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SANITATION: THE CORNERSTONE OF SURVIVAL

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- Has NO information for post-war survival
- Has NO government directed warning systems, sirens, evacuation plans, or general preparations for nuclear attack available for the general public

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IN THIS ISSUE

WARNING:

When building a shelter, seek a professional design from appropriate, certified professionals, including electrical and civil engineers and ask to see the appropriate credentials from your builder and installer. Secure your area while under construction. Consult a geotechnical engineer to test your water table and soil type, and do not place your shelter in an area that could flood or accumulate water. Wet shelters could destroy and contaminate your supplies. You must keep entrances securely covered at all times. A poorly built or flooded shelter could result in death or injury from structure failure or dangerous levels of CO or CO_2 or other chemicals. TACDA and the authors of JCD journal entries offer this material as conceptual ideas, only, and cannot legally design your shelter, nor can it ensure it has been safely constructed.

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PRESIDENT'S MESSAGE

Sanitation is a very important aspect of preparing for emergencies and should not be minimized. Poor hygiene and waste management will jeopardize our good health and could lead to premature death. Many cholera outbreaks in the past have resulted in mortality rates approaching 50%, along with significant losses in time and productivity. We cannot afford such consequences in a survival situation.

There are many elements of proper hygiene, including personal cleanliness, sanitary food preparation and cooking, and the safe disposal of human and animal waste. We should have a workable plan and contingency plans for all these areas.

We have become complacent in this country because of the well-developed support systems that provide clean running water, effective cooking techniques to ensure our food is safe to eat, and the efficient removal of trash and human waste.

It is now quite easy to maintain proper levels of sanitation in all these areas. However, all the systems we rely on could cease to function in a relatively short period of time. If that happens, we are left with the contingency measures we have prepared and the knowledge we have accumulated.

Please do not be complacent—continue to prepare. We hope that the information included in this issue will be useful in your readiness efforts. We wish you well in the uncertain future before us.

Sincerely,

Jay Whimpey, PE
TACDA President

FROM THE DIRECTOR

Sanitation in Disasters

By Roseanne Hassett, Executive Director

When disaster strikes, the top priorities for most of us are food, water, and shelter, which are essential for survival. But there is an element of survival that, unfortunately, is often overlooked and can become the most dangerous threat: sanitation. Without careful planning, sanitation failures can trigger severe illness and disease, which can become more devastating than the initial event itself.

That is why this issue of the Journal of Civil Defense focuses on the critical role of sanitation in emergency preparedness and response. In this journal, our contributors highlight sanitation methods, as well as water collection and purification techniques, and floodwater safety recommendations.

With thoughtful preparation, you can keep your family and community safer and healthier in a crisis. Sanitation should not be an afterthought; it is a cornerstone of survival.

THE SILENT THREAT IN GRID FAILURE: SANITATION AND DISEASE

By Paul Seyfried,
TACDA Board Member

Photo by Nathan Dumlao on Unsplash

Along with the cornerstones of food, water, shelter, and security, sanitation is often overlooked by most Americans because we take for granted our ready access to modern plumbing, abundant safe water, and, for most of us, a daily shower. We enjoy clean laundry as routine. But what about sanitation when electricity, and the critical infrastructure that depends on it, fails? In the short term, city water may continue to flow for a little while as the water tanks are depleted. However, the lift pumps in the city sewer system will not be moving wastewater on to the treatment plant. If your home is located at a lower elevation, raw sewage will back up into it. In severe cases, this will make your home uninhabitable. It is wise to obtain expandable drain plugs for every drain in your home, starting with the basement drain, shower, wash basin, and toilet.

This article focuses primarily on the risk of a long-term grid failure, potentially caused by a cyberattack, EMP, or even nuclear attack.

DISPOSAL

Along with the above actions we should take to block unwanted sewage from entering the home, we need to address the daily creation of human waste. Since garbage collection will abruptly cease, we are stuck with handling and disposing of waste on-site. This is best accomplished by digging a deep hole and fashioning a privy of some sort for privacy. A supply of quick lime would be very handy to help break down solid waste and extend the service life of the pit. It is important to control insects around the privy to prevent them from transmitting microbes from the contents of the pit to our kitchen and living environment.

TOILETS

Some experts advocate using ten-gallon trash bags to line the home toilet and simply remove the bags when needed, but I find this idea risky and unpleasant. My experience in Canada using outhouses was surprisingly tolerable, and I learned that it is possible to use them even in temperatures down to minus 60 degrees F. Insect control in warmer weather was easy with a No-Pest Strip hung inside.

LAUNDRY

Often overlooked, laundry is a very important part of sanitation. There are a variety of hand-operated agitators available to wash clothing in five-gallon buckets. The key factor here is having enough clean water not just for this task, but also for drinking, cooking, washing dishes, and bathing. So, the "1 gallon of water per day for emergencies" advice is, in my view, very short of the mark.

THE DEADLY CONSEQUENCES OF POOR SANITATION

Throughout history, the consequences of poor sanitation have often been catastrophic. When hygiene breaks down, especially in group settings or high-stress environments, disease spreads rapidly, and sometimes with deadly results.

To understand just how critical sanitation becomes during infrastructure collapse, we need only look to past

events. Military campaigns provide stark examples of what happens when large groups of people cannot maintain proper hygiene under stress.

The importance of proper hygiene, including washing clothing, is well illustrated by countless examples of military campaigns throughout history. One striking example comes from Napoleon's ill-fated invasion of Russia in June of 1812. His Grand Army of 625,000 soldiers crossed into Poland and found the inhabitants living in squalor. Their homes were infested with cockroaches and vermin, and the people were crawling with lice. Typhus was a disease that ravaged Europe for centuries, and many in Poland and Russia were already sick and dying from it.

The French army marched in the same uniforms for days at a time. They were hot and sweaty, the perfect environment for lice, which hid in the seams of their clothing. They could not stop their advance into Russia to properly launder their clothing, so the lice thrived. Adding to this, soldiers slept huddled in large groups for warmth, allowing lice to travel from one soldier to another. Napoleon lost 80,000 soldiers in the first month of the campaign from typhus alone.

Fast-forwarding, typhus probably killed or incapacitated more French soldiers than cannon and musket fire. In the end, Napoleon's Grand Army stumbled back to Paris with only about 5,000 soldiers, and a year later, only 1,000 were still fit for duty. This catastrophic loss, where disease killed far more soldiers than enemy action, demonstrates that even the world's most powerful military force could be brought to its knees by poor sanitation.

LESSONS FOR MODERN PREPAREDNESS

Napoleon's campaign illustrates a sobering truth: when sanitation systems fail, the consequences can be swift and devastating. In a grid-down scenario, we face similar challenges: large populations suddenly without modern waste management, limited water for cleaning, and the rapid spread of disease through contaminated environments.

The key difference is that we have the advantage of foresight. By preparing proper waste disposal methods, securing adequate water supplies for all sanitation needs, and understanding the critical importance of personal hygiene, we can avoid repeating history's deadly mistakes. In any long-term emergency, your survival may depend less on your food stockpile and more on your ability to stay clean.

Paul Seyfried has been interested in national security affairs since his enrollment at Missouri Military Academy and later New Mexico Military Institute. His interest in self-help civil defense intensified during the late Cold War. After building his first shelter with Sharon Packer, he became acquainted with several nuclear-weapons physicists involved in the creation of the nuclear age—including Edwin York and Dr. Conrad Chester—who had hands-on experience with field testing and with the effects of nuclear detonations on buried shelter structures. Paul's primary focus is the development and construction of cost-effective blast and fallout shelters within reach of middle-class Americans. As co-owner of Utah Shelter Systems, he designs and builds all-hazard NBC/CBRN shelters nationwide. His broader civil defense work includes practical guidance on emergency sanitation, water purification and storage, EMP resilience and hardening, family communications and power backup, firearms safety and secure storage. He serves as a Board Member of The American Civil Defense Association (TACDA).

EMERGENCY PREPAREDNESS AND THE ROLE OF COMPOST TOILETS

By Joseph Jenkins

WHY COMPOST TOILETS MATTER IN A CRISIS

Compost toilets operate without electricity or running water and, therefore, are reliable when other toilet systems are not. As the twenty-first century grinds on, we seem to be finding ourselves confronted with more and more natural disasters: hurricanes, earthquakes, tornadoes, floods, wildfires, ice storms, windstorms, and so on. Add homelessness, temporary encampments, refugee camps, temporary military outposts, "it" hitting the fan, and the like, and it should be obvious that we ought to be taking a look at sanitation systems that are reliable without needing electricity or running water; systems that are better than the "collect and dump" portable chemical toilets currently in widespread use in many parts of the world.

SCALABILITY AND POLICY SUPPORT

Compost toilet systems can be rapidly scaled up or down, depending on the need, even during disasters and even in large populations. It seems wise to incorporate such systems into disaster preparedness and response plans. It would help if regulators supported the permitting of compost sanitation systems and if they developed regulations, policies, and guidelines that encouraged compost-based sanitation.

THE WEAKNESS OF U.S. WASTEWATER INFRASTRUCTURE

The United States has over seventeen thousand wastewater treatment plants serving three-quarters of the population. These plants don't work without electricity and running water. What happens when your electricity suddenly shuts off and you have no idea when, or if, it will come back on? You begin to have some idea of what it's like for the billions of humans who live without electricity or running water every day. Suddenly, you don't have a functioning water toilet. What do you do?

The American Society of Civil Engineers rates American wastewater infrastructure as a D+, slightly above a failing grade. They estimate that fifty-six million new users will be connected to American wastewater facilities by 2032. That's a lot of people with flush toilets in the US alone, and a lot of toilet material that will continue to be produced by their bodies, whether they can flush their toilets or not. It is estimated that the US will need $271 billion to meet current and future wastewater treatment needs.

