



MONTHLY

News and Views from the Connecticut Association of Home Inspectors, Inc.

February 2008

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Meeting Dates

- Feb 27** *Water Analysis* - Mary Ellen Diluzio, EnviroTech Laboratory
- Mar 26** *Inspection Safety* - Daniel Friedman
- Apr 23** *Radon Mitigation Systems* - Jay Dockendorff, RSA Laboratories
- May 23** *Wood Destroying Insects* - John O'Brien, Mastershield

Holiday Inn
201 Washington Ave
North Haven
(203) 239-6700

Water - Basic Health Risks and Precautions

Submitted by Pete Petrino

Approximately 14-15 million households in the United States rely on a private, household well for drinking water each year, and more than 90,000 new wells are drilled throughout the United States each year. Contamination of a private well is not only the concern of the household served by the well, but also the households using other nearby water supplies and the aquifer that the water is drawn from.

Contaminated private well water causes 26% of the drinking water outbreaks that make people sick. The U.S. Environmental Protection Agency's (EPA) rules that protect public drinking water systems do not apply to privately owned wells. Most states have rules for private wells, but these rules may not completely protect a private well. In other words, it is up to the private well owner, to make sure that their well water is safe to drink.

Germs and chemicals can get into a well and contaminate it in different ways. Some germs and chemicals occur naturally. For example, heavy metals like arsenic, lead and cadmium are naturally found in rocks and soil and sometimes seep into ground water. Other contaminants come from human and animal waste resulting from polluted storm water runoff, agricultural runoff, flooded sewers or individual septic systems that are not working properly.

Total Coliform

Coliform bacteria are microbes found in the digestive systems of warm-blooded animals, in soil, on plants and in surface water. These microbes typically do not make you sick; however, because microbes that do cause disease are hard to test for in the water, "total coliforms" are tested instead. If the total coliform count is high, then it is very possible that harmful germs like viruses, bacteria and parasites might also be found in the water.

Fecal Coliform / *Escherichia coli* (*E. coli*)

Fecal coliform bacteria are a kind of total coliform. The feces (or stool) and digestive systems of humans and warm-blooded animals contain millions of fecal coliforms. *E. coli* is part of the fecal coliform group and may be tested for by itself. Fecal coliforms and *E. coli* are usually harmless. However, a positive test may mean that feces and harmful germs have found their way into a water system. These harmful germs can cause diarrhea, dysentery and hepatitis.

Nitrate

Nitrate is naturally found in many types of food. However, high levels of nitrate in drinking water can make people sick. Nitrate in well water can come from animal waste, private septic systems, wastewater, flooded sewers, polluted storm water runoff, fertilizers, agricultural runoff and decaying plants. The presence of nitrate in well water also depends on the geology of the land around a well. A nitrate test is recommended for all wells. If the nitrate level in water is higher than the EPA standards, other sources of water or ways to treat the water should be explored.

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President's Corner

Bernie Caliendo

First of all, CAHI is off to a great start for 2008. At our last meeting we had over 80 attendees for the septic inspection presentation. This month we are having Mary Ellen DiLuzio from EnviroTech Lab in Windsor, Connecticut. Mary Ellen gave a great presentation on well water analysis three years ago, and we look forward to seeing her again.

Besides our monthly presentations, you have been informed, by e-mail, that CAHI has been in the process of providing free continuing education to its members. We have put together an all-day continuing education seminar at the Independent Connecticut Petroleum Association headquarters in Cromwell for April 21. Eight continuing education credits will be received by all attendees. The only cost to our members is \$10 which is for lunch and refreshments. Please read the notice in this newsletter about this seminar and the sign-up process. The seminar is limited to 75 attendees. If you try to sign up and find that the seminar is full, you may add your name to a waiting list. We must have a minimum of 20 more attendees to schedule another day for this seminar at which time we will inform the members on the waiting list of that date.

