

## **Malfunctioning Onsite Wastewater Systems: Causes and Corrections**

Onsite wastewater management systems (OWMS) provide a cost effective method for treating domestic wastewater and dispersing it into the soil and groundwater environment in a manner that will protect water resources and public health. However, when OWMS are improperly sited, designed, installed, operated or maintained, they will not perform properly which can lead to contamination of groundwater, surface water and the ground surface.

OWMS that are not performing properly are usually referred to as “malfunctioning” or “failing”. System malfunctions are usually associated with improper operation and maintenance and can often be corrected through proper operation and maintenance procedures, routine inspections, repairs, upgrades or modifications. A system failure occurs when the problem is so serious that the OWMS cannot be repaired effectively and must be replaced. If the soil and site conditions are suitable and sufficient space is available, a property owner may be able to replace the failing system with another disposal field-type system. In some instances this is not an option and an alternative system such as a holding tank, modified disposal field, or secondary wastewater treatment system is required. Regardless of whether the system is malfunctioning or failing, the problem(s) must be corrected in compliance with the *Onsite Wastewater Management Systems Regulation*.

### **Signs of OWMS Malfunctions and Failures**

Signs of a malfunctioning or failing OWMS include but are not limited to the following:

- Contamination of groundwater and wells
- Untreated sewage discharging to streams and ditches
- Sewage backing up into the residence
- Slow drainage of plumbing fixtures like toilets, sinks and tubs
- A soft, smelly spot in the yard with lush grass growth
- Wet spots or ponding of untreated sewage on the ground around the disposal field

Not every sign of a system malfunction or failure is obvious. For example, improperly designed systems can discharge poorly treated wastewater into the groundwater where it can travel for hundreds of feet before contaminating a well and/or posing a threat to public health. The offending property owner may not even know that a problem exists.

To protect public health and the environment, discharge limits are set and used to evaluate systems to make sure they stay in compliance with standards. Systems can be out of compliance because they are malfunctioning or are failing. The circumstances determine the actions that must be taken to bring the system back into compliance.

### **Causes of OWMS Malfunctions and Failures**

The most common causes of OWMS malfunctions and failure are attributed to the following:

- The system was improperly sited (e.g., disposal located in a low lying, wet area)
- The system was poorly designed and/or installed
- The system has been damaged by vehicular traffic, roots or other activities
- The system has not been properly operated and maintained
- The system is old and has reached its service life expectancy

## **Avoiding System Malfunctions and Failures**

The most effective way to avoid system malfunctions and failures is to ensure the OWMS is properly sited, designed, installed, operated and maintained. Information in the *Homeowner's Manual for OWMS* and the *Operation & Maintenance Tips for OWMS* are good reference documents that can be found on our website. Other important ways to avoid system malfunctions and failure include the following:

1. Hire a Certified Installer to design and install the OWMS. Certified Installers are trained to perform this work and are familiar with the OWMS regulations and standards.
2. Ensure a detailed soil and site assessment is conducted on the property. The soil and site conditions are the most important factors influencing the design, installation and performance of an OWMS. These conditions must be accurately assessed using test pit excavations or auger boreholes combined with visual observations and measurements of slope, drainage, ground elevations, and setback distances.
3. Systems should only be installed and constructed when the soil is dry. Construction in wet soil can result in soil compaction and smearing that substantially reduces the ability of the soil to absorb and treat wastewater. Frozen soil should also be avoided due to the potential problems associated with excavation and backfilling. It is imperative that the soil absorption system area is protected from compaction and damage from vehicular traffic during and after construction. Tracked machines cause much less damage than machines with tires.
4. Do not connect foundation perimeter drains or weeping tile drains to the OWMS. This additional water will overload and saturate the system.
5. Do not pipe sewage to the ditch or storm sewer. Do not allow the construction of a shallow drain to carry untreated sewage to a ditch, drain tile, or storm sewer. If sewage is ponding in the yard, the problem should be corrected immediately. If the system is beyond repair, a Certified Installer should be retained to evaluate the site and design a new system.

## **Troubleshooting**

The following tables outline some potential causes and remedies that can be used to identify and correct system malfunctions:

<b>1. Sewage backing up into house and/or plumbing fixtures not draining properly</b>	
<b>Potential Causes</b>	<b>Potential Remedies</b>
<ul style="list-style-type: none"><li>• Excess water entering system</li></ul>	<ul style="list-style-type: none"><li>• Fix leaks</li></ul>
<ul style="list-style-type: none"><li>• Improper plumbing</li></ul>	<ul style="list-style-type: none"><li>• Install water-saving fixtures</li></ul>
<ul style="list-style-type: none"><li>• Blockage in plumbing</li></ul>	<ul style="list-style-type: none"><li>• Stop using garbage disposal</li></ul>
<ul style="list-style-type: none"><li>• Improper operation</li></ul>	<ul style="list-style-type: none"><li>• Clean septic tank and check pumps</li></ul>
<ul style="list-style-type: none"><li>• Pump failure</li></ul>	<ul style="list-style-type: none"><li>• Replace broken or cracked pipes and remove roots</li></ul>

