

Your Name and/or Company
Registered Onsite Wastewater Practitioner
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Owner's Manual for Sewerage System at 1234 Anywhere Road, Any City, BC

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OWNER'S RESPONSIBILITIES:

The Sewerage System Regulation includes regulatory requirements that property owners should be aware of, and are obliged to comply with including the following:

1. Owners are required to ensure that the system be maintained in accordance with the maintenance plan. The maintenance plan is filed with the local Health Authority and a copy is included in this package of documents. The maintenance plan specifies that the initial maintenance service should occur within three months. Subsequent maintenance service must be completed no later than every two years thereafter, for this type 1 system.
2. Maintenance (and construction or repair) must be done only by Authorized Persons who hold registration certificates as a Professional, or Registered Onsite Wastewater Practitioner. My recommended service provider is Acme Maintenance Services (250 123 4567). Alternatively, maintenance could be provided by any other authorized maintenance provider. Check the Applied Science Technologist's and Technicians of BC (ASTTBC) website for a current listing of Authorized Persons <http://owrp.asttbc.org/c/finder.php>
3. Owners must maintain records of maintenance and repairs carried out.
4. Owners must ensure that the system does not cause or contribute to a health hazard - which can be caused by misuse, overuse, or neglect. Overloading the system, discharging sewage with inappropriate materials, neglecting repairs and maintenance are key factors that can contribute to the owner's liability.

The owner must ensure the system is not overloaded:

Your system includes a 1200 gallon concrete septic tank, followed with a 400 gallon concrete pump chamber. The pump sends effluent to a soil dispersal system (drain field). Each of these components is designed for a specific volume of sewage.

Your system is designed for residential sewage with peak flow volume of 1600 L (350 gallons) in any individual day. Average flows in any 30 day period should not exceed 50% of the peak volume design flow - this equals an average flow allowance of 800 L (175 gallons) per day. These design flow volumes are a conservative allowance for the expected flow under normal use of your four bedroom residence.

Prolonged flows in excess of this design capacity will overload the system. This can cause premature failure of the system and expensive repairs. It can also cause damage to the environment and/or cause effluent to appear at ground surface, which will pose a health hazard to humans. Health regulation violations and liability can result.

Although you are not expected to accurately determine and monitor the daily flow volume, you are advised to use a common sense approach to avoid overloading the system. The control panel includes features to measure the volume of sewage discharged to the system, and your authorized Maintenance Provider will determine if your actual flow volume is appropriate for the system.

If changes occur that cause increased sewage flow volume, the system design should be reviewed by an Authorized Person. Changes to the system may be required to accommodate greater flow volume. Examples of changes that affect the flow volume include: installing water treatment systems with backflush discharge to the sewer, renovations, increased occupancy, starting a home based business, etc.

The system is designed to treat typical domestic sewage - not commercial or industrial waste. Introducing "high strength" sewage or discharging materials and chemicals that are harmful to bacteria can severely reduce the treatment ability of the system. If changes occur that cause changes to the characteristics of the sewage, the system design should be reviewed by an Authorized Person. Changes to the system may be required to accommodate changes in sewage characteristics. Examples of changes that affect the type of sewage include: adding water softener systems, adding in-sink garbage disposal units, commercial or industrial uses with discharge to the septic system, some hobbies like photography darkrooms, wine and beer making, etc.

See the Do's and Don'ts section of this manual for more information on how to avoid misuse of the system.

Record keeping:

Please keep your records (as required by the regulation) including the Health Authority forms, design documents, the drawings, this owner's manual, and the maintenance plan. Copies of these documents have been filed with the local Health Authority as required by the regulation. Anyone performing maintenance or repairs should review these documents prior to working on the system.

Maintenance:

The Sewerage System Regulation requires owners to ensure their systems are maintained by Authorized Persons as per the directions in the maintenance plan. Lack of effective maintenance is an offense and increases your potential liability. Proper maintenance will help prevent sewage backups into the buildings, and will protect your investment by ensuring long life of the system. Unmaintained systems can fail within a few years.

The specified interval for inspection and maintenance of your Type 1 treatment system with pressure distribution is **3 months after start up and every 24 months thereafter.**

Details of the prescribed maintenance tasks are listed in the maintenance plan as a separate technical document intended for the trained and authorized Maintenance Provider. A simplified overview is included here for the owner's information.