FUNDING PRIORITIES AND PUBLIC HEALTH

Although this sounds like a huge amount of money, it is equivalent to the amount US taxpayers spend on military expenses every 14 weeks. It seems ironic and unfortunate that spending money to protect the public from large-scale sewage pollution in the event of a disaster is not considered "defense" spending, and therefore, "defense" money can't be allocated for these purposes.

TURNING DISASTER DEBRIS INTO SANITATION RESOURCES

After a hurricane or other extreme wind or weather event, trees are downed, possibly by the thousands. In Louisiana, USA, after Hurricane Katrina, trees were laid flat over a 50-mile (80 km) expanse. Many trees were blocking roadways, breaking electric lines, damaging houses, and so on. These trees needed to be removed and

cleaned up. The branches could have provided the potential for many tons of fresh cover material for emergency compost toilets if ground up fine enough to use for this purpose. In a disaster scenario, we can clean up the trees and debris and prevent sewage at the same time by using composting as a sanitation option. Put in perspective, a US military air-to-air missile costs upwards of half a million US dollars. How many chipper/shredders or compost grinders would that buy?

CASE STUDY: KENTUCKY MUSIC FESTIVAL

A group of three hundred people gathered in Kentucky, USA, for a music festival in a remote wooded area where toilets had to be provided. Portable chemical toilets and pump trucks were not practical due to the rugged terrain and lack of access. Instead, heavy-duty plastic, wheeled garbage cans, also known as "wheelie bins," were used to collect the toilet material. The approximately 50-gallon (190-liter) bins were positioned directly underneath the toilets. A cover material was used after each deposit. When about 75 percent full, the bins were wheeled out from underneath the toilet building and replaced with empty bins. The full bins were set aside with lids.

About three hundred people filled six bins over the duration of the festival. What is interesting about this scenario is that nothing was done with the bin contents. The full bins just sat there for an entire year until the author came upon them a year later while conducting research. What he found was that the bin contents had shrunk by at least half. There was almost no odor inside the bins. He dumped the bin contents into a pallet bin set up for making compost. New organic materials, including toilet material and food scraps, were then added to the pallet bin as needed.

URBAN AND COMMUNITY APPLICATIONS

What does this have to do with disaster preparedness? Clearly, if a family in an urban situation had a compost toilet available to them and had a bale of compressed peat moss, or a bag of rice husks, sawdust, or fine wood shavings, and a couple of wheelie bins, they could have a quick, functional sanitation system that could be used for months. The toilet contents could be deposited into the wheelie bins, as could food scraps. Once the disaster scenario had passed, the wheelie bins could be collected by a municipal authority and composted off-site later. It won't hurt the organic material in the bins if many months pass before the bins are emptied.

Alternatively, centralized community compost bins could be constructed, and the wheelie bin contents collected there, managed by trained personnel. Finally, individual compost bins quickly constructed from pallets, for example, could be used for collecting the toilet material in a suburban backyard, provided an adequate supply of suitable cover material is available, and the users had some composting knowledge or training.

INDOOR COMFORT WITHOUT WATER OR POWER

This would allow continuous use of comfortable, odorless, secure indoor toilets without the need for water or electricity. A small amount of water would be needed to wash out the toilet receptacles, or else compostable plastic bag liners could be used in the receptacles, thereby eliminating the need for water altogether (as was done at the Kentucky music festival). Approximately one plastic bag liner per person per week would be needed.

This emergency sanitation system can be scaled up to include large, waterproof "dumpsters" where toilet material could be collected by emergency sanitation workers. The contents of the dumpsters could be composted once circumstances allow. The object is to keep all toilet material from entering the environment. If you can't flush it, that doesn't mean you're justified in dumping it outside or into a hole in the ground. Use a carbon-based organic cover material and collect it all in a watertight container so that it can be composted at a later date.

EMERGENCY SUPPLY ESSENTIALS

Emergency preparedness supplies would include a compost toilet with enough receptacles (with lids) to comfortably service the number of people using it. The toilet can be as simple as a 5-gallon (20-liter) plastic receptacle with a snap-on toilet seat.

These tend to be unstable on smooth surfaces where they can tip over when you're sitting on

them and leaning sideways (to wipe), so it's better if the toilet is enclosed in a stable cabinet of some sort.

One adult is going to fill one receptacle per week, depending on the size of the adult, how much he or she eats, and the quality of the cover material being used. Loose, fluffy cover material such as wood shavings will fill a receptacle much faster than finer material such as sawdust—especially if the sawdust has some moisture content, which greatly improves the biofilter qualities, or odor-blocking characteristics, of the sawdust.

COVER MATERIALS AND STORAGE

Cover materials can be bought in loose bags or in compressed form at feed stores or garden supply outlets. These can include peat moss, fine wood shavings, and rice hulls. The shavings and husks are typically used for animal bedding. The moss is typically used for soil mixes. These will all be dry and should be rehydrated somehow for optimum performance. They can be left outside in the rain to rehydrate and become biologically active, or they can be misted with water before adding to the toilet. For urinals, just leave the material dry.

Have watertight 50-gallon wheelie bins, with lids, available. Include several boxes of 13-gallon compostable plastic bags as toilet liners, ideally a brand that is suitable for backyard compost (it should say so on the box). These are readily available for purchase on the internet.

FINAL PREPARATIONS

Put about 12 inches of dry cover material in the bottom of the wheelie bins, then dump the toilet contents—bags and all—into the bins. There is no need to puncture the bags beforehand. When the bin is full, cover the contents thoroughly with clean cover material, close the lid, and deal with it later when circumstances allow.

Finally, keep an emergency supply of toilet paper on hand.

See Compost Toilet Review on page 11.

This article is an exerpt from the author's book, *Compost Toilet Handbook*, chapter 18, "Emergency Preparedness".

Joseph Jenkins is internationally known for authoring The Humanure Handbook, a book about composting human manure, originally published in January 1995. The most recent edition (2019) being The Humanure Handbook, 4th Edition: Shit in a Nutshell. The Humanure Handbook title has been sold worldwide, published in foreign editions on four continents, and translated into over twenty languages so far. The author also published The Compost Toilet Handbook in 2021. Jenkins' speaking and training schedule has taken him nationwide in the USA, to Canada, Mongolia, Uganda, Kenya, Tanzania, Finland, Mozambique, Morocco, Nicaragua, India, and Haiti teaching "composting as a sanitation alternative" or "ecological sanitation" since 2006. He has been a compost practitioner since 1975 and has grown a humanure compost-amended organic garden for the past 50 years. Jenkins can be reached via his web site at HumanureHandbook.com where videos, instructions, and the complete Humanure Handbook, 4th edition can be accessed free of charge.

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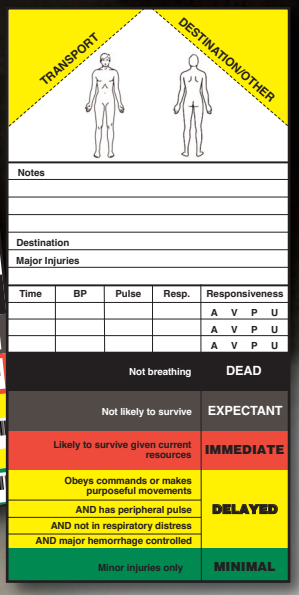

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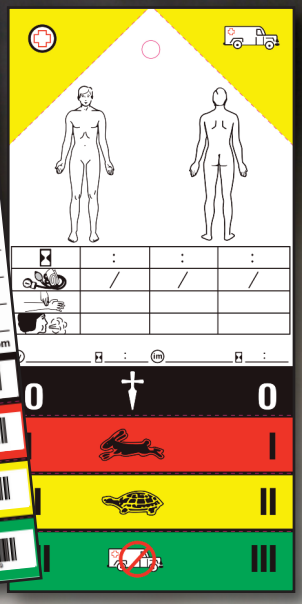

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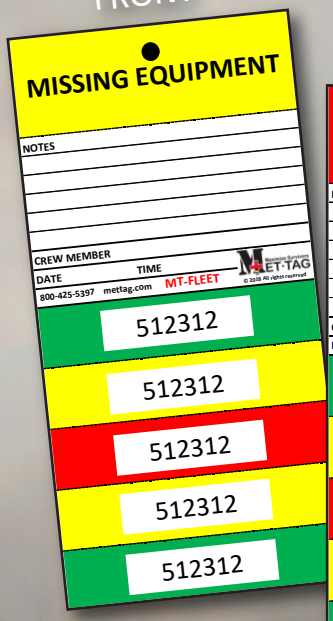

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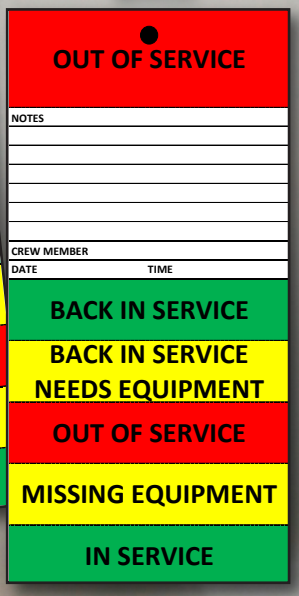

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COMPOST TOILET REVIEW

By Joseph Jenkins

DOs:

- DO – Collect urine, feces, and toilet paper in the same toilet receptacle. Urine provides essential moisture and nitrogen.
- DO – Keep a supply of clean, organic cover material near the toilet at all times. Rotting sawdust, peat moss, leaf mold, and other such cover materials prevent odor, absorb excess moisture, and balance the carbon/nitrogen (C/N) ratio.
- DO – Keep another supply of cover material near the compost bins for covering the compost pile itself. Coarser materials such as hay, straw, weeds, leaves, and grass clippings prevent odor, trap air in the pile, and balance the C/N ratio.
- DO – Deposit human manure into a depression in the top center of the compost pile, not around the edges.
- DO – Add a mix of organic materials to the human manure compost pile, including food scraps.
- DO – Keep the top of the compost pile somewhat flat. This allows the compost to absorb rainwater and makes it easy to cover fresh material added to the pile.
- DO – Use a compost thermometer to check for thermophilic activity.

