

SHYTE, PISS AND DISHWATER by Douglas Hamilton January 2010

So you finally decided to make the big move to the country. Ah, the happy rural lifestyle--clean air, sparkling streams, friendly neighbors, a bursting vegetable garden, and goodbye forever to that stressful commute. But sometimes things are not as simple as they seem. While not exactly the center of polite conversation or learned discourse there lingers in the background of country living the nagging question of human waste. Many rural areas, particularly in the beautiful Gulf Islands, have no sewer pipe outlets, holding tanks, or processing areas. In the good old days before the current population explosion, a hole in the ground was grand, or even better, one could go for a soulful dump in the deep blue sea. Greywater was pitched out the window without a second thought. Incredibly, some cities like Victoria still show their respect for our environment by dumping human waste and greywater directly into the ocean without treatment.

The problem of shyte disposal is not academic question to be disputed in some ivory tower. Misplaced caca has caused more death and human suffering in the world than any other single factor throughout world history. Even a microscopic piece can be deadly-- jam packed with dangerous viruses, bacteria and parasites. Think hepatitis B, typhoid, diphtheria, cholera, diarrhea, salmonella, hookworm, roundworm and many others, discovered and undiscovered. Many of these monsters have been quelled here, but thousands still die every day from their ravages in the third world. Be aware, one of the most deadly poisons known to humankind is produced by each and every one of us every day. Simply put, what has recently passed from a person's (or animal) asshole must never find its way back into someone else's mouth and digestive system.

In 2005, the rules and regulation concerning wastewater in British Columbia were

drastically changed. As part of the Gordon's Campbell's obsession with privatization, the Health authorities lost control over such matters as septic fields and greywater.

As a result, they have no advice, nor suggestions about these systems. Instead, overseeing greywater and septic planning has been turned over to the private sector industry, in this case the ASTTBC or Applied Science Technologists and Technicians of British Columbia. Their website for wastewater information is:

<http://wastewater.asttbc.org/c/index.php>. The rules are draconian, and intensely bureaucratic—yet another example of the narrow minded view that one-size-fits-all--in a province of mind boggling diversity in climate, terrain, ecosystems and population density. More and more these days one cannot do the simplest things around the home without falling afoul of the law and becoming a criminal. Here is a sample from the site.

What is an Authorized Person?

The Sewerage System Regulation (SSR) provides for two types of 'Authorized Person': a Registered Onsite Wastewater Practitioner and a Professional. No others may plan, install or maintain systems in British Columbia. Doing so is illegal and considered an offense under the Regulation.

Registered Onsite Wastewater Practitioner

Depending on training and qualifications, a Registered Onsite Wastewater Practitioner (ROWP) plans, installs, maintains and/or inspects onsite systems. They are registered with the Applied Science Technologists & Technicians of British Columbia (ASTTBC). To be registered, individuals must complete the required education, a Professional Practice & Ethics exam, provide references, and demonstrate experience by successfully completing a Practice Assessment.

As far as I can tell there have been few prosecutions for breaching these regulations. It is hard to imagine a simple greywater system would excite much interest

or criticism. But, if the health department receives a complaint and discovers a gross sewage violation, especially near a watershed used for collecting drinking water, the punishment could be brutal—say a fine of \$10,000-\$100,000.

Of course, this author would never dream of inciting anyone to break the law. All suggestions in this little essay are purely theoretical and hypothetical.

Septic Fields

The ASTTBC swears by the septic field. This time honored method involves digging out an area for large holding tank, and a 50' by 50' absorption field. Drainage pipes are buried in the field to disperse the waste. A mantle of specially approved gravel is laid to a depth of 10" along the pipes followed by another 3' of imported sandy soil to improve absorption. In some places this method works very well, but it does have its problems. What happens when the homeowner's yard is a rock bluff, which cannot be dug? Or, suppose the area is entirely under water during the winter months? These are not unusual circumstances in rural areas. In these cases, putting in septic field is a complete waste of time and money.

Then there is the problem of disposal. A septic tank has to be cleaned out every three to five years. These systems work on the basis of creeping failure. As solids build up in the tank and dispersal pipes, there is less space for the sludge and scum to settle out before seeping into the leaching field. Unattended, your system backs up, bringing a pond or stinking rotted sewage to the surface. Beware, when this happens your field has failed, and the whole thing will probably have to be replaced. In many rural areas it is

simply not practical to bring in a truck to pump out your tank. Tankers must be barged over to isolated islands at great expense, and some areas are simply inaccessible for these large unwieldy vehicles. In these cases, it is not uncommon for the landowner to take matters into his own hands and simply pump out the filthy contents of his tank on some remote area of his property. So why go to the enormous expense of installing a septic system in the first place?