The maintenance tasks will include:

- Examination of all components of the system for safe, leak-free, and efficient operation.
- Checking the control panel record of flow volume and comparing usage to the design capacity of the system.

- Examination of the septic tank to determine whether pumping out of solids is required.
- The pump chamber will be examined to confirm proper operation of the high level alarm, the effluent pump and control systems.
- The forcemain and dispersal system piping will be flushed to remove accumulations of solids from the pipes and to prevent clogging of the 'squirt holes'.
- A 'squirt test' will be conducted to confirm even distribution, leak free condition and absence of orifice clogging in the dispersal laterals.
- ... and other maintenance and monitoring tasks as required.

OVERVIEW OF THE SYSTEM:

An overview of the system is included here (as required by the Standard Practice Manual) to help you understand how the system works, how to avoid improper use, how to recognize performance problems and what to do when problems occur. Please refer to the drawings included in your package of documents, and take the time to familiarize yourself with the location and function of the components.

The importance of bacteria:

Treatment processes in your wastewater system rely primarily on bacteria. A huge number and variety of bacteria grow inside the septic tank, and within the soil dispersal area. Bacteria break down the organic solids and help to remove harmful components of the wastewater. Proper use of the system encourages bacteria growth. Improper use can drastically reduce bacteria growth.

Bacteria thrive when they have oxygen and an abundant supply of bio degradable material to consume. Human waste is the best source of bacteria and the best 'food' for bacteria. It is not necessary to add anything else to promote bacteria (i.e. additives).

Materials that reduce or 'kill off' bacteria include many of the common household cleaning products, disinfectants, bleach, liquid drain cleaners, some cosmetics, some pharmaceuticals, paints, solvents, petroleum products and other common products. Use a common sense approach to reduce or eliminate materials that harm bacteria.

The importance of soil based treatment:

Soil is the most important factor for effective treatment in onsite wastewater systems. One gram of soil can have 100 million to 3 billion bacteria – which are essential for sewage treatment.

It is very important to keep the soil in the dispersal area relatively dry by not overloading the system with excessive sewage flows, by avoiding excessive irrigation and by ensuring surface water flows are controlled/diverted from the drainfield. Saturated soil offers poor treatment. Dryer soil provides much better treatment. Overloading the system increases soil saturation and reduces the depth of 'dry' soil.

It is also important to avoid compaction of soil over the dispersal system and within the adjacent area - this could occur from traffic of any kind, buildings, pathways, heavy farm animals or similar uses that cause compaction of soil. The depth of cover soil over the drain field pipes is only

six to twelve inches deep. The shallow depth is selected to promote evaporation of effluent and oxygen transfer. Grass or similar vegetative cover with shallow and non-invasive roots is required.

A very common cause of septic system failure is clogging of the soil by fats, oils and grease. **Avoid, reduce, and control the quantities of fats, oils, and grease** from food preparation that enters the septic system. The do's and don'ts section later in this manual has further guidance.

Frequent overloading of the soil (i.e. when sewage volume exceeds the average daily design allowance) is the most common cause of reduced system life and system failure.

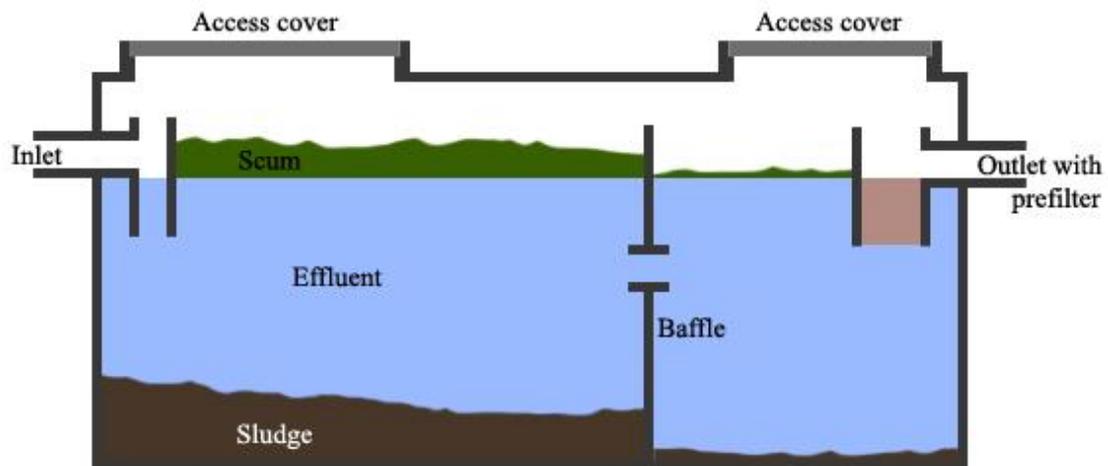
The primary septic tank:

The purpose of the septic tank is to provide settling of solids and provide initial bacteriological break down of organic materials. The main goal of the septic tank is to reduce the amount of suspended solids passing through the system so that the soil clogging effects are minimized and the life span of the soil dispersal system is increased.