DON'Ts:

- DON'T – Segregate urine or toilet paper from feces.
- DON'T – Turn the compost pile. Sit back and relax and let the microbes do the work for you. Once your pile is built, let it age in peace, undisturbed, for approximately one year.
- DON'T – Use lime or wood ashes on the compost pile. Put these things directly on the soil.
- DON'T – Expect thermophilic activity until a sufficient mass has accumulated.
- DON'T – Deposit anything smelly into a toilet or onto a compost pile without covering it with a clean cover material.
- DON'T – Allow dogs or other animals to disturb your compost pile. If you have problems with animals, install wire mesh or other suitable barriers around your compost, and underneath if necessary.
- DON'T – Segregate food items from your human manure compost pile. Add all organic materials to the same compost bin.
- DON'T – Use the compost before it has fully aged. This means one year after the pile has been constructed, or two years if the human manure originated from a diseased population.

Photo by Frederic Bourbeau on Unsplash

SANITATION STRATEGIES FOR SURVIVAL IN NUCLEAR SHELTERS

By Sharon Packer, MS Nuclear Engineering

Sanitation is essential in all aspects of life, but during a nuclear crisis, it can mean the difference between survival and disaster. Many sanitation concerns that seem minor in daily life, such as dust control, waste management, and personal hygiene, become critical in the confined, resource-limited conditions of a fallout shelter.

DUST

Dust is rarely thought of as a sanitation issue, yet in a nuclear event, fallout dust is one of the greatest threats to health. During the first two weeks after a nuclear attack, fallout dust is the main source of deadly gamma radiation. If no visible dust is found on cars, sidewalks, or other surfaces in the days following an attack, your radiation exposure may be minimal. However, if dust is present, you must remain sheltered for at least two weeks. After this period, the dust primarily poses an internal hazard due to alpha and beta radiation.

Fallout dust may start accumulating before we reach our sheltered area. Everyone should carry shoe covers, a raincoat, and a hat in their emergency kits. Remove and discard these items before entering to prevent contamination of the shelter. Those without this protective outerwear should discard all outer clothing and shoes and wash all exposed areas of skin.

During our stay in our shelters, we may see dust accumulating on counters and canned foods. This dust should be removed with disposable wipes. Rodents and insects may have been present at some earlier time, and all food, cans, utensils, and dishes should be kept meticulously clean.

RODENTS, INSECTS, AND SNAKES

Shelters can attract pests such as mice, rats, snakes, and insects. Use sticky traps for insects, and heavy-duty glue boards for rodents and snakes. Although some consider glue traps cruel, they are safer than poison in the confined shelter environment. Inspect and replace traps regularly to prevent infestations.

FOOD AND SUPPLIES

Rotate canned food and store bulk items in metal or heavy plastic containers to keep out pests. Monitor expiration dates on cleaning products, shampoos, and other liquids—plastic containers can degrade over time and leak. Cardboard and paper containers can absorb moisture, weaken, and spill contents, so store goods in plastic or metal packaging.

PERSONAL CLEANLINESS

Since water is scarce, full showers are impractical. Water conservation is critical. One toilet flush or a small shower can use a full day's drinking water for one person. Use a bucket system for bathing, with disposable washcloths for cleaning. Cover hair with a hat or scarf to postpone washing.

TOILETS

Consider the use of "dry" toilets with plastic-lined containers for solid waste, storing sealed waste in metal containers until safe disposal is possible. Flush toilets require septic or holding tanks. Septic tanks fail at about 5 psi, which may force waste back into the shelter. If not in a blast area, septic tanks can be used but must be installed well below and away from the sheltered area. Avoid connecting shelter plumbing to municipal sewer systems,

as these are likely to fail, with the risk of flooding your shelter with sewage.

Separate burnable trash from garbage and bury waste after your stay. Think ahead and dig a pit outside for garbage and human waste. After the shelter stay, cover the garbage with several feet of dirt so animals will not disturb it.

LAUNDRY

Washing clothes in a shelter is water-intensive and creates excess humidity. Each person should store at least a two-week supply of underwear, socks, and outerwear. Store disposable diapers. Keep dirty clothing in sealed plastic bags until it can be removed safely.

MOLD AND MILDEW

Humidity is an ongoing problem in shelters, especially in concrete structures. Use a 12-volt dehumidifier if needed. Hatch-type metal doors can cause condensation to drip down into the entrances. Clean mold if present with appropriate cleaners and quickly address any flooding issues. Consider placing a good insulating material over the outside of the hatch. During winter, this may also keep the snow from melting around the entrance. Groups of people who may be looting would look for melting snow as a sign of buried underground supplies.

INJURIES AND ILLNESS

Sanitize and bandage all wounds to prevent infection. Keep antibiotics on hand and isolate anyone with a contagious illness. Stay up to date with tetanus and pneumonia vaccinations.

POST-SHELTER SANITATION

Wear masks for several months to prevent inhalation of fallout dust and protect eyes with safety glasses or goggles. Wash dust from exposed skin with soap and water to prevent beta radiation burns.

FOOD AND WATER SAFETY

- Fruits & Vegetables: Fresh fruits and vegetables with hard skins can safely be eaten if washed and peeled before consuming. Soft-skinned fruits and vegetables with rough skins, such as peaches or broccoli that have been exposed to dust, should not be eaten.
- Prepared Foods: Canned foods can be eaten after washing the outside of the container. Boxed foods should not be eaten as they may be contaminated with radioactive fallout and should be buried with other garbage. Any garbage suspected of radiation contamication should not be added to compost piles.
- Dairy: Fresh milk from cows or goats should not be consumed for at least 90 days, as iodine-131 may have contaminated the animal's feed. Eggs can safely be eaten, but eggshells should be discarded.
- Meat & Fish: Meat from livestock that appear healthy may be slaughtered and eaten; however, organs and bones may contain the radioactive isotope, strontium-90, and should be discarded and buried. Top-feeding fish, such as trout, are generally safe to eat. Avoid bottom-feeding fish, such as carp and catfish, as they may have ingested radioactive particles from the lake or stream bed.
- Water: Radiation will not harm water unless the fallout dust has entered an open container. When foraging, draw water from the top layer of deep sources, then clarify and purify before drinking.

CONCLUSION

Strict sanitation practices before, during, and after sheltering are essential for survival in a nuclear crisis. Both pre-war preparation and education are critical for post-war survival. Gather your supplies, store and rotate them carefully, and join TACDA in educating friends and neighbors on essential survival techniques.

Sharon Packer has a Bachelor's degree in Mathematics with a minor in Physics, and a Master's degree in Nuclear Engineering. Sharon is currently the owner and operator of Underground Shelters USA and builds and designs all hazard NBC shelters throughout the nation.

BEWARE OF FLOOD WATERS
HIDDEN DANGERS AFTER THE STORM

By Bruce Curley, TACDA Vice President

Photo by Jonathan Ford on Unsplash

Floodwaters may look harmless from a distance, but they can hide serious health hazards. Understanding these dangers and knowing how to respond can help protect your family during and after a flood.

When flooding occurs, water purification plants, which are designed to process dirty water and make it safe for reuse, can become overwhelmed. The holding ponds at these facilities can overflow, releasing untreated water into surrounding areas. What is normally a contained process may suddenly become a significant health threat.

Floodwaters often contain a dangerous mix of sewage and debris. This contamination can carry harmful pathogens such as E. coli and Salmonella, increasing the risk of diseases like dysentery or hepatitis A if the water is used for drinking, cooking, or personal hygiene. Heavy rainfall (two to four inches in less than an hour) can also overwhelm local sewage systems. When that happens, raw human waste, industrial runoff, and other pollutants can spill into homes and streets, increasing the danger of waterborne illnesses, including typhoid fever.

Even after the floodwaters recede, the dangers remain. Persistent dampness in flood-damaged homes creates an ideal environment for mold growth, which can trigger respiratory problems, allergic reactions, and even infections. Standing water left behind can also become a breeding ground for mosquitoes, which can lead to vector-borne diseases such as the West Nile virus. Chemical contamination is another serious concern. In industrial areas, flooding can cause chemical ponds to overflow, releasing substances that may cause skin irritation, respiratory issues, or even poisoning.

In addition, flood damage to infrastructure can leave communities without clean water or functioning sanitation systems. This makes it difficult to maintain proper hygiene and increases the spread of disease. In some cases, residents may need to relocate to hotels or shelters simply to access safe, sanitary living conditions.

PRECAUTIONS TO PROTECT YOURSELF AND YOUR FAMILY

Here are some precautions you can take to ensure your safety when floodwaters impact your family, home, and community:

- Use safe drinking and cooking water. After a flood, drink and cook only with bottled, filtered, or boiled water. WaterBrick® containers are an excellent option for storing potable water and are available for purchase through TACDA's Survival Store.
- Avoid direct contact with floodwater. Floodwater can contain sewage, animal waste, industrial chemicals, sharp debris, and even snakes or insects. Whenever possible, stay out of floodwater to reduce your risk of illness or injury.
- Wear proper protective gear if contact is unavoidable. Always wear heavy boots to protect your feet from

cuts and punctures and gloves to protect your hands from debris and contaminants. This protection can also help you climb or steady yourself in moving water. Avoid walking through floodwater in sneakers, sandals, or flip-flops, as these offer little protection and can lead to injuries or infections. In a disaster, medical help may be delayed for hours or even days.

