



# COMMONWEALTH of VIRGINIA

ROBERT B. STROUBE, M.D., M.P.H.  
STATE HEALTH COMMISSIONER

Department of Health

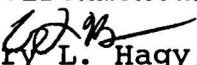
P. O. BOX 2448  
RICHMOND, VA 23218

September 4, 1992

GMP #2

## MEMORANDUM

TO: District Directors  
Environmental Health Project Managers  
Environmental Health Managers  
Environmental Health Supervisors

FROM:  Gary L. Hagy, Assistant Director  
Division of Onsite Sewage and Water Services

SUBJECT: Health and Environmental Considerations in Evaluating  
Applications for Onsite Sewage Disposal Systems

The attached memo is a revision of basically the same memo dated August 1, 1986 memo from Dr. C. M. G. Buttery, former State Health Commissioner. The major revision is that it is now from Dr. Stroube. Other minor revisions were made.

The new memo replaces Dr. Buttery's previous memo and is to be used in informal hearings on the denials of sewage disposal system construction permits. Every appellant should be given a copy of Dr. Stroube's memo during the informal hearing and this should be noted in the hearing notes and written decision. Feel free to use this memo in any other ways you believe to be appropriate.

This memo should be retained in the Environmental Health GMP Manual. An index to the GMP's that have been issued thus far is attached for your reference.

Attachment

pc: Division of Onsite Sewage and Water Services Staff

GMP #2  
SEWAGE - ONSITE - HEALTH CONSIDERATIONS



# COMMONWEALTH of VIRGINIA

ROBERT B. STROUBE, M.D., M.P.H.  
STATE HEALTH COMMISSIONER

*Department of Health*

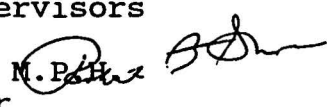
P. O. BOX 2448  
RICHMOND, VA 23218

September 2, 1992

GMP #2

## MEMORANDUM

TO: District Directors  
Environmental Health Project Managers  
Environmental Health Managers  
Environmental Health Supervisors

FROM: Robert B. Stroube, M.D., M.P.H.   
State Health Commissioner

SUBJECT: Health and Environmental Considerations in Evaluating  
Applications for Onsite Sewage Disposal Systems

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 hygienic problems. However, the use of onsite systems on lots with limited soil permeability and/or a high level of water saturation, or other limiting conditions, presents a wide array of health and environmental concerns.

It is of the utmost importance that these concerns be taken into consideration when analyzing an application for the operation of such a system. Primary problems stemming from the defective functioning of these systems include the numerous health risks to humans caused by direct exposure to improperly treated sewage, and the great possibility of contamination of water supplies and shellfish grounds.

The use of septic tanks on lots with low soil permeability, or with a high water table, or other limiting conditions, may result in the risk of having partially treated human waste reach the ground level where it may become present on the ground's surface or find its way into adjacent ditches or waterways. 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 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.

Health hazards may also arise due to a faulty septic tank system, if human waste contaminates a water supply or a shellfish ground. Many diseases, which will be discussed in more detail later, can be caused by drinking contaminated water or eating seafood which has been removed from contaminated water. Contamination of a shellfish harvest ground may also have serious economic ramifications. Once contamination is discovered in the shellfish ground, it must be condemned, and the taking of any more shellfish from the area must be prevented until it is shown that the water meets the minimum standards for water quality.

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 septic tank 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 vary 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 protozoa. 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 septic tank systems function properly is of extreme importance.