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# Extension Extra

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Agriculture and  
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Engineering

COLLEGE OF AGRICULTURE & BIOLOGICAL SCIENCES / SOUTH DAKOTA STATE UNIVERSITY / USDA

## Troubleshooting Septic Systems

*by Russ Derickson, Extension associate for water and natural resources,  
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To use this chart, find the problem that describes your situation from the sections below (labeled A - D). At the right of the possible problems are a list of numbers. These numbers represent possible cause of the problem. Find the corresponding number in the "Possible Causes" section.

### A. Sluggish or no drainage from fixtures or back-up of sewage into the house.

Possible Problem Area (possible causes)

- Excess water entering the system. (17,18,19,20,21,22,23,24,25,26,27,28,29,30,39,57)
- Improper plumbing in house. (1, 2, 3, 4, 5, 6, 9)
- Blockage in house plumbing. (10, 11, 12, 14, 37)
- Improper fixture / appliance operation. (15, 16)
- Blockage in sewer: house to septic tank. (10, 12, 31, 32)
- Blockage in septic tank. (33, 34, 35)
- Blockage in effluent sewer: septic tank to drainfield. (10,12,31,32)
- Blockage in distribution box. (38, 40, 61, 64, 65)
- Blockage in distribution piping. (31, 36, 37, 58, 59, 60, 61, 62)
- Blockage at the drainfield soil treatment surface. (40, 45, 46, 47, 48,49,50,51,52, 53,54,55,56)
- Improper elevations in sewer system. (41, 42, 43, 44, 64)
- Pump failure or improper operation. (69,73,74,75,76,77,86,87,88,89,90)

### B. Sewage surfacing in the yard.

Possible Problem Area (possible causes)

- Excess water entering the system. (17,18,19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 39, 57)
- Blockage at the drainfield soil treatment surface. (40, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56)
- Blockage in distribution piping. (31, 36, 37, 58, 59,60, 61,62)
- Improper elevations for drainfield. (44, 63)
- Blockage in distribution box. (38,40,61,64,65)
- Short-circuiting in distribution box or drainfield. (64, 66, 67, 68, 69)
- Under-sized drainfield due to design or construction. (70,71, 72)
- Pump failure or improper operation. (69, 73, 74, 75, 76, 77, 86, 87, 88, 89, 90)
- Point Source discharge (91, 92, 93)

### C. Sewage Odors.

Possible Problem Area (possible causes)

- Sewage surfacing in yard. (-see symptom B.)
- Improper plumbing in house. (4,7,8,9)
- Pump station vent or an inspection pipe located too close to house. (27,28,79)
- Traps not filled with water.
- Sewage back-up into house, (see symptom A.)
- Unsealed sewage ejector sump pit.
- Source other than owners sewage system.

#### **D. Contaminated drinking or surface waters.**

Possible Problem Area (possible causes)

- Inappropriate or improperly installed sewage system. (78, 79, 80, 81)
- Direct flow to surface or groundwater. (80,82,83,84,85)
- Improper well construction. (13)
- Broken water supply pipe. (9,13)
- Source other than owner's sewage system.