There are other problems as well. A septic field is not a closed system and there cannot help but be some contamination of ground water. When a number of these fields are located in a crowded subdivision, wells and drinking water will be dangerously contaminated-- as happened on Mayne Island a few years ago. Plus these systems are vulnerable to physical damage. Grease, chemicals, diapers, coffee grounds, paper, plastics tampons, indeed, anything other than human waste, will clog and eventually destroy your septic field. Care must be taken not to compact the soil and pipes by forgetting their location and driving over them. And be careful not to get too intimate with your tank during inspection and cleanout. Every year there are always a few poor souls who pass out and expire, asphyxiated by the delicate fumes of their own waste.

Yes, I know. The great appeal of septic fields is that they encourage the comforting yet antiquated flush toilet. A quick jerk of the chain and all those embarrassing sights and smells vanish magically into the void forever. Such squeamishness may be regarded as criminal in the near future. So what are the alternatives?

No Toilet

When the urge strikes in the big outdoors and no “rest room” is available, look for a well-drained site with diggable soil, 150’ from the nearest lake or stream. The most powerful soil enzymes are in the top 8”, so dig a hole to that depth and cover. Use as little toilet paper as possible. Even better, crap into a plastic bag and pack it out. Of course, all toiletries like diapers, tampons, sanitary napkins and condoms should also be taken home and disposed of properly.

Outhouse

This time honored method works fine over the short term when the density of people is low. Outhouses though, leach their contents into watersheds over time as the waste is not sealed in a watertight container. In some parts of the undeveloped world it is not uncommon to see a drinking well and outhouse within a few feet of each other. This is obviously a recipe for disaster. But, an outhouse is better than nothing, so if you must use this method look for a well drained site at least 150’ from the nearest watershed.

Composting Toilets In isolated inaccessible rural areas the most sensible and safest method for disposing of human wastes is composting. If you are short on time and long on money, a reliable commercial composting toilet can be purchased or constructed. Look online for factory made units and plans. The rudiments of rot allow for two methods of composting. Anaerobic (without oxygen) compost occurs when turds are all piled up on each other with no added organic material. This is what happens in the traditional outhouse. Here the process moves slowly and often incompletely. Foul smelling compounds like hydrogen sulfide are released and little heat is generated to kill pathogens. Aerobic composting (with oxygen) works quite differently. Handfuls of organic material sawdust, grass clippings, peat, straw or leaves are added each day after

use. Periodically the contents are mixed by hand or motor for several weeks. The process takes place quite quickly and few smells and a lot of heat are generated. To add piss or not to add piss is an interesting question. Urine mixed with caca will present special problems, but it can be impossible to completely separate it. Piss is very high in nitrogen and can smother the composting process, so much additional organic matter will have to be added for successful composting if large quantities are being added to the mix. As urine is close to sterile when fresh, some simply collect it and store separately. It makes an excellent fast acting garden fertilizer when diluted 3 to 1 with water.

A homemade shyte composter can be easily assembled from simple materials. The container must be waterproof and leak free. It should also be kid and animal proof. A 4 to 45 gallon steel drum works nicely. (see diagram my book pg. 12) Or consider a 4'X4'X4' wooden box lined with plastic with enough overlap to keep out the rain. This is also a good size to maximize heat retention. Top with a piece of plywood and add sawdust after each use. (see diagram my book pg. 14) It should take two people about 8 years to fill. Temperature is critical for successful composting. Organic materials do not begin to break down until the temperature reaches 18C, and things slow down during the winter months. Paint the box black and leave it in the sun--- or even add a heating coil if you want it to process quickly. If the pile is too wet or too dry composting will be delayed. Below 40% moisture stops the process all-together, while above 70% causes the anaerobic process to take over. Somewhere in between leaves the pile damp but not sopping.

Remember you can never add too much sawdust, straw or leaves to your toilet and to your composter. Microorganisms need carbon for energy and growth. They also

utilize a small amount of nitrogen. Thirty parts carbon to one part nitrogen is optimum for composting. Less than 20 to one and the pile starts to stink. The Ph will be slightly acidic so add a dash of lime or ashes now and again. For speedy action the pile should be thoroughly mixed every month for the first 6 months and then every 3 months. This feeds oxygen, nitrogen and carbon to the bacteria that are doing all the work. Keep your shyte stirring tools separate from regular gardening implements.

How long before your compost is safe to handle? Much depends on temperature. If you keep it above 18C you should have beautiful compost in 6 to 8 months. If your composter is outside and unheated, the time will be a good deal longer. Always err on the side of caution! Anyone with a serious infection like Hepatitis B, Giardia, or Cryptosporidium should be prepared to compost for several years. Never use your compost directly on food that will be eaten directly from the garden. Use instead on fruit trees and ornamentals.