<ul style="list-style-type: none"> <li>• Improper system design</li> </ul>	<ul style="list-style-type: none"> <li>• Seal pipe connections</li> </ul>
<ul style="list-style-type: none"> <li>• Roots clogging pipes</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid willow trees near system</li> </ul>

<b>2. Sewage surfacing in yard</b>	
<b>Potential Causes</b>	<b>Potential Remedies</b>
<ul style="list-style-type: none"> <li>• Excessive water use</li> </ul>	<ul style="list-style-type: none"> <li>• Fix leaks</li> </ul>
<ul style="list-style-type: none"> <li>• System blockages</li> </ul>	<ul style="list-style-type: none"> <li>• Install water-saving fixtures</li> </ul>
<ul style="list-style-type: none"> <li>• Improper system elevations</li> </ul>	<ul style="list-style-type: none"> <li>• Clean septic tank and check pumps</li> </ul>
<ul style="list-style-type: none"> <li>• Undersized soil treatment system</li> </ul>	<ul style="list-style-type: none"> <li>• Consult professionals</li> </ul>
<ul style="list-style-type: none"> <li>• Pump failure or improper operation</li> </ul>	<ul style="list-style-type: none"> <li>• Fence off area until problem is fixed</li> </ul>

<b>3. Sewage odours-indoors</b>	
<b>Potential Causes</b>	<b>Potential Remedies</b>
<ul style="list-style-type: none"> <li>• Sewage surfacing in yard</li> </ul>	<ul style="list-style-type: none"> <li>• Repair plumbing</li> </ul>
<ul style="list-style-type: none"> <li>• Improper plumbing</li> </ul>	<ul style="list-style-type: none"> <li>• Clean septic tank and check pumps</li> </ul>
<ul style="list-style-type: none"> <li>• Dry drain traps</li> </ul>	<ul style="list-style-type: none"> <li>• Replace water in drain traps</li> </ul>
<ul style="list-style-type: none"> <li>• Sewage backup in house</li> </ul>	
<ul style="list-style-type: none"> <li>• Unsealed ejector sump pump</li> </ul>	
<ul style="list-style-type: none"> <li>• Roof vent pipe frozen closed</li> </ul>	

<b>4. Sewage odours-outdoors</b>	
<b>Potential Causes</b>	<b>Potential Remedies</b>
<ul style="list-style-type: none"> <li>• Source other than owner's system</li> </ul>	<ul style="list-style-type: none"> <li>• Clean tank and check pumps</li> </ul>
<ul style="list-style-type: none"> <li>• Sewage surfacing in yard</li> </ul>	<ul style="list-style-type: none"> <li>• Replace damaged caps</li> </ul>
<ul style="list-style-type: none"> <li>• Inspection pipe caps damaged or removed</li> </ul>	<ul style="list-style-type: none"> <li>• Repair or replace drain field</li> </ul>

### 5. Contaminated drinking or surface waters

Potential Causes	Potential Remedies
<ul style="list-style-type: none"> <li>• System too close to well, water table, or fractured bedrock</li> </ul>	<ul style="list-style-type: none"> <li>• Replace your well and/or septic system</li> </ul>
<ul style="list-style-type: none"> <li>• Cesspool or drywell in use</li> </ul>	<ul style="list-style-type: none"> <li>• Contact a local unit of government to investigate other potential sources</li> </ul>
<ul style="list-style-type: none"> <li>• Sewage discharges to surface or groundwater</li> </ul>	
<ul style="list-style-type: none"> <li>• Improper well construction</li> </ul>	
<ul style="list-style-type: none"> <li>• Broken water supply pipe</li> </ul>	
<ul style="list-style-type: none"> <li>• Source other than homeowner's system</li> </ul>	
<ul style="list-style-type: none"> <li>• Broken sewage lines</li> </ul>	

### 6. Distribution pipes and/or soil treatment system freezes in winter

Potential Causes	Potential Remedies
<ul style="list-style-type: none"> <li>• Improper construction</li> </ul>	<ul style="list-style-type: none"> <li>• Check construction</li> </ul>
<ul style="list-style-type: none"> <li>• Check valve in lift station is not working</li> </ul>	<ul style="list-style-type: none"> <li>• Examine check valve and/or replace it</li> </ul>
<ul style="list-style-type: none"> <li>• Foot or vehicle traffic over piping</li> </ul>	<ul style="list-style-type: none"> <li>• Keep people and vehicles off area</li> </ul>
<ul style="list-style-type: none"> <li>• Low flow rate</li> </ul>	<ul style="list-style-type: none"> <li>• Increase water use</li> </ul>
<ul style="list-style-type: none"> <li>• Back of use</li> </ul>	<ul style="list-style-type: none"> <li>• Have someone use water in house if you are away</li> </ul>
<ul style="list-style-type: none"> <li>• Undersized pump</li> </ul>	<ul style="list-style-type: none"> <li>• Increase frequency of pump cycling</li> </ul>
	<ul style="list-style-type: none"> <li>• Operate septic tank as a holding tank</li> </ul>
	<ul style="list-style-type: none"> <li>• Pump system in fall and use carefully over winter months</li> </ul>
	<ul style="list-style-type: none"> <li>• Don't use antifreeze</li> </ul>

