

# SEPTIC SYSTEM USER'S MANUAL

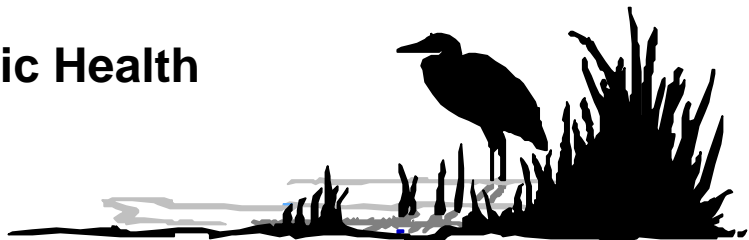
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Care and Feeding of Your On-Site Sewage System

by Toby Tahja-Syrett



**Mason County Public Health**  
P.O. Box 1666  
Shelton, WA 98584  
(360) 427-9670 ext. 352



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PROPERTY ADDRESS: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

PARCEL NUMBER: \_ \_ \_ \_ \_ -- \_ \_ \_ \_ \_ -- \_ \_ \_ \_ \_

- Your major system components are checked below.
- First, read Sections 1 & 2 to learn the basics everyone needs to know about using and maintaining a septic system.
- Then turn to the pages shown next to your system components below. To learn more about how your system works and how to maintain it, be sure to follow the links on all pages.

**System Type:**

- Gravity Distribution (pg 31)     Pressure Distribution (pg 32)     Sub-Surface Drip (pg 33)
- Glendon Biofilter (pg 34)     Sand Filter (pg 35)     Mound (pg 36)     Sand Lined Drainfield (pg 37)
- Aerobic Treatment Unit (ATU). Make/model: \_\_\_\_\_ (pg 38)
- Recirculating Filter. Type: \_\_\_\_\_ (pg 39)
- Disinfection Unit. Make/model: \_\_\_\_\_ (pg 55)

**Other Components:**

- Septic Tank (pg 40)                       Trash Trap (pg 42)                       Grease Trap (pg 44)
- Pump Tank (pg 41)                       Pump Basin (pg 43)                       Commercial System (pg 57)

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## Purpose of This Manual

This manual is a guide to owning and maintaining your septic system. It is designed to cover the major issues that you may face, and hopefully to give you a better understanding and appreciation of how your system works and why.

## Your Mission – Should You Choose to Accept It...

Congratulations. Now that you own an on-site sewage system, you have become a wastewater treatment plant operator (just on a very small scale). You are also a farmer – of bacteria that is. Your mission, should you choose to accept it is to properly operate and maintain your system and make sure at all times to keep your micro-livestock happy. Happy bugs in your system means they are alive, well, and doing their job to turn your smelly sewage into clean, clear, recycled water.



Your first step is to read this manual and try to follow it's advice. And remember – be nice to your system and it will be nice to you.

## How to Use This Manual

This manual is organized to cover all types of systems, and you should read Section's 1 and 2 no matter what type of system you have. Section 1 is a Do's and Don't list to familiarize you with what you should and shouldn't be doing with your system. Section 2 covers the basics that affect all on-site septic systems. Section 3 describes different system components, their place in the system, how they work and their maintenance requirements.

In order for you to understand your particular system, look at the front cover of this manual and see which **System Type** and other **Components** have been checked. Then turn to the pages shown next to the items to read more.

**Example – System Type: ATU – read page 38. (Make sure and follow all page links on page 38).**

**Other components: Pump Basin – read page 43.**

# Important Contact Information:

## Mason County Public Health

426 W. Cedar St.  
P.O. Box 1666  
Shelton, WA 98584

Shelton (360) 427-9670, Ext. 352  
Belfair (360) 275-4467  
Elma (360) 482-5269  
FAX: (360) 427-8442

WEB: <http://www.co.mason.wa.us/envhealth/index.php>

### Your System Designer:

*(If you don't know, check your approved **permit & design** or contact Mason County)*

Designer: \_\_\_\_\_ Phone: \_\_\_\_\_

### Your System Installer:

*(If you don't know, check your approved **as-built** or contact Mason County)*

Installer: \_\_\_\_\_ Phone: \_\_\_\_\_

### Your Septic Tank Pumper:

*(contact Mason County for an approved list)*

Pumper: \_\_\_\_\_ Phone: \_\_\_\_\_

### Your Operation & Maintenance (O&M) Provider:

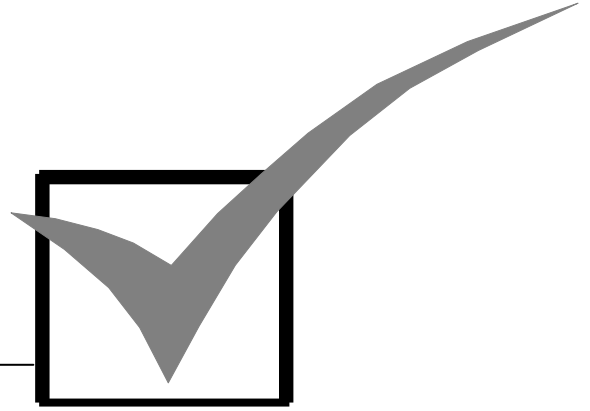
*(contact Mason County for approved list)*

O&M Provider: \_\_\_\_\_ Phone: \_\_\_\_\_

# SECTION 1:

## Septic System Do's and Don'ts

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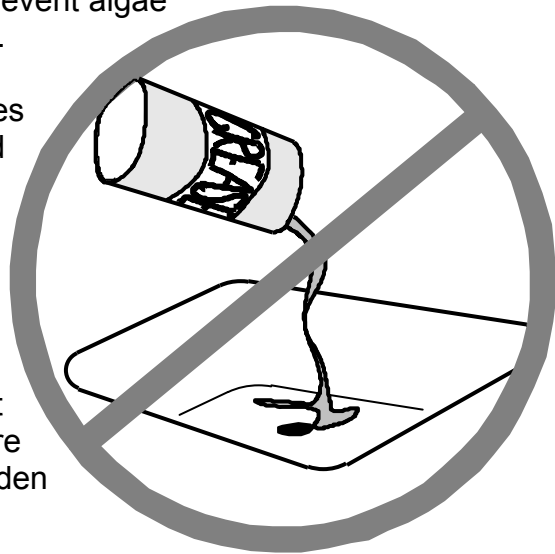


### Do's

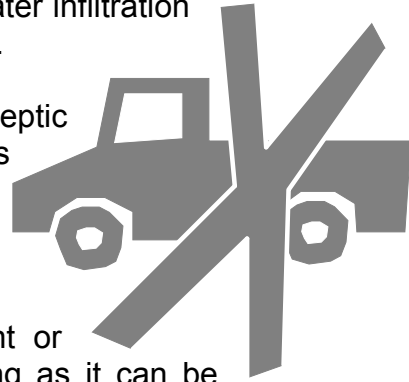
1. **Do** keep your as-built system diagram, design, permit, and all related records in a safe place for reference. Know where your septic tank system is and keep a diagram of it's location. Records may be available at your local health agency. They will be helpful if problems occur, and will be valuable to the next owner of your home.
2. **Do** keep accurate maintenance records. Make sure whoever services your tank keeps provides a written report and ask for a copy for your own records. System records are often necessary when applying for future permits for decks, remodels, expansions, etc. and will help future contractors locate and protect your system.
3. **Do** practice water conservation. By reducing the amount of water going into your system you can extend the life of the system and lower power consumption.
4. **Do** reduce water use by:
  - Using low flow faucets, showers and toilets.
  - Running appliances one at a time (dishwasher, washing machine, etc).
  - Spreading laundry over the entire week and avoid partial loads.
  - Washing only full loads of dishes and laundry.
  - Taking showers instead of baths
  - Limiting shower length
  - Taking baths with a partially filled tub
  - Fixing all faucets and toilet leaks promptly
  - Turning water off while brushing, shaving, etc.
5. **Do** consider purchasing a front-loading, high efficiency, low-water use washing machine at replacement time. These machines have become comparable in price to top-loaders and use much less water and electricity – saving your septic system and your money.



6. **Do** install faucet aerators or other water saving devices on all sinks. You can also cut down on sink water by turning down the valves under the sink to lower gallons per minute coming out of the faucet.
7. **Do** put a water-displacing device (bag, brick, plastic water bottle) in your toilet tank to save water by reducing flush volume. Or bend the float arm downward to lower the amount of water needed to fill the reservoir. Or, consider replacing older toilets with new low-flush models.
8. **Do be aware that a simple toilet float can hang up and result in thousands of gallons of wasted water per day into the system and quickly kill it.**
9. **Do** check to make sure your toilet tank isn't leaking into the bowl. You can place 5 drops of food coloring in the tank. Wait a few hours to see if the color is showing up in the bowl below, and repair or replace the toilet if it is.
10. **Do** clean the lint filter on the washing machine (if you have one) at least as often as the manufacturer recommends. This usually takes less than a minute. Lint can cause your drainfield to plug up resulting in a costly failure. If your washer doesn't have a lint filter, consider installing one. They usually retrofit onto the end of the discharge hose .
11. **Do** use liquid, phosphate-free laundry detergent and no more than the recommended amount. Phosphate-free detergents help keep your drainfield critters from being overfed and help prevent algae problems in nearby lakes and streams.
12. **Do** reduce the discharge of greases and oils. Scrape dishes, pots and plates and be sure to remove all grease. Wipe with paper towels if necessary (not wash rags). Place grease in trash **NOT DOWN THE SINK.**
13. **Do** compost your food wastes or put them in the trash. Compost bins are available at your local home & garden store.
14. **Do** be aware that medications used in the house can have an adverse effect on the system. Long term use of antibiotics and chemotherapy kill bacteria in your tank. Have your system inspected more frequently and consult with a maintenance professional to work on a solution. Some HMO's have an disposal drop-off for un-used medications.



15. **Do** familiarize yourself with the location of your septic system and drainfield. Contact the county Health Department for a copy of your records.
16. **Do** direct water from downspouts, roofs, streets, driveways, drains and surface runoff away from drainfield. Additional water from these sources can overload your system and prevent it from working properly.
17. **Do** direct all water away from the tank area. Water infiltration into tanks is a major cause of drainfield overload.
18. **Do** keep cars and trucks, RV's, etc. off the septic tank and drainfield areas. This prevents pipes from breaking and soil from becoming compacted. Compacted soils can't absorb water from the drainfield.
19. **Do** feel free to place a birdbath, potted plant or other yard decoration on tank riser lids, as long as it can be easily removed for access. Landscaping or permanent structures should be planned around your septic system to ensure its components and functionality isn't jeopardized.
20. **Do** keep all lids, ports, valve boxes, etc. easily accessible. You or your contractor will have to get back to these components for monitoring and maintenance.
21. **Do** plant grass and/or other shallow-rooted plants on your drainfield. Plants such as grass can play a major role in disposing of household wastewater by absorption and transpiration. But please, no shrubs or trees, as they have larger root systems which could intrude in the drainfield and cause drainfield pipe plugging.
22. **Do** keep irrigation or sprinkler systems at least 10 feet from drainfield. Extra water can overload your system.
23. **Do** ensure the ground over your drainfield and tanks is higher than surrounding areas and sloped to keep surface water from pooling.
24. **Do** make arrangements with a reliable service person to provide regular monitoring and maintenance. See Section 3 for information on how often your system components should be checked by yourself or a certified O&M provider.
25. **Do** inspect your system annually. See page 21 for information on how often your tank needs to be pumped. Regular pumping ensures that solids will not



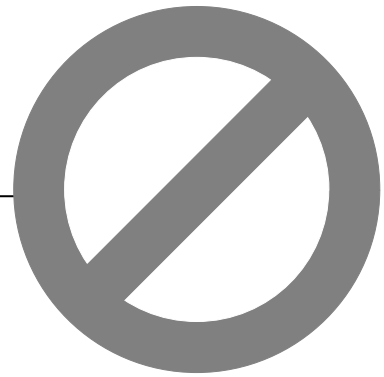
flow from the septic tank into the drainfield. Solids can destroy the drainfield, and pumping will not bring a failed drainfield back to life.

26. **Do** have your entire system checked regularly. Pumpers often only check the tank. A licensed Operation and Maintenance (O&M) provider can thoroughly inspect your entire system to see if it's working properly. A list of licensed O&M providers is available by calling the Health Department.
27. **Do** call an expert when you think you may have problems. Although some major malfunctions may require complete drainfield replacement, many problems can be corrected with a minimum amount of cost and effort.
28. **Do** familiarize yourself with the location of the system alarm & control panel and respond to alarm conditions promptly. Ignoring repeated alarms is a recipe for disaster. See page 25 for more information on alarms.
29. **Do** remember that the audible alarm can be silenced by pushing the lighted button, lever, etc., usually labeled "PUSH TO SILENCE" and on the front or side of the electrical control panel. However, don't just silence and ignore.
30. **Do** remember: most alarms are caused by water over-use in the house, or leaky tanks taking in groundwater in the winter. In the house, cut back water use until the alarm clears. Call a septic installer to fix leaky tanks.

## Septic System Do's and Don'ts

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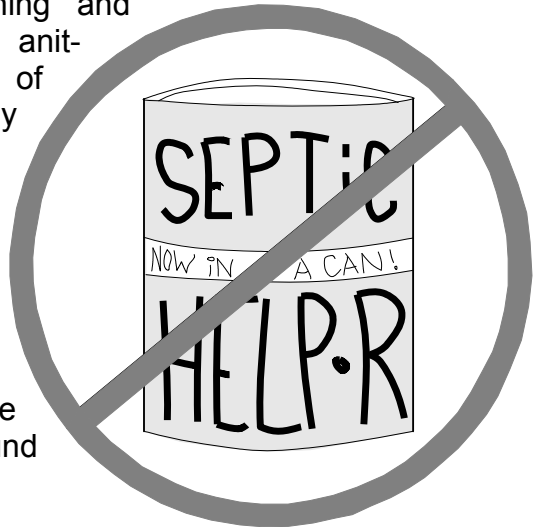
### DON'TS



1. **Don't** do more than one or two loads of laundry a day if possible.
2. **Don't** drain a bath, take a shower, wash clothes, wash dishes, etc. at the same time. Large amounts of water entering the system in a short time can disrupt the tank and wash solids into the drainfield.
3. **Don't** allow leaky fixtures to drip. The extra water adds up quickly and overloads your system.
4. **Don't** use a garbage disposal. If you have a garbage disposal, consider getting rid of it or use as rarely as possible. A septic system repeatedly overloaded with organic solids may plug up and quit working. Compost

scraps or dispose of in your trash.

5. **Don't** pour grease down your drain. Collect it in a container and dispose of it in the trash.
6. **Don't** use large amounts of bath and body oils.
7. **Don't** overuse soaps and detergents – use liquids and concentrates whenever possible. Compulsive cleaning and disinfection with bleach and other anti-bacterial products is a common cause of system failure because it kills the healthy organisms in your system needed to make it work properly.
8. **Don't** use septic tank additives or “miracle” system cleaners. These chemicals can actually harm your on-site sewage system by allowing solids to flow into and clog the drainfield. The chemicals can also contaminate ground and surface water.
9. **Don't** discharge water softener backwash into the septic tank. The backwash brine contains high levels of chlorides that can destroy microorganisms, and the added water can overload your system.
10. **Don't** use toilet tank deodorizers or other chlorine products in your toilet. Chlorine damages the rubber seals and gaskets, and may cause them to leak, overloading the system.
11. **Don't** flush floor wax, rug cleaners, or other chemicals into your septic tank. These products will interfere with the normal operation of your system.
12. **Don't** flush pool or spa products into your system.
13. **Don't** pour strong chemicals, abrasive cleaning products or other bacteria-destroying products down drains such as:
  - Drain/floor/sink cleaners
  - Excessive amounts of bleach
  - Pesticides & herbicides
  - Paint & Thinners
  - Solvents
  - Motor oil
  - Antifreeze
  - Photo chemicals



14. **Don't** dispose of excessive food preparation wastes down the drain such as home canning wastes, wine/beer making wastes, fish or game waste, etc. Compost or dispose of in the trash.
15. **Don't** flush excessive pet wastes down the drain. Dispose of in trash or in an appropriate way outside (such as a pet waste compost system).
16. **Don't** dispose of inappropriate materials down the drain. Don't flush trash or other non-biodegradable solid wastes such as:
  - Diapers
  - Coffee grounds
  - Grease
  - Plastics
  - Kitty litter
  - Paper towels
  - Cigarette butts
  - Oils
  - Bones
  - Dental floss
  - Hair
  - Tampons/Pads
  - Egg Shells
17. **Don't** dig into or around your system tanks, filters or drainfield areas.
18. **Don't** ditch, or grade your drainfield or the areas immediately adjacent to it. This could cause a disruption of the system, surfacing sewage, and possible system failure.
19. **Don't** dig without knowing where your system components, water lines, and power lines are. Knowing the location of your underground utilities can help you avoid costly repairs when digging in your yard.
20. **Don't** disturb or compact the soil over filters or drainfield or within 30' of the downhill side of mound-type systems.
21. **Don't** remove or damage inspection ports.
22. **Don't** plant medium or large plants, shrubs or trees on or near system components. 10' is a good setback for deep-rooted plants. Grass or other shallow-rooted plants over the drainfield is best.
23. **Don't** park vehicles or heavy equipment (including boats, RVs, tractors, trailers, etc.) over drainfield.
24. **Don't** drive on the tanks, filters, or drainfield areas or within 30' downhill from mound-type systems.



25. **Don't** drive over your tank or any buried pipes. If your system is near a traffic area, put up a fence, hedge, or other barricade to prevent damage.
26. **Don't** repair without permits. Any short-term savings could be offset by having the wrong thing repaired or by legal entanglements.
27. **Don't** cover filters or drainfields with impermeable materials such as plastic sheeting, concrete, asphalt, above-ground swimming pools, etc. This prevents the bacteria that break down and purify the sewage from getting the oxygen they need.
28. **Don't** raise or lower the level of the ground over filters or drainfield areas. Adding soil decreases your system's ability to breathe.
29. **Don't** drain hot tubs, waterbeds or other large amounts of water into the system. Large volumes of water are harmful to the system, and the chlorine can destroy important bacteria in the system. Drain hot tubs onto the ground, away from the drainfield but not into a storm drain.
30. **Don't** connect rain gutters or storm drains to your septic system, or allow surface water to drain into it.
31. **Don't** dump recreational vehicle (RV) waste into your septic tank. The system is designed for your residence flow and may not be able to handle the extra load. RV waste may also contain chemicals that are toxic or that may hamper the biological activity in your system.
32. **Don't** build, place sidewalks, or pave over your drainfield or reserve areas. This causes compaction of the soil, and prevents oxygen from reaching the drainfield. Compaction destroys the soil's ability to absorb wastewater.
33. **Don't** turn off electricity to the septic system pumps when going on vacation. If there is any leak or flow into the system, the pump will need to run or sewage could back up into the house or on the ground.
34. **Don't** reset timers or other system controls. A certified professional is the only person who should be altering your system settings. If you're having problems, call a professional, don't fumble around for a fix – chances are you may be making it worse.



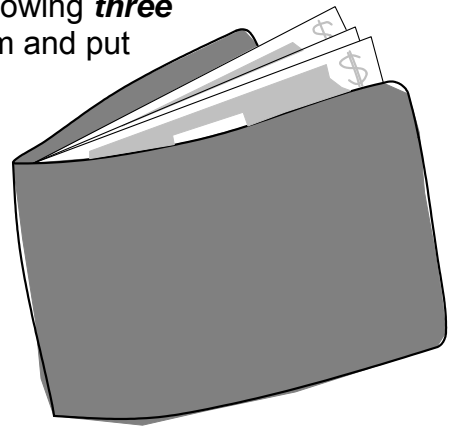
# SECTION 2:

## Information for All Septic System Users

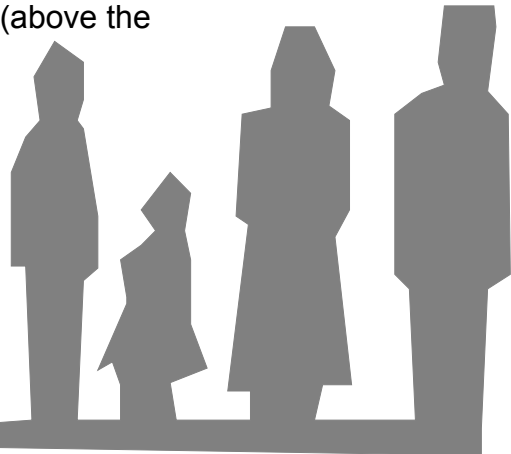
### What's in it For You?

