

## **What To Do Before and After a Flood**

### **Before a Flood Strikes**

- Buy flood insurance
- Consider building modifications
  - Permanent protection
  - Emergency protection
- Prepare emergency supplies

### **Before a Flood Strikes — Buy Flood Insurance**

One of the first steps in planning flood protection is to buy flood insurance. Damages from flood waters, rising surface waters, waves, sewers or drains and from water seeping from below ground are generally not covered under standard homeowners policies.

Until the late 1960s, insuring a home against flood loss was very difficult and expensive, if not impossible, because insurance is based on risk-sharing principle. Naturally, people in areas that are not flood prone, would not want to share the risk with those who were likely to flood. In 1968, Congress created the National Flood Insurance Program (NFIP). Its purpose was to offer flood insurance at a reasonable cost in exchange for the careful management of flood-prone areas by local communities.

Flood insurance is administered by the Federal Insurance Administration, a department of the Federal Emergency Management Agency (FEMA). You can purchase it from any licensed property/casualty agent or broker - the same person who sells homeowner and automobile policies. You can get flood insurance whether you own a home, a business or are renting.

Flood insurance is generally required when buying, building or improving property in an identified flood-prone area if the financing is in any way federally connected - either direct financing from a federal agency (FHA and VA loans, EPA grants, etc.) or a conventional mortgage from a bank or savings and loan that is regulated or insured by the federal government.

Flood insurance is offered in two phases to communities which qualify by setting up flood plain management and standards for new construction.

- Under the first phase, called the emergency phase, property owners can buy up to \$35,000 coverage on a single family dwelling and \$10,000 coverage on the contents.
- Residents in communities in the second phase of the program may buy additional coverage. The rates depend on the degree of risk as determined by the Flood Hazard Boundary Maps and the site elevation of the building to be insured. For example, if the base flood level in a particular area is 30 feet, then a first floor level of a structure at an elevation of 33 feet is less likely to suffer severe damage from flooding than a structure that has a first floor elevation below 30 feet. Therefore, rates for insurance will vary depending on the elevation of the structure and the degree of risk as indicated on the Flood Hazard map. A finished floor elevation certificate is usually needed at the time of application for the insurance. Normally, there is a five-day waiting period from the time a policy is purchased until it goes into effect. If there is a transfer of title, coverage becomes effective immediately.

There is a deductible which the policy must cover to assume a part of the loss. And, the government will pay only a minimal lump sum for jewelry, art objects or any precious metals. In case of a flood, these items should be well protected.

Keep your flood insurance policies and paperwork in a secure place such as a safe deposit box, along with a list of personal property that might be damaged if flooding occurs. Keep the name, phone number and location of the insurance agent(s) who wrote your policy at hand. In case of flooding, call your agent or broker immediately. The agent submits a form for flood damage or loss to the National Flood Insurance Property. After a major flood covering a large area, there could be delays in getting an adjuster and in servicing your claim.

When the adjuster comes, have your insurance policy in hand along with a list of possessions damaged by the flood. If there is a delay in getting an adjuster, you do not need to delay the cleanup. As soon as it is safe to enter the structure, you may begin the cleanup — as long as you keep flood-damaged items available for inspection. Before and after pictures of possessions and receipts will be useful in verifying claims.

## **Before a Flood Strikes — Consider Building Modifications**

If your existing property is in a flood plain, you may wish to make structural changes to protect it. If you are building a new structure, there are important things you should consider.

The first step in either case is to make a thorough study of flood elevation levels and the flood history of your area. Contact your local public works or soil conservation office for this information.

If you cannot avoid building in an area that has a possibility of flooding, consider building your home on pilings so flood waters would flow beneath the structure. Consider a home built on well compacted fill or one with minimum damage. Homes can be attractive and still meet this need.

If your existing home is in a flood-prone area, there are ways to protect it from flooding in some cases. These methods require modifications in construction that must be done in advance. They can be broken down into two types, permanent and emergency.