- Control mold growth quickly. If floodwaters have entered your home or business, mold is almost certain to develop. First, wipe affected areas with bleach. Second, wipe with hydrogen peroxide. Third, use an industrial cleaner for especially stubborn spots. This three-step approach kills most viruses, bacteria, and fungi.
- Be prepared for additional flooding. Monitor local alerts and keep a NOAA All-Weather Radio on hand. It is not uncommon for a second flood to occur within days or weeks of the first.

Flooding changes everything, especially when it comes to sanitation for you, your family, and your neighbors. Your ability to adapt to these changed circumstances will determine how quickly you recover. Adults must stay aware of and guard against the secondary risks of flooding to protect their family's health, safety, and overall sanitary conditions. Your children and grandchildren depend on your skills before, during, and after a flood.

Bruce Curley is the volunteer Vice President of TACDA. He has done professional and volunteer civil defense work for over 40 years. You can find 25 years of his civil defense strategies on https://poetslife.blogspot.com/ and more recently on Substack at https://poetslife.substack.com/.

Photo by Wes Warren on Unsplash

Welcome to our new Board Member!

Meira M. Pernicone, M.D.

Meira was born in Florida, graduated from Jacksonville University in Florida in 1982, received her medical doctorate from the University of South Florida College of Medicine in Tampa in 1986, and then completed her general surgery training at the Mayo Clinic in Rochester, MN, in 1992. Following completion of her residency training, she and her husband moved to Orlando, Florida, where they both joined busy practices, she in Surgery, and he in Pathology. Dr. Pernicone became certified in general surgery by the American College of Surgeons in 1994, and she has and will continue to maintain her board certification. In 1995, she opened a multi specialty, comprehensive breast care center, where she worked for several years as a breast cancer surgical specialist. In late 2000, Dr. Pernicone placed her active surgical career on hold so that she could care for her husband and homeschool their four children. However, she kept her Florida medical license active and current, she maintained advanced, cardiac life support, and basic life support certifications, and attended medical and surgical conferences several times each year to stay current in the dynamic field of medicine. In 2007, she returned to surgical practice at the University of South Florida College of Medicine in the Breast Health Program directed by Dr. Charles E. Cox. Dr. Pernicone has a long-standing, keen interest in preparedness, not just for her family, but for her community and for our wonderful United States of America. She has been a member of TACDA since the mid-1990s. At the end of 2023, Meira retired from the University of South Florida College of Medicine. She looks forward to serving on the board of TACDA, and she hopes to contribute her insights into the medical aspects of civil preparedness and defense.

SAFE WATER IN ANY SITUATION:

STORAGE, PURIFICATION, AND DIY METHODS

By James C. Jones

Water, water everywhere, and not a drop to drink" was the lament of the ancient mariner, stranded and thirsty in a sea of undrinkable saltwater. Today, water flows easily from a faucet or is purchased in bottles, clean and (arguably) pure. But what if it didn't?

Next to air, water is the most critical life-sustaining resource. The human body can survive far longer without food than without water. In the long term, you can't even grow or cook most foods without access to water. Cleaning, decontamination, first aid, sanitation, and even fire control all depend on access to water.

Wars have been fought over access to water sources, and entire civilizations have risen and fallen with the flow of rivers and springs. Water supplies are prime targets for terrorists and military attacks, as seen in Ukraine and Gaza, and are vulnerable to both natural and man-made disasters. Water supplies may be deliberately poisoned or contaminated by terrorists, or they may carry diseases such as typhoid fever, cholera, dysentery, or hepatitis A due to flooding, damage, or poor maintenance.

Safe water will be critical not only for your family's survival, but it may also become a more valuable trade commodity than food or medicine. Water pumps and treatment plants are the heart of urban and suburban civilization. Without them, society would collapse into chaos within days, and millions could die within weeks. Truly, he who controls the water controls life, and he who has his own water is free.

Depending on age, health, activity level, and environment (temperature and humidity), the average person can survive only about three days without water. Under normal conditions, the average person requires at least one quart of drinking water per day. When sanitation and cooking needs are included, a more practical rule of thumb is to store at least 4–5 gallons per person per day for emergencies.

STORING WATER

In theory, you can never store too much water, but it is heavy and takes up a lot of space. If you expect to remain at home, and your home is safe from fire, floods, or other threats, then storing water there makes sense. However, if your home could become damaged or inaccessible, you should consider storing water in a safer but still reachable location.

Think about whether you may need to carry your water. A 55-gallon drum in the basement is useless if you need to evacuate. For portability, use plastic containers designed to hold water or soft drinks. Milk and juice jugs may be used in an emergency, if there is nothing else, but the CDC recommends not using them because they are flimsy and difficult to clean properly. Never use containers that once held soaps, solvents, or chemicals.

Before use, clean the bottle with soap and water and rinse thoroughly. Then prepare the sanitizer. Mix 4 teaspoons of household bleach that contains 5-9% sodium hypochlorite with 4 cups of clean water. Shake well, and make sure the solution contacts all surfaces for at least 30 seconds, then pour the solution out, and allow it to air dry. Once the container is completely dry, refill it with clean water and secure the opening with a tight-fitting lid.

Another simple option is to buy bottled water from the store. As a rule of thumb, store at least five gallons of water per person for basic short-term emergencies. This would be the minimum amount needed for 5 days, but 1.5 to 2 times more would be ideal. Don't forget your pets!

If you receive early warning of a possible water shortage, collect as much water as possible while the supply is still running. Fill your bathtub, sinks, pots, and pans. Run your washing machine full of water (without soap). You can also use children's wading pools, storage totes, or any other large, clean containers you have available.

METHODS FOR PURIFYING WATER

Chemical Purification

The two most common methods of water purification are chlorine bleach and iodine.

- Chlorine bleach: Household bleach typically contains about 5-9% sodium hypochlorite. Use 8 drops per gallon of water to purify. Cloudy, colored, or very cold water requires more bleach. The CDC recommends doubling the amount of bleach for those conditions.
- Iodine: Tincture of iodine is another effective method, especially recommended for southern and tropical environments. Add 5 drops of 2% USP tincture of iodine to one quart of clear water, or 10 drops if the water is cloudy. Note: Those who are pregnant or have thyroid disease should avoid iodine use. Do not use iodine for more than a few weeks. Iodine does not kill Cryptosporidium (chlorine dioxide tablets do).

In both cases, mix well and let the water stand for at least 30 minutes before drinking.

Commercial chlorine and iodine purification tablets are also widely available from camping supply outlets. They typically cost around $5 for a 50-tablet bottle and are small enough to carry in a pocket or survival kit. Each comes with clear instructions for use.

Boiling Water to Purify

Bringing water to a vigorous boil for one minute (or 3 minutes at elevations ≥6,500 ft.) will kill most biological contaminants.

To improve taste after boiling:

- Add a pinch of salt, or
- Pour the water back and forth between containers to aerate it.

Boiling is one of the most effective and practical purification methods, provided that you have enough fuel.

Distillation of Water

Distillation involves boiling water into steam and then condensing it back into liquid form. This process removes biological and particulate contaminants, and even turns salt water into drinkable water.

Limitations

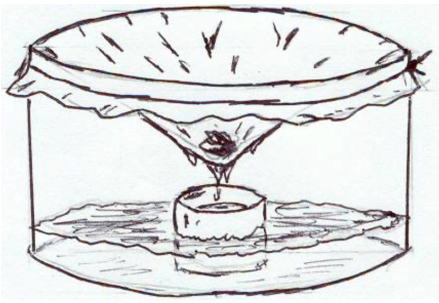
Some volatile chemical contaminants can remain in distilled water. If you suspect serious chemical contamination, do not rely on this method.

Distilled water may also taste flat. Shaking or pouring it back and forth will help restore a normal taste. While stills can be improvised in an emergency, it is best to prepare the necessary components and test them in advance.

A still system consists of:

1. Heat sources such as a stove or fire.
2. A closed tank or pot to boil the contaminated water in.
3. A long tube or coil to take the steam away and cool it.
4. The tube can be cooled by air (coiling) or water. Wrap the coil in a cloth kept wet.
5. A container to catch the water.

Distillation can also be done using a solar still, as shown below. This may be slower, but it requires no fuel usage.



Left: A simple solar still. Place a weighted cup in the center of a round pan or bucket. Pour saltwater into the pan around the cup (not into the cup). Cover the top tightly with clear plastic and seal the edges. Set a small pebble on the plastic directly above the cup to form a low point. In sunlight, vapor condenses on the plastic and drips into the cup, leaving the salt behind.

WATER FILTRATION AND PURIFICATION SYSTEMS

There are far too many commercial water purification systems to cover in detail here, but a few examples show the range of options available. Note: Most portable filters do not remove viruses; make sure to pair the filtration with a chemical disinfectant or UV, or use a purifier certified to NSF/ANSI P231 (or reverse osmosis) when virus removal is required.

- Pocket filters: Compact systems such as the LifeStraw™ can filter several hundred gallons of water

and typically cost around $20 (link here).

- Filtration bottles: These allow you to pour unfiltered water in and squeeze clean water out, which is handy for hiking and emergencies.
- Portable family units: Larger portable systems capable of filtering 4,000–5,000 gallons of water are available for under $100.
- Home systems: Large household units that can remove 99.999% of bacteria and many chemicals at a rate of ten gallons or more per day can be purchased for a few hundred dollars.

One of the first steps toward true preparedness is to invest in a larger filtration system for home use and a smaller one for your evacuation pack. Water-filtering canteens and bottles are available at most sporting goods or survival stores for $30–$40, with replacement filters costing around $20–$30.

These smaller systems are excellent for evacuation packs and short-term emergencies, but a larger home system is more practical for long-term shelter-in-place situations.