Why should you maintain your septic system? You just paid a fortune for this new system and the first thing you are told is to get to work maintaining it. It isn't that difficult, especially when you understand the following **three health risks** that result when you ignore your system and put it "out of sight, out of mind".

1. **The Health of your pocketbook.** If you recently paid to have your system installed, you already know what this means. A wise person once said "If you can't afford to do it right the first time, then how will you be able to afford to do it over again?" We couldn't agree more. On-Site Septic Systems are expensive. If you don't properly care for your system, it will fail and you will be paying to repair or replace it. It's that simple.



2. **The Health of your family, community and environment.** Your septic system – when properly operated – does a very important community service. It takes dangerous waste and turns it into clean water. All it asks in return for keeping you safe is a little help from above (above the ground that is). A properly functioning system eliminates harmful bacteria and viruses that can make humans sick, and it also reduces pollution (such as nitrogen and phosphorus) which can make the environment sick.



3. **The Health of your economy:** Here in the Northwest, water related tourism, fishing and shellfish are very big industries that provide income for thousands and help keep our economy pumping. If you love to see shellfish beds that aren't closed due to low water quality, you'll have your system checked regularly, keep it maintained, and have it pumped when necessary.

## What is a Septic System Anyway?

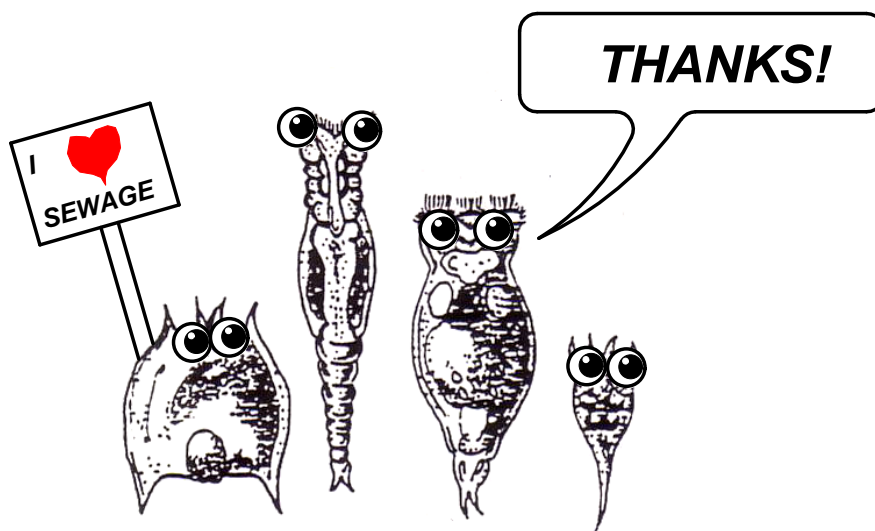
No matter what type of tanks and other components you have, your system is above all else, **a wastewater treatment and disposal machine**. It takes all the smelly, icky sewage coming out of your home and collects it, treats it, then allows the purified water to flow back into the environment.

How does it do this you might wonder? The short answer is bugs – bacteria and other microorganisms. These tiny creatures are present almost everywhere, yet invisible to the naked eye. They don't have to be placed in your system, they are already present from the first flush both in your waste and in the soil of the drainfield.

They thrive on the waste coming into your system – in the tanks, filters and drainfield, they grow, multiply, and eat up all the bad stuff. What's left after they get done with their feast? Purified water. This clean water flows into the soil under your drainfield and then eventually groundwater tables feeding lakes, rivers, streams, and Puget Sound.

To help keep your bugs happy, please follow these general requirements:

- **Keep them from drowning** – Keep flows low and all water diverted away from your system areas, especially the drainfield.
- **Don't overfeed them** – minimize food scraps and excessive soaps, oils, greases, etc. going in to the system.
- **Don't poison them** – keep strong chemicals, cleaners and additives out!



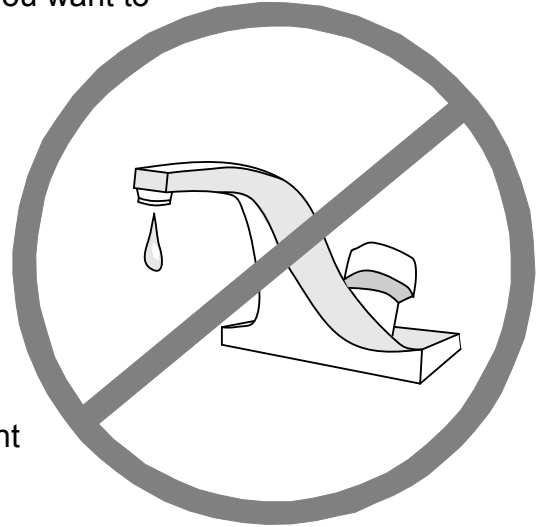


## Common Problems

### ***High Flows***

Your system is only designed to handle a limited amount of sewage per day. For residences, the design flow should be 120 gallons per day per bedroom in the home, or 60 gallons per person per day. This design flow is a maximum. Average daily flows should be 60-70% of the design flow. Operating at maximum design flow on a daily basis is like driving your car with the engine revved up to the redline at all times. It isn't recommended unless you want to blow your engine.

Excessive water coming from the house can cause some serious negative effects on your system. Remember – your system was designed to handle a limited amount of water per day. High flow can cause solids to be washed from your tanks into your drainfield, plugging it up and causing it to surface. Also, just the sheer volume of water going to the drainfield may be more than the soil can absorb, causing sewage breakout on the ground, not to mention unpleasant smells and costly repairs.



Always try to limit your water use. Don't do seven loads of laundry on one day – instead, do one load a day for seven days if possible. If you are planning a large gathering, reunion, etc. rent 'port-a-potties' for the event. This will prevent your system from being overloaded. Install low flow fixtures and appliances if possible and fix leaking toilets and faucets. Remember, it's easier than fixing your septic system.

### ***Garbage Disposals and High Strength Waste***

A Garbage Disposal (usually under the kitchen sink) is a standard appliance in many homes. However, using a garbage disposal can be very unhealthy for your septic system (and your bank account). Garbage Disposals have been shown to increase solids levels in the septic system up to 33% faster, which means you'll be pumping your tank more frequently. Disposals can also greatly increase the waste strength, making more work for your system. Excess solids and high waste strength will mean higher maintenance costs and could lead to premature failure of the system – both of which will put the squeeze on your pocketbook. Limit your grinder use (if you have one), or consider eliminating it entirely. Compost food wastes or put them in the trash.

Other practices can also increase waste strength. Any and all products making their way down the drain are things your system has to attempt to clean and

dispose of. Excessive use of cleaning products, excessive food preparation, home canning or other food processing, using a lot of oils, soaps, toilet paper, etc. all can have a negative impact on your system. Keep them to a minimum or find alternative disposal methods.

### ***Septic Tank Additives and Chemicals***

You've gotten the phone call. Some telemarketer is on the line trying to sell you a 'miracle in a can' which will prevent you from ever having to pump your septic tank again, rejuvenate your drainfield, etc. The proper response is "**no thanks**". Septic tank additives have been shown to have no positive effect on your system. Some may even be harmful, interfering with your system's proper functioning, and contaminating groundwater.

### ***Water Softeners and Hot Tubs***

Water softeners are the subject of debate over causes of septic system failure. These devices generally add sodium to the system and also elevate the amount of water sent into the system. At this time, there is no conclusive evidence that water softeners harm your system, although the jury is still out. The safest alternative is to NOT dump backwash into your system. Since this is not sewage, the softener can be plumbed to discharge to an outside footing or other drain.

The same goes for hot tubs – Drain them in the yard and not in your septic system!

## **Pop Quiz – Do You Know Where Your System Is?**

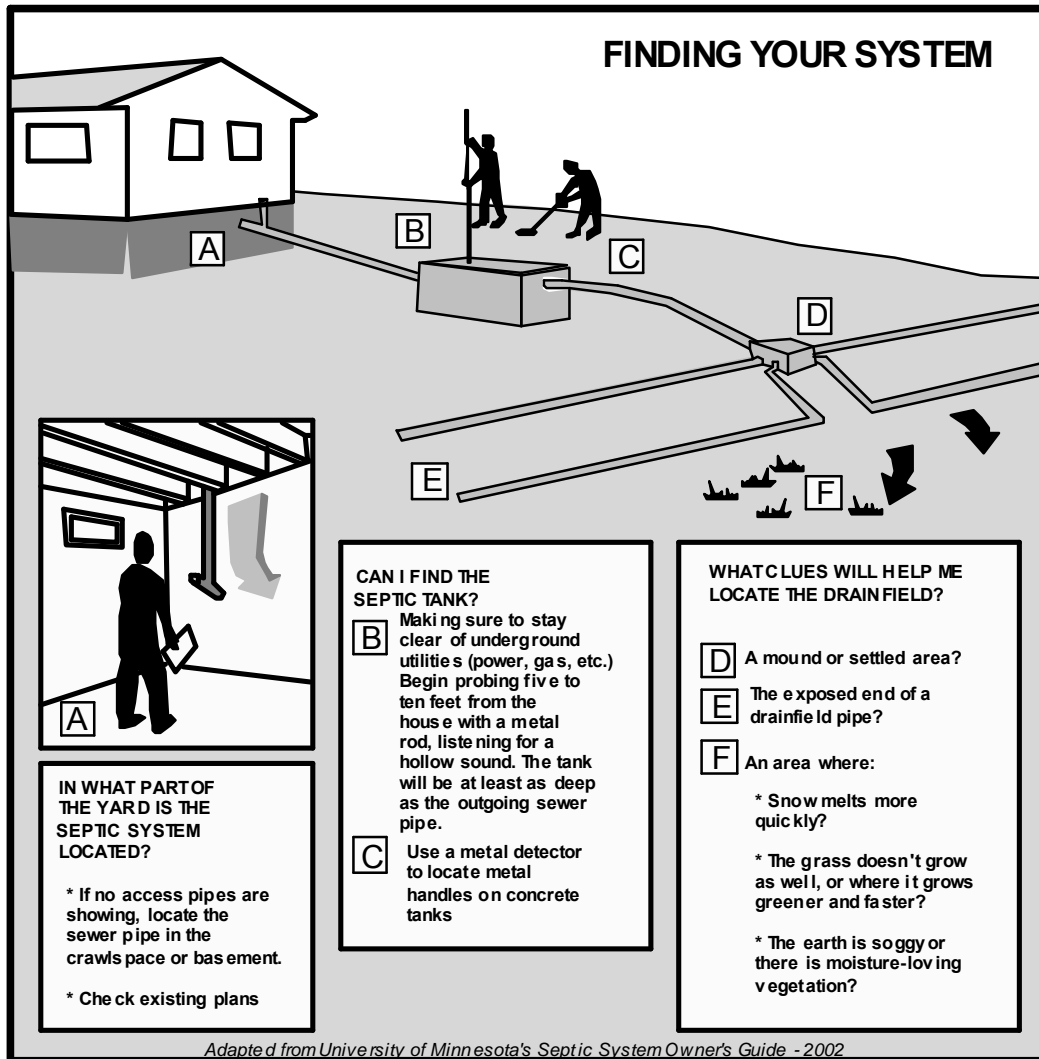
### ***Locating your system***

There are many reasons to know where your septic system is. The most important ones are to *protection* and *monitoring*. You want to protect it from damaging activities such as ditching and parking. And you (or your hired professionals) want to monitor it to ensure it is functioning properly.

In order to do either one of these things, it is first necessary to know where your system is located. The system design and system as-built can help you find major components. If you don't have these documents, call Mason County Public Health. They can perform a search for your records and mail you a copy of what they have on file. You can also try contacting the system designer and installer to see if they have records.

Once you locate your system's access points, mark them if necessary. Make note of their locations on the system 'as-built' drawing, and keep them free and

clear. If you don't have an 'as-built' drawing and one isn't available from the county or a contractor, use the form on page 59 to create your own.

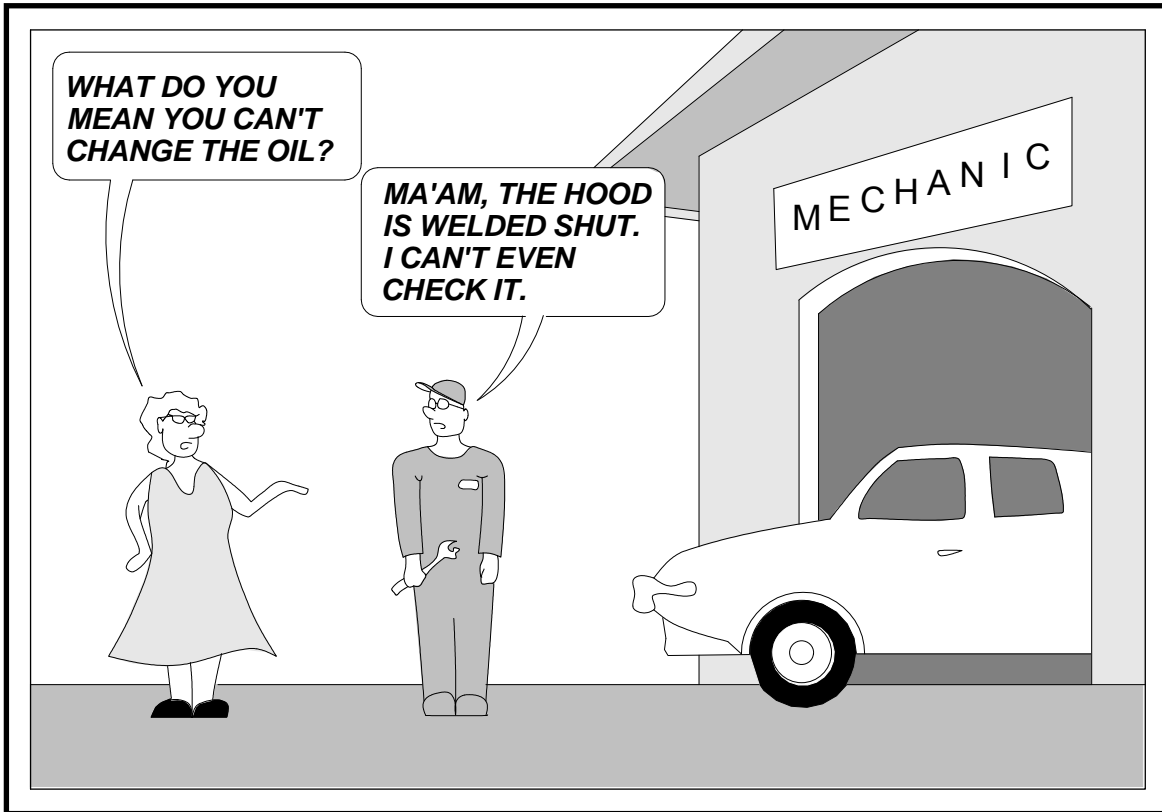


**Keeping your system accessible**

Don't bury tank access lids under ground, under decks or under future additions. Some one will need to get back in those tanks periodically to pump and inspect them.

Don't bury valve boxes or observation ports and cleanouts. Valve boxes provide access to system valves for flushing and future adjustments. Observation ports allow easy checking of the drainfield to see if it's working properly or ponding. Cleanout ports provide access points to the ends of pressure distribution laterals so they can be flushed and cleaned when necessary.

Finally, keeping your components accessible is the best way to keep them in view, and therefore remember where they are. They are also especially helpful in aiding a new owner, pumper or maintenance person in figuring out where components are located.



These are the problems with non-accessible systems:

- Since no one can easily look at them, no one does. This means that if they have problems no one knows until they are bigger and harder to fix.
- If and when someone does decide to look in on the system, they will have to dig up the yard. This can cost a lot of money and really wreaks havoc on those new flower beds you spent all weekend on.

If you have a system that **does not** have accessible components, you must seriously consider making them accessible for monitoring and maintenance. Having your system inspected by a knowledgeable operation and maintenance (O&M) provider can help you identify access problems and how to fix them. It may cost a little money to upgrade your system, but you could be saving the cost of a full replacement if it's not maintained properly.

### ***Hiding in Plain Site***

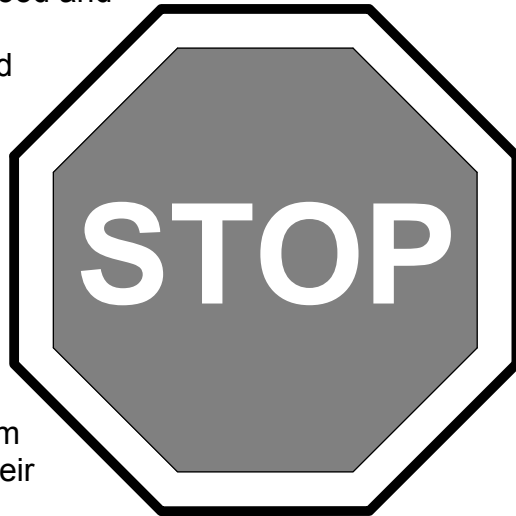
There are plenty of creative ways to make your system more attractive while maintaining access to it. Putting a birdbath or other such feature on a tank lid helps you remember where the location while keeping harmful activities such as vehicle traffic away. Ornamental fiberglass and resin 'rocks' which are hollow and relatively light-weight can also camouflage lids, vents, ports, etc. And no one will ever know what you're hiding – except your pumper, of course!

### ***Protecting your system***

Construction in your septic system area could damage your tank, pipes or soil. Construction can also block access to septic components and make monitoring and maintaining your system more difficult.

Put barriers in place to keep cars and other heavy objects off the drainfield. Ornamental fencing and shrubbery look good and keep damaging traffic off the drainfield. Vehicles compact the soil over and around the drainfield, cutting off oxygen and destroying soil structure. This very often leads to system failure. A general rule is: *nothing heavier than a riding lawnmower should be driven over the drainfield.*

Remember your microscopic farm animals? They're out there eating the pollutants in the waste-stream coming from the house. If you crush them or seal off their oxygen, then how can they do their job?



Heavy, wheeled vehicles can also damage system pipes. Car weight can collapse pipes leading from the tanks to the drainfield. Even worse, cars and machinery could also collapse access risers or even the tank itself. Be careful – know where your system is and keep heavy objects away from it!

### ***Preventing unauthorized access***

Remember that although being able to access your system components quickly and easily is your goal, safety is a concern. Make sure all lids to tanks are secured with bolts or screws. Make sure all valve boxes and drainfield ports are secured and have tight fitting lids and caps. Running a stainless-steel screw through the lid or cap can prevent someone from pulling it off easily. The last thing you want is a neighbor's child falling in your septic tank because the lid wasn't properly secured.

## ***Landscaping Your System***

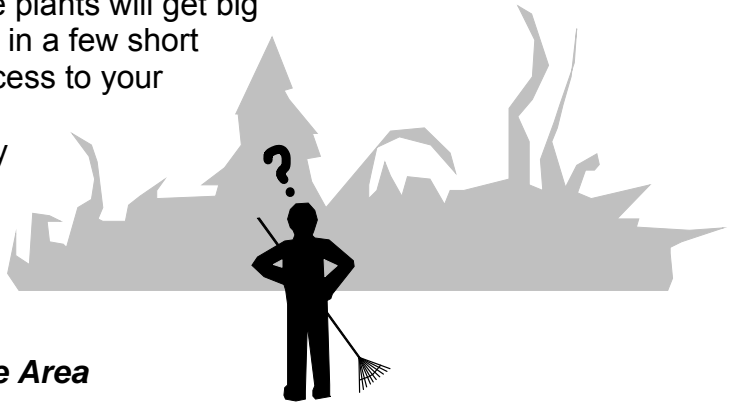
The best cover for your drainfield is grass or other shallowly rooted plants such as ferns, wildflowers, heather, kinnikinnick, etc. Keep trees and bigger shrubs (such as rhododendrons) 10 feet away from your system.

It is best not to garden over your drainfield. Root crops could be exposed to harmful bacteria and viruses, and digging in your drainfield area could damage pipes and disturb system functions.