## **Permanent Protection**

Permanent modifications involve changes to the home or the area surrounding the home which prevent flood waters from reaching the interior of the structure. These include:

- Construction of berm walls, subdivision levees and retaining walls (either attached to the home or out away from the home). With each of these, several options exist in terms of materials and appearance. These are costly alternatives for protection of your home; however, comparing those costs against the cost of restoring a flood-damaged home may make the relatively minor construction more appealing.
- Jacking the house up off its present foundation (a more costly alternative for some houses) and supporting it at a height well above anticipated flood levels. Usually, a house mover is contracted to raise the house and a second contractor may be involved in building new foundations, the new ground level may be left open or closed in for additional living space. If it is to be closed in, select finish materials which require minimal protection from flooding and are easily cleaned up after flooding occurs.

### **Between pilings, use:**

- Removable panels
- Screens or Louvers
- Collapsible Block
- Hinged Panels

While all of the alternatives are costly, they may serve to raise property values if well done. They will definitely reduce the risk and extent of future flood damage.

Each home and site offers a specific set of problems. Secure the services of experienced, licensed architects or engineers before making major modifications.

## **Emergency Protection**

The emergency procedures involve wrapping the home with polyethylene and using a sump pump to remove water that might seep through. This procedure requires four to five hours work and depends on the structure itself to support the pressures associated with the flood waters. Although structural failure is rare, significant damage is possible if the flood water rises more than two feet above the floor.

To be successful, this procedure requires you gather materials in advance and that there is enough time before the flood waters reach your home. You will need the help of four to six people and it will cost \$500 - \$700.

### **Procedure for "wrapping" a home:**

- Dig a trench approximately 8 inches deep and 8-10 inches wide around the perimeter of the house, right at the base of the structure,
- Place a 2-inch diameter PVC pipe at the bottom of the wall just above the trench. The purpose of this pipe is to carry any water that may leak around the polyethylene back to the sump pump for removal.
- Drill one-half-inch holes approximately 8 inches on center.
- Place the polyethylene film 6 mils thick and 8 feet wide, on the wall to a height of about 4 feet and attach it with duct tape and masonry nails. Drape the rest of the film down into and across the trench. Use loose sand to fill the trench on top of the polyethylene.
- The polyethylene film, although waterproof, is not very strong. Bridge any open areas around the home before you wrap with polyethylene. Use 2" X 4" and 2" X 6" lumber to construct beams that allow you to span these open areas. Use half-inch plywood sheets on the outside of the beams before placing the polyethylene over the plywood.

## **Before a Flood Strikes — Prepare Emergency Supplies**

As soon as you determine your home is in a flood-prone area, start planning. Preparation and organization can help you through the emergency at home or in an evacuation shelter with much more peace of mind than if you try to collect essential supplies at the last minute. It may be too late to make a dash to the grocery or hardware store or gas station for something you need.

Sit down with the family while you have plenty of time to prepare a list of emergency supplies and make plans for coping with the flood.

## **Divide Your Planning**

Use the following questions as a guide when planning for emergencies.

### **What do we need to do before the water rises?**

- Think about a way out of high ground if the water came up suddenly and you couldn't use your car.
- Consider putting emergency supplies and a first aid kit near the most likely exit door.
- Decide if you want to wrap your home and gather the necessary materials if you decide to do that.

### **What will we need if we stay in our home?**

- Assume that there will be no electricity, telephone, fresh water, sewer facilities or natural gas for appliances or heating systems — perhaps for several days.
- Think about what you would need. How much:
  - food
  - gasoline
  - medical supplies
  - water for drinking and bathing/cleaning/hygiene,
  - protective clothing and
  - communication.

### **What immunizations do family members need?**

Call your local health department for a list of potential health risks and schedule an appointment to get any vaccinations needed. Make sure all booster shots are current, too.

### **What supplies will we need at an evacuation center or a friend or relative's home?**

- Consider what you would need for your family and pets' comfort and safety if you must move to a friend's home or an evacuation center for several days. Pets may not be allowed in evacuation centers.
- Your emergency kit, whether it is designed to help you through the flood at home or away from home should include:
  - Camping supplies and equipment, including battery-operated flashlights, lamps, lanterns and appropriate fuel, candles and a portable radio for receiving weather bulletins and emergency information (fresh batteries are a necessity; extra batteries and bulbs are desirable), and matches in a waterproof container.