Wastewater from the plumbing system of the residence will flow into a 1200 gallon septic tank, located in the front yard next to the driveway. The tank has two compartments. Larger particles settle to the bottom of the first compartment as sludge. Lighter materials including fats, oils, and grease form a scum layer floating at the surface.

The wall separating the two compartments in the septic tank has an opening approximately 1/3 of the height below the liquid surface to allow flow only from the 'clear zone' of the first compartment. This prevents most of the solid material of the bottom and top layers from entering the second compartment. At the outlet of the second compartment, a pipe baffle with a filter further reduces suspended solids.

Typical Septic Tank



Monitoring the buildup of these layers of solids and making sure the tanks are pumped out when appropriate is an important part of the maintenance procedures. When solids build up in the first compartment, the liquid capacity decreases, the retention time is shortened and the settling effect is reduced. Eventually, solids will build up to the height of the baffle opening between the

two compartments. Solids will 'carry over' to the second compartment and will accelerate clogging of the effluent filter. Despite the inclusion of an effluent filter, solids that escape from the first compartment tend to move through the entire system as small suspended particles. These particles contribute to soil clogging in the drain field - ultimately causing system failure and requiring expensive re building of the dispersal system.

Solids must be pumped out of the septic tank before the level in the first compartment becomes excessive. On the other hand, pumping out the septic tank prematurely is not advised. The disturbance of a pump-out causes increased suspended solids to carry over to the soil, and in general a "mature" septic tank with a well-developed bacteria population does a better job of treatment. Measuring these layers during maintenance ensures you only pay for pumper services when required. **Typically, pumping of septic tank solids is required every three to seven years.**

The effluent pump and pump chamber:

Effluent flows from the septic tank to a 400 gallon pump chamber with a 3/4 HP effluent pump. The pump sends effluent to the drain field. The pump is controlled by float switches within the pump chamber and a programmable control panel mounted adjacent to the pump chamber.

As the level of liquid rises, the "start" float switch activates the pump to send flow under pressure to the dispersal field. The pump dose is intentionally small to reduce the saturation of soil in the drain field - providing better treatment. The pump runs less than 1 minute per dose. The control panel has features to keep track of the volume discharged to the soil dispersal system over time.

The pump chamber is also equipped with a higher float switch that activates a high level alarm. This indicates failure of the pump or other problem that has caused the liquid level within the pump chamber to rise excessively.

The audible and visual alarm is part of the control panel. If the alarm is activated, you may still use the system since there is a reserve volume above the alarm float position of approximately 800 L (175 G). This allows limited use in the event of a power failure, or failure of the pump **BUT** be aware of the limited reserve volume. Sewage flow volume exceeding the reserve will cause backups into the house.

Note that, in the event of a BC Hydro power failure, neither the effluent pump nor the high level alarm will operate. Your on site well pump will presumably also not be operating without power service, but if you supply emergency power (i.e. genset) to the well pump, any water use will increase sewage levels in tanks without the effluent pump switching on – **sewage will back up into the house if you exceed the reserve capacity. During a power outage this can happen without activation of the high level alarm.**

Also note that when power service returns, the high level alarm may sound until the effluent pump lowers the liquid level in the pump chamber. This may take a few minutes.

If the cause of the high liquid level (alarm event) is a power outage, the pump will operate when power is restored and the alarm will turn off automatically when the liquid level returns to normal. However, if the alarm persists, the cause of the high level (alarm) is failure of the pump or controls; you will need to call one of the emergency contacts listed in this manual (or other

Authorized Person) to make repairs. **The alarm can be silenced by activating the spring loaded switch on the outside (left side) of the control panel.** This does not permanently disable the alarm - it will operate normally next time the liquid rises above the intended height.