It is best not to plant anything over the drainfield that needs a lot of water. Excessive watering – even during dry months – can hydraulically overload the drainfield and cause loss of treatment and even system breakout. If you have to water over your drainfield, do it VERY sparingly. Also, keep irrigation systems at least 10 feet away from the drainfield.

## ***Forget About It?***

What you don't want to do with your drainfield landscape is to forget about it. Scotch Broom, Himalayan Blackberry and Red Alder will spring up very quickly in disturbed soil. The roots of these plants will get big enough to disrupt your drainfield in a few short years. Also, they will prevent access to your drainfield area for monitoring purposes, which means you may not find out there is a system problem until it's too late. Keep the area clear and monitoring ports located and accessible.



## ***Maintaining Adequate Reserve Area***

Your 'reserve' or 'repair' area is a very important part of your septic system. If and when your system should ever fail, this area will be needed to site a new system. If you use your reserve area for a parking lot, new shed, garage, or level it out for a nicer landscape, you will probably end up paying thousands of dollars extra if you have to replace your system. Your repair area should be treated with the same care and regard you treat your primary system, because one day, it will be your new primary system.

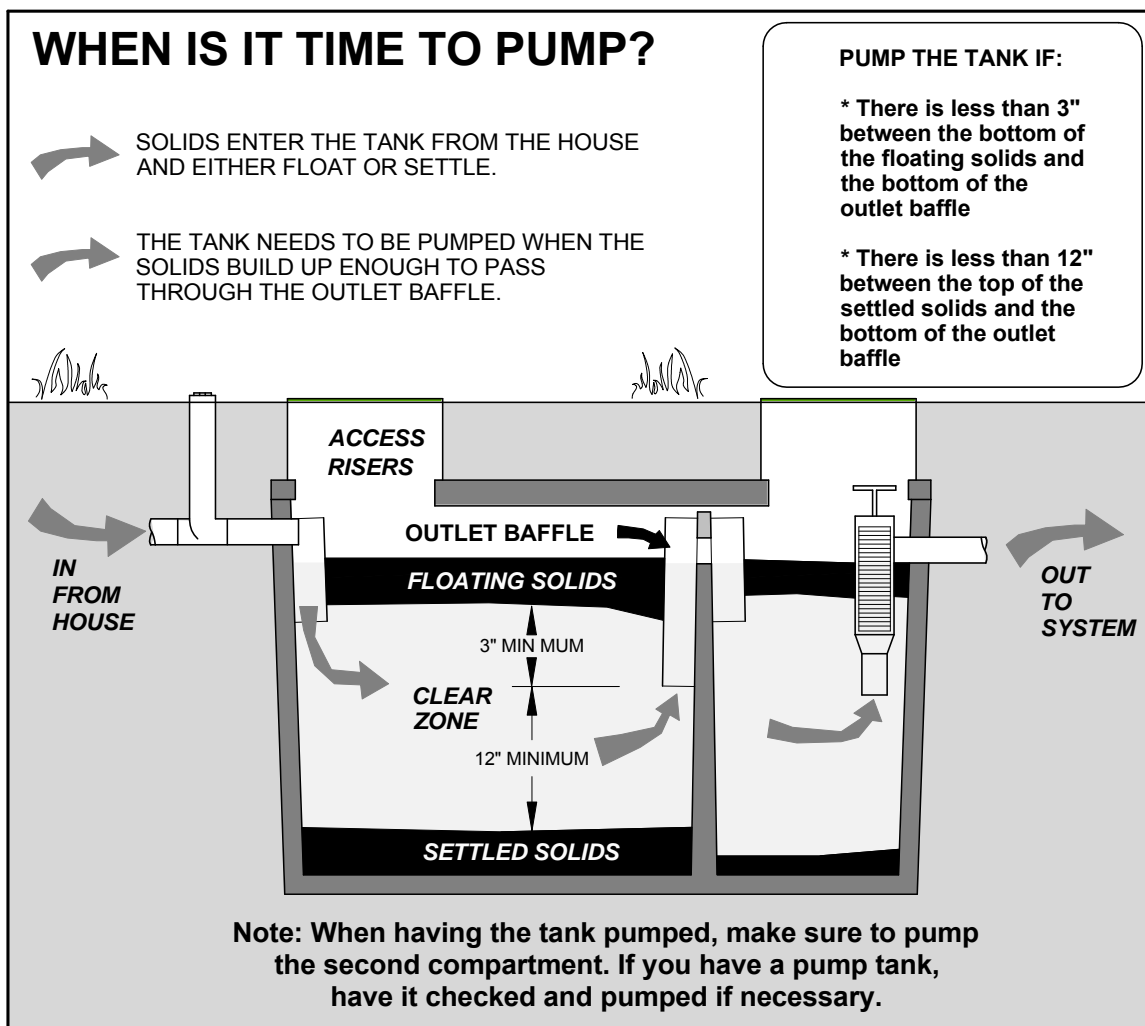
- Familiarize yourself with your septic design and as-built drawings
- Identify the areas indicated for reserve. Sometimes this is an area separate from your primary drainfield, but usually they are connected or interwoven.
- Follow do's and don'ts the same for your drainfield as for your reserve area.

- If the reserve area has been left with natural trees and vegetation, it is best to keep it that way. Clearing can damage soil and make your future system more expensive if not done very carefully.
- If you want to landscape your reserve area, the same rules apply as for your regular system.
- Remember – **It's not *if* but *when***, so treat your reserve area like gold.

## Pumping Your System

### *Why it's important*

Having your tanks pumped is important. Solids exiting the house build up in the septic tank and often in the pump tank. If the solids build up too high, they can plug the baffles in your septic tank, causing backup in the house. Solids can also be forced into your drainfield (or sand/gravel filter, etc.) causing it to plug and fail.



**How often should it be pumped?**

Your system should be pumped WHENEVER IT NEEDS IT. This will be different for everyone. Hard and fast rules like “pump the tank every other year” just aren’t scientifically valid. Also, pumping the system is hard on the bugs because it can take years before the anaerobic zoo in your tank is functioning at its peak. Over-pumping is hard on your micro-critters, and it’s a big bite on your pocketbook.

How often you have to pump a septic tank is a function of how big the tank is relative to how many people are using the system, and how they are using the system. The chart below illustrates some average times between pumping, based the size of the tank and the number of users. Please keep in mind that this is ‘average’. Your pumping frequency may be higher or lower – even with the same sized tank and number of occupants.

<b>SUGGESTED PUMPING FREQUENCIES WITH NORMAL USE:</b>					
<b>Suggested Pumping Frequency (In Years)</b>					
<b>Tank Size (gallons)</b>	<b>Number of people using the system:</b>				
	<b>1</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>8</b>
<b>1000 gal</b>	12 years	6 years	3 years	2 years	1 year
<b>1500 gal</b>	19 years	9 years	4 years	3 years	2 years

Adapted from “Estimated Septic Tank Pumping Frequency” by Karen Mancini, 1984 Journal of Environmental Engineering, Volume 110.

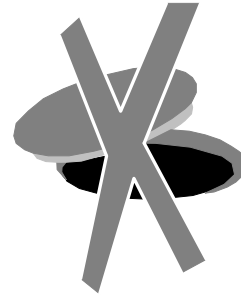
The most important thing remember is to check your system annually. Once your system has to be pumped for the first time or two, your pumper should be able to tell you the future frequency that is best for your system. Remember, if the number of occupants or your use of the system changes, your pumping needs may increase or decrease (i.e. – kids move out, kids move back in, you get rid of your garbage grinder, open a home-based business, etc.)

When having your septic tank pumped, make sure to have the second chamber checked if it is a two-compartment tank. If you have a pump tank, be sure that is checked as well. Some materials can liquefy and then re-solidify, settling out in the pump tank. Have them removed if they are present. You DO NOT want any solids sucked into the pump and passed into the drainfield, this is a quick road to failure.



## Tank Safety Checklist

- Never enter the septic tank or pump tank. Components should be accessed from the outside only. There are very low levels of oxygen in the tanks, plus there could be accumulations of hydrogen sulfide, methane, carbon dioxide and other harmful gases.

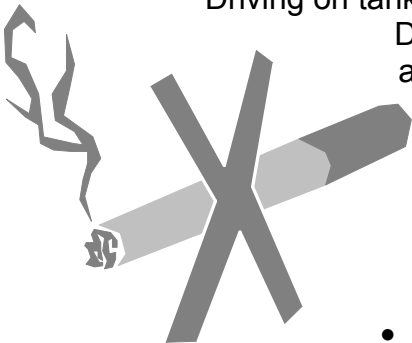


- Never use electrical devices (extension cords, lights, tools, etc.) in, or close to water or wet ground near the system. You could be shocked or cause an explosion.



- Always remember that the contents of your tank are hazardous to human health and can cause infectious diseases. Anytime you come into contact with liquids or solids from your system, wash yourself and your clothes before eating, drinking, going inside or being around others.

- Keep vehicles and other equipment away from your system. Driving on tanks or over pipes could collapse them. Driving over your drainfield will destroy its ability to breathe and transmit water.



- Never smoke near system openings. Combustible gases may be present.

- Keep children and pets away from the system when it is open or being worked on.

- If you smell sewage inside your home, take action immediately. You may have a blocked or incorrectly routed pipe, or other problem that should be taken care of as soon as possible. Call a plumber if needed.



# Inspecting and Maintaining Your System

## ***Conduct regular checks and maintenance***

Most systems should be checked annually. With simpler systems, you might opt to do this yourself. For more complex systems it is best to hire a pro. Proprietary systems like ATUs usually require all maintenance is done by one of their licensed representatives.

Having your tanks pumped is not a complete maintenance inspection. Your entire system needs to be looked at. With more complicated systems, this takes time and expertise. Even with a gravity system you can't just 'flush and forget'. See Section 3 for more information on maintenance frequencies for different types of systems.

## ***Hire a pro***

It is important to ensure that the system is set up and functioning correctly from day one. Nobody is perfect – things could have been wrong with the design, installation, final landscaping, electrical hookups, initial use of the system, etc. That's why it is a good idea to have the system inspected initially by a knowledgeable, licensed, Operation and Maintenance (O&M) provider. They can identify and help correct problems before they damage the system.

Your pumper may or may not be a certified O&M provider, so check to be sure. The county maintains a list of currently licensed providers – contact them for a copy.

## ***Look at the whole thing***

When your system is checked, it is important that the entire system is looked at – from the source plumbing coming from the house to the last line on the drainfield. If you are doing the checking yourself, see Section 3 for on checking different components.

First you need to know what components make up your system, so start with page 1 of this manual to see a checklist of your specific system and components. Then read the pages shown. Do you have a solids pump basin? Is your drainfield a gravity distribution, pressure distribution, or a high-tech drip system? Do you have a recirculating filter or ATU? Get your design and 'as-built' drawing and find out. Then go out in the yard and look at it.

## ***Special systems – special requirements***

Some systems are proprietary and have their own maintenance schedules and agreements, etc. These are between you and the manufacturer of the

technology. You need to follow the directives of the company or their area representative as it relates to their treatment unit (ATU, filter, etc.). If you disagree with your provider or want a second opinion, call the company to find out if there is another representative or provider in your area.

As with pumpers, not all manufacturer's representatives are licensed O&M providers. They may just want to come out and look at their part of the system, but not the whole thing. If this is the case, try finding a representative who can look at your whole system, or call a regular O&M provider to look at everything else.

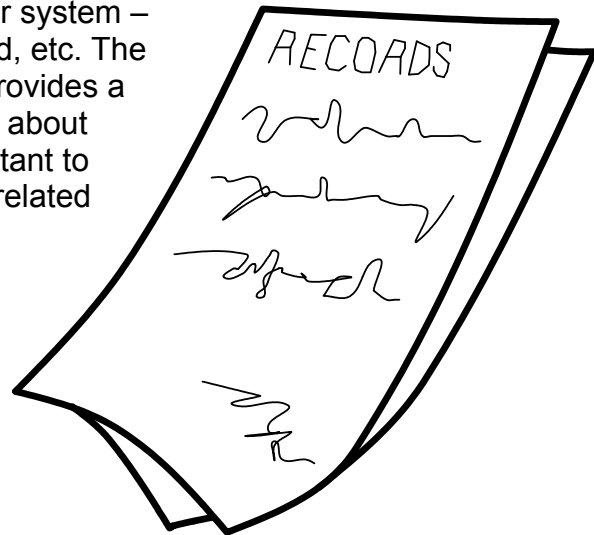
Remember, it is important to have the whole system monitored and maintained, especially the more complex the system is.

### ***Maintaining your records***

Part of being an educated owner and micro-sewage plant operator is keeping records. First of all, make sure you have your design and as-built drawing. If you don't have an as-built and the county can't find one for you, create one yourself using the worksheet on page 59, or hire a designer to generate one.

Keep a record of any work done on your system – inspections, when it is pumped, repaired, etc. The Maintenance Record Log on page 60 provides a place to write down general information about services to your system. It is also important to keep any receipts, reports, letters, etc. related to the work done.

You can use this manual as a storage place for all this information. Place a rubber band around it to keep things inside.



### ***Alarms***

A traditional gravity system is the only system that doesn't require some kind of an alarm or control panel. All pumps, air blowers for ATUs, and some disinfection units require alarms.

Septic system alarms are generally loud and annoying – they are designed that way to make sure problems aren't ignored. They usually consist of a small plastic box mounted on a wall or post near the tanks. Most alarms have a loud ringer (or buzzer) and a flashing light.

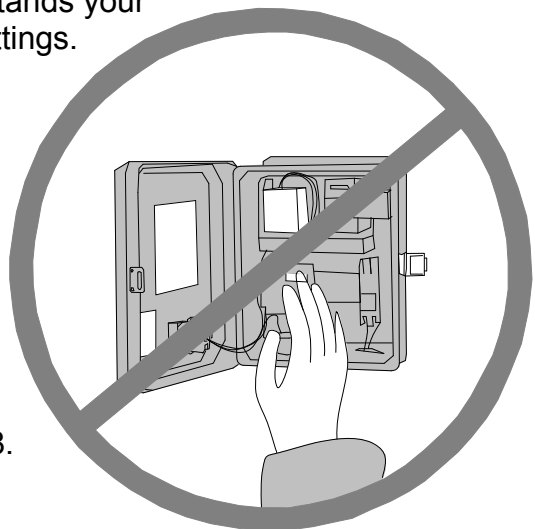
When you have an alarm, you can usually silence it by pushing a button on the front of the panel. Some panels may have a button on the side, or a lever or other switch. However you do it, turn off that noise.

The light will generally continue to flash. This means that the problem that caused the alarm (a high water level for example) is still present. Once the problem subsides (i.e. water level goes down and float drops) the light will stop flashing. If the problem happens again, the whole cycle of buzzing and flashing will happen over again, requiring you to silence it and try to figure out what's causing the problem.

Air blower (ATU) and disinfection unit alarms function to alert you that a unit is not working properly. When one of these alarms sounds, you should call the installer or manufacturer's representative immediately to correct the problem.

Many alarm boxes are called 'control panels' and have functional controls inside such as switches, timers, meters, etc. **DO NOT ALTER SETTINGS INSIDE YOUR PANEL.** Only a professional who understands your system design and permit should alter these settings.

Tampering with these settings may temporarily shut your alarm up, but won't make the problem go away, in fact it may make it worse. Systems are set up a certain way for a reason. If you are having problems with your system or think the settings are incorrect, call a professional to look at it and make any necessary changes.



For additional troubleshooting information see Troubleshooting Common Problems on page 28.

### ***What is a Failure?***

To the homeowner, a 'failing' system is one that isn't properly disposing of sewage – either it's backing up in the house, or it's breaking out in the yard. Either one of these problems is serious and requires immediate attention (see Troubleshooting Common Problems on page 28). If you have surfacing sewage on the ground, chances are high that it is a serious problem.

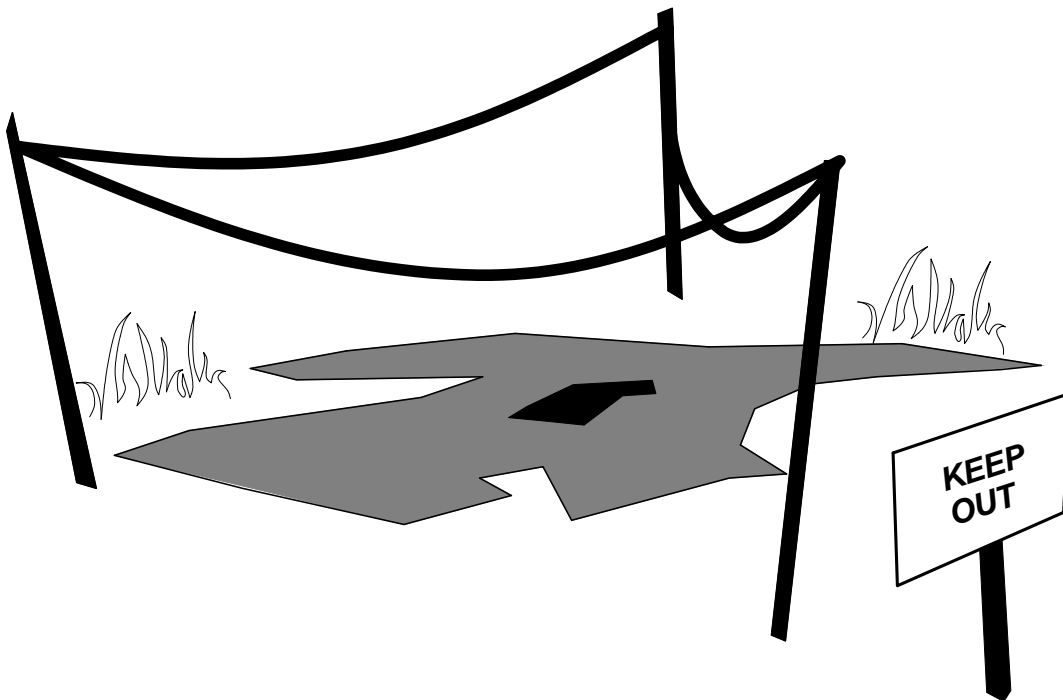
To the County, a 'failing' system is one that is not properly TREATING and DISPOSING of sewage. Backups in the house and surfacing in the yard are obvious failings. But, systems that are not being operated according to their approved design are also considered 'failing' because they are not living up to their permitted intent.