We are not done yet. CAHI has scheduled more free continuing education for its members. We have put together a bus trip to tour the facilities at the Factory Mutual Insurance Company's building materials destructive testing complex in Johnston, Rhode Island. Factory Mutual only allows 20 attendees per day on the tour, so we have scheduled two dates - March 12 and April 9. Each tour lasts approximately 5 hours. Five continuing education credits will be received by all attendees. Since CAHI has arranged these two tours, we are picking up all expenses including transportation, except the cost of lunch which is on your own. Please read the notice in this newsletter concerning these bus trips. Space is limited and a waiting list will be created for those who do not register in time.

CAHI has been constantly growing the membership and has reached an all time high of 189 members. We encourage all our members to take advantage of your membership by signing up for the upcoming free seminars and bus trips, attending our monthly meetings, using our website to your advantage and enjoying our monthly newsletters. 60% of our membership is registered to log in the Members Only section of our web. Our Members' Forum is being used by more and more members every month. We encourage you to use this informational tool and sounding board to post your comments and offer your expertise. As always, if you have any suggestions or questions, please feel free to contact me or any other board member.

Last but not least, the board is pleased to announce the appointment of Randy Howland to the Board of Directors. We want to thank Randy for giving his time and expertise. CAHI welcomes him to the board and we look forward to his contributions.

See you at the next meeting!

Bernie

February Keynote Speaker

This month's meeting topic is **Water Analysis**.

Our meeting will feature Mary Ellen Diluzio from EnviroTech Laboratory presenting "Water Test & Analysis", system treatments & filtration systems.

2 hours of Continuing Education Credits

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pH

The pH level tells how acidic or basic water is. The pH level of the water can change how water looks and tastes. If the pH of water is too low or too high, it could damage pipes, cause heavy metals like lead to leak out of the pipes into the water and eventually cause illness.

Well Drinking Water a Danger to Infants

High nitrate levels in drinking water pose a risk to infants by causing a condition known as "blue baby" also known as methemoglobinemia. According to the American Academy of Pediatrics, an estimated 15 million families drink water from private, unregulated wells. 2 million families drink from wells that fail to meet federal drinking water standards for nitrate.

The National Academy of Sciences estimates that 200 to 1000 people die in the United States each year from cancers caused by ingesting the contaminants in water. The major health threat posed by these pollutants is far more likely to be from their inhalation as air pollutants. The reason that emissions are high is because water droplets dispersed by the shower head have a larger surface-to-volume ratio than water streaming into the bath."

- *Science News-Vol. 130, Janet Raloff*

Chlorinated Water and Unknown Hazards of the Shower

There is another side to the chlorine-water story. When we return from a gym workout or a jogging session or dirty summer inspection, not only are we thirsty but we usually shower or bathe. We have been taught that cleanliness and health go together, and indeed they do, when chemical-free water is used.

When chlorinated water is used, however, bathing may be much less healthy than we ever supposed. Gases are as a rule less soluble in hot water, and when water is heated or the free chlorine content in water is greatly reduced, the chlorine escapes into the air. When we have a hot shower or run a bath we can sometimes smell the chlorine released as it escapes from the hot water. In a confined shower recess, however, especially one with poor ventilation, the chlorine escapes from the water as we continue the hot shower and steadily increases in concentration in the air we breathe. The olfactory threshold for chlorine is about 3.5 PPM (parts per million) so when we can smell chlorine the concentration is already above this level. The lethal concentration for ten-minute exposure is about 600 PPM and we suggest that regularly taking hot showers with chlorinated water could pose a health risk.

Chlorine causes pulmonary edema, and it would seem likely that regular exposure to chlorine gas, even at low levels such as in normal showering, may reduce the oxygen transfer capacity of the lungs. This could be a critical factor for athletes and for others prone to heart failure. Another aspect to be considered is our skin. Our skin is an important protective barrier for our bodies. When we shower with chlorinated water we are essentially exposing our skin to a relatively large volume of a dilute chlorine solution. Some of this chlorine reacts with the oils in the skin to form chlorinated compounds and it is these compounds which may then be absorbed by the body. It seems very likely, considering strong oxidizing power of chlorine, that regular exposure to chlorinated water serves also to promote the aging process of the skin, not unlike extended exposure to sunlight. Moreover, chlorine may actually enhance the aging effects of ultraviolet radiation by reinforcing the process of cell deterioration.