The dispersal field:

The dispersal system is a pressure distribution drain field on a raised sand mound, located in the front yard. The dispersal system is intended to evenly distribute wastewater to soil, where treatment occurs from biological activity and filtering effects of the soil. Wastewater is evenly distributed to the soil dispersal area by a shallow system of pressurized pipes with small 'squirt holes'.

The dispersal system piping is installed as shallow as possible (approximately 6 to 12 inches of cover soil) to promote oxygen supply to the bacteria in the soil. Evaporation and uptake by vegetation are also encouraged by shallow placement. Maintaining appropriate vegetation (generally grass) over the drain field is important. Vegetation helps to establish and maintain soil permeability and air flow, prevents excessive compaction, and promotes growth of bacteria and other organisms. It is important that the owner maintains grass (or similar shallow rooted vegetation), and prevents the site from being overrun with weeds or aggressive long rooted plants. Excessive thistles, broom, alders, or similar - will destroy the system.

The drain field is configured as a raised sand mound with a shallow rectangular dispersal bed. The bed is 2.7 m x 22 m. There are three pressurized, 1 ¼ inch diameter lines, 90 cm apart. Effluent is pumped through 'squirt holes' (small – 3/16 inch diameter holes) drilled in these lines approximately 62 cm (24 inches) apart. When the pump operates, these holes evenly distribute the effluent over the entire area of the dispersal field. The underlying native soil provides treatment before the liquid is reintegrated into the natural groundwater.

A 62 mm (2 ½ inch) force main is installed from your pump chamber to a manifold at the centre of the drain field. The manifold splits the flow to the 1 ¼ inch dispersal pipes within the drain field. Each of these lateral dispersal pipes is equipped with a ball valve (6) at the manifold so that each lateral line can be shut off independently in the event of leaks or to facilitate flushing for maintenance. Each of these valves is enclosed in a 6 inch diameter plastic access port, with a green lid installed flush with the surface.

Each of the pressurized dispersal lateral pipes is fitted with a threaded cleanout cap at the far end (opposite end than the valves). Each of these cleanouts (6) is enclosed in a 6 inch diameter plastic access port, with a green lid installed flush with the surface. Pressure testing (squirt testing) these lines for even distribution, and flushing to reduce solids build-up is part of the scheduled maintenance service.

Note that strips of greener grass on the top surface of the dispersal area are normal. This is caused by increased water and nutrients dispersed to the soil from the pressure distribution pipes – but very wet or spongy grass in any areas of the system could indicate a leak. Leaks or any sign of effluent pose a serious health risk and must be immediately repaired.

CAUTIONS AND SAFETY WARNINGS:

- Gases within the septic tank and the pump chamber can be explosive and/or cause asphyxiation. DO NOT extend your head into tank openings and DO NOT enter tank risers or tanks at any time. Lids are to be properly secured at all times.
- When lids are removed from access openings to tanks there is a severe tripping and falling hazard. Falling into a septic tank can cause serious injury or death. If you remove any of the tank lids for any reason, ensure the safety of all bystanders and be sure to secure the lids correctly after service.
- Sewage poses a health risk from viruses, parasites, disease-causing bacteria and other pathogens. Avoid contact. If exposure occurs, ensure effective clean up and disinfection.
- The onsite wastewater system includes electrical components which pose an electrocution hazard. If malfunctions occur - especially sewage back-ups and floods – immediately disconnect the electrical service to the sewerage system at the electrical service panel for the house ('breaker box'). There is also a breaker within the sewerage system control panel that can provide another means of disconnection of power to the pump chamber. Never open any tank or the internal portions of the control panel while circuits are "live". Avoid any contact with any tank, control panel, or junction box if malfunctions have caused liquids to back up, unless you are completely confident that electrical service has been disconnected.
- Preferably, leave any maintenance or repair tasks to qualified service providers.

DO'S AND DON'TS:

Proper use of the system involves the following strategies:

1. Promote bacteria growth by avoiding products and chemicals that will reduce or 'kill off' bacteria growth.
2. Minimize non-biodegradable material.
3. Minimize fats, oils, and grease.
4. Do not overload the system beyond its capacity to treat the sewage.

Professional maintenance of the system is critical. Ensure that maintenance is carried out as per the maintenance plan. Note that the recommended maintenance interval for this system is every 24 months.