### ***When should I call a Professional?***

- If you have sewage surfacing in the yard
- If you keep having an alarm that won't go away when you cut back on water use in the house
- If you have any kind of 'pretreatment' system such as a sand filter, mound, ATU, gravel filter, drip system, etc. and it hasn't been looked at before by a licensed O&M provider
- If you have broken pipes
- If you have electrical components that are malfunctioning or defective
- If you are getting strong sewage odors in or around the house and you cannot figure out where they are coming from and fix the problem yourself

**If you have sewage on the ground, take immediate action to protect yourself and your family from contamination:**

- ***Cover the breakout with sand and/or bark chips***
- ***Place a rope or barricade around the area to prevent contact***
- ***Keep children and pets away***



## Troubleshooting Common Problems

Problem	Risks	Potential Causes	Potential Solutions
<b>Slow Draining Fixtures (sink, tub, shower); Sewage Backing Up in House</b>	Human contact with sewage is a serious health threat. Bacteria and viruses in sewage could cause serious illness. AVOID CONTACT.	<ul style="list-style-type: none"> <li>Excess water use in house</li> </ul>	<ul style="list-style-type: none"> <li>Fix leaks</li> <li>Install water saving fixtures</li> </ul>
		<ul style="list-style-type: none"> <li>Groundwater infiltrating into tanks</li> </ul>	<ul style="list-style-type: none"> <li>Drain ground and surface water away from tanks</li> <li>Find and fix leaking openings</li> <li>Water-tight tanks if possible</li> </ul>
		<ul style="list-style-type: none"> <li>Improper plumbing</li> <li>Blocked pipe</li> </ul>	<ul style="list-style-type: none"> <li>Check plumbing</li> <li>Clear pipes</li> </ul>
		<ul style="list-style-type: none"> <li>Pump failure</li> </ul>	<ul style="list-style-type: none"> <li>Check pump operation by running manually</li> <li>Replace pump if necessary*</li> </ul>
		<ul style="list-style-type: none"> <li>Roots clogging pipes</li> </ul>	<ul style="list-style-type: none"> <li>Avoid planting trees near system components</li> <li>Seal pipe connections*</li> <li>Replace broken or cracked pipes and remove roots*</li> </ul>
		<ul style="list-style-type: none"> <li>Tank's outlet filter plugging up</li> </ul>	<ul style="list-style-type: none"> <li>Remove, clean and replace filter</li> <li>Stop using garbage disposal</li> </ul>
		<ul style="list-style-type: none"> <li>Tank baffles broken or plugged</li> </ul>	<ul style="list-style-type: none"> <li>Ensure baffles clear</li> <li>Fix or replace baffles if necessary</li> <li>Pump tank if solids are problem</li> </ul>
<b>Sewage Breaking Out on Ground</b>	Human contact with sewage is a serious health threat. Bacteria and viruses in sewage could cause serious illness. AVOID CONTACT. <ul style="list-style-type: none"> <li>Consult professionals</li> <li>Place barrier around area until problem is fixed</li> <li>Place sand or bark dust over breakout to minimize potential contact</li> </ul>	<ul style="list-style-type: none"> <li>Excess water use in house</li> </ul>	<ul style="list-style-type: none"> <li>Fix leaks</li> <li>Limit high use activities</li> <li>Install water saving fixtures</li> </ul>
		<ul style="list-style-type: none"> <li>Groundwater infiltrating into tanks</li> </ul>	<ul style="list-style-type: none"> <li>Drain ground and surface water away from tanks</li> <li>Find and fix leaking openings</li> <li>Water-tight tanks if possible</li> </ul>
		<ul style="list-style-type: none"> <li>High waste strength</li> </ul>	<ul style="list-style-type: none"> <li>Stop using garbage disposal or placing excess grease, oil, food, etc. in system</li> <li>Use a sink strainer</li> <li>Stop using harsh chemicals in house</li> </ul>
		<ul style="list-style-type: none"> <li>Broken or blocked pipes</li> </ul>	<ul style="list-style-type: none"> <li>Check plumbing</li> <li>Clear pipes</li> <li>Locate and repair broken pipes</li> </ul>
		<ul style="list-style-type: none"> <li>Pump failure</li> </ul>	<ul style="list-style-type: none"> <li>Check pump operation by running manually</li> <li>Replace pump if necessary*</li> </ul>
		<ul style="list-style-type: none"> <li>Improper distribution</li> </ul>	<ul style="list-style-type: none"> <li>Adjust D-box or manifold for equal distribution</li> </ul>
		<ul style="list-style-type: none"> <li>Undersized drainfield</li> </ul>	<ul style="list-style-type: none"> <li>Install new system</li> </ul>

<b>Alarm Sounding</b>	Sewage may back up into house or break out on ground	<ul style="list-style-type: none"> <li>• Too much water being used in house</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Reduce water use</i></li> <li>• <i>Check for leaky fixtures</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Groundwater infiltrating into tanks</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Drain ground and surface water away from tanks</i></li> <li>• <i>Find and fix leaking openings</i></li> <li>• <i>Water-tight tanks if possible</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Pump failure</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Check pump operation by running manually</i></li> <li>• <i>Replace pump if necessary*</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Fuse breaker tripped</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Check breaker and reset</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Pump or float power cord unplugged</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Check electrical plugs</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Controls malfunctioning</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Call system installer and/or electrician</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Control floats tangled by other parts in the chamber</li> <li>• Debris on floats and power cords causing improper function</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Untangle and secure cords</i></li> <li>• <i>Ensure all floats swing freely</i></li> <li>• <i>Clean floats and cords by hosing/scraping off</i></li> <li>• <i>Pump tank if necessary</i></li> </ul>
<b>Sewage Smells in House</b>	Toxic gases can be flammable or make people sick	<ul style="list-style-type: none"> <li>• Sewage backup in house</li> </ul>	<ul style="list-style-type: none"> <li>• <i>See "Sewage Backing Up In House" on previous page</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Sewage surfacing in yard</li> </ul>	<ul style="list-style-type: none"> <li>• <i>See "Sewage Breaking Out On Ground" on previous page</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Roof vent pipe blocked</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Locate and clear roof vent pipe(s)</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Improper plumbing</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Repair plumbing</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Unsealed ejector sump pump</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Locate and seal ejector sump properly</i></li> </ul>
<b>Sewage Smells Outside</b>	Nuisance	<ul style="list-style-type: none"> <li>• Someone else's septic problems</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Talk to your neighbor about correcting the problem</i></li> <li>• <i>If public health is threatened call county</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Sewage surfacing in yard</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Repair or replace drainfield</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Inspection port caps damaged or removed</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Replace damaged caps</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Tank lids not sealed or improperly installed</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Repair or replace lids with ones that seal properly*</i></li> </ul>
<b>Float Chattering - Pump turns off and on rapidly.</b>	<ul style="list-style-type: none"> <li>• Nuisance</li> <li>• Inaccurate meter readings</li> </ul>	<ul style="list-style-type: none"> <li>• Mercury float switch installed to control pump</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Replace chattering float switch with correct 'mechanical' float switch*</i></li> </ul>
<b>Pipes or system freezes in winter</b>	The system may stop functioning causing breakouts or backups	<ul style="list-style-type: none"> <li>• Improper construction</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Check system for problems*</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Transport line doesn't drain between doses</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Remove check valve from line or install anti-siphon device if pumping downhill*</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Water not flowing through system often enough</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Increase frequency of pump cycling</i></li> </ul>
		<ul style="list-style-type: none"> <li>• Compacted ground not insulating pipes or drainfield</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Keep people and vehicles off area</i></li> </ul>

**\* Call a professional**

# SECTION 3

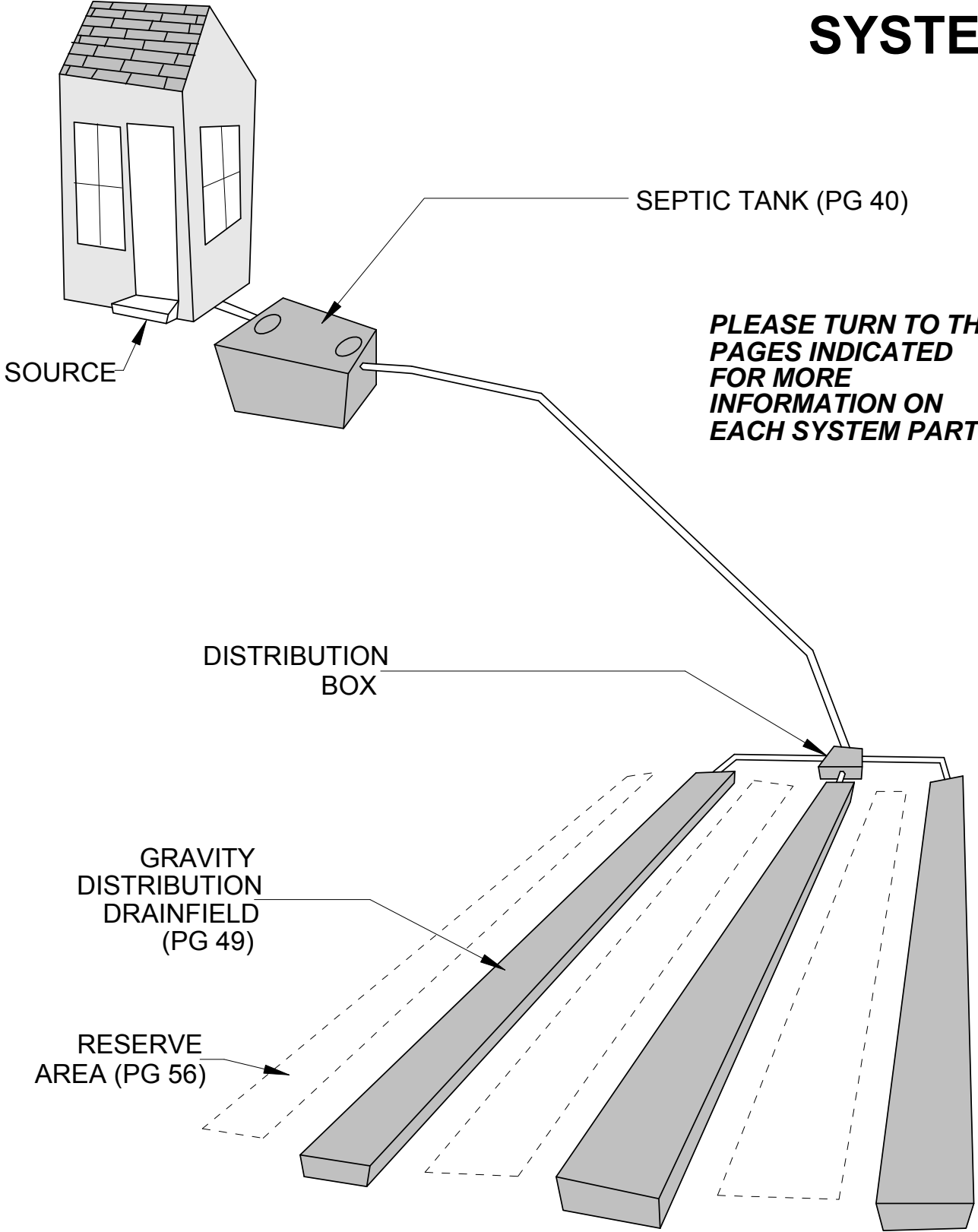
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## Individual System Information

- *Look on **Page 1** of this manual to see what system and components are checked.*
- *Next to those checked components are page numbers.*
- *Those are the pages you need to read to learn more about your particular system, how it works, and how to make sure it keeps working.*
- *Follow the links on all pages to read about your particular system components and how to properly maintain them.*

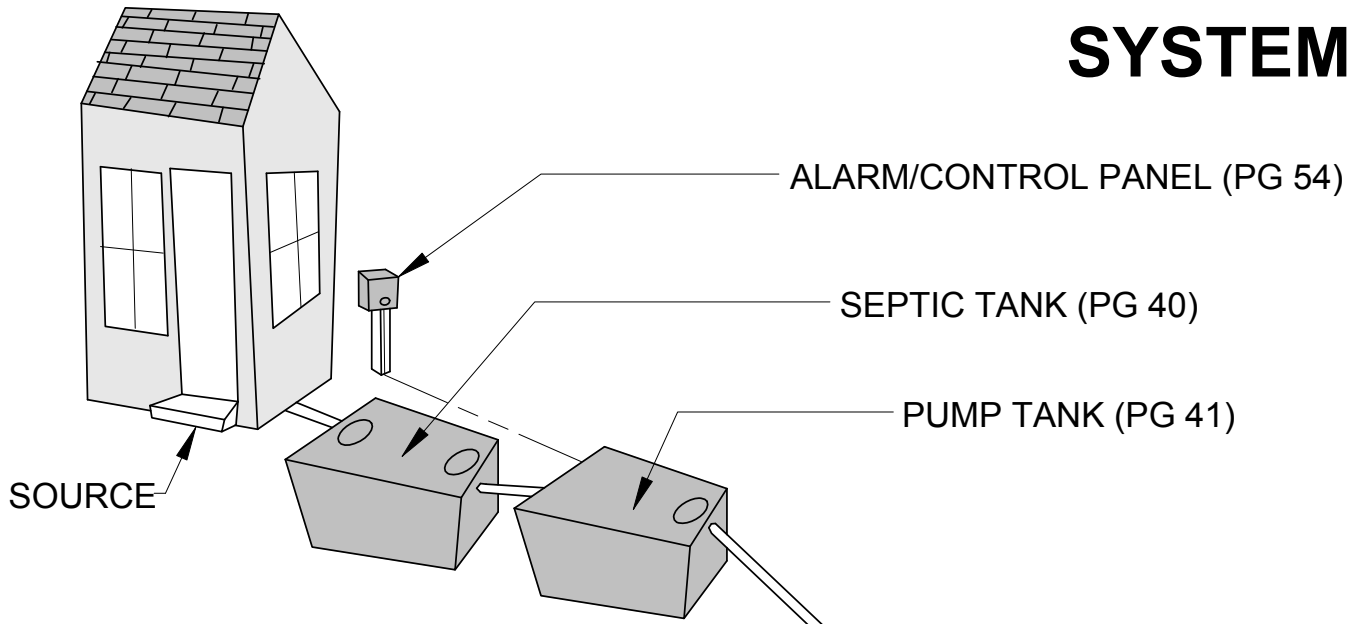


# GRAVITY SYSTEM

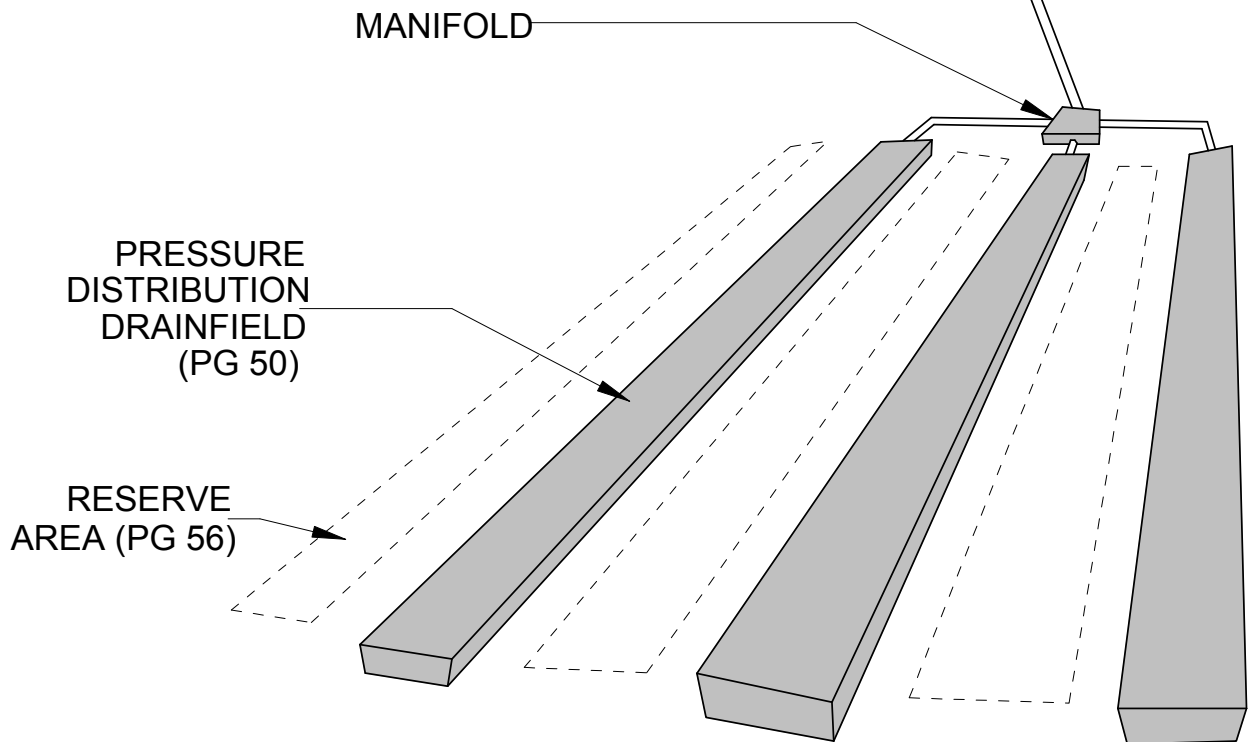


**PLEASE TURN TO THE PAGES INDICATED FOR MORE INFORMATION ON EACH SYSTEM PART.**

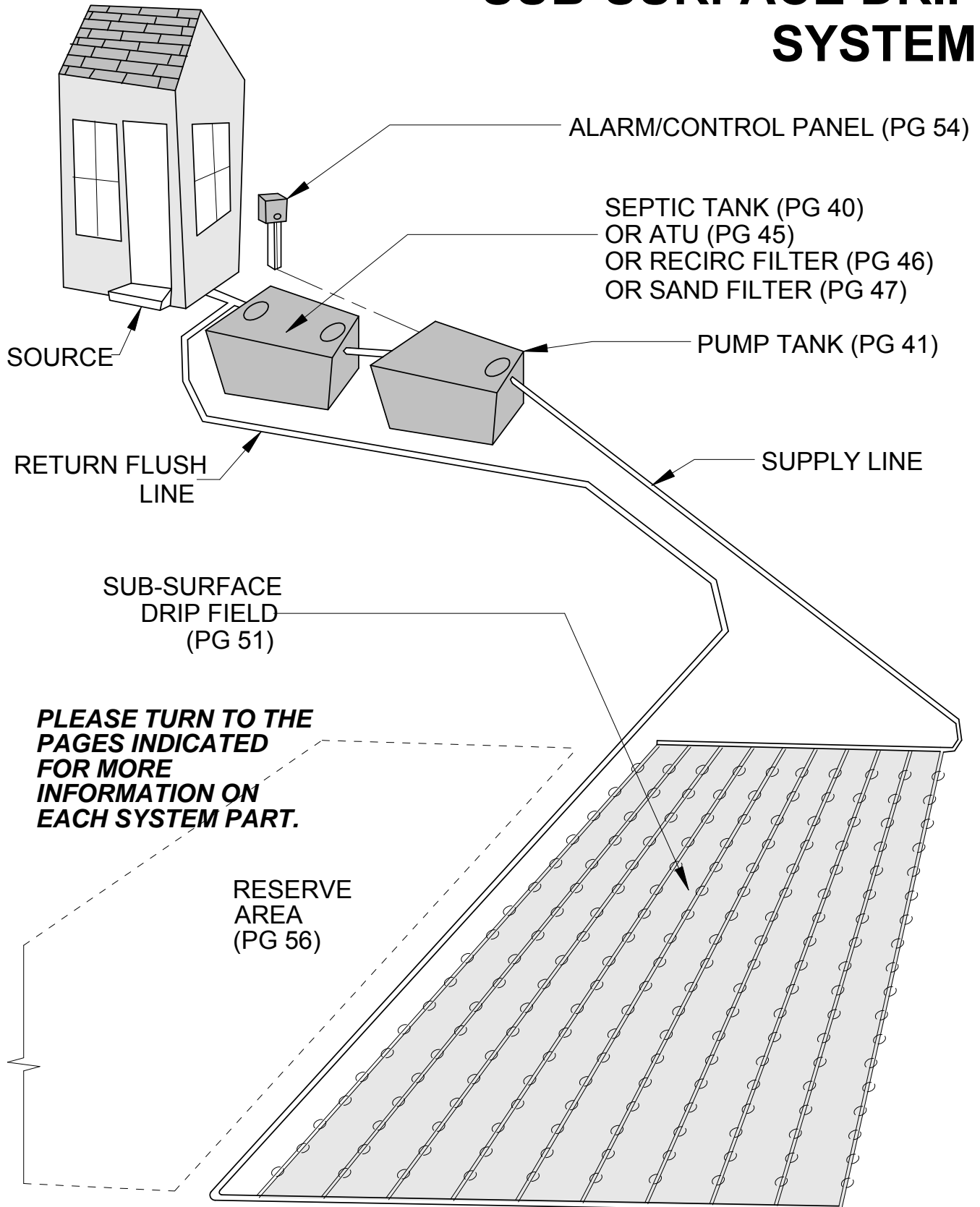
# PRESSURE SYSTEM



**PLEASE TURN TO THE PAGES INDICATED FOR MORE INFORMATION ON EACH SYSTEM PART.**



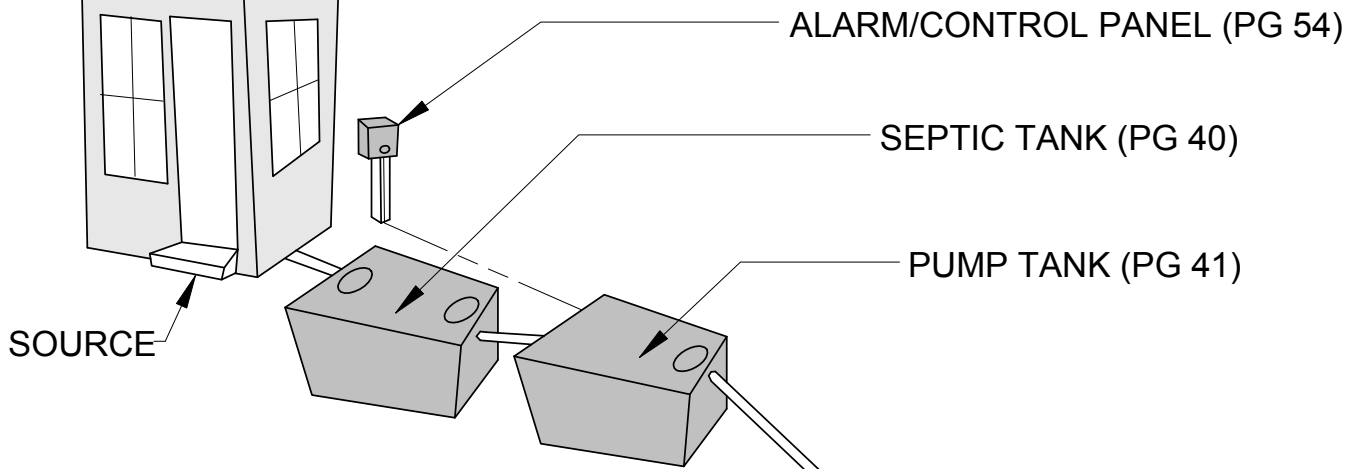
# SUB-SURFACE DRIP SYSTEM



**PLEASE TURN TO THE PAGES INDICATED FOR MORE INFORMATION ON EACH SYSTEM PART.**

RESERVE AREA (PG 56)