Another skin factor to be considered with the destruction by chlorine is the natural bacteria balance on our skin. Our skin has an ecology, all of its own, which needs to be preserved in order to maintain healthy skin and its associated beauty.

Volatile Organic Compounds (VOCs)

VOCs are industrial and fuel-related chemicals that may cause bad health effects at certain levels. Some VOCs to test for are benzene, carbon tetrachloride, toluene, trichloroethylene and methyl tertiary butyl ether (MTBE).

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Skin Absorption as a Route of Exposure For Volatile Organic Compounds

by the American Journal of Public Health 1984 74:479-484

HYDRATION

The more hydrated the skin, the greater the absorption. If the skin is hydrated (through perspiration or immersion in water) or if the contaminant compounds are in solution, diffusion and penetration will be enhanced.

TEMPERATURE

Increased skin or water temperature will enhance skin absorption capacity proportionately. During swimming and bathing, it may be expected that greater hydration of skin surfaces will take place.

SKIN CONDITION

Any insult (i.e. sunburn) or injury (i.e. cuts, wounds, abrasions) to the outer layer of skin will lower its ability to act as a barrier against foreign substances. A history of skin disease such as psoriasis or eczema acts to lower the natural barrier of the outer skin layer, as do rashes, dermatitis or any chronic skin condition.

REGIONAL VARIABILITY

Skin absorption rates vary with the different regions of the body. Underestimated is the case of whole body immersion during swimming or bathing. The epidermis of the hand represents a relatively greater barrier to penetration than many other parts of the body, including the scalp, forehead, abdomen, area in and around the ears, underarms and genital area. Penetration through the genital area, in fact, is estimated to be 100% as compared to 8.56% for the forearm.

OTHER ROUTES OF ENTRY

Other significant routes of absorption include oral, nasal, cheeks and mouth cavity, and eye and ear areas. These routes have been underestimated in their ability to absorb contaminants during immersion in water. Inhalation serves as yet another route. In the case of swimming or bathing, the volatilized chemicals are likely to gather near the surface of the water and are readily inhalable. In addition, water may be swallowed in these situations.

INDIVIDUAL VARIABILITY

Absorption rates obtained from healthy adults will again tend to underestimate absorption for children or populations that are more sensitive.

Filtering Your Shower Water

Chlorine is a toxic chemical. It is used in water treatment to reduce and kill forms of biological agents, such as bacteria and viruses found in water systems. Chlorine is harmful to you when you drink it and when it is absorbed into our skin and inhaled into your lungs when you shower. It has been estimated that the "shower steam" in a bathroom can contain up to 100 times the amount of chlorine than the water, because chlorine evaporates out of water at a relatively low temperature. If you bathe or shower in unfiltered tap water, you are inhaling and absorbing chlorine into your body.

Conditions contributed to or aggravated by chlorine exposure:

- *Respiratory Conditions* (nose, throat, lungs, sinuses): Asthma, bronchitis
- *Hair*: Dry, brittle
- *Skin*: Dry, flaking, dandruff, itching, rashes (especially with infants and children)
- *Eyes conditions*

Chlorine is universally used to chemically disinfect water. It kills germs, bacteria and other living organisms. Chlorine readily passes through the cell wall and attaches to the fatty acids of the cell, disrupting the life sustaining functions. The human body is composed of billions of cells. Most people are aware that the quality of their drinking water can be improved by filtering their tap water or buying bottled water. However, many do not realize that they are addressing only a part of the problem.

One half of our daily chlorine exposure is from showering. Chlorine is not only absorbed through the skin, but also re-vaporized in the shower, inhaled into the lungs, and transferred directly into the blood system. In fact, the chlorine exposure from one shower is equal to an entire day's amount of drinking the same water. Drinking filtered or bottled water only does half the job. For people who are concerned about their health and are willing to take the responsibility to do something about it, a specifically designed shower filter should be recommended.