Here's a list of tips to ensure proper treatment and long life of your system:

- Avoid, reduce, and eliminate when possible, the use of disinfectants, bleach, and any products that kill bacteria. Limited quantities of domestic strength bleach for laundry, and occasional use of typical household disinfectant cleaners is generally OK, but avoid excessive use.
- Do not use Drano or Liquid Plumber style products to clear clogged plumbing – they are very damaging to bacteria.
- Do not put into the system any of the following: lubricating oils, greases, other petroleum products, antifreeze or other automotive fluids, chemical wastes, toxins, paints, solvents, thinners, caustic cleaners, pesticides, herbicides.

- **Avoid, reduce, and control the quantities of fats, oils, and grease** from food preparation that enter the septic system. They are difficult to break down in the septic tank, and can drastically shorten the life of the system by clogging the soil in the dispersal system. Limited quantities are inevitable and OK, but it is important to use strategies to reduce fats oils and grease - for example, collect fat from fried foods and oil from deep frying, etc., in tin cans or similar – and dispose of as much fat as possible in the garbage rather than the plumbing system.
- Avoid putting non-biodegradable material into the system, or other materials that decompose slowly. They will cause quicker buildup of solids in the septic tank and increase the required frequency of septage pump out.
- Objects like the following should not be put into the system: dental floss, bandages, strings, rags, cotton balls, coffee grounds, paper towels, condoms, disposable diapers, cigarette butts, plastics, metals, kitty litter, and other materials that do not decompose easily. Do not flush kitty litter, even if the product claims to be “septic friendly” - severe clogging of the effluent filter will result, and other damage to the system may occur.
- Hair can cause thickening and matting of the scum in the tank by entangling other solids, and can cause clogging of the effluent filter. Laundry lint poses a similar problem. Some hair and lint is unavoidable and OK, but minimize the amount of hair and lint entering the system. Dispose of hair and laundry dryer lint in the garbage.
- In-sink garbage disposal units increase the organic matter entering the system and should not be used unless the system is designed and sized to accommodate the increased organic loading. Composting or disposal in the garbage of waste food is always preferable to disposal in the sewage system.
- Be aware of the volume of wastewater going into the system. Try to “even out” the flows when feasible. For example, doing the entire week’s laundry for a large household all in one day can cause excessive volume and reduced treatment.
- Irrigation over the mound or drain field should be closely monitored. It should be sufficient to ensure healthy grass growth but excessive amounts of water should be avoided. Saturated soil provides poor treatment.
- Protect the dispersal field.
 - Keep traffic and heavy loads off the distribution area, and the tanks.
 - Don’t build any structures over any part of the system.
 - Don’t place any impervious materials over the dispersal soil.
 - Don’t allow heavy farm animals on the system – they compact soil and can damage components.
 - Restrict access over the dispersal field for bicycles, ATVs, motorcycles, snow mobiles etc.
 - Keep surface flows of water away from dispersal field and tanks.
 - Grow vegetation with shallow root systems (grass is good – willows are bad!). Keep weeds under control - especially invasive and long rooted vegetation such as alder trees, scotch broom, thistles.

- There must not be any connections to the wastewater system of water softeners, water treatment devices, floor drains, roof drains, foundation perimeter drains, lawn drains, car wash drains, oil separators or any other secondary sources.
- Maintenance, troubleshooting, and repair procedures will require quick and easy access to the lids for the septic tank, pump chamber, and also to the small lawn boxes in the soil dispersal system for the valves and cleanouts. Keep these lids exposed and readily accessible.

EMERGENCY CONTACTS:

If the high level alarm goes off, remember the limited reserve capacity (allows limited use only), and stop flows to the system before the reserve volume is exceeded and sewage back up occurs. Call an authorized maintenance provider to investigate the cause of the high level in the pump chamber.

If sewage has backed up into the house, take practical measures to control the flood (e.g. create barriers on the floor with rolled up towels, or similar measures), and remember that exposure to sewage poses health risks. Septic pumpers can deal with the immediate issue – pump out the tank to stop sewage backup, and they are generally able to make simple emergency repairs.

Significant repairs and full maintenance service must be done by Authorized Persons with Maintenance Provider certification. Contact Acme Maintenance Services (250 123 4567) or any authorized maintenance provider if you notice leaks, effluent on the ground, sewage backups or anything you see that could cause a health hazard.

Local authorized service contractors include:

Super Suck 250 234 5678

Elite Septic Pumpers 250 345 6789