# GLENDON BIOFILTER® SYSTEM

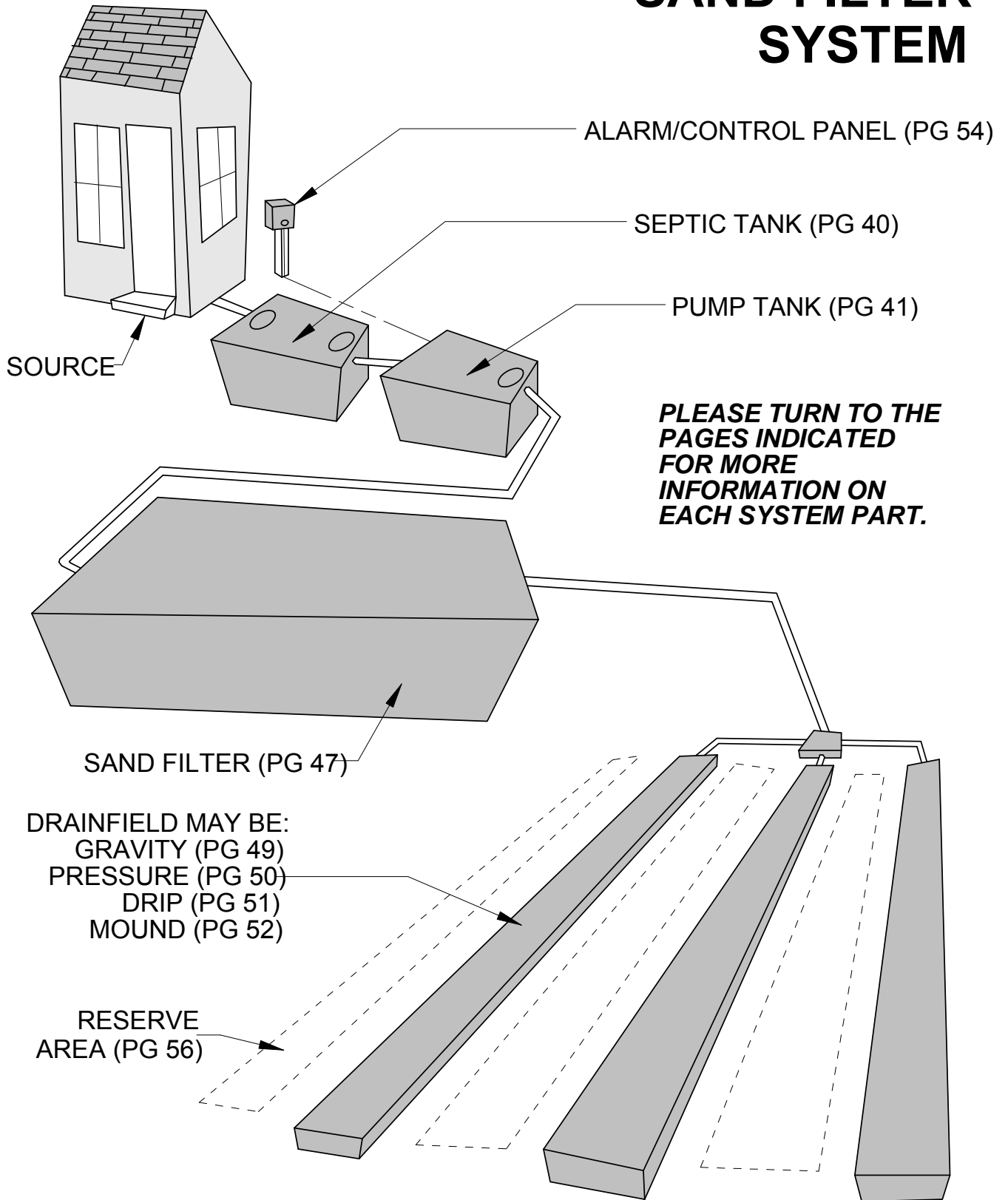


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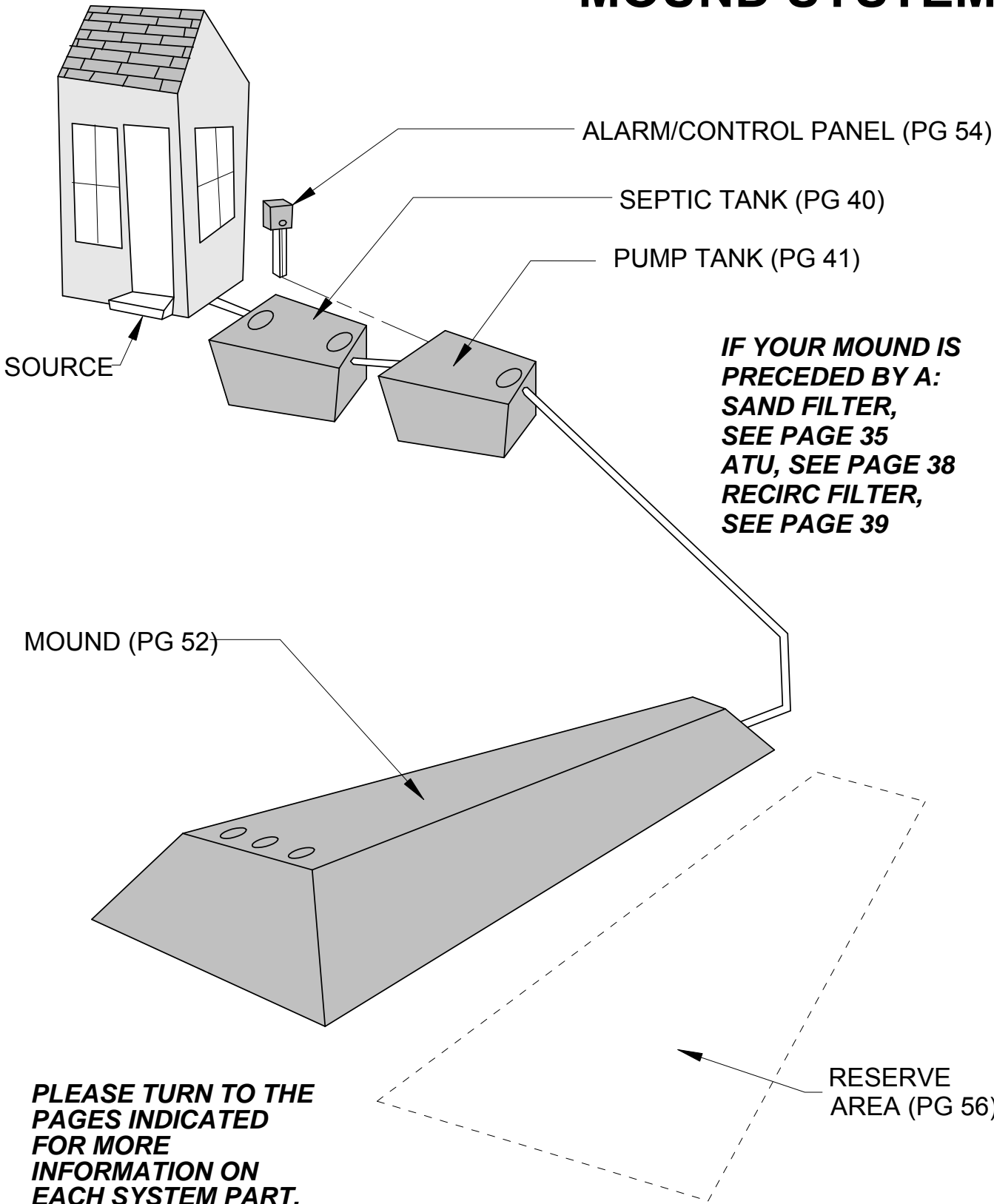
GLENDON  
BIOFILTER  
MOUNDS  
(PG 53)

RESERVE  
AREA (PG 56)

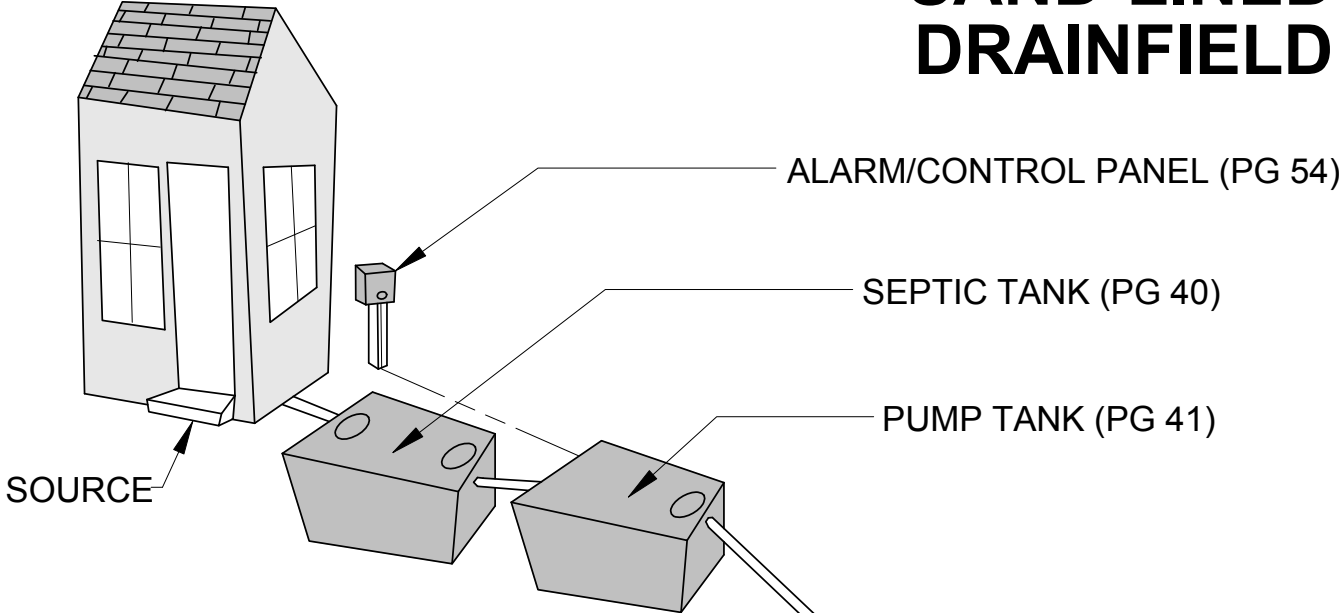
# SAND FILTER SYSTEM



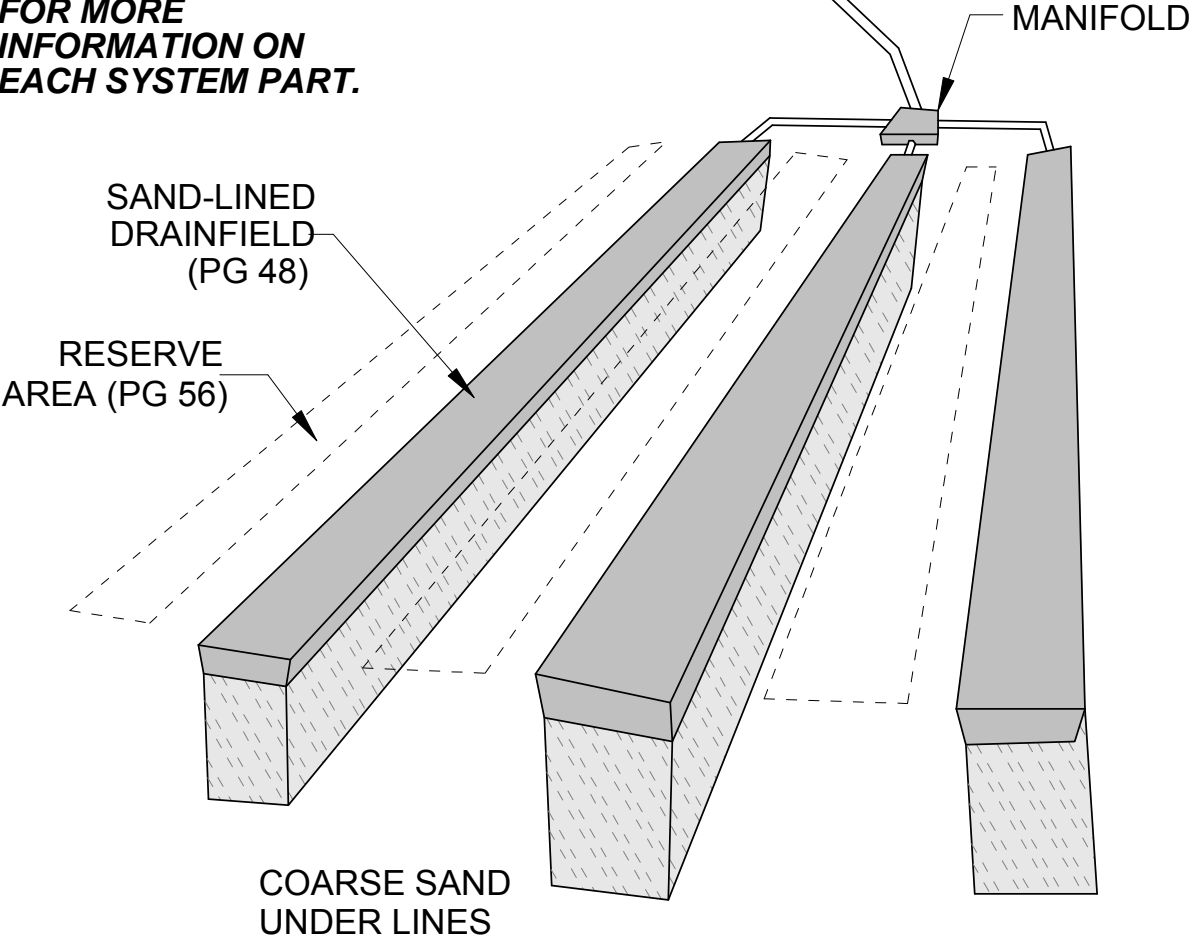
# MOUND SYSTEM



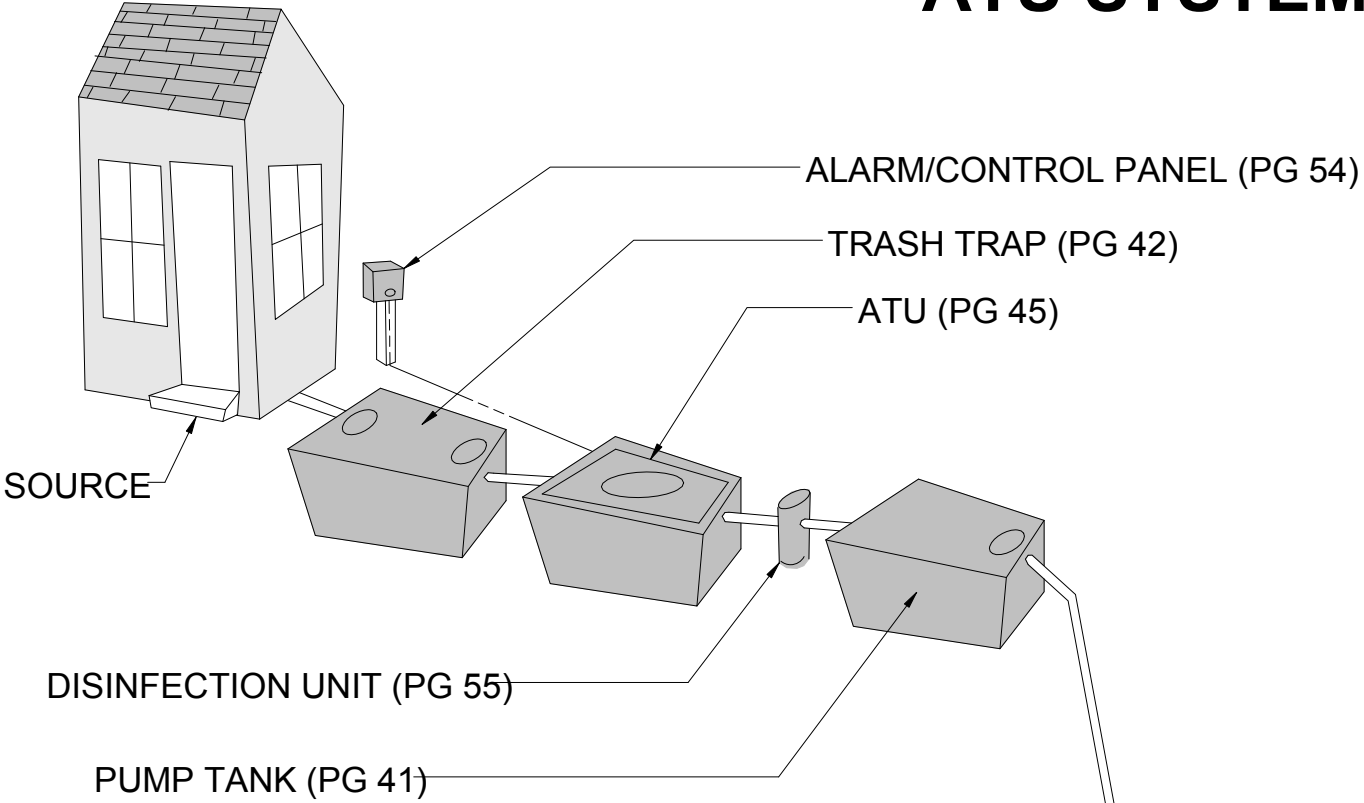
# SAND-LINED DRAINFIELD



**PLEASE TURN TO THE PAGES INDICATED FOR MORE INFORMATION ON EACH SYSTEM PART.**



# ATU SYSTEM



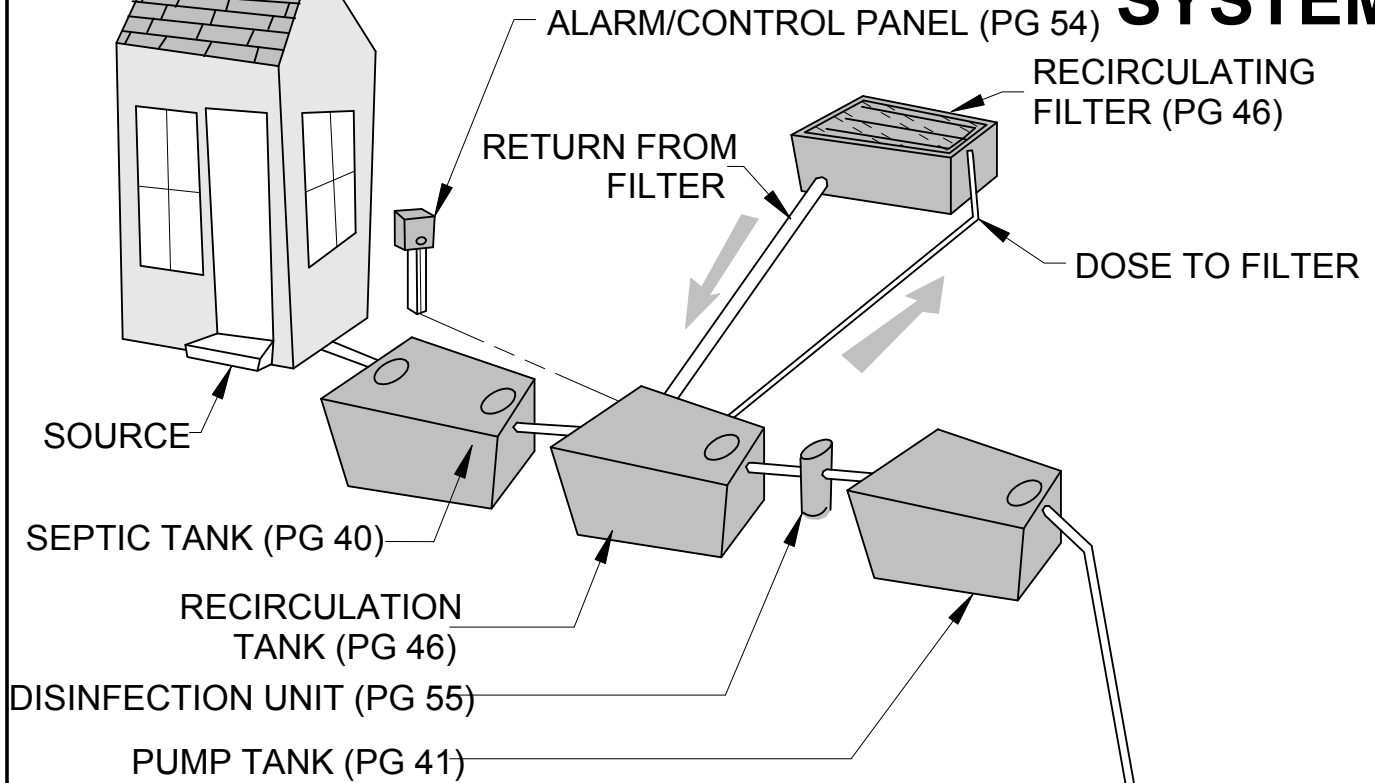
**PLEASE TURN TO THE  
PAGES INDICATED  
FOR MORE  
INFORMATION ON  
EACH SYSTEM PART.**

