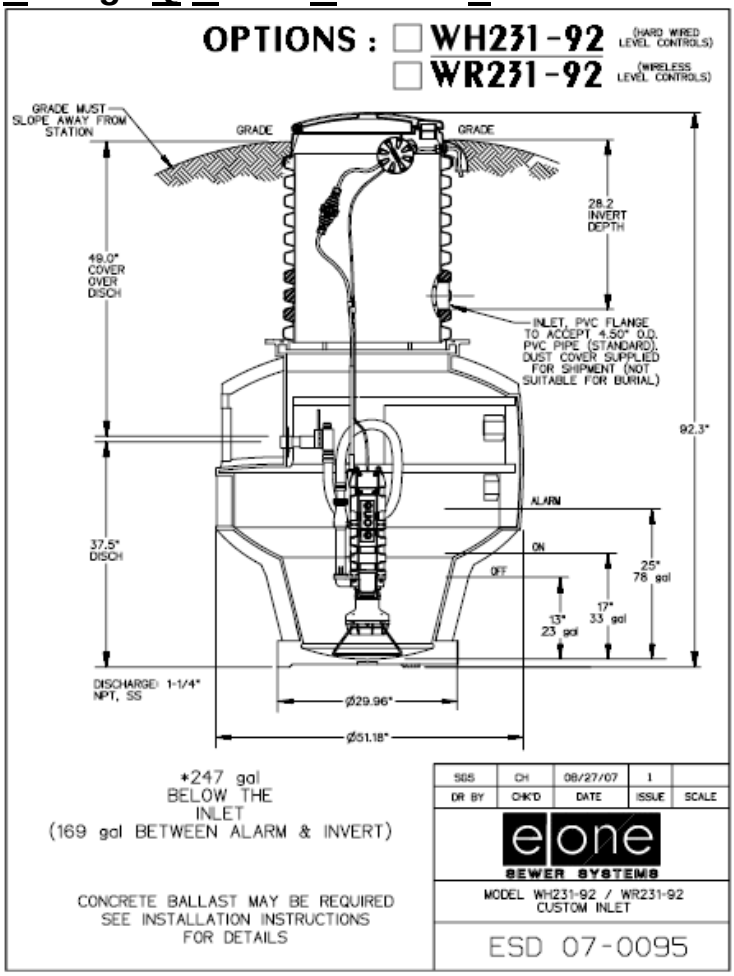
Specific indicators and switches shall include:

- Ready LED to indicate AC power to the station is satisfactory
- Pump Run LED to indicate pump is operating
- Trouble LED indicator
- High Level Alarm LED indicator
- Manual Run switch to manually activate pump
- Enter switch is used to enter selections
- Scroll switch for navigating through menus
- Normal Operation LED for Mode status
- Diagnostic LED's to indicate the Mode switch has been activated

I live in an area that has longer power failures or my local Sewer Authority requires me to have more storage, what do I do?

Some locations may be more prone to power failures that are longer than the national average. Additional storage volume may be required under adverse times. Field constructed tanks or use of oversized structures can cause more problems if not properly designed and constructed. Environment One has utilized the features of their standard products to develop a solution to this demand.

The Environment One 'S.Q.U.A.T' configuration provides Storage Q Under Adverse Times



Features of the 'SQUAT' Configuration

- **Standard Accessway**
- **Standard AMGP Core**
- **Inlet flexibility**
- **Discharge below frost depth**
- **Lower portion of basin operates efficiently in 'normal' times**
- **Upper basin permits additional storage without solids deposition and odor generation**
- **Basin can hold 237 gallons and still pump down to 23 gallons**

Each WH231 station comes with the SENTRY alarm panel. The same optional features are available for this station and perform all of the same functions. So if you live in an area that has frequent issues with power loss, Environment One has the solution.

For more information please call: 781-982-9300

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There's no limit to where we can go.

The World's Best Low Pressure Sewer System Has Set a New Standard in Reliability and Convenience