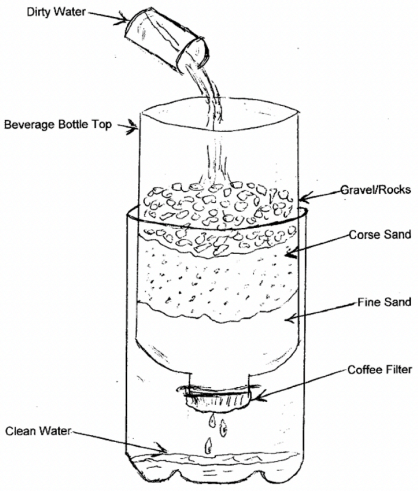
Water purification tablets, filter straws, filtration bottles, and compact filtration systems are widely available at camping and sporting goods stores. These items are essential additions to evacuation packs and survival kits.

Commercial water filtration systems come in a wide range of sizes and price points, with many models capable of filtering thousands of gallons of water for reliable home use.

HOMEMADE WATER FILTERS

A simple homemade filter can be constructed using a large plastic beverage bottle with the top half cut off and inverted into the bottom half. The top layer should be clean gravel, followed by coarse sand, then fine sand, all held in place by a coffee filter at the bottom. For improved effectiveness, activated charcoal can be added as one of the layers.

This type of filter helps remove visible particles and some impurities. However, filtration alone does not make water safe to drink. After running rainwater or other collected water through the filter, disinfect it by adding household bleach (6–8 drops per gallon) to kill biological contaminants. This is especially important for rainwater collected from rooftops, which can carry bacteria and debris.



Tip: The best source for clean gravel, sand, and activated charcoal is aquarium supply stores, where materials are packaged specifically for water use.

ULTRAVIOLET PURIFICATION

Ultraviolet (UV) light has been used in municipal water treatment since the 1940s. It destroys microorganisms that cause disease through a process called thymine dimerization, which disrupts their DNA and prevents reproduction.

In recent years, UV water purification systems have

become available for both home and outdoor use. These devices use very little energy, require no added chemicals, and are highly effective against biological contamination. However, UV does not remove chemical pollutants or particulates, so pre-filtration is necessary if such contaminants are present.

- Home UV systems: Cost anywhere from a few hundred to several thousand dollars, depending on size and capability.
- Portable UV devices: Pocket-sized UV water purifiers, often rechargeable, range from $50 to a few hundred dollars.

Using Sunlight for UV Purification

Natural sunlight can also be used to purify water, provided the source water is not chemically contaminated. Sunlight works in much the same way as artificial UV devices by killing microorganisms.

To use this method:

1. Start with a clear PET plastic bottle (avoid glass, as it blocks UV rays).
2. Fill the bottle with clean, colorless water.
3. Place the bottle on its side in direct sunlight, with the long side facing the sun to maximize exposure.
4. For improved results, place the bottle on a dark or reflective surface such as aluminum foil.
5. Leave the bottle in the sun for at least six hours on a mostly sunny day. If the sky is partly cloudy, leave it for up to two full days to ensure effective decontamination.

WATER PREPAREDNESS AND SURVIVAL

Not all water needs to be safe for drinking to be useful. Water that is unsafe to drink may still be fine for washing clothes, watering plants, or flushing toilets.

Think carefully about how you use your supply:

- Reserve safe drinking water for drinking, food preparation, handwashing, and medical care.
- Reuse or recycle gray water (water that has already been used for washing or is from non-potable sources) for non-contact tasks such as cleaning floors or flushing toilets.
- When possible, recycle used water through filtration and purification to extend your supply.

Once an emergency begins, you must gather every drop you can and make every drop count. Stay hydrated; your survival depends on it.

EVERY DROP COUNTS

In an emergency, water becomes the most valuable resource you can control. From safe storage and chemical purification to filters, UV systems, and conservation strategies, preparedness is the difference between survival and disaster.

By planning ahead and storing enough water, keeping purification tools ready, and knowing how to use them, you can ensure that you and your family remain safe, healthy, and resilient when the taps stop running.

QUICK-REFERENCE CHECKLIST: STORING WATER

- **Storage location:** Safe, accessible, and protected from hazards
- **Container choice:** Food-grade plastic or bottles; avoid chemical containers and plastic milk or juice jugs
- **Container prep:** Rinse, sanitize with 5-9% bleach solution, then fill
- **Treatment:** Tap water stores safely; add bleach (8 drops/gal) for questionable sources
- **Minimum storage:** Five gallons minimum per person for short-term emergencies (5 days)
- **Emergency collection:** Bathtub, sinks, pans, washing machine (no soap), kiddie pools, totes

James C. Jones is a Certified Hazard Control Manager. Emergency Medical Technician, and retired Safety and Security Manager for a Fortune Two Hundred corporation. He has spent over 40 years teaching survival skills and advocating for family preparedness and self-sufficiency. He founded Live Free USA in 1968 and has written articles for many national preparedness magazines and has authored five books from Skyhorse Publications. His articles are also featured on the Live Free USA website at www.AmericanSurvivor.org. He can be contacted at survivorjj@aol.com.

Make Water Safe During an Emergency

After a disaster or emergency, tap water may not be safe to use. Always listen to your local authorities for specific advice.

Use bottled water for drinking, cooking, and brushing teeth if possible. If bottled water is not available, choose one of the following methods to make your water safe.

Water contaminated with harmful chemicals or toxins cannot be made safe by boiling,disinfecting, or filtering.

BOIL

This method will kill bacteria, viruses, and parasites.

Boiling water is the best method.

Boil your water for 1 minute.

At elevations above 6,500 feet, boil for 3 minutes. Let the water cool.

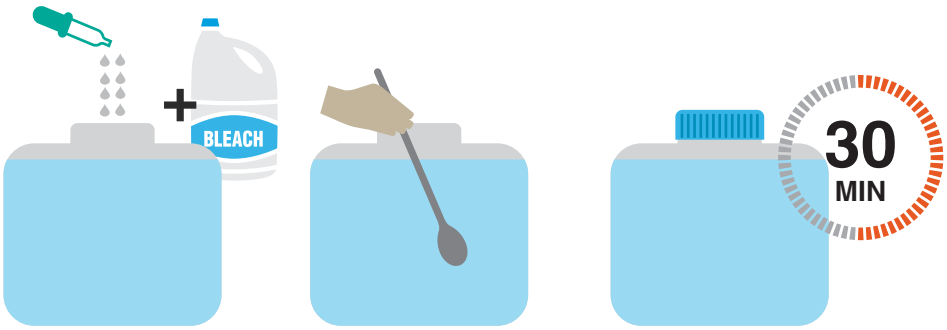
DISINFECT

This method will kill most viruses and bacteria.

Add 8 drops or a little less than 1/8 of a teaspoon of 5%-9% unscented household bleach to 1 gallon water.

For cloudy tap water, use 16 drops or ¼ teaspoon.

If you don't have household bleach, chlorine dioxide tablets or iodine can be used according to label instructions.



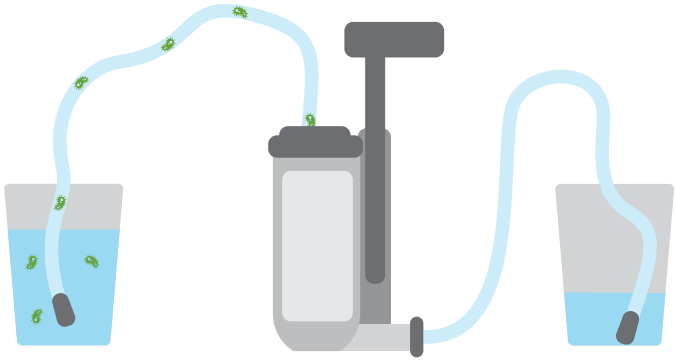
Add bleach to water. **Mix well.** **Wait at least 30 minutes before using.**

FILTER

This method can remove parasites.

Most portable water filters do not remove bacteria or viruses.

Choose a water filter labeled to remove parasites, and follow manufacturer's instructions. Filtered water might need additional treatment to be safe.



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Learn more:
www.cdc.gov/healthywater/emergency/making-water-safe.html

CS334749-A

BUCKET TOILETS:

PRACTICAL WASTE SOLUTIONS FOR POWER OR WATER OUTAGES

By Jay Whimpey, PE, Chemical Engineering, TACDA President

A proven method for safe waste disposal that conserves water, produces compost, and can be built with materials you already have.

Sanitation during an emergency situation is very important. When normal sanitation practices are disrupted due to a power outage, a failure in utility water delivery systems, or other emergencies, we still need a way to safely and efficiently dispose of human fecal matter. Fecal matter is biologically hazardous and must be handled properly.

Good news: there is a simple and inexpensive way to treat and dispose of it safely, while producing usable compost as a by-product. Urine from healthy individuals is generally low in harmful bacteria when fresh, which is why it is often described as "nearly sterile." It can be diluted with water and applied directly to a garden, where it provides ammonia and other valuable minerals that benefit plant growth.

A 5-gallon plastic bucket toilet is an inexpensive and effective method for handling human waste, including both fecal matter and urine. Many people have used this method daily for years with excellent results. One family of eight, for example, first turned to the bucket toilet over a decade ago when they had trouble with their septic system and sewage piping. They found it worked so well, saving water and producing compost for their vegetable garden and flowers, that they continued using it full time.

The method is straightforward. A bucket is placed inside a support structure fitted with a regular toilet seat. Wood shavings or pellets are used to absorb moisture, cover the fecal matter, control odor, and discourage pests such as flies. Large families may need to empty the bucket daily. To start a fresh bucket, place a small handful of shavings or pellets in the bottom, then add a handful or two after each use. Toilet paper and other wipes can be added as long as they are biodegradable. Dark-colored buckets, such as black, tend to last longer outdoors because the pigments (especially carbon black) help block UV rays that degrade plastic over time.