DRAINFIELD MAY BE:  
GRAVITY (PG 49)  
PRESSURE (PG 50)  
DRIP (PG 51)  
MOUND (PG 52)

RESERVE  
AREA (PG 56)



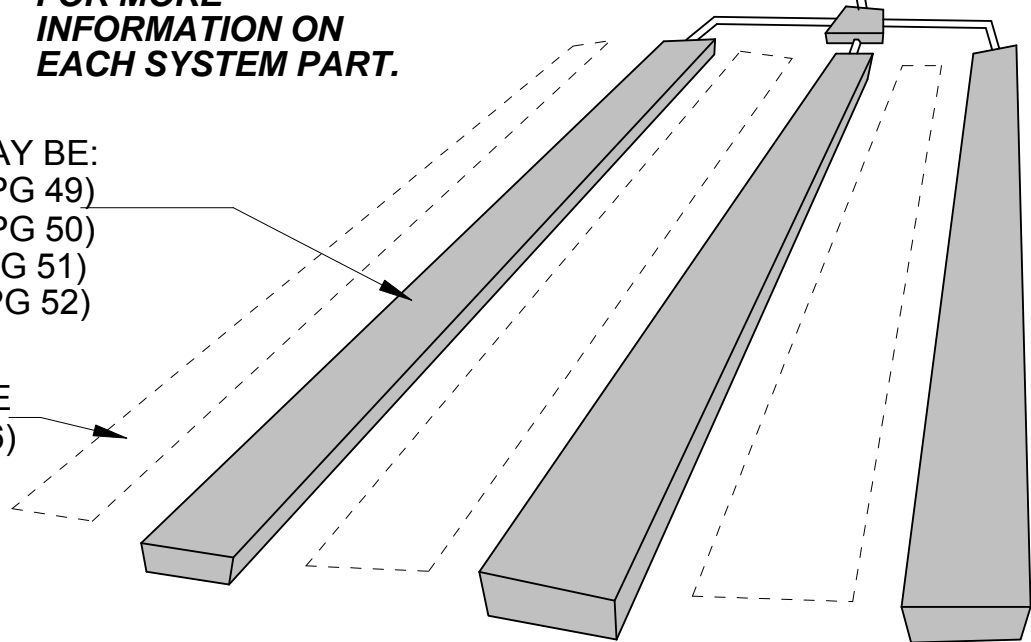
# RECIRCULATING FILTER SYSTEM



**PLEASE TURN TO THE PAGES INDICATED FOR MORE INFORMATION ON EACH SYSTEM PART.**

**DRAINFIELD MAY BE:**  
 GRAVITY (PG 49)  
 PRESSURE (PG 50)  
 DRIP (PG 51)  
 MOUND (PG 52)

**RESERVE AREA (PG 56)**



# Septic Tank

## **Description:**

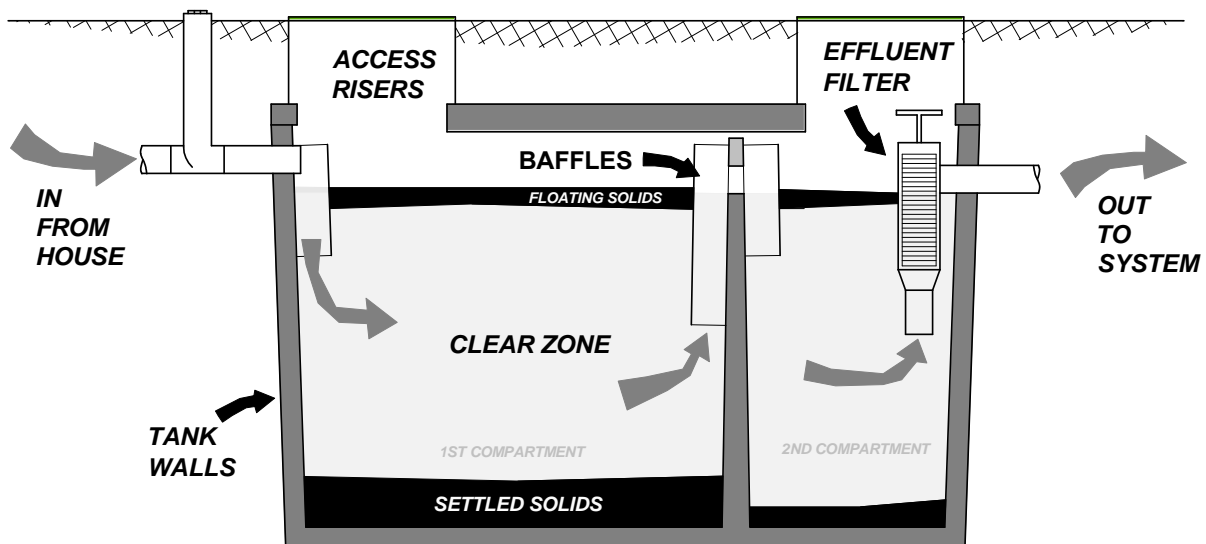
Septic tanks are under-ground tanks that receive wastewater flowing directly out of a building. They generally consist of a double-chambered, baffled tank with a filter installed in the outlet. Access risers to the surface allow the tank to be opened, pumped and checked. Older tanks are often single-compartment and may not have an outlet filter or access risers from the surface. Strongly consider having older tanks retrofitted with risers and an effluent filter for longer system life and maintainability.

## **Function:**

The septic tank is a primary tank that collects all wastewater coming into the septic system. With the use of baffles in the tank, wastewater is slowed down. This allows the heavy solids to sink and the lighter ones to float, while a clear zone forms in the middle. Clarified effluent from this clear zone is then passed on to the rest of the system.

## **Maintenance:**

- Check the septic tank annually and have it pumped when needed. (See page 21 for more information on when to pump).
- Pull and clean the effluent filter as necessary (hose solids back into tank).
- Visually inspect the tank for damage, leaks, etc.
- See Sections 1 & 2 for more information on protecting your tanks.



# Pump Tank

## **Description:**

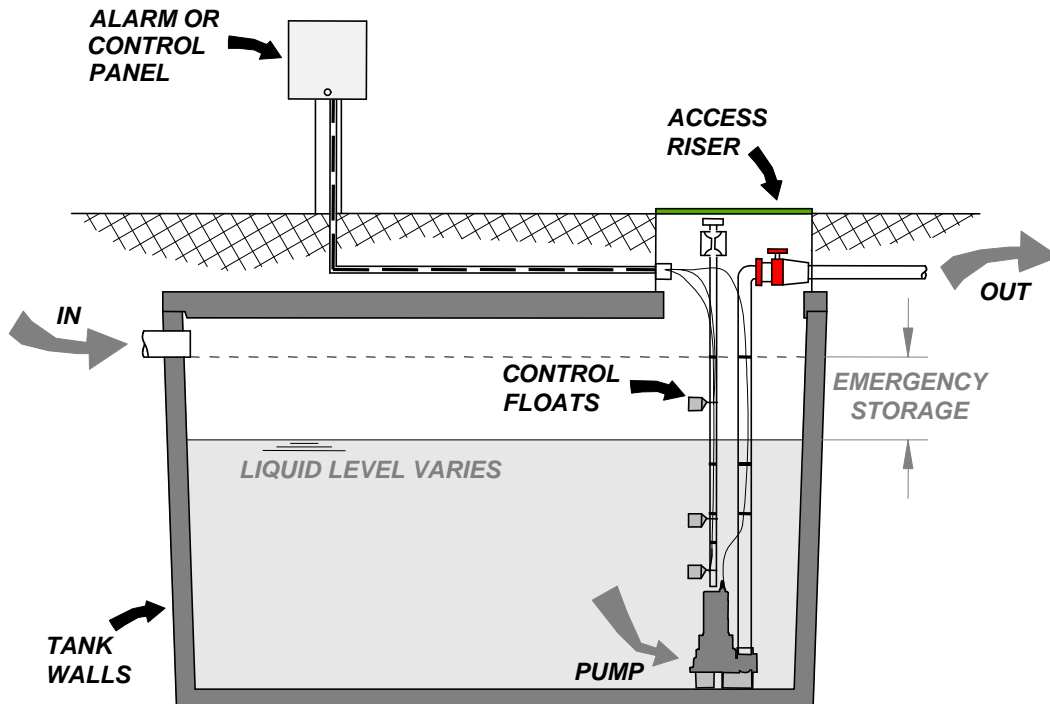
Pump tanks are under-ground tanks that receive wastewater flowing from one component – septic tank, ATU, filter, etc. – and pump it to another (drainfield, filter, etc.) Pump tanks generally consist of a single chamber with a pump, control floats and discharge line out. Access risers from the surface allow the tank to be opened, pumped and checked. Older tanks may not have risers. If so, seriously consider installing them to facilitate routine inspection and maintenance.

## **Function:**

The pump tank collects effluent coming from another component (usually a septic tank, ATU or filter) and then sends it on to another component (generally a drainfield or filter). Many pump tanks function ‘on demand’ which means that when enough water enters the tank to activate the pump switch (usually a float), the pump comes on and pumps until the switch goes off. Other pumps are controlled by a timer which limits how often and how long a pump can run.

## **Maintenance:**

- Check the pump tank whenever the septic tank or ATU is checked and pump when needed.
- Visually inspect the tank for damage, leaks, etc.
- Make sure floats swing freely and that cords are not tangled up.
- See Sections 1 & 2 for more information on protecting your tanks.



# Trash Trap

## **Description:**

Trash traps are under ground-tanks placed in front of ATUs (page 45) that receive wastewater flowing directly out of a residence, business, etc. They generally consist of a single-chambered, baffled tank. Access risers allow the tank to be opened, pumped and checked.

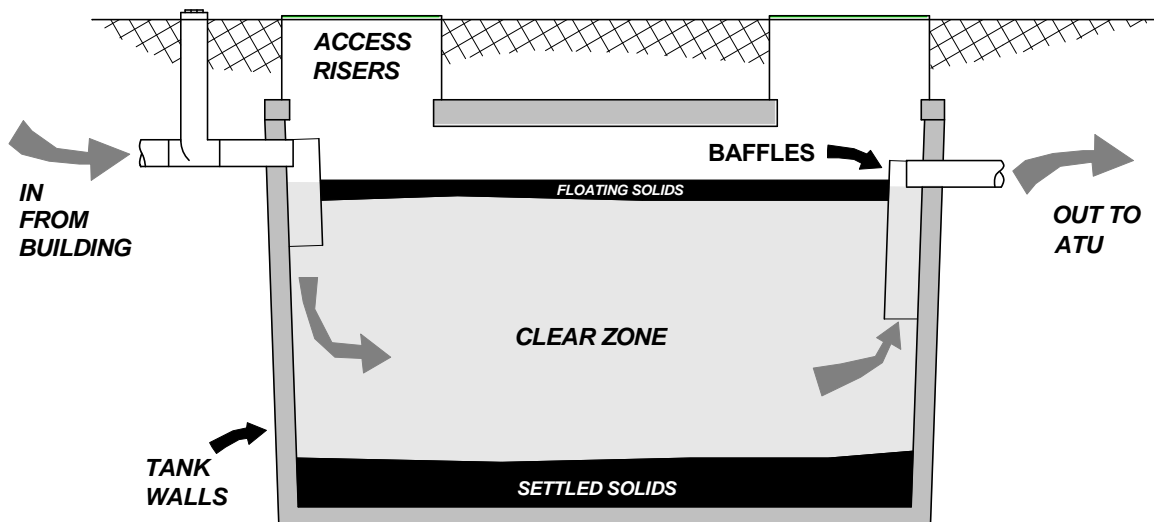
The trash trap may be a completely separate tank from the ATU, or it may be the first compartment of a multi-chambered tank with the ATU in another compartment.

## **Function:**

The trash trap is a primary tank that collects all wastewater coming into the septic system. With the use of baffles in the tank, wastewater is slowed down. This allows the heavy solids to sink and the lighter ones to float, while a clear zone forms in the middle. Clarified effluent from this clear zone is then passed on to the ATU for treatment.

## **Maintenance:**

- ATUs must be checked yearly at a minimum by a certified O&M provider.
- Check the trash trap whenever the ATU is checked and pump when needed.
- Visually inspect the tank annually for damage, leaks, etc.
- See Sections 1 & 2 for more information on protecting your tanks.



# Pump Basin

## **Description:**

Pump basins are generally plastic or fiberglass chambers housing a pump. They are usually 24" to 30" in diameter and 5' to 6' deep and can be for moving solids or liquids.

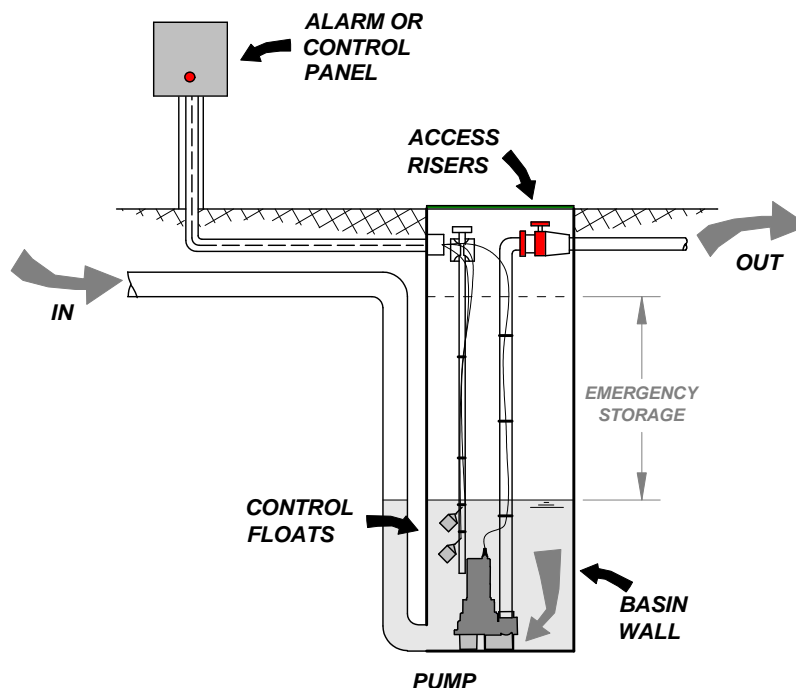
## **Function:**

'Solids' or 'grinder' pump basins are usually installed because the plumbing comes out in a place where it was not possible to install a full sized tank. These pump basins take in building wastes and pump them to a full-sized tank located somewhere else.

'Liquid' pump basins are installed as lift-stations to collect and transmit effluent between tanks, or to a drainfield.

## **Maintenance:**

- Check pump basins yearly and clean or pump as necessary.
- Solids pump basins are more prone to solids build-up and floats hanging up, so check and clean often.
- Make sure floats swing freely and that cords are not tangled up.
- Visually inspect the basin annually for damage, leaks, etc.
- See Sections 1 & 2 for more information on protecting your tanks.



# Grease Trap

## **Description:**

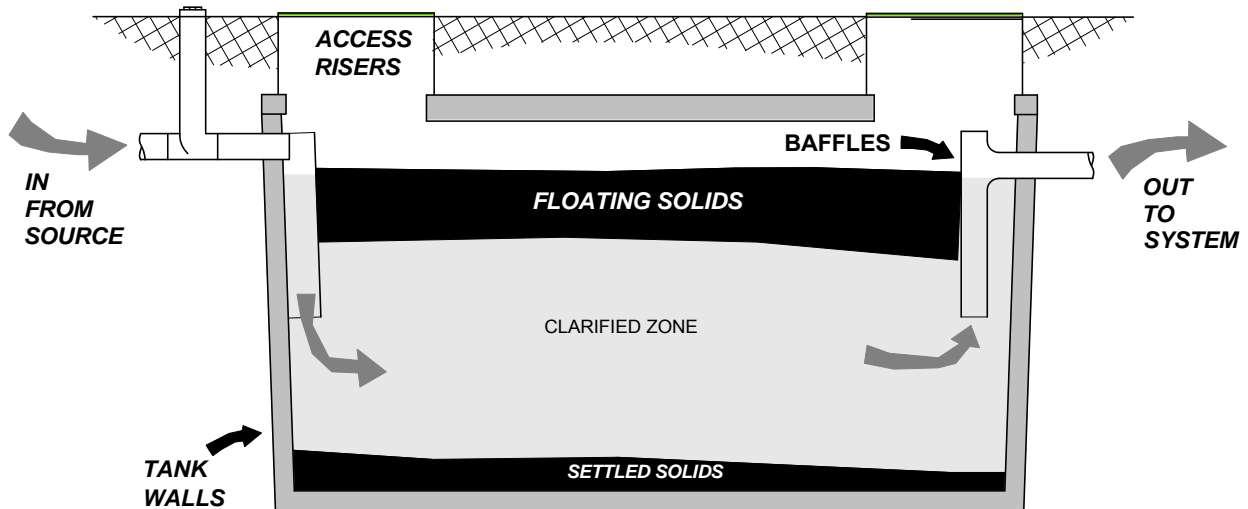
Grease traps are under-ground tanks that receive wastewater flowing directly out of a building with commercial food preparation such as a restaurant, gas station, grocery store, deli, etc. Grease traps generally consist of a single-chambered, baffled tank. Access risers allow the tank to be opened, pumped and checked.

## **Function:**

The function of the grease trap is to stop grease from entering the downstream septic system components – especially filters and drainfields. It functions much the same as a septic tank with the exception that it's generally a single compartment and the baffles go deeper in the tank to allow for more floating grease buildup.

## **Maintenance:**

- Commercial systems must be checked yearly by a certified O&M provider.
- Grease traps must be checked regularly and pumped when necessary. Depending on the establishment, this could be monthly, quarterly, annually, etc.
- Visually inspect the tank when pumping for damage, leaks, etc.
- See Sections 1 & 2 for more information on protecting your tanks.



## Aerobic Treatment Unit (ATU)

### **Description:**

An ATU is a system generally made up of a buried tank and an air-blower. Sewage first passes through a trash trap (page 42) and then enters the ATU tank where it is injected with a large volume of air and often agitated or mixed.

