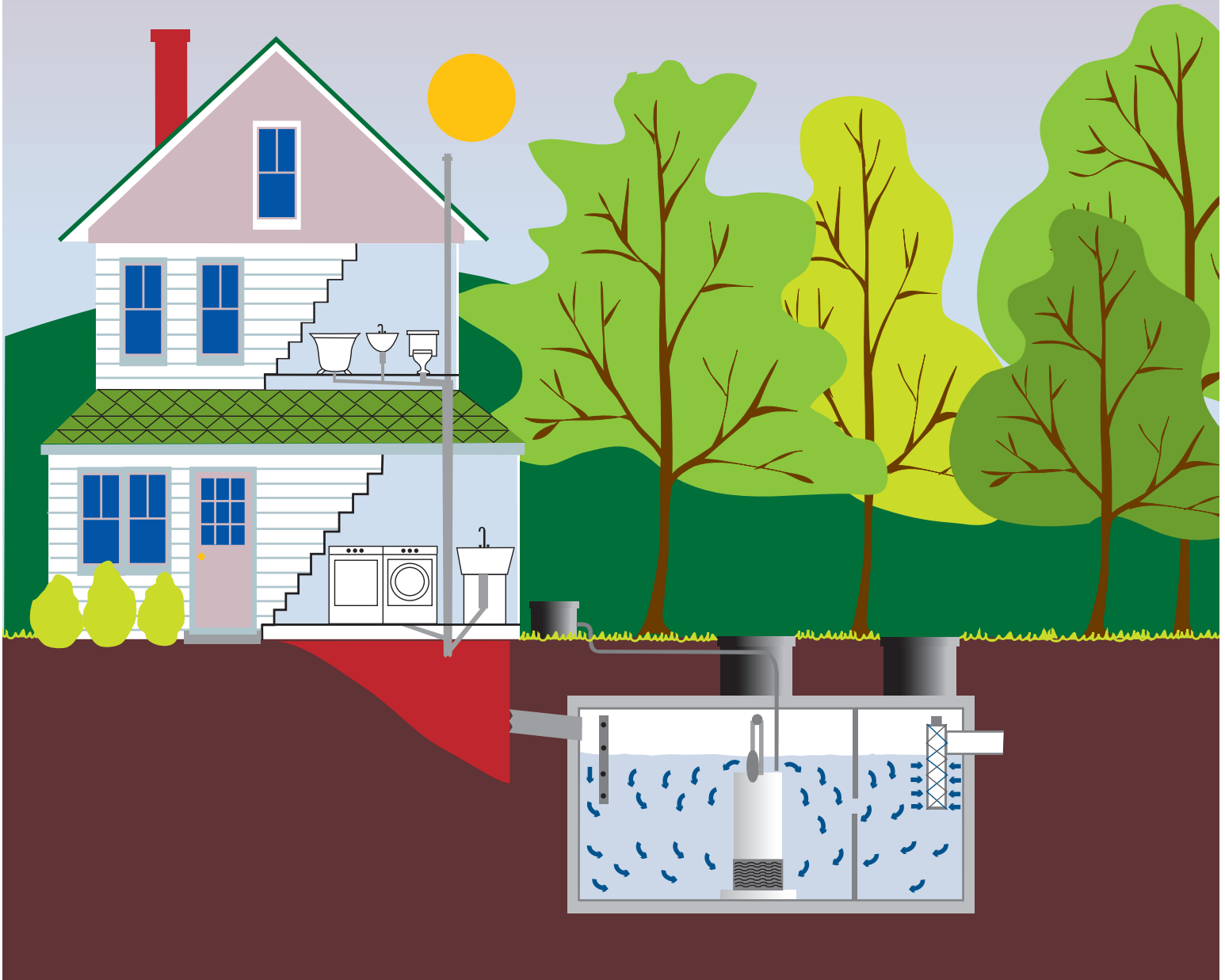


White Knight™ Microbial Inoculator/Generator Owners Manual



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The intelligent alternative to septic system replacement



The White Knight™ Tower



External pump



Bagged up IOS 500 bacteria.