The family mentioned earlier eventually switched to using pellets almost exclusively, finding them less messy and more compact than shavings. Pellets quickly disintegrate when exposed to moisture, expanding in volume. A bucket can be fitted with a screw-on bucket lid to control odor when it is not in use, but most people who have used the bucket toilet report that odor is not a major issue.

Wood pellets are widely available at hardware stores and are typically sold for use in pellet heating stoves. They are less expensive and more effective than smoker pellets. Pine pellets work better than hardwood smoker pellets for this purpose. Shavings, on the other hand, are available at pet supply or farm supply stores, usually as animal bedding, and are most often made from pine.

The contents of the bucket can be composted by emptying them onto a bed of hay and covering with additional hay, particularly in warm weather when insects are active. As the compost pile grows, new material can be covered with the drier, older compost. In about six months, the compost is usually ready to be applied to the garden.

This method is inexpensive, easy to implement, and conserves water, which is a major advantage in a survival situation. It can also be useful in a shelter-in-place scenario, with multiple buckets available and full buckets

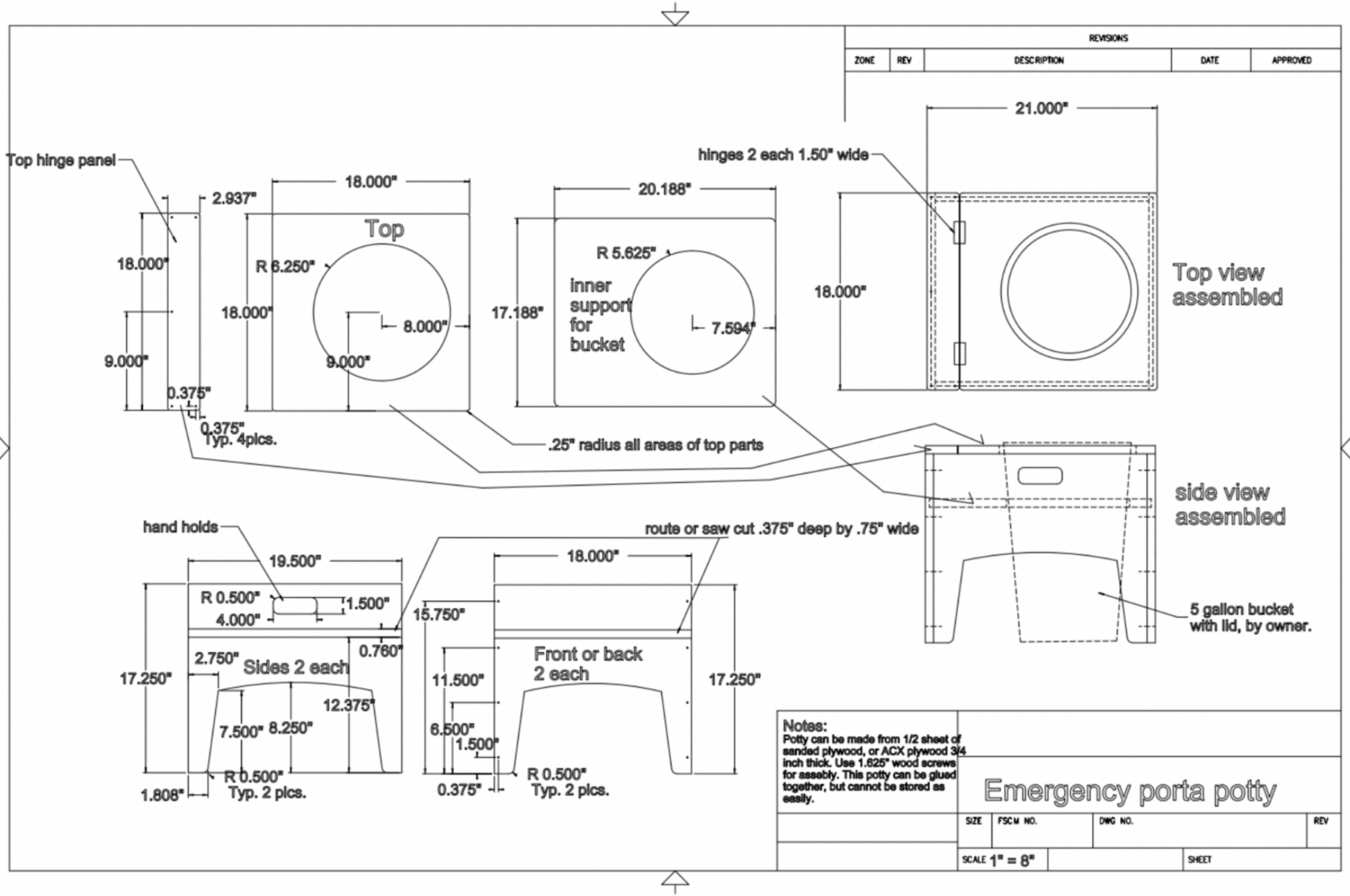
sealed until they can be emptied into a compost pile.

Bucket toilets are also sold commercially, often marketed for camping where portability and low weight are important. For long-term use, especially for children or older individuals, a sturdy support structure makes the setup more comfortable.

Plans and pictures for a basic bucket support structure are included with this article, but the concept is simple enough that anyone can design and build a version to suit their needs.

See full diagram on page 23.

Jay Whimpey is the president of The American Civil Defense Association and the president of The Civil Defense Volunteers of Utah. He is a licensed chemical engineer with a vast amount of knowledge and experience in civil defense, developing new techniques and teaching preparedness skills.


REVISIONS
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Top hinge panel
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Top view
assembled
side view
assembled
5 gallon bucket
with lid, by owner.
hand holds
19.500"
R 0.500"
1.500"
4.000"
0.760"
2.750"
Sides 2 each
17.250"
12.375"
7.500"
8.250"
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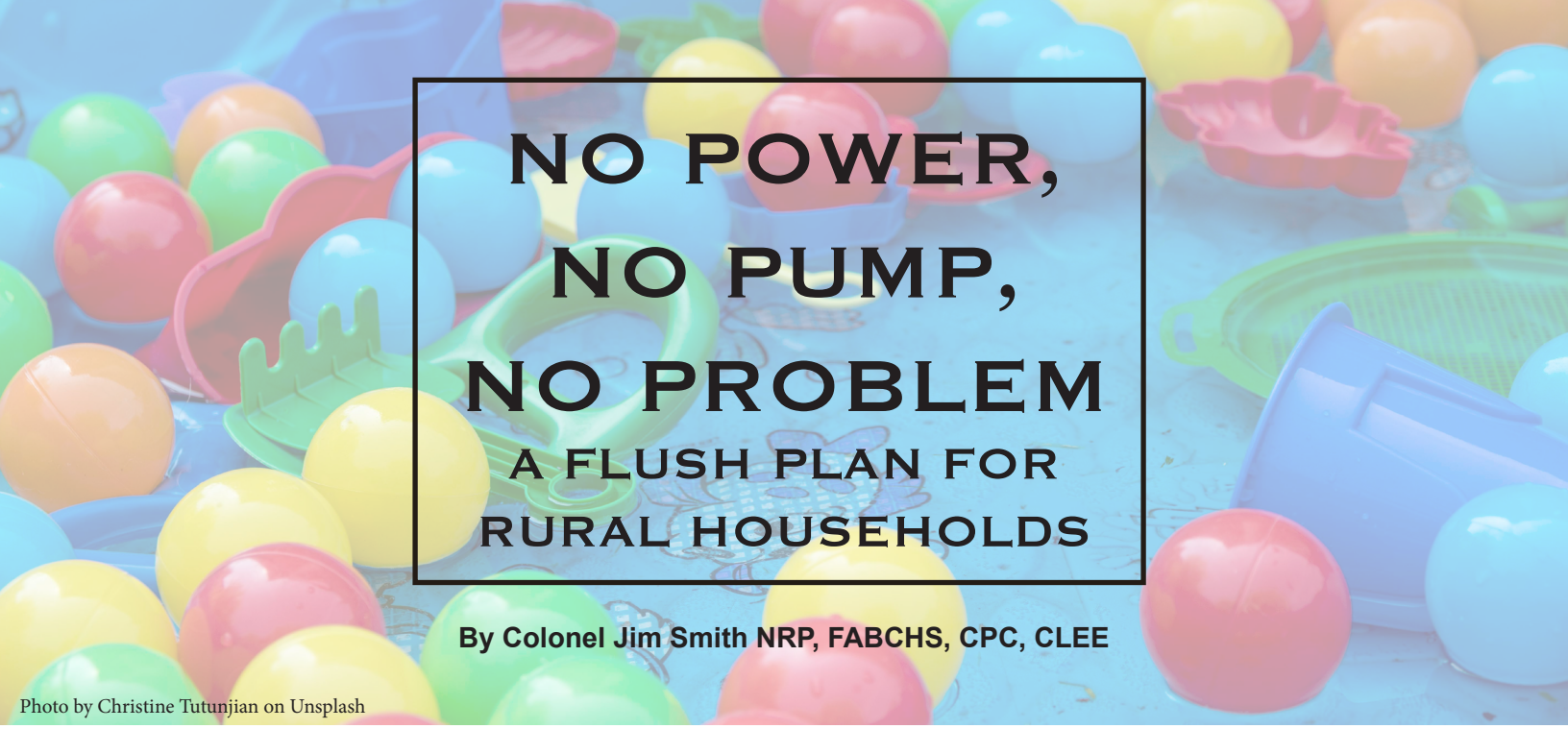
Typ. 2 plcs.
1.808"
route or saw cut .375" deep by .75" wide
18.000"
15.750"
Front or back
2 each
11.500"
17.250"
6.500"
1.500"
R 0.500"
Typ. 2 plcs.
0.375"
Notes:
Potty can be made from 1/2 sheet of sanded plywood, or ACX plywood 3/4 inch thick. Use 1.625" wood screws for assebly. This potty can be glued together, but cannot be stored as easily.
Emergency porta potty
SIZE
FSCM NO.
DWG NO.
REV
SCALE 1" = 8"
SHEET



NO POWER, NO PUMP, NO PROBLEM

A FLUSH PLAN FOR RURAL HOUSEHOLDS

By Colonel Jim Smith NRP, FABCHS, CPC, CLEE

Photo by Christine Tutunjian on Unsplash

In my region, tropical storms and hurricanes are a regular part of life. Over the past fifty years, we've weathered more than two dozen tropical systems, including one Category 5 hurricane, two Category 3 storms, and several of lesser strength. This history has made our rural communities well-prepared for power outages. Like many rural areas, potable water here is drawn from wells with electric pumps. A few homesteads still rely on windmills for livestock or have hand pumps at the house, but those are rare. Some residents fill their bathtubs before a storm, but most tubs leak around the drain stopper, and the capacity is modest-typically between 40 and 70 gallons.

