

# MUNICIPALITY OF ANCHORAGE



Development Services Department  
On-Site Water & Wastewater Section

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## On-Site Water and Wastewater Systems for Single Family Homes & Duplexes

**An Owner's Guide for Operation and Maintenance**



May 2023

# DESIGN AND INSTALLATION OF WASTEWATER SYSTEMS

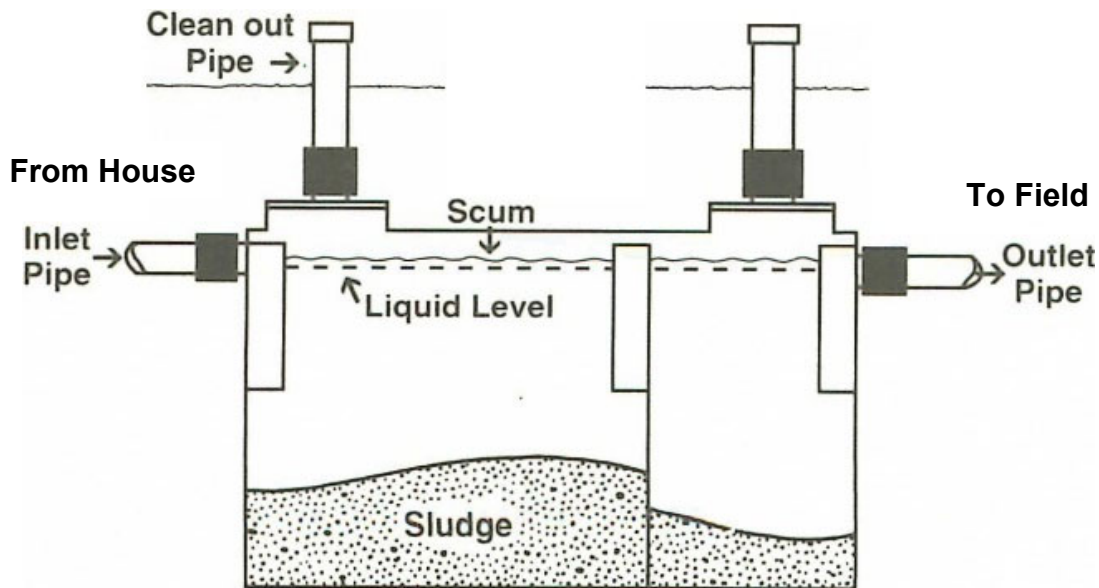
Unless wastewater disposal is given adequate consideration in the planning of a home, the problems with design, installation and maintenance of the system may be burdensome and, in some cases, financially prohibitive or technically infeasible. In general, the location of the septic system depends upon several factors:

- Absorbing quality of the soil;
- Depth to the seasonally high groundwater table and/or impervious layer;
- Size and slope of the lot;
- Original & replacement disposal field requirements;
- Distance to wells and other water supply system elements; and
- Distance to streams, lakes, and other surface water.

A permit is required prior to the installation, upgrade, or modification of a septic system. The design and inspection of the system must be performed by a civil or environmental engineer registered in the State of Alaska. Advanced wastewater treatment systems (AWWTS) are available where site conditions preclude the construction of conventional systems. A temporary holding tank may also be permitted under limited conditions.