Increased Risks of Bladder Cancer by Drinking, Bathing or Swimming in Chlorinated Water

by The American Journal of Epidemiology, January 2007

The findings are the first to suggest that these chemicals

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Affordable Radon Training

At registration time, state you are a CAHI member and get \$25.00 off the Course Fee!!

Certification and Continuing Education for "Residential Radon Measurement"

- Residential Radon Measurement certification prerequisite
- 16 NEHA-NRPP & NRSB Category I CE Credits
- 16 CT Inspector CE Hours
- 2 MA Inspector CE Hours
- 2 Renewal ASHI MRCs
- 16 NAHI CEUs
- Accepted by all New England States

Course Location:

Three Rivers Community College
Thames Valley Campus
574 New London Turnpike
Norwich, CT

Course Time:

8:00am – 5:30pm both days

Optional Certification

Exam Time:

8:00am, March 1

Course Fee:

\$299.00 – At registration time, state that you are a CAHI member and get \$25.00 off.

Exam Fee:

\$95.00, discounted to only \$76.00 for *early bird* registrations received before January 25

For Registration:

Three Rivers Community College
860-885-2607

For Course Information:

Spruce Radon Training
800-355-0901

**\$100 LESS THAN COMPARABLE COURSES
EXPAND YOUR BUSINESS
PREPARE FOR CERTIFICATION
LEARN VALUABLE CE CREDITS**

"RESIDENTIAL RADON MEASUREMENT"

**Two-Day Course
Three Rivers Community College
Norwich, CT**

**Thursday-Friday, February 28-29, 2008
Certification Exam: March 1**

Here are a few examples of what previous attendees say about this course and Trudy Smith, our award-winning instructor:

"Very informative, well-prepared class."

"Trudy's enthusiasm and ability to translate complex technical concepts into everyday language was fabulous."

"Awesome experience! I would recommend this to all my inspector friends."

Spruce Radon Training is offered in conjunction with AccuStar Labs® and RadonAway
Phone 800.355.0901

Pat Everett, Training Coordinator
Spruce Radon Training
3 Saber Way
Ward Hill, MA 01835

e-mail: peverett@spruce.com
web: <http://www.spruce.com>

For descriptions and a schedule for this and other Spruce Radon Training courses offered in conjunction with AccuStar Labs and RadonAway, please visit www.accustarlabs.com

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can be harmful when they are inhaled or absorbed through the skin, as well as when they are ingested, Dr. Cristina M. Villanueva of the Municipal Institute of Medical Research in Barcelona and colleagues note.

Chemicals, most commonly chlorine, used to disinfect water can produce by-products that have been tied to increased cancer risks, Villanueva and her team point out. The most prevalent chlorination by-products, chemicals called trihalomethanes (THM), can be absorbed into the body through the skin or by inhalation, they add.

To investigate lifetime trihalomethanes (THM) exposure and bladder cancer risks, the researchers matched 1,219 men and women with bladder cancer to 1,271 control individuals who did not have the disease, surveying them about their exposure to chlorinated water via drinking water, swimming pools, showering and bathing. The researchers also analyzed the average water trihalomethanes (THM) levels in the 123 municipalities included in the study.

People living in households with an average household

water trihalomethanes (THM) level of more than 49 micrograms per liter had double the bladder cancer risks of those living in households where water trihalomethanes (THM) concentration was below 8 micrograms per liter, the researchers found. trihalomethanes (THM) levels of about 50 micrograms per liter are common in industrialized societies, they note.

Study participants who drank chlorinated water were at 35% greater risks of bladder cancer than those who didn't, while use of swimming pools boosted bladder cancer risks by 57%. And those who took longer showers or baths and lived in municipalities with higher trihalomethanes (THM) levels were also at increased cancer risks.