Some similar units are sequencing batch reactors (SBR's) and rotating biological contactors (RBC's). Function and maintenance of these units is similar to ATUs.

See the manufacturers' guidance documents for your particular system for more information on system components.

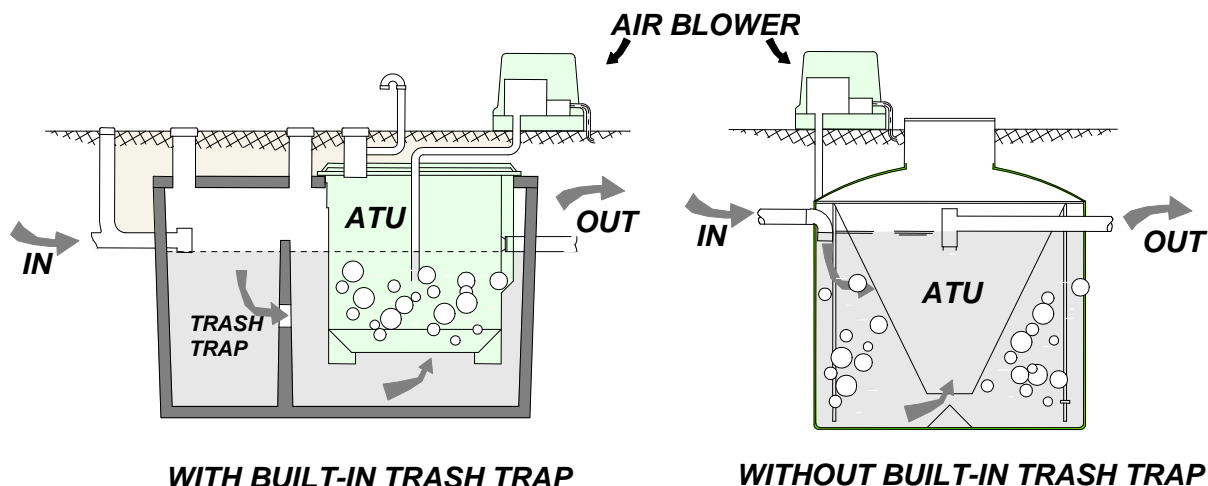
### **Function:**

The function of the ATU is to clean the wastewater to a high level before passing it on to the drainfield. The ATU creates an oxygen-rich treatment environment. Microbes consume most pollution out of the water before it passes on to the drainfield for final treatment and dispersal.

### **Maintenance:**

- ATUs must be checked a minimum of yearly by a certified O&M provider and pumped when necessary. Depending on the unit, this could be quarterly, every 6 months, annually, etc. (See manufacturer's guidance.)
- When pumping, make sure to hire a qualified person familiar with your type of ATU. Pumping these units incorrectly can easily damage them.
- Visually inspect the tank when pumping for damage, leaks, etc.
- See Sections 1 & 2 for more information on protecting your tanks.

### **EXAMPLES OF ATU's**



# Recirculating Filter

## **Description:**

A recirculating filter is a system made up of recirculation tank with a pump, a media filter pod (or pods), and a return line from the filter back to the recirculation tank. After sewage passes through a septic tank, it enters the recirculation tank where it is pumped to the filter pod(s). After flowing down through the filter, it is collected and sent back to the recirculation tank where it mixes with untreated effluent and is pumped back to the filter again. With each dose, a portion of the effluent passing through the filter is split off and sent to the drainfield (usually through a disinfection unit first). Effluent usually averages 3-5 passes through the filter.

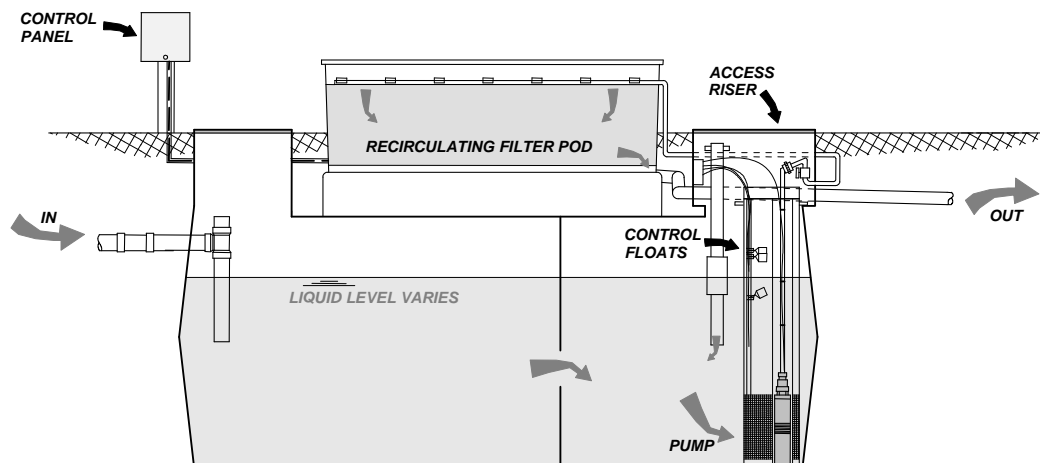
## **Function:**

The function of the recirculating filter is to clean the wastewater to a high level before passing it on to the drainfield. The filter oxygenates the effluent and creates a surface area for treatment. Microbes consume most pollution out of the water after multiple passes before it flows on to the drainfield.

## **Maintenance:**

- Recirculating Filters should be checked yearly by a certified O&M provider.
- Visually inspect the filter tank/container for damage, leaks, etc.
- Make sure floats swing freely and that cords are not tangled up.
- Check observation ports and surface of the filter for ponding water.
- Clear filter of large vegetation & ensure ports are accessible.
- Check surface of filter for soggy spots or breakouts.
- See Sections 1 & 2 for more information on protecting your tanks and filter.

## **ONE TYPE OF RECIRCULATING FILTER:**





# Sand Filter

## **Description:**

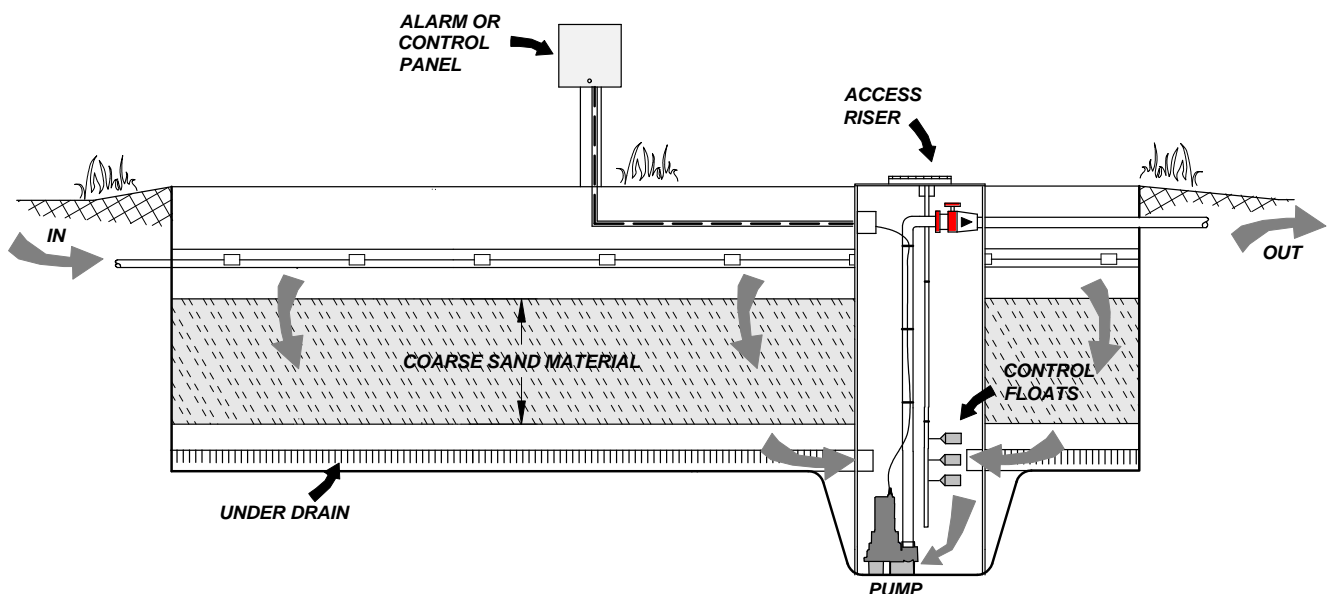
A sand filter is made up of a buried plastic liner filled with special sand and gravel. After sewage passes through a septic tank, it enters a pump tank where it is pumped to the sand filter. After flowing down through the filter, it is collected and sent to the drainfield.

## **Function:**

The function of the sand filter is to clean the wastewater to a high level before passing it on to the drainfield. The coarse-sand filter creates an oxygen-rich surface area for treatment. Microbes consume most pollution out of the water before it flows into the drainfield.

## **Maintenance:**

- Sand filters should be checked every 3 years by a certified O&M provider. Homeowners should check the system annually.
- If sand filter has a pump basin, clean and pump when needed.
- Make sure floats swing freely and that cords are not tangled up.
- Check observation ports for ponding water.
- Clear filter of large vegetation & ensure ports are accessible.
- Check surface of filter for soggy spots or breakouts.
- See Sections 1 & 2 for more information on protecting your tanks and filter.



## Sand-Lined Drainfield

### **Description:**

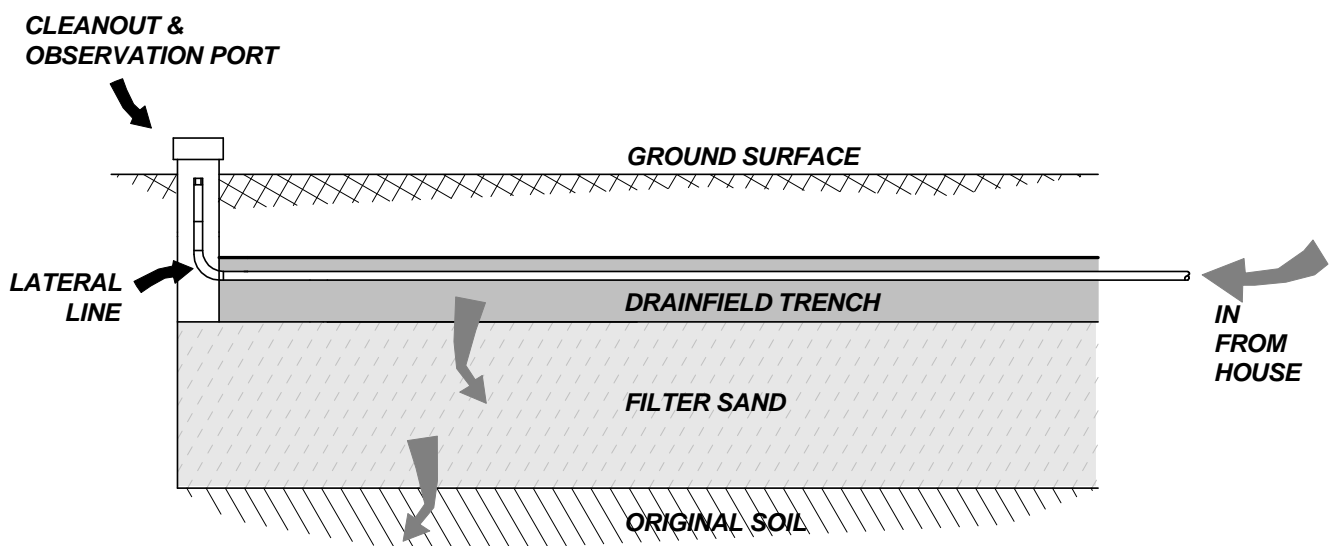
A sand-lined drainfield consists of a pressure distribution drainfield (page 50) overlaying a thick layer of filter sand, which is laid down first. Sand-lining provides extra treatment of wastewater on sites where the original soil isn't suitable (too gravelly), or where extra treatment is required.

### **Function:**

The function of the sand-lined drainfield is to clean the wastewater to a high level before passing it into the original soil. The sand creates an oxygen-rich surface area for treatment. Microbes consume most pollution out of the water as it passes through and moves into the environment.

### **Maintenance:**

- Sand-lined drainfields should be checked every 3 years by a certified O&M provider. Homeowners should check the system annually.
- Check the observation ports for ponding water.
- Have laterals flushed as needed.
- Clear drainfield of large vegetation & ensure ports are accessible.
- Check drainfield area for soggy spots or breakouts.
- See Sections 1 & 2 for more information on protecting your drainfield.



# Gravity Drainfield

## **Description:**

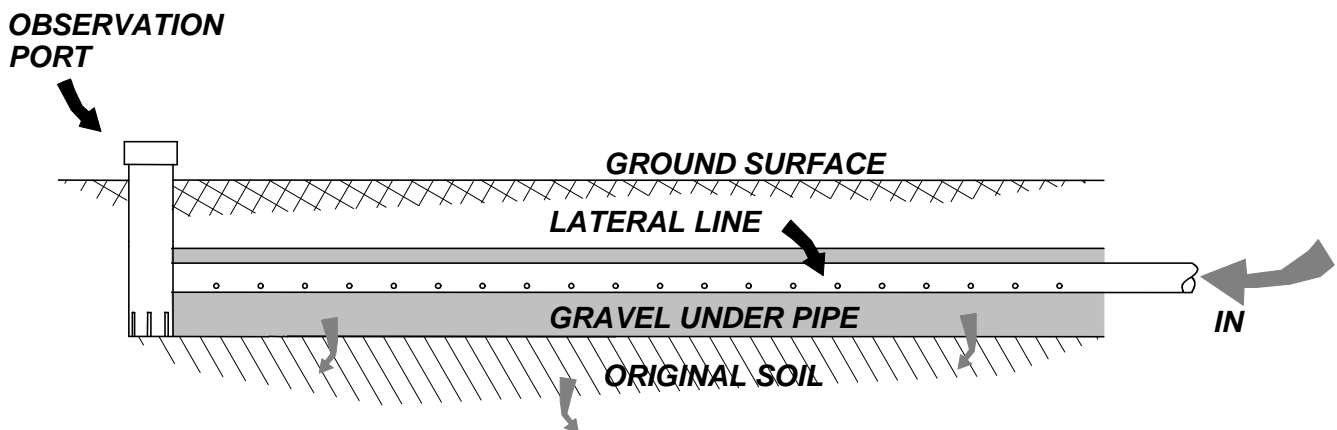
A gravity drainfield consists of a network of pipes under ground. Effluent flows to the pipes by gravity and a distribution box is used to split the flow evenly between multiple lines. The effluent flows out the bottom of the pipes through a series of small holes. It then it moves down to the bottom of the trench or bed and into the original soil.

## **Function:**

A gravity drainfield disposes of effluent by allowing it to absorb into the underlying soil. The soil provides an oxygen-rich surface area for treatment. Microbes consume most pollution out of the water as it flows through and moves into the environment.

## **Maintenance:**

- Gravity drainfields must be checked every 5 years at a minimum. Homeowner's should inspect the system annually.
- Check observation ports for ponding water.
- Clear drainfield of large vegetation & ensure ports are accessible.
- Check drainfield area for soggy spots or breakouts.
- See Sections 1 & 2 for more information on protecting your drainfield.



## Pressure Drainfield

### **Description:**

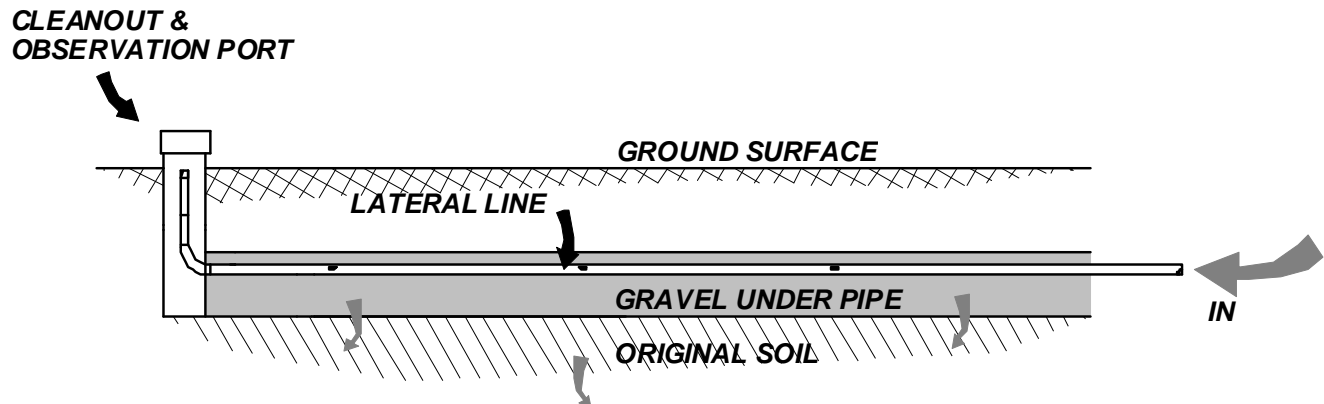
A pressure drainfield consists of a network of small pipes under ground. Effluent is pumped to the pipes under pressure and a manifold is used to split the flow evenly between multiple lines. The effluent is sprayed out of the pipes through a series of small holes, then it moves down to the bottom of the trench or bed and into the original soil.

### **Function:**

A pressure drainfield disposes of effluent by allowing it to absorb into the underlying soil. The soil provides an oxygen-rich surface area for treatment. Microbes consume most pollution out of the water as it flows through into the environment.

### **Maintenance:**

- Pressure drainfields must be checked a minimum of every 5 years. Homeowner's should inspect the system annually.
- Check the observation ports for ponding water.
- Have laterals flushed as needed.
- Clear drainfield of large vegetation & ensure ports are accessible.
- Check drainfield area for soggy spots or breakouts.
- See Sections 1 & 2 for more information on protecting your drainfield.



## Sub-Surface Drip

### **Description:**

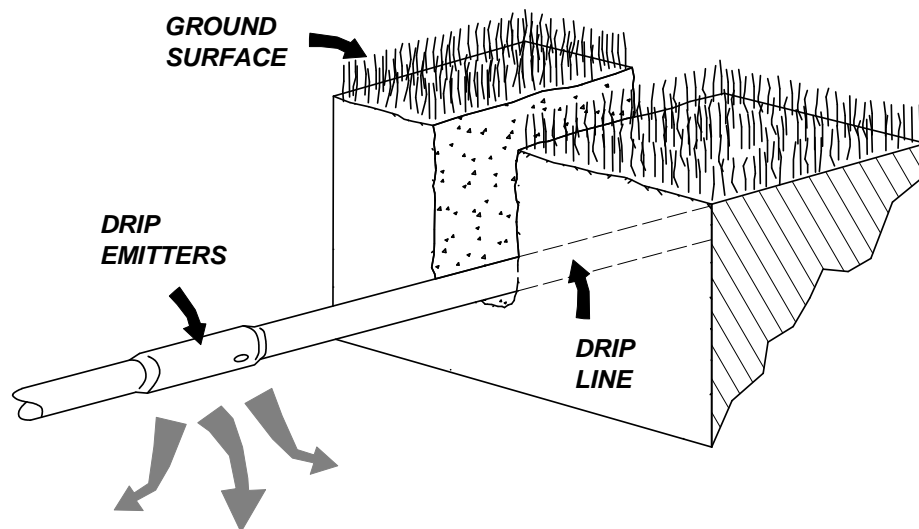
A sub-surface drip drainfield consists of a network of very small diameter plastic tubes under ground. Effluent is pumped to the tubes under pressure and a manifold is used to split the flow evenly between multiple lines. The effluent drips out of the tubing through small emitters – special holes in the pipe wall – then it moves directly into the original soil.

### **Function:**

A subsurface drip drainfield disposes of effluent by allowing it to absorb into the underlying soil. The soil provides an oxygen-rich surface area for treatment. Microbes consume most pollution out of the water as it flows through into the environment.

### **Maintenance:**

- Sub-surface drip systems must be checked yearly at a minimum by a certified O&M provider. Some systems must be checked quarterly or every 6-months – ask your designer and/or installer for more information.
- Field and filters must be flushed very frequently.
- Clear drainfield of large vegetation & ensure ports are accessible.
- Check drainfield area for soggy spots or breakouts.
- See Sections 1 & 2 for more information on protecting your drainfield..