When these storms strike, you can count on losing power. Those who can afford it have "whole-house" generators, usually powered by propane, while others rely on portable units. A whole-house generator that powers the HVAC system eliminates the danger of residents overheating, an important consideration in the southeastern U.S.

One problem, however, is that when the power fails, so do flush toilets. A serious inconvenience in a prolonged outage, and one that requires some creative workarounds. This is because most rural homes here rely on wells with electric pumps, and without power, the pump can't refill the toilet tank. Even municipal water systems can lose pressure after a day or two if their pumping stations go down.

With portable generators, people typically run them only as needed (not continuously) due to fuel limits, noise, fumes, and the need to have the well pump wired for generator use. Some pumps require higher voltages than certain portable units can provide, and many draw enough amperage to require a large-wattage generator to power them.

One of the more practical and low-cost solutions to the loss of flushing capability comes from those without generator support for their wells. When a tropical system is on the way, many set up children's plastic play pools in open areas of the yard, weighing them down with concrete blocks. These pools quickly fill with rainwater, which is then carried in buckets to fill toilet tanks. Many rural homes have mudrooms with sinks, toilets, and floor drains, so spills aren't an issue.

Some very old structures still collect rainwater in cisterns for flushing. In a few rural areas with commercial water systems, households can switch from well water to commercial water during outages. But commercial systems here often have only 24 to 72 hours of stored water during a power failure. Although pumping stations usually have priority for power restoration, that's not guaranteed during a hurricane. Many rural systems can't afford backup generators for their pumps and depend entirely on above-ground storage tanks.

In most cases, power is restored within a few days. Families keep potable water in gallon jugs or larger containers, purchased each year at the start of hurricane season, typically one gallon per person per day for drinking. Many stock at least a 15-day supply, plus extra for cooking and bathing. Those with above-ground or in-ground pools often use pool water for flushing toilets.

Plastic play pools are inexpensive, usually $20 to $50, and hold 250 to 450 gallons (capacity is listed on the label). They last about one season and should be stored

out of direct sunlight when not in use. Kept chlorinated, they remain free of algae and mosquitoes. Even a small pool with 250 gallons can provide dozens of flushes, depending on toilet type. Modern models use about two gallons per flush, older ones five to seven. Multiply by six to ten flushes per day per person, and you'll know your needs. It's always better to have extra water than to run short.

There are challenges: until they're filled, pools can blow away in strong winds; falling limbs can puncture them; and carrying water (over eight pounds per gallon) can be exhausting, especially for the elderly. Cheap buckets often fail with repeated use. To reduce risk, some people set up multiple pools, placing a few in sheltered spots away from trees.

If you plan to use this method, calculate your maximum expected usage and typical days without power, then double or triple that number. Multiple pools provide a buffer if the outage lasts longer than expected and guard against losing a single water source.

Colonel Jim Smith is the public safety director for a rural Alabama town. He holds a master's degree in safety from the University of Southern California and undergraduate degrees in chemistry-biology and emergency medical technology. He is the coauthor of Tactical Medicine Essentials and several other textbooks, including Crisis Management. Smith serves as a peer reviewer for multiple journals and frequently authors articles. He teaches graduate and undergraduate courses in public administration and criminal justice and has more than 50 years of public safety experience.

Welcome to our new Board Member!

Parker Twiss

Parker's career includes work in both remote and urban settings with jobs ranging from Wildland Fire Dispatch, tours as a remote Fire Lookout, an Emergency Planning Specialist for a Health Department, and serving as an Emergency Management Consultant. He has an M.S. in Emergency Management & Disaster Preparedness, and has completed FEMA's Professional Development Series (and many other FEMA-ISP courses). Additionally, Parker is a certified Wilderness First Responder, Firearms Instructor (Pistol/Rifle/Shotgun), and Technician-class HAM radio operator. He's currently serving as the Nuclear Disaster Subject Matter Expert for HazAdapt, a startup connecting the public to essential information regarding disasters & crises.

He is well-versed in both writing and presenting content to the public, having provided informational material for various companies such as Jackery Solar Systems. During COVID, he created a regular newsletter with daily and weekly content to an audience of over 85,000, which provided current pandemic stats and preparedness information. He draws on his career, education, and certifications to best serve appropriate audiences based on their specific needs.

Parker has numerous interests, including writing, horticulture, historic artifacts, and enjoying the outdoors.

With his experience in both preparedness and catering to a wide range of audiences on digital platforms, Parker brings a willingness and excitement to TACDA to help the organization further reach those seeking stability in a time of great uncertainty.

FROM WASTE TO HARVEST:
OFF-GRID SANITATION FOR DISASTER RECOVERY

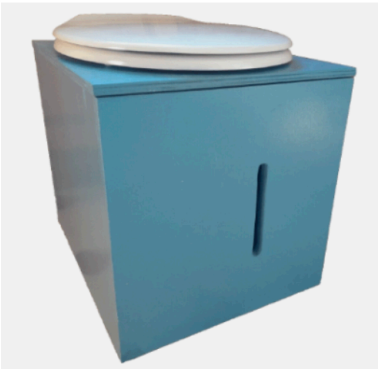
By Richard Higgins,
Director, Good Gardeners International, UK

Photo by Markus Winkler on Unsplash

I am the director of the long-standing charity, Good Gardeners International, based in the UK. We came to California after the recent wildfires which emphasized the importance of sanitation in disasters.

Good Gardeners International has been working on this topic for 30 years, and we have developed off-grid equipment that relies on fungi and bacteria that YOU generate. The system follows a timing schedule for the management of all forms of sanitation wastes.

First, we have developed our HH-3 DRY toilet. This is specially designed and made of high quality plywood. It collects the solid waste in a bio liner, and the liquid goes into a six-litre collection bottle. The level can be easily viewed at a glance.



The HH-3 units come with a built in viewing port and are supplied with a month's supply of bio liners to go in the solids bucket. This means it becomes the toilet you never have to clean out!

We also supply the SuperFast Activator HH-5 which is used to cover the contents after each use. There are no smell or flies with this cover, and it requires no vent pipes or fans - only an open window in the bathroom for ventilation.

We supply two units for solids and two units for urine collection so your toilet is never out of service. When the solids bucket is full, remove and replace it with the spare, placing a bio liner in it. This bag can then be treated in one of two ways. It can either be buried in the ground or placed into our HH-2 processor unit that will turn it into fertiliser/soil conditioner in 90 days.

The urine bottle is removed when full and replaced with the spare. This urine has a very special use in the making of organic fertiliser. All details are presented in the 32-page colour manual you get with the HH-2.

HH-2 UNITS

These are now made in California, so there is no tariff on imports. They are delivered one inside the other, and, when set up side by side, they offer a complete recycling system for all your food waste, house sweepings, and pet waste too. The main material for this unique composting system is straw: old straw or straw from stable waste (which is the best). You will need one or two ton-sized bags filled with straw or stable waste for use per week. If you only have your own family's waste to deal with, you only need to fill the bins half full. Other inputs are all your garden waste, plant waste, lawn mowings etc., All is described in the colour manual.

The system comes with a long stem thermometer and a reusable chart to mark off the timings for the operation to be complete. You fill one box in a week and then start the other and so on. The process is simple and based on fungi and bacteria breaking down the wastes.

The end product, HH-4 fertilizer, is so effective that you can grow voluminous amounts of nutrient-rich food by simply placing it on the ground. You don't even have

to dig it in. There are virtually no pests or diseases in the crops with this system. If you save some of the seeds from each crop you grow, you will have even bigger crops next year!

This picture shows the results of food growing with the HH-2 Waste Management and Horticultural System.

We have been doing this for 30 years. We sell bagged compost as well as food. Check out our latest video, "The HH-2 Horticultural system", on YouTube.

You can do it when you HH-2 it!

Find products and contact information at https://ggi.org.uk.

Richard Higgins NDA., PDC., Philosopher, Holistic Scientist and Fungi specialist is the Founder and Director of Sustainable Agriculture London and the chairman of the Good Gardeners International Charity.

Richard was raised on a Somerset mixed farm in the UK and studied his NDA at the Royal Berkshire College of Agriculture on Farm and Grassland Management. He later completed a ten-year postgraduate study of the fertility making works of Sir Albert Howard while travelling and teaching from China to Hawaii.

Howard is now considered the Grandfather of organic farming and his research from the Permanent Agriculture of the east (which is where the term Permaculture was derived) and the growing system that he employed in conjunction with the Good Gardeners No Dig technology has formed the foundation of the Howard-Higgins Horticultural system today.

Welcome to our new Board Member!

Paul Seyfried

Paul Seyfried has over 30 years of experience in the design, fabrication, and installation of corrugated and rolled plate steel NBC shelters in the North American market. His education is derived from studying a generous range of FEMA and Department of Energy publications, consultations with nuclear weapons physicists from Oak Ridge, Livermore, and Los Alamos National Laboratories, and experts with specific knowledge about weapon effects testing on various shelter designs conducted at the Nevada Test Site. Paul has personally toured the Nevada Test Site in the company of Edwin York, whose many years of activities designing and filming of destructive tests involving buried blast and fallout shelters spanned 1946 to 1964, when all above-ground nuclear testing ceased.