When trihalomethanes (THM) is absorbed through the skin or lungs, Villanueva and her team note, it may have a more powerful carcinogenic effect because it does not undergo detoxification via the liver. "If confirmed elsewhere, this observation has significant public health implications in relation to preventing exposure to these water contaminants," the researchers conclude.

Heating Seminar at ICPA Radiant, Steam, Hot Water

FREE to CAHI Members

CAHI is sponsoring an all day FREE (for members on record as of 2/1/08) heating seminar at the Independent Connecticut Petroleum Association (ICPA) headquarters, 10 Alcap Ridge, Cromwell, CT.

**Monday, April 21, 2008
8:30 - 4:30**

Anyone who attended the CAHI subsidized heating seminars in 2004 at the ICPA will remember the great classroom and workshop areas that were available to us.

There is a \$10 fee that covers lunch and refreshments at the breaks. We are limited to 75 attendees on a first come, first served basis. Please read the details concerning our cancellation notice requirements when registering.

To register: www.ctinspect.com - Click on "Special Events", click on Heating Seminar. Fill in the info and pay the \$10 lunch fee by Mastercard, Visa or Discover Card. **Attendees will receive 8 CE's** that meet the minimum requirements as set forth by the CT Home Inspection Licensing Board.

We look forward to seeing you there!

Septic Field Failure Causes - Septic Absorption Field Failure Causes of Drainfields and Leaching Beds

by Dan Friedman

Improper original construction, especially on rocky, poorly-drained sites (pipes settle, for example)

Houses clustered around a lake -

Often will have a marginal system as properties were crowded together, built as part-time summer-camps, were built without code supervision, and often were built using amateur, marginal home-made systems. In the photo shown here, new construction placed the septic tank and septic drainfields in the wet area shown in the photo. Everything looked questionable: the drainfield is placed near trees, risking root invasion of the piping; the drainfield is placed in wet soils, and the total elevation between the bottom of the drainfield piping and the top of the nearby lake is less than two feet. The drainfield is placed less than 20 ft. from the edge of the lake. It is improbable that the septic system belonging to this property will do much more than contaminate the nearby lake.



Improper septic field construction -

Inspecting raised bed and mound systems in New York State I have often seen improperly constructed mounds, including efforts by the builder to save on fill cost by using the "mound" as a place to first pile up all of the trees and tree stumps which needed to be cleared from the site, covering this mess with a too-thin layer of fill soil in which the septic absorption trenches are installed. The result is a mound system with a short life. If you see trees poking out from the perimeter of your mound, further investigation may be in order. Also watch for effluent breakout around the bottom edges of the mound.

- **Improper septic absorption field location:** One way to have a quick failure of a drain field is to install it in an area of high seasonal water tables (flooding the system) without sufficient fill and elevation, and/or without providing extra site and intercept drainage around the field to keep surface and subsurface water away from the field.
- **Ignoring site runoff and groundwater levels:** Improper absorption field siting is found at some properties where the builder fails to consider site runoff or natural groundwater paths. One mound system was constructed using too little fill and placed over what had been a stream bed. My septic dye test very quickly produced red-dyed effluent at the low end of the mound where a seasonal stream continued to run under the mound in wet weather. Flooding the absorption system with surface or roof runoff, or rocky, poorly-drained or under-sized sites may simply lack capacity means a short absorption field life.
- **Steep slope septic systems:** Placing a conventional septic system drainfield on a steep slope, over a stream bed, over a natural drainage swale (photo of this defect), specifying an under-sized mound or raised bed for the anticipated usage level, and poorly installed piping which does not slope properly or which becomes disconnected, and finally, use of improper fill soil which lacks the proper percolation rate all result in a costly installation with a too-short life.
- **Installing a drainfield in wet weather** (which compacts the soil) is likely to mean a shorter field life.

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Sloppy pipe layout and connections is a common cause of early failure in new drainfields. Pipes placed in trenches at uneven slope become disconnected; trenches with improper slope and omission of the specified amount and improper placement of gravel (for those systems) are also quite common where there is time or money pressure working against the builder.

