**The Discharging Option: Understanding the Risks Involved with a Surface Water Discharge**

(Based on GMP 002)

For millions of Americans, an onsite sewage disposal system (or "septic tank system") serves as a satisfactory sewage disposal device. Properly installed on a suitable lot, an onsite system presents few public health problems. When an onsite sewage disposal option cannot be found because of limited soil permeability and/or a high level of water saturation, or other limiting conditions, an onsite system that discharges to surface water, such as a stream, may be a viable alternative. In this case, a treatment system is used to treat the sewage before discharging the treated sewage to a stream. This type of system bypasses the use of soil for treatment and relies solely on the installed chemical, physical, biological and mechanical treatment components.

When properly sited, designed, and functioning, a discharging system poses little risk to public health and the environment. Primary problems stem from the defective functioning of these systems and include the numerous health risks to humans caused by direct exposure to improperly treated sewage, and the great possibility of contamination of water supplies. It is critical that your system be properly operated and maintained to protect you and your family’s health as well as your neighbors.

Discharging systems are generally comprised of settling tanks, a biological treatment system, disinfection, and post aeration. If anyone of these components is not functioning properly, the quality of the wastewater will degrade and the potential for human health risks increases. The risks occur when there is exposure to the untreated or partially treated sewage. If the discharge channel prior to the wastewater mixing with a stream is open, there is the risk of having partially treated human waste on the ground where exposure can occur. There is also the possibility that a malfunctioning system will cause the sewage to back up into plumbing fixtures and become present in a dwelling. Once this waste is exposed, the possibility of humans contracting any of a number of diseases from infectious agents in human excrement is greatly multiplied. This is particularly true of children, many of whom are unable to understand the dangers of raw sewage. These diseases may be contracted by humans through direct exposure to the untreated (or partially) treated waste or through contact with a number of creatures which may have been exposed to it, including dogs, cats, rats, flies, cockroaches, fleas and a host of others.

After exposure to improperly treated sewage, the diseases humans may possibly contract are myriad. Some of these diseases are addressed below in an attempt to illustrate the seriousness of exposure to improperly treated human sewage. This list should not be viewed as a comprehensive and complete listing of all health hazards that may result from an improperly functioning discharging system.

The following are diseases which can be related to exposure to improperly treated human waste. Included is a brief summary of each disease.

1. Salmonellosis - A bacterial disease commonly manifested by an acute enterocolitis, with sudden onset of headache, abdominal pain, diarrhea, nausea and sometimes vomiting. Dehydration may be severe, especially among infants. Deaths are ordinarily uncommon except in the case of the very young, the very old, or the debilitated. The disease is transmitted by eating food from infected food animals or food contaminated by the feces of an infected animal or person, or by drinking water contaminated by the feces of an infected animal or person.
2. Shigellosis - An acute bacterial disease involving the large and small intestines, characterized by diarrhea accompanied by fever, nausea and sometimes toxemia, vomiting, cramps and tenesmus. Convulsions may be an important complication in young children. The severity of illness and the possibility of death depend on the age and pre-existing nutritional state of the host, the size of the infecting dose and the serotype of the organism. The disease is transmitted by direct or indirect fecal-oral transmission from a patient or carrier. Infection may occur after the ingestion of very few organisms. Cockroach and fly- borne transmission may occur as the result of direct fecal contamination.
3. Cholera - An acute bacterial enteric disease with sudden onset, profuse watery stools, occasional vomiting, rapid dehydration, acidosis and circulatory collapse. Mild cases with only diarrhea are common, especially among children. Death may occur in severe, untreated cases within a few hours and the case fatality rate in such cases may exceed 50%. With proper treatment, the death rate is below 1%. The ways the disease may be transmitted include drinking water contaminated with feces of patients, or, to a lesser extent, feces of carriers, or eating food which has been contaminated by feces. Raw or undercooked seafood from polluted waters has been the cause of several cholera epidemics.
4. Viral hepatitis A - This is characterized by abrupt onset with fever, malaise, anorexia, nausea and abdominal discomfort, followed within a few days by jaundice. The effects very from a mild illness lasting one to two weeks to a more rare, and severely disabling disease lasting several months. In general, severity increases with age, but complete recovery is the rule. The disease is transmitted person-to-person by the fecal-oral route. The infectious agent is found in feces, reaching peak levels the week or two before the onset of symptoms appear, concurrent with the appearance of circulating antibodies. The disease is most common among school-age children and young adults.
5. Sporadic viral gastroenteritis - Sporadic severe gastroenteritis in infants and young children is characterized by diarrhea and vomiting, often with severe dehydration and occasional deaths in the younger age groups. Milder forms of gastroenteritis can also occur. While the disease's mode of transmission is not exactly known, it is thought to probably be fecal-oral and possibly fecal-respiratory.
6. Epidemic viral gastroenteritis - A usually self-limited mild disease that often occurs in outbreaks with clinical symptoms of nausea, vomiting, diarrhea, abdominal pain, myalgia, headache, malaise, low-grade fever or a combination of these symptoms. Gastrointestinal symptoms characteristically last 24 to 48 hours. Again, it is believed that the transmission of the disease probably occurs by the fecal-oral route.
7. Amebiasis - This results from infection by a protozoan. Most infections are asymptomatic, but may become clinically important under certain circumstances. Intestinal disease varies from acute or fulminating dysentery with fever, chills, and bloody or mucoid diarrhea (amebic dysentery), to mild discomfort with diarrhea containing blood or mucous alternating with periods of constipation or remission. Epidemic outbreaks result mainly from ingestion, or fecally contaminated water containing amebic cysts. Epidemic spread is by hand-to-mouth transfer of feces.

As mentioned beforehand, the diseases addressed are hardly an encompassing list of all diseases which may result from the improper disposal of human feces. However, the list does cover a broad range of the types of diseases which may result from improper disposal. One characteristic that all of the above diseases have in common is that the sanitary disposal of human feces is a recommended preventive measure. Therefore, it is clear that taking the necessary measures to ensure that discharging systems function properly is of extreme importance.

The VDH regulations that govern these small discharging systems require you, the owner, to

* Keep your system functioning properly by having a licensed operator operate and maintain the system at least twice a year;
* Verify that your system is functioning properly by having the licensed operator sample the system in accordance with the General Permit and VDH regulation;
* Ensure the operator reports the results of each operator visit to VDH; and
* Have your system inspected by VDH annually and pay a $75 fee for the inspection.

If you maintain your system in good working order, your discharging system will provide a safe and sanitary method of disposing of your sewage for years to come.