## DESCRIPTION

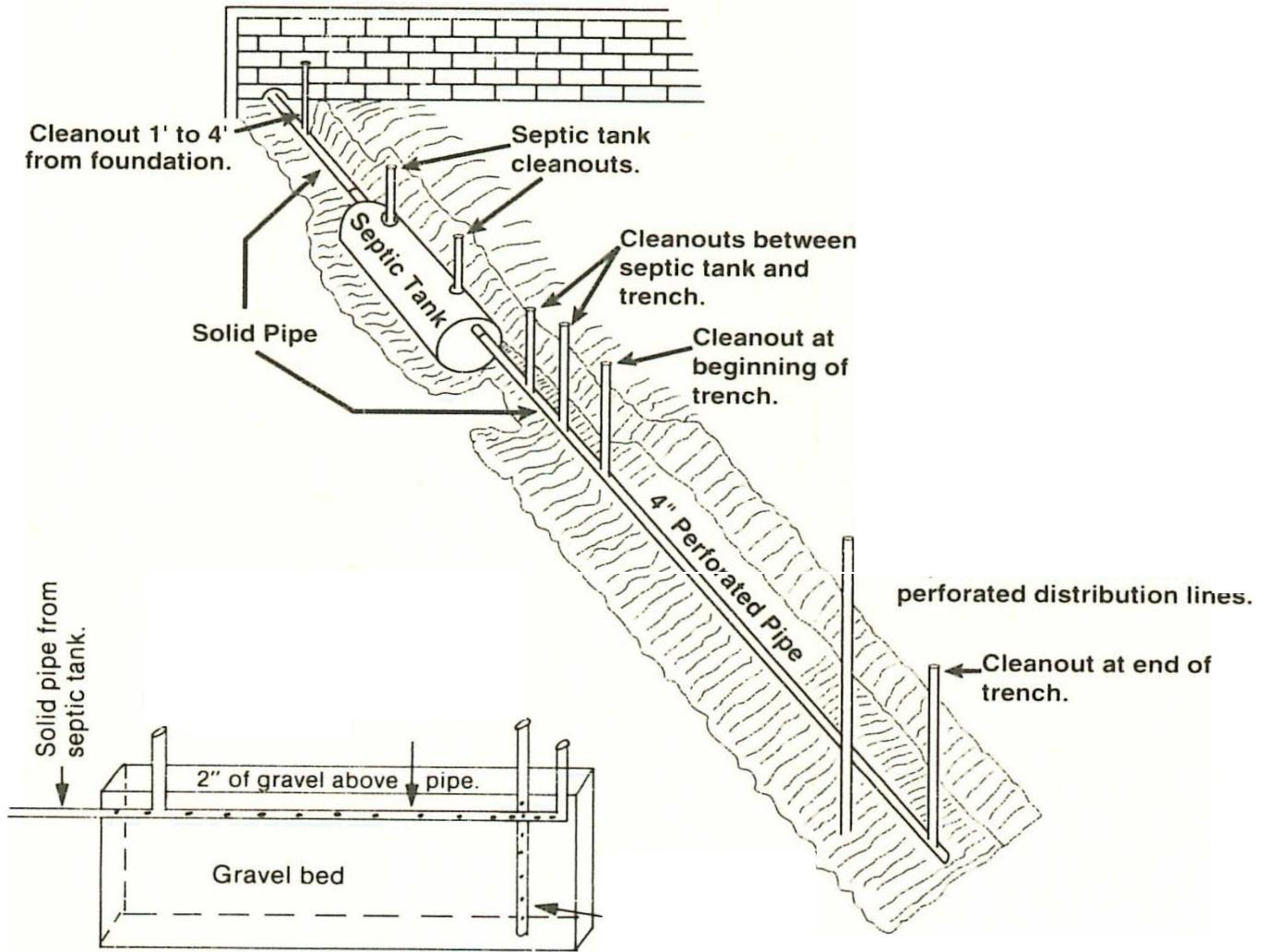
An on-site wastewater disposal (septic) system typically consists of a septic tank and a subsurface disposal field. The septic tank is a watertight receptacle designed to receive domestic wastes. The heavy solids settle to the bottom, where bacterial action partially converts them to a digested sludge. The lighter solids float to the surface of the liquid to form a scum layer. The liquid portion, carrying some suspended solids, flows out of the tank through pipes to the disposal field where the remaining suspended solids are further decomposed and the liquid is absorbed by the soil.



**Typical Two Compartment Septic Tank**

Three general types of disposal fields are used in the Anchorage area.

- Deep Trench: A deep trench is 1-3 feet wide and has at least 4 feet of sewer rock below a lateral perforated distribution pipe. Its effectiveness depends on absorption through the sidewalls of the trench.
- Wide Trench: A wide trench is 3-6 feet wide and has at least six inches but not more than 4 feet of sewer rock below the perforated distribution. Its effectiveness depends on absorption through both the sidewalls and through the bottom of the trench.
- Bed: A bed is a rectangular, shallow excavation with a series of lateral perforated pipes underlain with 6 inches of sewer rock. In a bed, absorption occurs only through the bottom.