Failure to pump the septic tank on schedule - Don't forget to pump out the septic tank regularly (solids/grease are discharged into the fields, clogging the soil).

Soil clogging at the biomat layer which forms below and around the drainfield trenches (or other absorption systems). The biomat is a bacteria layer which forms in soil below and around drainfield trenches where septic effluent or wastewater is discharged. This layer is critical in the processing of fine biological solids and pathogens which are in the effluent, and without it the septic system would not be adequately treating the effluent. Inadequately-treated effluent released into the ground risks contamination of nearby ponds, wells, streams, etc. The formation, clogging, and measures to protect and extend the life of the biomat is discussed at Septic System Absorption System Biomat Formation as a subchapter of this text.

Driving over the absorption system, leach field, drainfield. As with any septic absorption system, heavy traffic over the system can compress soil or break pipes, rendering the system inoperative and requiring costly repairs. At a recent inspection I found that the septic mound had been placed over a roadway connecting two properties owned by the same family. Family members continued to drive back and forth between homes right over the septic mound. Its future life was rather doubtful.



Placing structures, patios, or paving over the absorption system -

Covering an absorption bed, raised bed, or septic mound, such as by installation of paving, a patio, or weed-blocking solid plastic, will damage the mound and prevent proper operation by blocking both oxygen intake into the soil and also evaporation of effluent from the soil top. Blocking or sealing the ground surface will be a problem over just about any septic effluent absorption field. Don't build anything over a septic mound, no building, no fish pond, no patio, no tennis court, no parking area, no playground (compacts the soil). Don't put a swimming pool on top of a drainfield - yes I've seen people do this including my neighbor!

Placing improper substances into the building drains and septic system. Don't use the septic system to dispose of illegal oils, chemicals, fats, greases. One system in New York near the Taconic State Parkway was connected to house in which was operated an illegal drug manufacturing operation. So much contaminant was flushed down house drains that the workers contaminated their own well and poisoned themselves

Discharging excessive salts or other chemicals which destroy the biomat formation, clogging the soil. This problem and measures to protect and extend the life of the biomat is discussed at "Biomat Formation".

Planting trees, deep rooting shrubs and certain ground covers on the septic absorption field (roots enter pipes) and evaporation can be blocked. See "Plants over Septics."

Use of septic tank or drain field additives which claim to extend system life can generate so much activity in the tank that solids are held in suspension and forced into the soil absorption system! *Do not add any treatments, chemicals, yeast, or other treats to a septic system.* In general these treatments don't work, may ruin the system and are illegal in many localities. There is no magic bullet to repair a bad SAS.

Age -

Eventually even a well-maintained SAS will clog and have to be replaced.

DISPOSAL CLOGGING FAILURES - Effluent Disposal and Drain Clogging Failures

In simplest terms, there are two visible septic effluent or onsite wastewater **disposal failures:**

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FREE Bus Trip for Members

(Member on record as of 2/1/08)

Factory Mutual Global Research Campus
Building Material Destructive Testing Center

Johnston, R.I.

March 12th & April 9th

CAHI has done it again. We have put together another free bus trip available to members on two different dates. The five-hour tour will consist of a viewing of destructive testing of building materials. **Attendees will receive 5 CE's.**

Some of the incredible demonstrations you will witness may involve gas explosions with 50 to 60 foot flames, seeing the destructive force of a 2x4 being shot out of a cannon and bursting strengths of plumbing pipes. This is one trip not to miss.

We are restricted to 20 attendees per day.

Do not delay, sign up today!

To register: www.ctinspect.com – Click on "Special Events", click on either March 12th or April 9th. Each date will expire when 20 attendees are registered. If you try to sign up for one of the dates mentioned and the date is full, try signing up for the other date. When both dates are filled up, add your name to the "Bus Trip Waiting List" under "Special Events". If a registered attendee has to cancel, we will contact the first name on the waiting list and offer that seat to them.