# Mound

## **Description:**

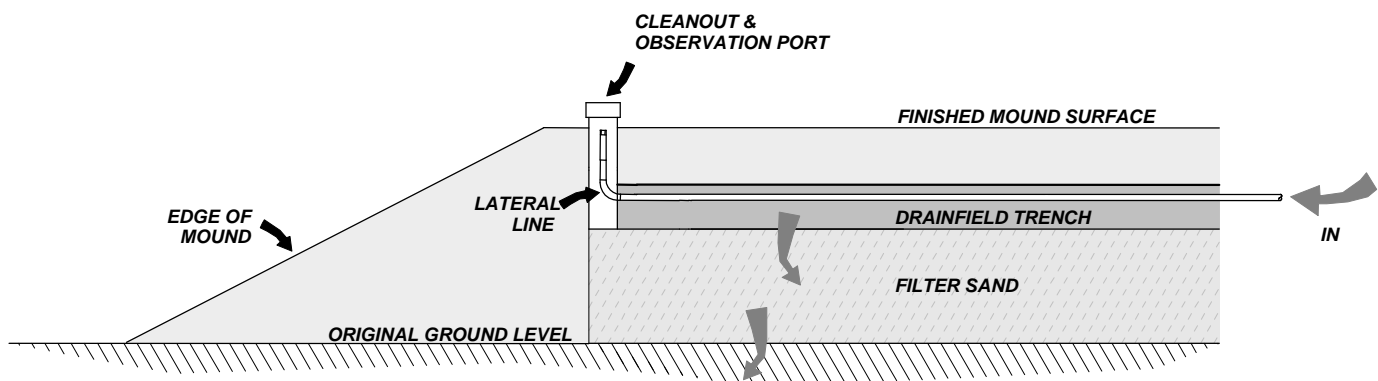
A mound consists of an elevated drainfield bed installed in a large sand berm. The pressure drainfield in the mound consists of a network of small diameter pipes. Effluent is pumped to the pipes under pressure and a manifold is used to split the flow evenly between multiple lines. The effluent is sprayed out of the pipes through a series of small holes, then it moves down through the filter sand for treatment.

## **Function:**

The function of the mound is to clean the wastewater to a high level before passing it into the underlying soil. The mound sand provides an oxygen-rich surface area for treatment. Microbes consume most pollution out of the water as it flows through to the underlying original soil for dispersal.

## **Maintenance:**

- Mounds should be checked every 3 years by a certified O&M provider. Homeowners should check the system annually.
- Check observation ports for ponding water.
- Have laterals flushed as needed.
- Clear mound of large vegetation & ensure ports are accessible.
- Ensure the mound's shape is maintained. Plant grass, etc. to keep sand from sloughing. DO NOT FILL around mound to make it level.
- Check surface of mound for soggy spots or breakouts.
- See Sections 1 & 2 for more information on protecting your drainfield.



# Glendon Biofilter®

## **Description:**

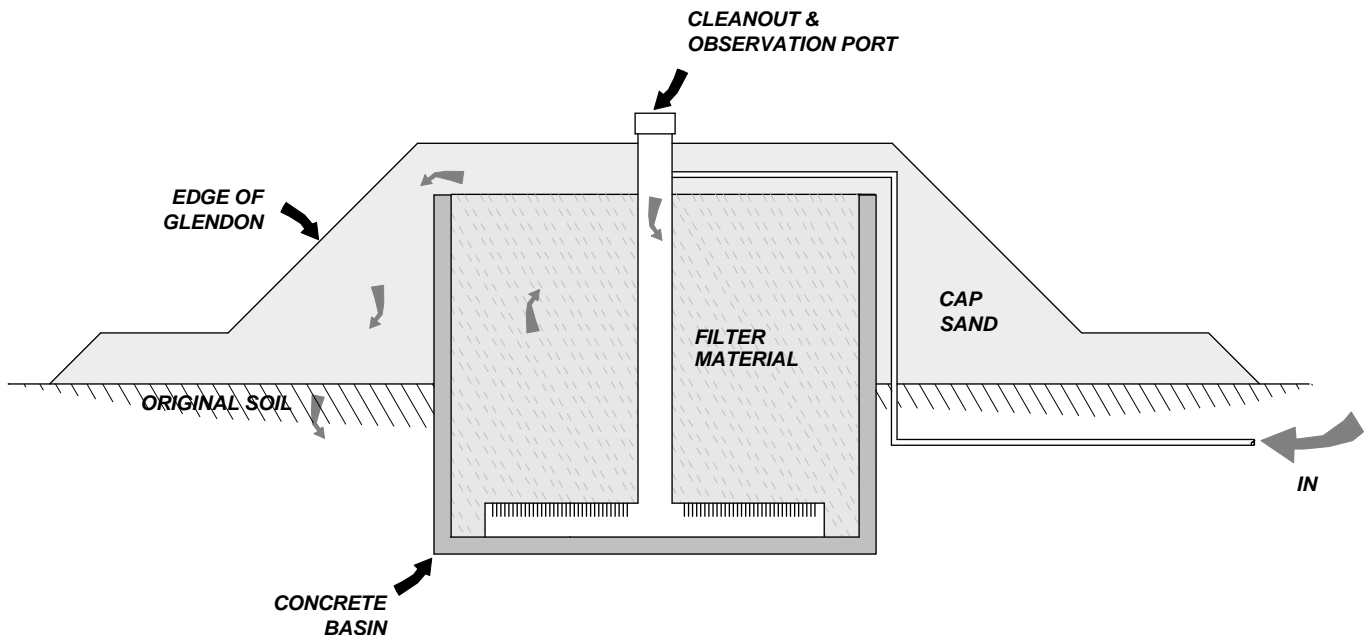
A Glendon Biofilter® is made up of a buried basin – usually a concrete tank – filled with sand and gravel. After sewage passes through a septic tank, it enters a pump tank where it is pumped to the Biofilter®. After moving into the bottom of the basin, it flows up through the layers of media. It then moves over the rim of the basin and down into the sand-covered area surrounding the unit where it absorbs into the original soil.

## **Function:**

The function of the Glendon Biofilter® is to clean the wastewater to a high level before passing it into the underlying original soil. The basin provides mechanical filtration and anaerobic breakdown of wastes. The mound sand provides an oxygen-rich surface area for treatment. Microbes consume most pollution out of the water as it flows through to the underlying original soil for dispersal.

## **Maintenance:**

- Glendon Biofilters® must be checked yearly by a certified O&M provider.
- Check basins for solids build up when other tanks are checked. Pump as needed.
- Check surface of mounds for soggy spots or breakouts.
- Clear mounds of large vegetation & ensure ports are accessible.
- Ensure the mound shapes are maintained. Plant grass, etc. to keep sand from sloughing. DO NOT FILL around/between mounds to make them level.
- See Sections 1 & 2 for more information on protecting your drainfield.



## Alarm & Control Panels

### *Description:*

Alarm and control panels are electrical boxes mounted near the system tanks which give off audible and visual signals when the system is experiencing malfunction. They also may contain controls, timers, counters, meters, data collectors, etc. which run your system.

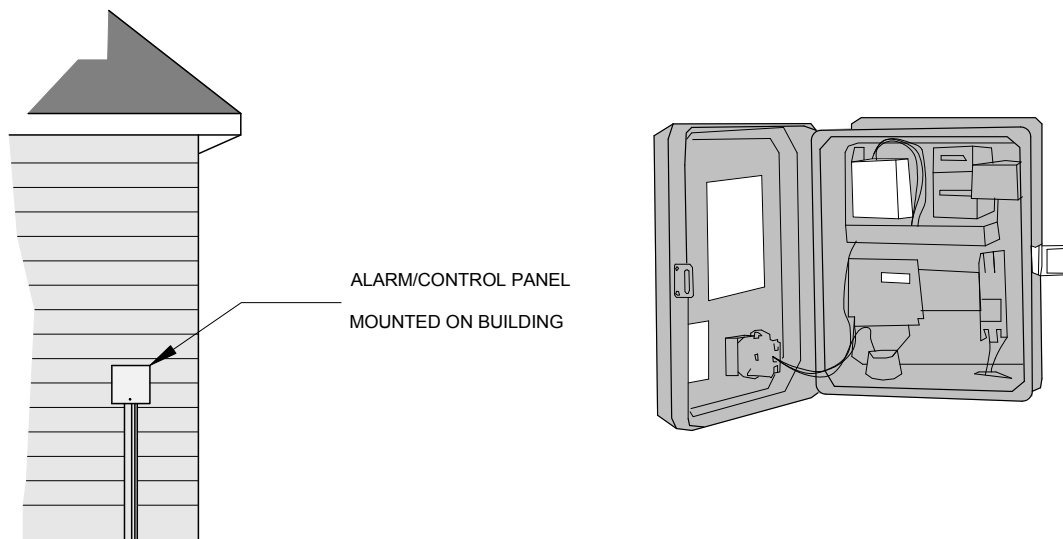
### *Function:*

The function of the alarm is to alert you to problems with the system. The signal is a very loud annoying ring or buzz in addition to a flashing light. If you observe an alarm, you should take action immediately to correct whatever is causing the problem.

For more information on alarms see page 25. For trouble-shooting see page 28.

### *Maintenance:*

- Respond to alarms as needed.
- Most alarms are caused by water over use in the house. Cut back on water use. If alarms persist, call a professional.
- Make sure power supply to control and alarm panels remains on. **Do not turn off breakers when going out of town, etc.**
- DO NOT tamper with settings inside the panel. This may damage the system and void your warranty. Call a professional.
- See Sections 1 & 2 for more information on maintaining and protecting your system.





# Disinfection Units

## Description:

Disinfection units are small devices that are designed to kill bacteria in wastewater as it passes through them. The two most common types are ultra-violet lights and chlorination units. Both of these units are usually located near the tanks in small pipes containing either a UV light bulb, or chlorine tablets. The wastewater enters the unit, comes in contact with the UV or Chlorine, before exiting.

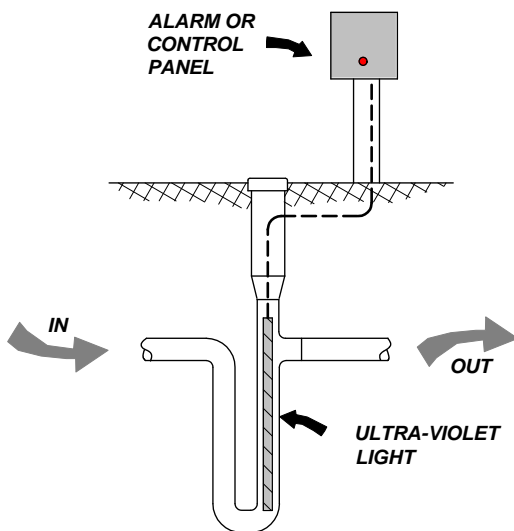
## Function:

The function of the disinfection unit is to kill harmful bacteria, viruses and other pathogens present in the wastewater. This reduces the potential human health risk once the water flows through the drainfield and into the environment.

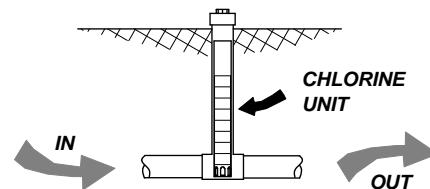
## Maintenance:

- Disinfection units are part of ATU or recirculating filter systems, which must be checked annually at a minimum by a certified O&M provider.
- Make sure that power to the disinfection unit remains on at all times.
- A certified maintenance provider will clean unit when necessary and replace bulbs or chemicals as needed.

### ULTRA-VIOLET DISINFECTION UNIT



### CHLORINATION DISINFECTION UNIT



# Reserve Area

## **Description:**

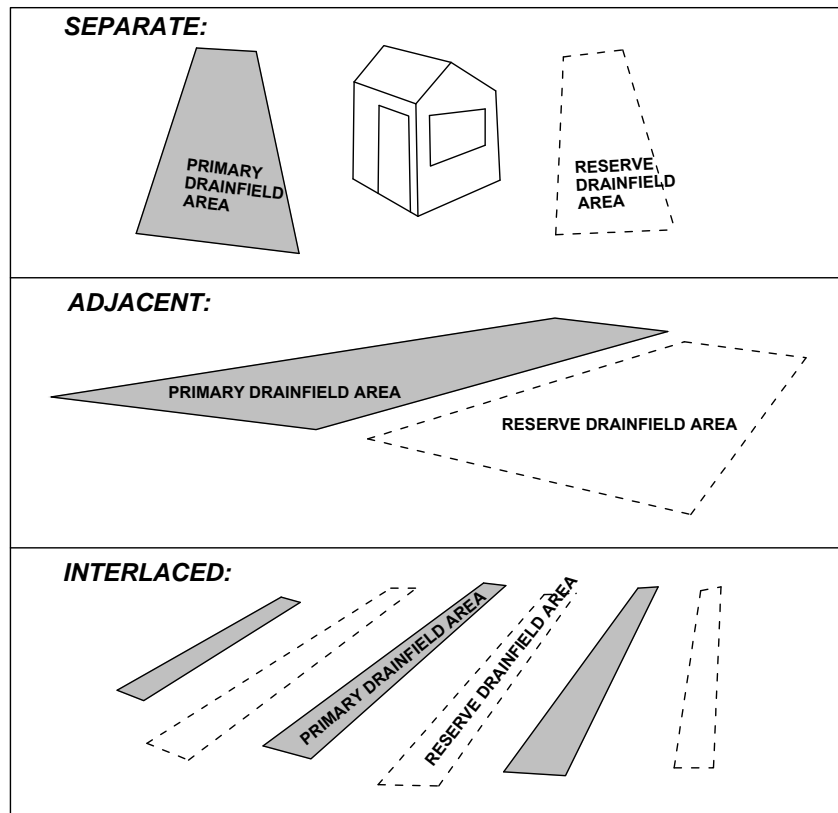
Your reserve drainfield area consists of an appropriately sized and located space in which to build another drainfield. It may be a completely separate area from your primary (installed) drainfield, or it may be adjacent to or interlaced with your primary field. Check your septic design to determine the location of your reserve area.

## **Function:**

Your reserve drainfield area is the area you will use to replace your primary system should it ever fail.

## **Maintenance:**

- Check your reserve area whenever you check the rest of your system.
- Treat your reserve area like you treat your drainfield.
- See sections 1 & 2 for more information on protecting your reserve area.



## Commercial Systems

*The wastewater system is a critical component on which your business success ultimately depends. Proper use, care and maintenance will ensure its longevity.*

### Variability:

It is *critical* to remember that in any commercial system, uses change, flow patterns shift, traffic fluctuates seasonally and also as a business becomes more popular. New employees, new fixtures, even new cleaning products can cause system changes and fluctuations.

The design calculations for your system are merely a jumping off point based on educated guesses. This is why ongoing system O&M is critical to diagnose changes and prevent problems “as you go” instead of waiting until there is an obvious problem and then trying to fix it – by which time it may be considerably complex and costly compared to preventative actions not taken.

### O&M Requirements for Commercial Systems:

Commercial septic systems should be checked yearly at a minimum by a qualified O&M provider who can analyze flows and sample waste strength. Food-prep operations with grease traps may need to be checked more frequently.

The long-term functioning of a commercial system requires pro-active O&M. In addition to the specific guidance outlined in this manual regarding your system components, proper O&M of a commercial system includes **tracking**:

- **Solids Accumulation** in grease traps, septic & pump tanks, etc. and pumping at the appropriate frequency.
- **Waste-Strength** (BOD5, FOG) to ensure appropriate levels are being met. Conduct annual sampling and lab testing to ensure waste strength is being met. If it is consistently high, you may have to expand the system.
- **Water Use** – immediately address any flows exceeding 60-70% of designed capacity. Running at capacity all the time will overload your system.
- **System Data** (alarms, problems, maintenance, etc.) and keeping a log.
- **Mechanical Operation** of system components to ensure proper function.
- **Employee Behavior** – habits and products put into the system – to ensure optimal conditions (i.e. scraping food into trash bins instead of washing down drains, using minimal amounts of abrasive chemicals for cleaning so as not to inhibit biological growth in system components, etc.).

### Fight The Flow

High flows are a major problem with many commercial systems. Understand that your ‘design’ flow is a maximum. If you ask your system to do the ‘max’ every

day, it isn't going to last over the long haul. Ideal flows are 60-70% of your stated 'design flow'. To lower flows, install low-flow fixtures and monitor employee habits to cut down on waste. Turn off drip water to pea-traps, route ice machine water to outside drains and do laundry off-site. Figure out everywhere water is being used and cut it back to the maximum extent possible.

### **Easy on the Cleaners**

Excessive cleaning is often required in commercial operations. Try to use less abrasive chemicals and cleaners if possible and always try to use minimal amounts. High amounts of harsh chemicals and cleaners end up killing the helpful bacteria in the tanks and drainfield. This at best causes the system to operate inefficiently. At worst, it will destroy the system and you'll find yourself with a costly repair.

### **Cut Through the FOG**

FOG – fat (and food), oil and grease – can be managed to minimize the discharge to the septic system and decrease maintenance of grease traps. By preventing the introduction of FOG into the septic system you reduce the burden on the grease traps and reduce maintenance time, costs and disposal fees.

#### ***Cleanup Tips:***

- Use rubber scrapers to remove FOG from cookware, utensils, chafing dishes and serving ware. Disposing of grease by recycling or in the garbage is cheaper than frequent tank pumping.
- Dry-wipe pots, pans and dishes before washing them. Dispose of wastes in the trash, not the sink! Extra solids create high-strength waste.
- Use absorbent material to soak up oil and grease under fryer baskets.
- Use paper towels to wipe down pots, pans, machines, work areas, etc. Cloth towels will accumulate grease and oil that will eventually end up in your drains from doing laundry.
- Place drain screens in all sinks and floor drains. Dump these solids in the trash.
- Get rid of garbage disposals – they create high-strength waste and cause the tanks to fill with solids faster, costing you more money for pumping.
- Keep water temperature in sinks at 140 degrees F or below.
- Post "NO GREASE" signs at appropriate locations such as above sink drains.
- Train kitchen staff in management practices and methods to reduce the volume of grease discharged to the septic system.
- Clean grease traps regularly and keep records. If grease level is at the max, increase cleanout frequency. If grease levels are minimal, reduce frequency.
  - Witness cleaning and maintenance events. Ensure they are performed completely and properly. Ensure all solids are removed during pumping and make sure components are put back together correctly when finished.

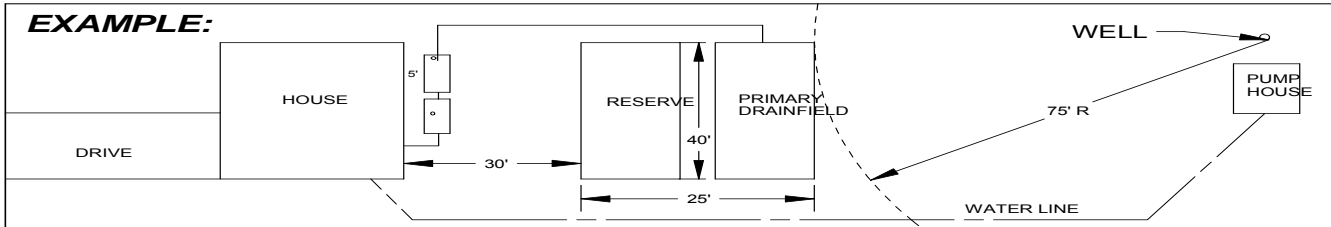
# As-Built Worksheet

Use the grid below to create a sketch of your system area.

Use a pencil so you can erase if necessary.

Be sure to include:

- Buildings
- Driveway
- Wells
- Water lines
- Tanks
- Sewer lines
- Valves or D-boxes
- Sand or other filters
- Drainfield lines
- Observation ports
- Reserve area
- Show distances in ft.



A large grid area for sketching the system area.

## Maintenance Record Log

<b>DATE:</b>	<b>ACTION TAKEN:</b>	<b>SERVICE PROVIDER:</b>	<b>NOTES:</b>

**Make additional copies of this sheet as necessary and keep them with your records**