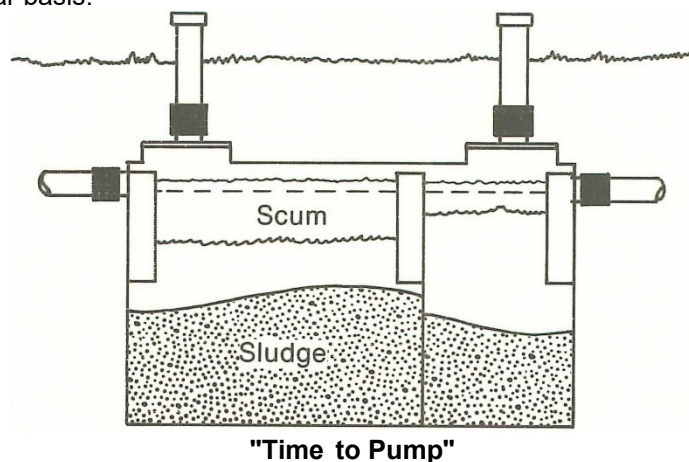
**Typical Trench System**

## SEPTIC SYSTEM OPERATION AND MAINTENANCE

The septic system is designed to receive all domestic wastewater from the dwelling including laundry and kitchen wastes. With proper use and maintenance of the septic system, the homeowner can expect to receive satisfactory service from it for many years. Consider the following factors which affect operation of a system:

- Toilet paper substitutes, paper towels, newspaper, wrapping paper, cigarettes, sanitary napkins, "flushable wipes, rags, etc., do not decompose, and should not be flushed into the septic tank.
- Wastes from garbage disposal units are not easily digested by bacteria in the septic tank. These wastes only add to the volume of solids in the tank and must be removed by pumping the tank. The use of garbage disposals is therefore not recommended.
- Footing, surface or roof drainage water, machinery cooling water, or hazardous substances may not be discharged into any septic system.
- The efficient operation of septic tanks can be harmed by the disposal or addition of disinfectants or other chemicals into the septic tank. Also, the life of the disposal field may be shortened by adding "enzymes" or other manufactured septic tank "activators" or cleaning solutions. It is strongly recommended that nothing other than normal day-to-day waste be discharged into a septic system. Soaps, detergents, bleach, drain cleaners or other materials normally used in the household will have no significant adverse effect on the system, if used in moderation.
- Since excessive water use is one of the prime factors in premature failure of a system, it is recommended that steps be taken to reduce water usage, such as using the washer only when it is full, taking showers instead of baths, and using flow reduction devices on shower and sink taps. Any leaking fixture or appliance should be immediately repaired.
- The emptying of a spa or hot tub into the septic system will temporarily overload the tank and disposal field which could adversely affect the performance and life of the system.
- Don't dump RV waste into your wastewater system. It will increase the frequency of required septage pumping. When dumped directly into the pumping vault, RV waste clogs or fouls equipment, causing undue maintenance and repair costs. (Also, some RV waste may contain chemicals that are toxic or that may retard the biological digestion occurring within the tank.)
- Heavy equipment should not be driven over the system, nor should structures, driveways, or parking areas be built over it.
- Water softeners can potentially adversely affect septic systems. If you have a water softener or are considering a water softener, please reach out to the Department to discuss the pros and cons of softened water and its effects on your septic system.
- If you have an AWWTS, you are required to enter into a service contract to have your system inspected and maintained on a regular frequency. Please refer to your AWWTS agreement.
- Airtight caps should be kept on the riser pipes of the septic tank and disposal field. The sewer system will then vent properly. Caps prevent unpleasant odors and plugged lines resulting from the entrance of foreign objects.

Code requires septic tanks to be pumped or have solids level checked at least once every two years. Some tanks may require more frequent pumping, depending on the type of use they receive. The omission of this important step in preventive maintenance has been implicated in numerous wastewater system failures. It is in a homeowner's interest to have their septic tank pumped on a regular basis.



## SEPTIC SYSTEM REPAIRS

Septic systems which have been properly installed, operated, and maintained should continue to function for many years. If a system begins to show symptoms of impending failure such as sewage backing up in the house or overflowing from a cleanout pipe, the following steps are recommended before calling an engineer or excavator:

- Verify that the sewage backup is not localized inside the building. Snaking lines may be appropriate.
- In winter, check the tank to make sure the contents are not frozen. It is possible that a system may freeze if improperly insulated and/or left unused for long periods in frigid temperatures.
- Snake the line from the house to the tank. Frequently a sewage plug occurs here due to solids in the line.
- After the tank has been pumped, and with all water sources shut off, listen for water entering the septic tank. Water may be coming from a leak inside the building or from groundwater infiltrating the tank. Check inside plumbing fixtures for possible malfunction.
- Measure the liquid level in the disposal field through a monitoring tube. Water at the level of the lateral pipes may signal system saturation or ground water encroachment.
- Compare the original design specifications with the present number of bedrooms. Systems which are utilized at greater than design specifications tend to fail sooner.