In order to schedule another trip date, CAHI will need a minimum of 20 people signed up on our waiting list.

Cancellations: If you have a confirmed reservation and cannot attend:

- Notify us immediately by e-mail at info@ctinspect.com in order for us to offer the seat to a member on the waiting list.
- If you do not show up for the bus trip and did not e-mail CAHI your cancellation prior to the bus trip date, you will be billed by CAHI for \$49.
- Factory Mutual will be sending you documents in advance. If you cancel after receiving these documents, you must return these documents to CAHI as soon as possible.

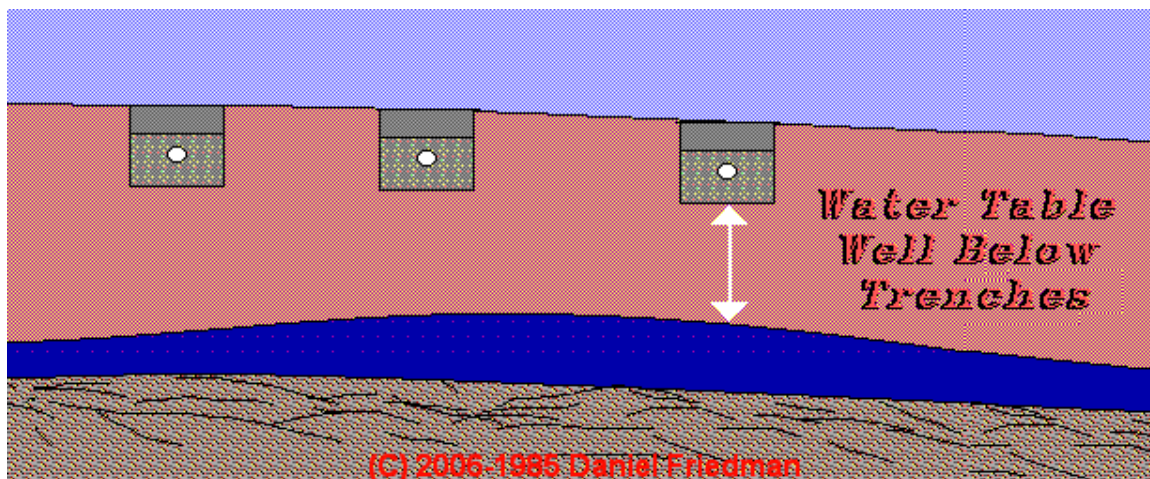
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- Toilets or other fixtures back up into the house - but first see "Diagnosing Clogged Drains."
- Effluent or sewage appears at the surface of the yard, or the neighbor's yard!

Septic odors may also indicate a system failure or an imminent failure. But such odors may also be produced by defects in the plumbing vent system or other site conditions. Beware, sewer gas contains methane and is explosive if it reaches a dangerous concentration inside a building.

Typical causes range from things that are easy and cheap to repair, to a need for complete system replacement:

- Clogged pipes
- Broken pipes
- Damaged tank
- Tipped distribution box
- Clogged/broken soil absorption piping
- Clogged absorption soils (grease & solids)
- Saturated soil absorption area



DISPOSAL vs TREATMENT - Successful Wastewater Disposal Does Not Necessarily Mean Successful Treatment. However there can also be treatment failures. Effluent may not back up or appear on the surface, but if insufficiently treated effluent reaches a private well or any stream or waterway, the environment is being contaminated -- an unacceptable condition. Historically many people have just worried about disposal. As the quality of drinking water deteriorates in many areas and as population grows in many previously thinly-populated areas, proper treatment has become the real concern for everyone's health.

For example, if there is not sufficient soil between the bottom of the soil absorption system trenches and the local groundwater, the local environment is being contaminated.

DRAINFIELD LIFE - What destroys or shortens the life of the absorption system?

