



NEXTGEN SEPTIC TECHNOLOGY SPECIFICATIONS FOR RETROFIT APPLICATIONS

One of the central environmental issues is the existence of failed septic tanks that are currently polluting ground water, and surface water bodies. In 2014 there were about two million septic tanks that have failed in this country, while approximately 730,000 more new septic tanks are being installed each year. In most cases, septic system failure is caused by clogging of the soil leach field, caused by the entrainment of solids from the septic tank into the soil leach field and by natural growth of the microorganisms treating the wastewater in the soil field.

Failure of soil leach fields is resulting in the following environmental and health issues:



(1) contamination of ground water with E.coli bacteria, that is providing drinking water to homes; (2) surface runoff of untreated wastewater into nearby creeks and rivers, resulting in growth of algal blooms due to the presence of nutrients, which contaminates drinking water supplies with algal toxins; (3) transport of pathogens and bacteria from the failed septic field to homes by pets and children, running in the field, jeopardizing the health of all the home residents; (4) emission of odors from the failed septic field; and (5) creating an unsightly condition in the backyard.

NextGen Septic system is a compact, stand-alone, automated and cost-effective sewage treatment system that can be used for individual homes, small industries, businesses, home subdivisions, schools, collection of portable toilets, etc. and anywhere else where a centralized sewage treatment system is unavailable.



As a complete treatment system, it is sold as the NextGen Technology, shown in the photograph that is installed inside a standard approved septic tank. Each state has its own regulations and approval process for septic tanks.

NextGen Technology can be installed inside an existing standard, approved septic tank, as long as the tank is

certified to be in good condition, has **at least** a single baffle, and has **at least** two manways, each **at least** 20 inches in diameter. NextGen technology, shown in the photograph can be installed through the manway, and will then begin to produce clear, treated water. In addition to the NextGen Treatment Technology shown in the photograph, special biomedica, provided by Green Forward Technologies, is also introduced into the standard, approved tank, which enables treatment of the organic load as well as the nitrogen and phosphorus (nutrients) in the inlet wastewater.

The main advantages of retrofitting an existing failed septic system in which the tank is in good condition but the soil leach field has got clogged are as follows:

- No digging or collapsing of the existing septic tank, which saves substantial costs;
- Since NextGen Technology, once installed inside the existing septic tank, provides clear, treated water, the clogged soil leach field begins to permeate water over time, as the bacteria in the soil consume the solids and organic growth clogging the soil leach field; this allows the homeowner **to reuse the existing, clogged soil leach field**, instead of installing a new soil leach field, if more land is available; and
- Significant savings in cost since installing a new septic tank and a new soil leach field can cost upwards of \$20,000.

NEXTGEN TECHNOLOGY

NextGen Technology involves two main treatment steps:

- (1) simultaneous biological aerobic and anoxic treatment of the organic material and nutrients (nitrogen and phosphorus), using biomedica; and
- (2) membrane separation of the solids, suspended biomass, and bacteria.

The technology is operated by a single, 1 HP, 110V, single phase, submersible pump, which is operated intermittently, based on demand. The system is controlled by several sensors, which determines the extent of pump run time, and transmits any alarms wirelessly through the power line. This allows the system to be monitored by the homeowner anywhere in the house. A Programmable Logic Controller (PLC) operates the technology intelligently, to minimize



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power consumption. The submersible pump can also be operated by solar cells or a windmill, although the cost of these systems is higher than if the pump is connected to a standard electrical line. The treated water is completely sterilized using Ultraviolet Light (UV) using LEDs, if the treated water is being surface discharged. If the treated water is not being surface discharged but rather to a soil leach field, then no UV treatment is required.

FEATURES AND BENEFITS

NextGen Technology, retrofitted into a failed septic system, offers the following features and benefits:

- **Substantial cost savings since the existing septic tank, certified to be in good condition, doesn't have to be removed or crushed in place, and a new soil leach field is not required, since the clear, treated water from the NextGen Technology will increase water permeability into the existing, clogged soil leach field;**
- Existing homes with a failed septic system that have small land areas or don't have extra space for a new leach field, can get their existing septic tank, if in certified good condition, to be retrofitted with NextGen Technology and retain their existing tank and soil leach field, saving over \$20,000;
- New homes with limited land areas or sloping backyards can also use NextGen Technology with any approved septic tank of their choice as long as the tank has at least two manways which are at least 20 inches in diameter;
- Homeowners can purchase an approved septic tank locally and get NextGen Technology installed in it with minimal costs, thereby saving on shipping costs for the tank itself;
- With NextGen Technology, soil leach fields will never clog, since the technology produces clear, treated water;
- If the treated water is disinfected with LED UV light system, that can also be provided by Green Forward Technologies, the disinfected water can be reused for surface irrigation, recycled back to the toilets, thereby saving over 40% of the water consumption, or directly discharged into a creek/pond/lake;

- NextGen Technology can be monitored from anywhere in the house, and homeowners don't have to figure out whether the system is operating or not;
- Approved septic tanks and NextGen Technology can be installed by many local installers with minimal training by Green Forward Technologies;
- Minimal electrical operating cost (estimating electrical cost is \$98/year at \$0.08/kWh), for a house with 4-6 people; and
- Homes in drought-ridden areas can save over 40% of their water consumption by recycling the disinfected treated water back to the toilets within the house.

PERFORMANCE DATA

The following table shows the water quality parameters for a typical home with just a standard septic tank and a standard septic tank using NextGen Technology.

Parameter	Units	Influent	Effluent
Ammonia-N	mg/L-N	29.5	<0.1
TOC	mg/L	52	3.7
Total Suspended Solids	mg/L	46	Below Detection Limit
Volatile Suspended Solids	mg/L	42	2.7
Turbidity	NTU	56	0.02
cBOD5	mg/L	47	2.8
Nitrate - N	mg/L	98.3	8.7
Fecal coliform	CFU/100 ml	6.2x10 ⁶	3.0

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