If the problem is indeed a failing or damaged system, consult an engineer who can evaluate the situation and recommend a course of action. In the meantime, the homeowner is responsible for ensuring that there is no discharge of sewage onto the ground surface. The septic tank and disposal field should be pumped as soon as possible and the amount of wastewater from the building reduced. Pumping must be repeated as needed until repairs can be accomplished. Sewage overflows already on the ground should be cleaned up as much as possible and the contaminated area disinfected.

Following repair or upgrading of the system, all abandoned septic tanks, seepage pits and cesspools must be excavated and backfilled with sand or an impervious material. This will inhibit continued contamination in the area and prevent future unexpected cave-ins of old systems.

## DOMESTIC WATER WELLS

It's important to note that the Municipality of Anchorage requires minimum separation distances for on-site disposal (septic) systems and other potential sources of contamination from private water wells. Failure to meet or maintain minimum separation distances for new and existing private water wells may only be discovered during the sale of your home when a COSA is required. Sources of contamination for private wells include animal wastes, chemicals, etc. Here are some helpful tips for maintaining your well and protecting your groundwater:

### Wellhead protection

- Maintain proper drainage away from the well; e.g. ensure no standing water around the wellhead.
- Make sure the top of the well casing is at least 12 inches above the ground surface for a well drilled before January 1997, and at least 18 inches for a well drilled after January 1997.
- Eliminate potential sources of contamination near the wellhead such as animal manure stockpiles.
- Utilize a sanitary seal to minimize the risk of contamination entering the well casing, such as animals seeking shelter.
- Limit use of lawn and garden chemicals: Apply sparingly, follow application instructions, and consider low-maintenance landscaping near wellhead.

### Well testing

- Regularly test your water for nitrate and coliform bacteria analyses, and in certain areas, test for arsenic.

### Well maintenance

- Periodically inspect well parts for damaged or missing parts:
- Take care working around your well to prevent damage to the well casing
- Consider installing bollards, or concrete posts, around wellhead to prevent collisions from vehicles and equipment.
- Don't pile snow, leaves or other materials around your well.
- Avoid planting flowers, trees and shrubs near your well.
- Install backflow preventers on all outdoor faucets to prevent aquifer contamination.

- Hire a MOA qualified well contractor for any new well construction, modification or decommissioning of your water wells.

### **Abandoned Water Wells**

If your well becomes no longer useable, it is required to decommission the well in such a manner that it does not become a potential conduit for contamination of nearby existing or future wells. Only an MOA certified well professional can decommission a water well.

## **CERTIFICATE OF ON-SITE SYSTEMS APPROVAL (COSA)**

The On-Site Water and Wastewater Section issues certificates of on-site systems approval (COSA) under the authority of Anchorage Municipal Code. A COSA is required by the MOA at time of title transfer of a single-family home or duplex. It is a report attesting to the adequate, legal, and safe operation of the subject lot's septic system and/or private well.

The COSA process requires that a licensed civil engineer perform a field inspection and testing of various system components. The engineer will research the records and determine if there has been a test on the well or septic system within the past two years. If not, the engineer will perform a well flow test and/or an adequacy test on the disposal field. The test results will help determine if the COSA can be granted or if upgrades are required. The engineer will also verify code required separation distances for the septic system and well are met. Should a separation distance waiver be necessary, the engineer will submit a waiver request. Once the engineer has completed all required testing and has submitted the completed COSA application, the On-site Section reviews the submittal and makes a final determination for approval.

Processing a COSA takes time for both the engineer and the department to do their part. Assuming there are no deficiencies in the on-site systems, sellers/buyers should allow approximately 5 days for the department to review and approve a COSA. Should system deficiencies be noted during the engineer's inspection, additional time may be required for correction of these deficiencies prior to COSA approval.

By following the recommended operation and maintenance procedures outlined in this brochure, the homeowner will help ensure that the water and septic system continues to operate properly. If you would like additional information or have any questions, call the On-Site Water and Wastewater Section at 343-7904.