**7. Effluent surfacing in soil absorption field**

<b>Potential Causes</b>	<b>Potential Remedies</b>
<ul style="list-style-type: none"> <li>Absorption field is too small</li> </ul>	<ul style="list-style-type: none"> <li>Investigate the proper field size based on soil conditions and home wastewater output</li> <li>If undersized, enlarge the existing system or build a new one</li> <li>Install water conservation devices such as low-flush toilets, low-volume showerheads and faucet aerators.</li> </ul>
<ul style="list-style-type: none"> <li>Clogged soil absorption field</li> </ul>	<ul style="list-style-type: none"> <li>Replace existing absorption field and/or install a second field if the lot size permits. Rotate field annually.</li> </ul>
<ul style="list-style-type: none"> <li>A seasonally high water table saturates soil and causes the system to become sluggish or fail during rainy periods.</li> </ul>	<ul style="list-style-type: none"> <li>Install interceptor drains to lower or divert the water table</li> <li>Use water conservation practices</li> <li>Modify the system using shallow placement of trench alternatives</li> <li>Build an alternative system such as a low-pressure pipe system</li> </ul>
<ul style="list-style-type: none"> <li>Solids carry over from the septic tank and clog the drainfield</li> </ul>	<ul style="list-style-type: none"> <li>Pump the tank and check baffles</li> </ul>
<ul style="list-style-type: none"> <li>Leaky faucets increase hydraulic load on the field</li> </ul>	<ul style="list-style-type: none"> <li>Fix and maintain plumbing in good repair</li> </ul>

**8. Plugged house sewer vent (soil stack)**

This problem can make sewer lines drain so slowly that solids settle out	
<b>Potential Causes or Symptoms</b>	<b>Potential Remedies</b>
<ul style="list-style-type: none"> <li>Sewer gas smell around the house and/or gurgling sound as air is pulled through the trap into the sewer when drains are used.</li> </ul>	<ul style="list-style-type: none"> <li>Enlarge undersized, broken, or plugged vents. In winter, check for ice build-up on vents</li> </ul>
	<ul style="list-style-type: none"> <li>Install roof vent extenders if snow accumulations cover the existing vent year after year.</li> </ul>

<b>9. Blockage between the house and septic tank</b>	
<b>Potential Causes</b>	<b>Potential Remedies</b>
<ul style="list-style-type: none"> <li>Blockage may be in the house sewer</li> </ul>	<ul style="list-style-type: none"> <li>Remove blockage with sewer tool</li> <li>If roots have penetrated pipe joints, reseal pipe joints after routing</li> </ul>
<ul style="list-style-type: none"> <li>Scum layer could be blocking the septic inlet baffle/tee</li> </ul>	<ul style="list-style-type: none"> <li>Pump the tank</li> <li>Check inlet baffles/tees after pumping tank</li> </ul>
<ul style="list-style-type: none"> <li>Blockage that recurs in a new system is likely caused by improperly installed sewer line(s)</li> </ul>	<ul style="list-style-type: none"> <li>Reconstruct the sewer line(s) using the correct slope</li> </ul>
<ul style="list-style-type: none"> <li>Blockage that recurs in a previously trouble-free system is likely caused by a broken pipe connection</li> </ul>	<ul style="list-style-type: none"> <li>Locate and replace broken pipe</li> </ul>

<b>10. Blockage between septic tank and absorption field</b>	
<b>Potential Causes</b>	<b>Potential Remedies</b>
If the liquid in the septic tank is higher than normal, look for:	
<ul style="list-style-type: none"> <li>Plugged tank outlet. In older tanks the outlet baffles can collapse, causing scum and solids to overflow and plug the outlet or the line to the absorption field</li> </ul>	<ul style="list-style-type: none"> <li>Pump the tank</li> <li>After pumping the tank, route the line and replace defective baffles</li> </ul>
<ul style="list-style-type: none"> <li>Obstruction in the line from the tank to the field. This is most likely caused by solids overflowing from the tank, root penetration, or collapse of a pipe section</li> </ul>	<ul style="list-style-type: none"> <li>Pump the tank</li> <li>After pumping the tank route the line and replace defective baffles</li> </ul>