But here's a thought. When your composter fills up, simply abandon it and build another. The main thing is to keep fecal matter dry and isolated until it is thoroughly composted and safe. If you don't feel comfortable or have the time to put extra energy into such things as turning the pile, and obsessing on temperature and moisture you really do not have to. Just mix your movement with sawdust in a watertight container and forget it. It will take longer to work out, but 15 years down the road when the box rots or rusts away it will be no danger to anyone. And using this homemade fertilizer in the orchard is not really necessary either, although it makes one feel a part of the great cycle of life and closer to the planet.

Greywater

Everyone living in a rural area should have a working greywater system. Most do not, and many others do not even know what it is. For the record, greywater is all household waste water except sewage/toilet water (better known as black water). It includes water from laundry, dishes and the bath. Because of dangerous fecal contamination, it would not include diaper rinse, or water used in cleaning animal stables, or bath water from someone with a communicable disease. But the line is a fine one. Greywater will usually contain some level of black materials like dead skin, food particles hair saliva, grease, detergents, crap residue , bacteria and chemicals. The question is how much is too much?

Because of the possible dangers, most municipalities do not distinguish between black and grey water. All household wastewater is considered black and must be disposed of in a sewer pipe, septic field or collecting depot. In areas with septic fields only, this puts a tremendous strain on the system. Our wastewater authorities are encouraging the use of septic fields to dispose of greywater, but owners should realize that the life of their field can be greatly prolonged by reducing water input. As an alternative, a simple system can be set up for home use cheaply and easily. Here are a few suggestions.

-----Greywater systems do not work well in crowded areas. If you have only a quarter acre and are surrounded by other homes some other alternative may have to be found.

-----Greywater is best absorbed and neutralized by living plants. Soil organisms break down organic materials into water soluble plant nutrients. Plant roots take up these nutrients and much of the water as well. The pure water left over seeps down to replenish the aquifer. As a sensible precaution do not use greywater directly on anything you will

eat later like radishes, carrots, potatoes and lettuce. Instead place your outflow in orchards, pasture, and on ornamentals. Lawn watering is acceptable but beware of possible contamination for animals and children. If you prefer a self regulating system, site your outflow on a well drained part of your property well away from streams and neighbors. Dig out a 6'X6" hole and fill with sand to filter and increase absorption.

-----Filter and strain all greywater to remove the larger particles of food, grease, etc.—compost or feed this to your chickens. Set up a steel drum or wooden box with different layers of materials for additional filtering (see diagram my book pg. 20). Sawdust or woodchips is best for your first layer. Direct the outflow into your leach field—an upside down flower pot with the pipe stuck in the top makes for splash free dispersal. Dilute with 50% freshwater for best results although this is not always necessary. On well drained sandy soil figure about a half gallon of greywater per week for every square foot of soil—less for hardpan. Keep an eye on things to see how the plants respond.

Your ideal system might include a pit lined with plastic and filled with topsoil. Greywater would feed the trees and ornamentals in the pit without leakage into surrounding soil. If you want to get fancy bury some perforated plastic pipe to disperse the filtered water like a septic field. (see my diagrams pg 22 &23)

-----Keep greywater in pipes or underground as much as possible. Do not spray on plants or hard surfaces as this defuses the water into microscopic droplets, which could spread contaminants. Do not store for more than a day or two or allow to puddle. A thick mulch of hay, wood chips or even cardboard speeds decomposition and provides protection for youngsters and pets.

-----Avoid bleach, fabric softeners, boron, phosphates, ammonia, chemical cleaners, and hot water, as these will damage plants.

So what are we to make of this story of caca, piss and dishwater? It is unfortunate that the authorities are clinging to old 19th century technologies in dealing with human waste problems today. Septic fields and sewer pipes certainly had their place at one time, but the many shortcomings of these systems dictate the need for a whole new approach. And consider the wastage of all that good humanure for fertilizer in a world of rapidly increasing hunger. Increasing populations and the shortage of fresh water will eventually force major changes in how this problem is handled. The writing is on the wall. It is a great pity that government and the private sector are not aggressively encouraging alternative technologies, especially in Canada's Gulf Islands, where public treatment and cleanout facilities are sparse or nonexistent, except on the larger ones. After all, people have to dump their personal wastes and wash water somewhere. As Aesop candidly observed way back in ancient Greece "I dyde shyte tre grete toordes." (Fables of Aesop, Caxton Translation, Vol. 15, 1484).

Hopefully this little essay will spark some discussion about these much neglected, yet critically important subjects.

Suggested Reading

The Humanure Handbook: A Guide to Composting Human Manure by Joseph C. Jenkins, 2005: Chelsea Green Publishing, PO Box 607, Grove City, PA.16127.

Web Site-- www.joseph-jenkins.com