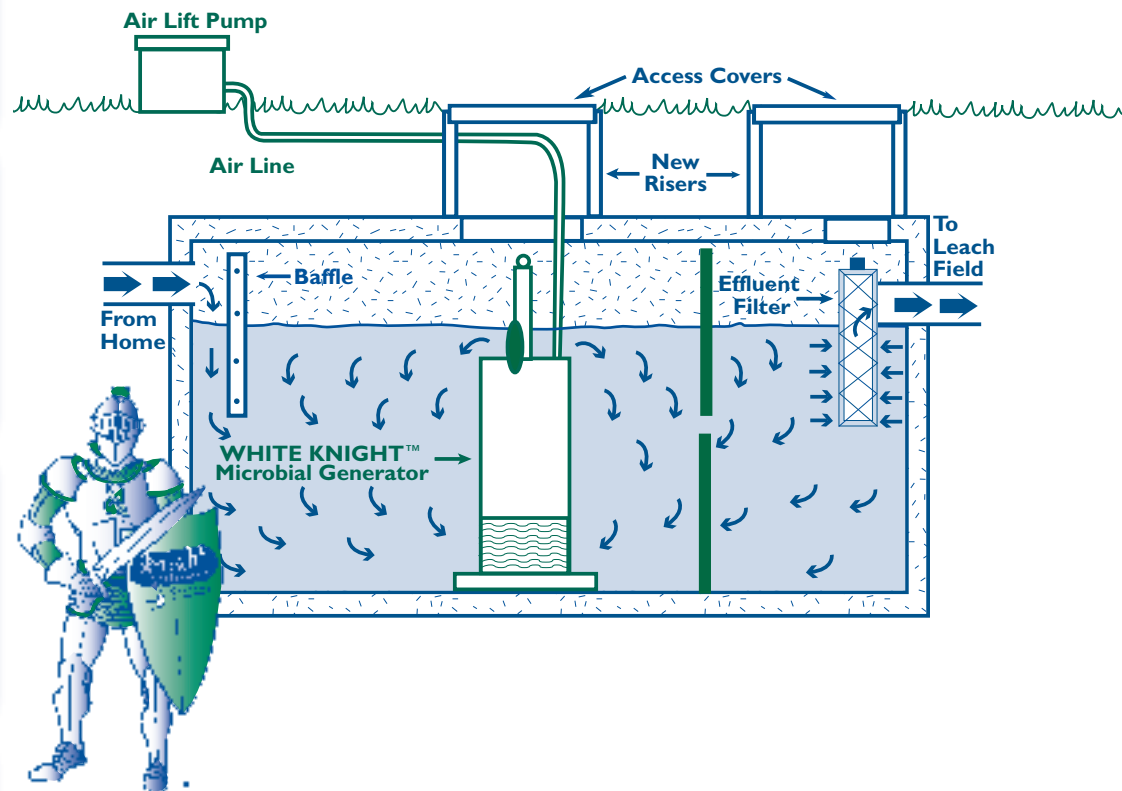
Post White Knight™-treated effluent

What the White Knight™ is

The White Knight™ is a Microbial Inoculator/ Generator that has been designed to enhance the performance of on-site wastewater treatment systems by growing air breathing (aerobic) bacteria in the septic tank and delivering them to the leach field.

How the White Knight™ works

- An external air pump runs constantly to deliver oxygen to the White Knight™ Tower that sits inside your septic tank.
- The White Knight™ Tower in turn, saturates the liquid in the septic tank with oxygen by pulling liquid in through the bottom of the tower and shooting it up through the top. As it does this, it also circulates the contents in the septic tank.



- IOS 500 bacteria within the tower breathe the oxygen and feed on the waste.
- This process occurs 24 hours a day, seven days a week to improve the quality of effluent that leaves the septic tank.
- The bacteria are carried into the leach field and begin to consume the organic material that is clogging the soil. As a result, the underlying soil begins to regain its porosity, which in turn allows the effluent to pass through.

How to keep your White Knight™ and septic system happy and healthy

The White Knight™ treats the effluent in your septic tank. It does this by introducing aerobic microbes and oxygen. These microbes break down the waste we generate, "cleaning up" the liquid we reintroduce back into our environment.

This is a sensitive biological process. To make sure it continues to work, responsible White Knight™ owners must be aware of what they send to their septic tank. A simple rule of thumb to remember is that only water, toilet paper, and human waste should go down the drain.