## **Possible Causes**

1. Improper fitting (reducers, wyes, etc.) or installation of fitting.
2. Pipe too small.
3. Too many connections to drain pipe.
4. Defective pipe material or failure of pipe.
5. Drain opening too small or clogged.
6. Too little slope or belly in pipe.
7. Vent stack improperly installed.
8. Improperly sealed or broken pipe stub.
9. Consult a qualified plumber.
10. Grease build up and plugged pipe.
11. Solids settled in pipe or belly in pipe.
12. Pipe corroded shut.
13. Consult a qualified well driller.
14. Large solids wedged in pipe.
15. Toilet does not provide adequate flush.
16. Garbage disposal unit broken or plugged.
17. Water usage greater than sewage system designed for.
18. Leaky fixture (e.g., toilet, faucet, etc.).
19. Excessive water from self-cleaning humidifier or furnace.
20. Excessive water from water conditioner.
21. Sump for footing drain connected to sewage system.
22. Bottomless or leaky gray or blackwater sump.
23. Infiltration into leaky sewer pipe to septic tank.
24. Sump pump bypass valve not in the correct position.
25. Surface water ponding over septic tank, pump station or drainfield
26. Leaky septic tank or pump station
27. Leaky or nonexistent inspection pipe cap.
28. Trench for sewer to septic tank under footings allowing flow between footing drain and septic tank.
29. Excessive lawn watering over drainfield
30. High ground water filling drainfield
31. Water in pipe frozen (e.g., inadequate bury depth, frost driven deep, belly in pipe).
32. Sewer pipe collapsed.
33. No baffles and solids plugged inlet/outlet.
34. Septic tank full of solids.
35. Inlet/outlet corroded shut.
36. Solids plugging pipe.
37. Collapsed pipe.
38. Solids build-up in distribution box.
39. Roof leader connected to sewage system.
40. Drainfield area frozen.
41. Improper or inadequate elevation drop from house to system
42. Septic tank or distribution box not installed properly (i.e., not level, installed backwards, etc.)
43. Inadequate elevation difference in septic tank.
44. Drainfield soil treatment surface not level.
45. Excessive accumulation of biomat due to age of system
46. Excessive organic loading and resultant biomat build-up in system.
47. Solids carry-over from septic tank without outlet baffle.
48. Solids carry-over from septic tank full of solids.
49. Solids carry-over from septic tank with inadequate retention time/capacity.
50. Inadequate covering of straw, paper, synthetic fabric, etc. over drainfield rock
51. Drainfield water level too high (at or above top of rock) washing soil into drainfield.
52. Damage to soil from septic tank/drainfield "cleansers" or chemicals.
53. Biomat buildup due to trenches installed too deep (no oxygen in soil).
54. Soil treatment surface smeared, compacted or not properly roughened.
55. Dirty or soluble rock (ex. Limestone) used in drainfield.
56. Soil fill used improperly.
57. Improper soil backfill used for drainfield.
58. Solids plugging pipe perforations.
59. Pipe perforations incorrectly positioned.
60. Pipe perforations too small.
61. Animal nest.
62. Distribution pipe not level or slightly sloping.
63. Drainfield not installed lengthwise on contours.
64. Distribution box inlet/outlet at improper elevation.
65. Collapsed distribution box.
66. High velocity flow to first distribution box not baffled
67. Gravity distribution used where pressure distribution should be.
68. Gravel between trenches or in mound sand bed.
69. Valves not adjusted, installed or operating properly.
70. Under-sized drainfield based on improper flow and soil design factors.
71. Damage to soil from construction activities causing slower percolation.
72. Improper materials used according to specs (sand, rock, pipe, cover material, etc.)

73. Pump controls installed backwards or defective.
74. Pump-out volume incorrect.
75. Over or under-sized pump for intended use.
76. Plugged pump.
77. Pump controls not allowed to operate freely or stuck float
78. Improper well set back distance used.
79. Improper horizontal set back distance.
80. Sewage system component installed in or too close to groundwater or fractured bedrock.
  
81. Cesspool or dry well in use.
82. Sewage discharge connected to abandoned well.
83. Sewage discharge pipe to surface drainage way or water body.
84. Surfaced effluent flowing to well or water body.
85. Illegal "midnight" pumping activities.
86. Drain back not accounted for in pump out gallon calculations
87. Power outage to pump and/or alarm system control box.
88. Power to pump not turned on.
89. Pump mechanical failure.
90. Improper type of pump for intended use.
  
91. Illegal construction of system allowing surface discharge.
92. Erosion to drainfield pipe/rock allowing surface discharge.
93. Bypass pipe valve adjusted or operating improperly.

**FOR MORE INFORMATION . . .** concerning on-site systems, contact your local County Extension Office, certified on-site wastewater treatment contractor, septic tank pumper, or obtain a copy of MWPS-24 "On-site Domestic Sewage Disposal Handbook" (cost \$6) available from SDSU's Agriculture and Biosystems Engineering Dept. Box 2120, Brookings, SD 57007, 605-688-5667.

**RELATED REFERENCE MATERIALS . . .**

- ESS 43-B Household Wastewater: Septic Systems and Other Treatment Methods
- EC 665 Rural Wastewater Treatment for Individual Homes
- FS 907 Septic System: Homeowner's Manual
- ExEx 1018 Septic Tank Maintenance
- ExEx 1032 Wastewater Treatment for Rural Homes and Cabins
- ExEx 1033 Periodic Maintenance for On-site Wastewater Treatment Systems
- ExEx 1034 Solving Wastewater System Backups
- ExEx 1035 Septic System Additives -- Not Needed
- ExEx 1043 Septic System Failures
- ExEx 1044 Recommended Method for Checking Homes with Septic System Failures
- ExEx 1045 Homeowner's Responsibilities for Using On-site Sewage Treatment Systems

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