Paul, along with Sharon Packer, has presented to annual conferences of The Doctors for Disaster Preparedness from 1990 to 2004 on shelter design and civil defense related topics. This afforded regular opportunities to consult with a number of nuclear weapons physicists from the national laboratories and members of The Commission To Assess The Threat To The United States from Electromagnetic Pulse Attack concerning sheltering issues, infrastructure vulnerability, and current threat assessments.

Paul is currently on the Speaker's Bureau of The American Civil Defense Association and is a regularly contributing columnist in the Journal of Civil Defense. Paul has worked along with Sharon Packer presenting blocks of instruction to FEMA planners working for the state of New Jersey and the National Emergency Training Center in Emmitsburg, PA.

Photo by The Humble Co. on Unsplash

EMERGENCY DENTAL PREP: SIMPLE TOOTHACHE CARE & DIY TOOTHPASTE

By James C. Jones

Tooth cavities and infections can become serious problems when no dentist is available. Left untreated, they can lead to severe, even life-threatening illness. Good dental maintenance before emergency or disaster conditions is an important preparedness step. This guide covers quick first-aid options and two simple toothpaste recipes for short-term use.

TOOTHACHE FIRST AID (WHEN A DENTIST ISN'T AVAILABLE)

- Rinse gently with warm salt water (½ tsp fine salt in 1 cup warm water).
- Use over-the-counter (OTC) toothache kits or temporary filling/cement kits as directed.
- Floss carefully around the painful tooth to remove trapped food; avoid snapping the floss.
- Use OTC pain relievers as labeled (e.g., acetaminophen or ibuprofen, if safe for you). Do not put aspirin on the gum, it can burn tissue. Apply a cold compress to the outside of the cheek (10–15 minutes on/off) to reduce swelling and discomfort.

HOW TO MAKE TOOTHPASTE (SHORT-TERM/EMERGENCY)

These simple mixes are for short-term use. They are abrasive and contain no fluoride. Use gently and avoid if you have sensitive enamel.

Formula #1

- 2/3 cup baking soda
- 4 tsp fine sea salt
- 5–10 drops food-grade peppermint essential oil
- Mix into a paste with a little clean water. Store in a covered container.

Formula #2

"Parts" = any consistent measure (teaspoon, tablespoon, cup)

- 6 parts baking soda
- 1 part vegetable-based glycerin
- 1 part 3% hydrogen peroxide

IMPORTANT DISCLAIMER (NOT MEDICAL ADVICE)

The information below is for general preparedness and short-term emergency use only and does not replace professional dental care. Do not swallow homemade pastes. Essential oils must be food-grade and used sparingly. Avoid use in young children and anyone with allergies or sensitivities. Seek urgent care if you have fever, facial swelling, spreading pain, trouble swallowing or breathing, or symptoms lasting more than 48–72 hours.

See bio on page 19.

Photo by Lesly Juarez on Unsplash

HOW TO MAKE SOAP

By James C. Jones

Photo by Sincerely Media on Unsplash

The most important element of keeping clean is soap. You can make your own for family use and for trade if commercial supplies run out. There are many ways to make soap; this guide focuses on a "pioneer" method that uses lye from wood ashes and rendered animal fat, materials that remain available in austere conditions. Optional herbs and essential oils (e.g., mint, rose) can improve scent and feel.

REQUIRED MATERIALS

- Rendered, clean animal fat (tallow or lard—strained of impurities)
- Lye (commercial sodium hydroxide or strong wood-ash lye)
- Soft water (distilled or rainwater preferred)

REQUIRED EQUIPMENT

- HDPE (No. 2) plastic or stainless container (~2 qt) for mixing lye (avoid thin drink bottles)
- PPE: nitrile/rubber gloves, apron, and eye protection
- Stirrer: wooden, stainless, or heat-resistant silicone
- Large 10–12-qt stainless pot (never use aluminum or tin with lye)
- Thermometer (0–220 °F / 0–100 °C)
- Mold: heavy cardboard/wooden box lined with freezer paper or HDPE; light coat of petroleum jelly optional
- Insulation (towel/blanket, cardboard, or foam)
- Newspapers/drop cloth to protect surfaces

INSTRUCTIONS

1. Prepare lye solution: In a well-ventilated area, slowly sprinkle 13 oz (~369 g) lye into 2½ pt (40 fl oz / 1.18 L) cold distilled water, stirring constantly. Never add water to lye. The solution will self-heat to ~200 °F.
2. Let the lye solution cool to 95–105 °F.
3. Warm 6 lb (~2.7 kg) rendered fat to 95–105 °F using a hot-water bath—never over an open flame.
2. Slowly pour the cooled lye solution into the warmed fat while stirring. Mix until uniformly opaque and beginning to trace (light pudding-like consistency).
3. Pour into the mold to a thickness of 1–1½ in. (2.5–4 cm).
4. Cover and insulate to allow slow cooling/saponification (24–48 h).
5. When firm, unmold and cut into bars. Cure 3–4 weeks in a ventilated area for best hardness and mildness.

MAKING LYE FOR SOAP PRODUCTION (WOOD-ASH LYE)

Fill a non-metallic or wooden leaching barrel with hardwood ashes (best). Place a layer of straw or pebbles at the bottom as a filter and fit a small drain hole/spigot near the base. Slowly pour hot, soft water (preferably rainwater) over the ashes and let it percolate; collect the leachate (lye solution) in an HDPE plastic or stainless container (avoid glass with strong lye). You may boil down the leachate to strengthen it if needed.

Strength test: Gently lower a fresh raw egg or a peeled potato into the lye. If it floats with just a small portion above the surface, the lye is likely strong enough. If it sinks, concentrate the lye by boiling off some water and retest.

CAUTION: Lye is highly corrosive and reacts with aluminum. Wear gloves, apron, and goggles. Work with ventilation. If skin contact occurs, flush with clean water for at least 15 minutes (do not neutralize with vinegar on skin). Use HDPE plastic or stainless containers; avoid aluminum and glass for strong lye solutions.

See bio on page 19.

Q & A: Pool Filtration for Drinking Water

with Paul Seyfried,
TACDA Board Member

QUESTION

I am looking for a filtration system for pool water. Boiling, I understand. But if I have no gas or electricity, I want to be able to drink my chlorinated pool water.

ANSWER

Pool water will contain a wide variety of chemicals and organisms you won't want to filter through your liver and kidneys. Pool shock (calcium hypochlorite) doesn't kill everything, especially cysts such as Giardia and Cryptosporidium which may be present.

A US company, Equinox, based in Michigan, offers the Lakewater System, which is designed to pull water from streams or lakes to produce potable water. It consists of three filter sumps to catch progressively smaller particles, beginning with a 30-micron cartridge, then a 5-micron, and finally a 0.35-micron. Interspersed between them is an in-line chlorinator and retention tank to maximize contact time, a very large carbon filter (5' tall, 12" diameter) whose job it is to recapture the calcium hypochlorite and several pages of organic chemicals such as nitrates, pesticides, herbicides, solvents, MTBE, and others. The last stage is a UV reactor that can process up to 10 gallons of water per minute.

The filter jars on the original system I purchased in 2014 featured 2 1/2" x 10" filters. While these did work on our mountain stream, sediment collected in the first two cartridges required changing at around 1500 gallons.

Eventually I discovered another company in Sandy, Utah, called Pure Water Technologies. They sell filter sumps measuring 4 1/2" x 20" - a huge increase in capacity. I also added a 90-micron prefilter featuring a stainless steel screen that is simply cleaned by flushing downward through a valve into a bucket. Pure Water Technologies also offers a cartridge that captures 99.9999% of viruses, DNA, and RNA. Flow rate on the sediment filters is 20 gallons per minute, maximum.

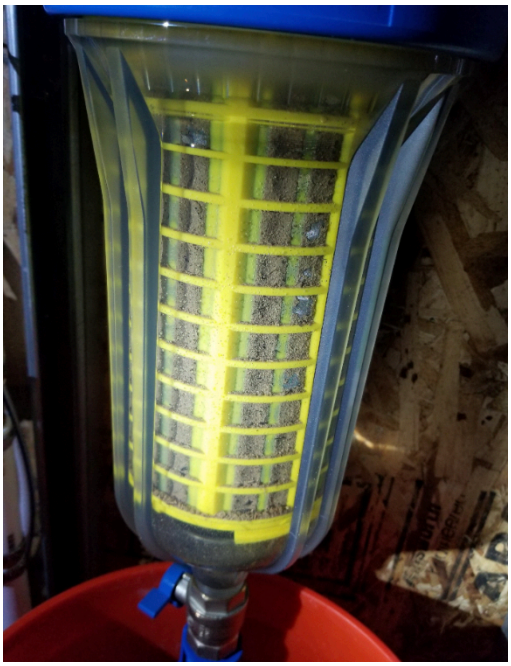
By the time my pump has dragged the stream water 200 feet to the building, pushed it through the system, my yield is around 8 gallons per minute: better than the city water at my home in town.

I had samples tested by the state lab. They found zero coliforms, and my nitrates were 0.14 parts per billion.

The carbon filter will encounter much heavier concentrations of calcium hypochlorite from your pool than the 2 parts per million dose the chlorinator releases into the water. The particles larger than 1 micron have been removed before being dosed with chlorine...organisms like to hide inside of dirt. The same is true with UV light disinfection: particles must be smaller than 1 micron for effective results.

The attached image shows the 90-micron prefilter, the screen full of coarse sediment. The flush valve is seen below.

See bios on pages 5 and 27.



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