Once a system has been improved with a White Knight™ as long as the guidelines contained in this owners manual are carefully followed the system should continue to function for the life of the structure.

Garbage disposers must be removed for this new aerobic process to work properly.

Water conditioning drains must not discharge into the septic system because this contains high concentrations of salt which is a natural preservative and will inhibit the biological process.

Do not flush items such as:

- Coffee grounds
- Disposable diapers
- Panty liners
- Dental floss
- Sanitary napkins
- Kitty litters
- Tampons
- Cigarette butts
- Condoms
- Gauze or bandages
- Fat, grease, and oil
- Paper or cleaning towels
- Wipes
- Wrappers
- Mop water
- Drain cleaners

Never flush other substances, such as:

- Paint
- Waste oils
- Varnish
- Photographic solutions
- Thinners
- Pesticides
- Old or unwanted medications
- Hair from shower drains
- Hair from brushes and combs
- Lint or other materials removed from filters or screens.
- Food from sink drains
- Hair dyes
- Hair treatment chemicals

Tips from the pros

- Remove the garbage disposal.
- Do not put grease down drains.
- Spread loads of laundry out over time rather than doing multiple loads in a short period of time, and use liquid detergents rather than powdered detergents.
- Avoid long showers.
- Avoid leaving tap water running when shaving, brushing teeth or doing other personal or household tasks.
- Do not flush medications, harmful chemicals, excessive amounts of bleach, harsh drain cleaners or degreasers.
- Do not add any septic system cleaners, enzymes or additives.
- Remove water conditioning backwash discharges from the septic system.
- Do not plant trees and shrubs over leach fields.
- Do not flush personal products, paper towels, wipes or diapers.
- Do not clean or rinse paint brushes in the sinks.
- Equip all hot tubs, spas, whirlpool baths, etc., with drain limiting valves that will only allow five gallons per minute to drain from fixture.
- Do not drive vehicles over leach fields.
- It is necessary to correct toilets that continue to run after flushing. This type of leak can easily add several hundred gallons a day to the system and hydraulically overload the system.

Frequently asked questions

Why do leach fields fail?

Leach fields fail for two primary reasons. The main reason is referred to as biological clogging. This is the development of a biomat beneath the leach field that eventually prevents the liquid or effluent from entering the underlying soil. This biomat is a combination of fine organic solids that have been carried out of the septic tank and the remnants of anaerobic bacteria. These bacteria originate in the human intestinal track and enter the septic system with the waste products. 95% of all leach field failures are biological. The second primary reason is referred to as a mechanical failure. This could be a structural collapse of the leach field piping or chambers, root intrusion, or fine non-organic materials that are washed down to the bottom of the leach field and seal the soil.

How do I know if my leach field is failing?

The telltale signs of a failing leach field are dampness of the soil above the leach field, a strong odor in the leach field area, lush vegetation over the leach field, frequent pumping of the tank, and/or slow drains.

Can the White Knight™ be used to prevent leach field failure?

Yes. When the White Knight™ is installed in a septic system, the normal clogging process ceases. Not only that but also any existing clogging in the leachfield begins to reverse.

How does the White Knight™ restore leach fields?

The White Knight™ system creates an aerobic environment within the septic system and provides a large surface area for the growth of a specialized bacterial colony. As the bacteria multiply, they consume the organic material coming into the septic tank. At the same time, a great many of these bacteria are carried into the leachfield and begin to consume the organic material that is clogging the soil. As a result, the underlying soil begins to regain its porosity, which in turn allows the effluent to pass through.

Are the bacteria used in the White Knight™ safe?

Yes. These are naturally occurring soil bacteria.

Is there an odor when the White Knight™ is operating?

In a properly vented septic system, there is no discernable odor when the White Knight™ is operating. Moreover, the noxious gases normally produced in a septic system are not produced in the aerobic environment created by the White Knight™.

Is there any noise when the White Knight™ is operating?

The only noise is a faint hum produced by the linear air pump. Generally, this is not detectable more than three feet from the air pump chamber.

Does the White Knight™ operate continuously?

Yes.

What happens if there is a power failure?

The air supply will be cut off and the system will slowly revert to an anaerobic condition. However, this situation reverses itself as soon as power is restored. When the power failure extends beyond twenty-four hours, we re-inoculate the White Knight™ with fresh bacteria.