I've seen drain fields still working fine after 25 years and others which failed in the first week of occupancy of a new home. In a properly designed septic absorption field the level of usage of the system, site characteristics such as slope, rock, groundwater level and soil percolation rate have all been considered. Barring such foul ups

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as we discuss in this document, such a field may last from 10 to 20 years. But it's easy to ruin or shorten the life of a drainfield/leaching bed. Review the causes of septic field failure discussed at Field Failure Causes.

FAILURE CRITERIA - Soil Absorption System Failure Criteria

- Breakout of effluent observed (& I consider odors as well)
- BOH evaluation in MA if within 100 ft of surface water supply
- within Zone 1 of a public well
- within 50ft of a private well
- between 50ft and 100ft of a private well if well fails bacteria test.

SOIL CONDITIONS – The Drainfield: Leaching Bed Soil Condition & Liquid level

The absorption system or "drain field" has two jobs. First, it disposes of liquid effluent by permitting it to seep into the soil below. Second, a "bio-mat" of bacteria which forms in the soil below the drainage field processes pathogens in the septic effluent to make the effluent sufficiently sanitary as to avoid contaminating nearby ground water. This distinction between successful "disposal" and successful "treatment" is important to avoid groundwater contamination but has not been addressed by regulation in every municipality. Municipalities which require a minimum distance between the bottom of the drain field trenches (or equivalent component) and the top of the seasonal high ground water table have recognized the importance of a working bio-mat and the need to provide adequate dry soil for it to function.

Even in a well-designed drainage field, eventually the soil surrounding the drainfield device (perforated pipe in gravel trench or other seepage system) becomes clogged with grease and debris. Examining an excavated cross-section of a failed drainfield will often display a black or gray band of sludge and grease of about 1" thickness at the inside perimeter of the gravel trench. When this layer of soil becomes

sufficiently clogged the passage of effluent into the soil below is slowed and eventually blocked, leading to the need for replacement. Keeping a tank pumped so as to reduce the passage of debris and grease into a drain field will extend its life.

This is the most expensive problem to correct. Look for septic effluent seepage to ground surface in area of equipment or downhill from such equipment. Look for (illegal) drainfield line extensions to nearby streams, storm drains, or adjoining properties where the temptation to "fix" a failing system by sending the effluent to an improper destination overwhelmed a previous owner or repair company. In some areas inspectors use septic loading and dye test. Seepage may be due to overloaded tank, failed absorption system, or blocked/broken piping (may be less costly).

An excavator or septic contractor will often explore one or more drain lines (or similar components) by excavating a portion of it to look for evidence of flooding or soil clogging. We've used a simple probe at the end and along a leach bed to check for flooding of that component. (Be careful not to break or collapse old piping.)

More Reading -

Soil Percolation Tests or "perc tests" are used to evaluate the ability of the soil to absorb effluent. Normally this test is done at the time the absorption system is being designed or to obtain a board of health approval on the leach field location. However, a perc test may also be performed during the evaluation of an existing septic drainfield. Soil percolation tests are discussed in more detail at the Soil Percolation Testing chapter.

Planting Guidelines for Septic Drainfields, Mounds, Raised Beds and other Septic Absorption Systems -

Planting grasses or flowers over septic fields

Many people have written to ask me what can be

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planted over a septic field. Grasses, weeds, flower are o.k. The best answer is grass or native grasses and weeds. Flowers are o.k. so long as they are not varieties which send down deep roots. Basically, any shallow-rooting planting will be o.k. over the surface of a absorption field or over most other septic drainfields.

Planting Trees or Shrubs Near or Over Septic Absorption Systems

Stay away from trees or shrubs which are likely to put down deep roots. The roots will quickly invade and clog the buried effluent lines and may also cause them to move, break or become disconnected. Some experts (Kahn, Allen, Jones) also point out that if you're planting on the edges and lower toe of a septic mound, those plants need to be able to tolerate the higher moisture levels found in those parts of the mound system.

Article by Dan Friedman

<http://www.inspect-ny.com/septic/fieldfail.htm>

Submitted by Scott Monforte

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The public is always welcome.

E-mail Bernie Caliendo for the latest meeting schedule
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