Do I have to continue pumping the septic tank?

The White Knight™ only processes fine organic material. The accumulated solids from garbage disposals and other non-organic materials may need to be pumped every few years.

How much does it cost to operate the White Knight™ each month?

The air pump in a residential installation uses 40 watts of power. That's about one kilowatt-hour per day or approximately \$ 3.50 per month, depending on the local cost per kilowatt of electricity.

Is there an annual maintenance fee?

Yes. The amount will vary based on location, but it is typically comparable to having the tank pumped.

Is the White Knight™ approved in my state?

The White Knight™ is only offered for sale in states it has been approved, and is installed by factory trained technicians.

Continued on next page

Frequently asked questions Continued from page 4

Is the White Knight™ guaranteed to restore my leachfield?

The White Knight™ is guaranteed to re-establish the downward flow of the effluent into the underlying soil and eliminate the failure symptoms.

How long does it take to rejuvenate a leachfield?

Each installation responds differently. While we can generally begin to open a failed field in thirty to sixty days, it may take several months to completely rejuvenate the leachfield.

How will I know if the White Knight™ is restoring my leachfield?

We install a monitoring well within the leachfield. A field that is being rejuvenated will show a marked decrease in the level of effluent in this monitoring well. Also, the symptoms of failure will slowly disappear.

What happens when the White Knight™ components wear out or fail?

All of the components are warranted as long as the System is serviced annually by certified factory trained technicians.

Is the warrantee transferable if I sell my property?

Yes and it will remain in effect for as long as the new owner renews the annual maintenance agreement.

What maintenance is required and who is responsible for the maintenance?

We assume all responsibility for monitoring and maintaining the White Knight™. We replace the bacteria as needed, clean the effluent and air filters and clean or change out the internal media. Generally this maintenance is done during the spring and fall.

What are my responsibilities after the White Knight™ has been installed?

Use the system responsibly in accordance with the guidelines on page 3 of this manual.

Glossary of terms

Biomat

Layer of organic material that develops on the bottom and sides of a leach field. Initially, *biomat* acts as a biological filter, but eventually it becomes too thick and holds *effluent* in the *leach field*, causing septic failure.

Septic System

A two-part treatment of wastewater. Step 1 occurs in the septic tank, it is usually the settling of solids or aerobic treatment. Step 2 occurs in the soil at the leach field. As the effluent drains through the soil, it is purified and eventually returns to the water table.

Retention Time

The amount of time effluent spends in the septic tank before moving on to the leach bed (RT = tank size / gallons per day). Greater retention time leads to cleaner effluent.

Aerobic Bacteria

Bacteria that thrive in an oxygen rich environment. These bacteria 'breathe' oxygen and 'exhale' water and CO₂.

Anaerobic Bacteria

Bacteria that remove oxygen from molecules in wastewater to breathe. This causes the offensive odor associated with septic systems.

Nitrogen

Nitrogen is linked to pollution, algae blooms and several diseases including Blue Baby Syndrome.

Soil clogging

This occurs when the *biomat* layer become so thick that *effluent* cannot pass through it. The result is septic failure.

Leach field

System beyond the septic tank that delivers *effluent* to the ground for secondary/final treatment.

IOS 500

A special blend of aerobic bacteria used by the White Knight™ to enhance the natural biological process.

Inlet Baffle

Directs the flow of wastewater from the home down into the main body of the tank, allowing proper treatment to take place in the septic tank.

Outlet Baffle

Prevents floating scum (fats, oils, and greases) from escaping the septic tank.

Effluent Filter

An improvement on the *outlet baffle*, this filters effluent exiting the septic tank and removes small floating particles.

Air Pump

The air pump delivers oxygen to the White Knight™ in your septic tank.

White Knight™ Tower

This device circulates the contents of the septic tank and generates *IOS-500 aerobic bacteria*, which improve the performance of your septic system.

Air Lift Effect

Creates the actual circulation within the *White Knight™ Tower* and septic tank.

Effluent

This is another word for wastewater.

Bubble Diffuser

A rubber membrane with thousands of tiny holes found at the base of the *White Knight™ Tower*. This receives oxygen from the air pump and delivers it to the effluent in the septic tank.