- Drinking water and ready-to-eat, non-perishable food (can or jar sizes appropriate for one meal with no leftovers would be best) and canned fruit juices (juice boxes may disintegrate in water.)
- Insect repellent, soap and toilet articles and towels.
- Clothing for the entire family. (Warm, dry clothes can really lift up your spirits when you've been up all night bailing water.)
- Medical supplies and required prescriptions such as for glasses and medication.
- Remember to include disposable diapers and baby food if you have children that age.
- Since you may want to use your charcoal or gas grill or camp stove outside for heating water for coffee or instant soup, matches (in a waterproof container), charcoal and lighter fluid should be stored for easy access. Never use a charcoal grill or cooking stove indoors.
- Keep batteries, food and water fresh by rotating your emergency supplies. Use some of them every so often and replace them in your emergency kit with fresh. Just remember to keep an adequate supply on hand.

### **What supplies will we need when we return home to begin cleanup and restoration?**

- Your checkbook, credit card, important papers, insurance company addresses and telephone numbers and property inventory for insurance claims will be invaluable and save you a lot of stress.
- Store gasoline for pump, generator or boat engines safely outside the house.
- You may need household chlorine bleach to disinfect during or after the flood.
- A garden sprayer, hoses, brooms and protective gloves will be useful. A wet-vacuum and fans will be helpful after the flood for cleanup when the electricity is restored. Everyone else will be looking for them, too and rental agencies and hardware stores may run out of stock.
- Duct tape, a roll of polyethylene and lots of plastic garbage bags can protect furniture, appliances and clothing from water damage.
- Heavy duty plastic bags or pallet covers are available in quantities commercially. Large plastic bags can protect a clothes washer or dryer. Smaller trash bags may be used for garbage generated during the flood — it will probably be several days before you can get to a dump or sanitation crews can get to your house.
- Chemical camp toilets, buckets with tight fitting lids and/or smaller plastic bags can be used for human and pet waste.
- Review your emergency supply inventory regularly. Be certain that your stock reflects your prepared list. Replace items which are stale or have been used. This advance preparation can be worth a lot of comfort during your battle with the flood.

## **When a Flood is Predicted**

- Listen for flood warnings
- Think safety first
- If time permits, protect your possessions

### **When a Flood is Predicted — Listen for Flood Warnings**

If a flood is predicted for your area, keep a battery-powered radio tuned to a local station and follow all emergency instructions. For immediate information, a weather-channel dedicated radio may be more useful. Pay particular attention to weather bulletins and listen for reports of hurricanes, storms and rainfall in nearby or upstream areas.

Gaging stations are used to keep track of water levels in major rivers, streams and bayous. There is a fairly close relationship between area flooding and river elevations. This relationship may change as drainage channels become more silted or clogged by vegetative growth and with new development in your area. This means that each flood will behave somewhat differently. This is why it is imperative that you remain alert to timely flood status reports and their consequences.

### **When a Flood is Predicted — Think Safety First**

#### **The most important consideration is safety of human life**

Be prepared to evacuate if necessary. If it is safe to evacuate by car, avoid roads which are under water, since parts of the road may already be washed out.

If your car stalls in a flooded area, abandon it as quickly as possible. Flood waters can rise rapidly and sweep a car (and its occupants) away. Try to avoid walking in flood waters more than knee deep. Seek higher ground or, if caught in a house, move to a second floor, attic or rooftop. Wait for help.

## When a Flood is Predicted — If Time Permits, Protect Your Possessions

If time permits, there are last minute precautions that can be taken to reduce flood damage to personal property:

- **Remove pictures, mirrors, paintings and decorations from walls.** Water in the house may cause the wallboard to soften. Nails and hanging devices can loosen and slip out, causing wall-hung items to drop to the wet floor. Art objects will not likely be covered at full value by your flood insurance.
- **Empty fireplace ashes.** If water gets into the fireplace, ashes may be carried all over the house.
- **Remove food items from lower cabinets.** Don't forget pet foods or other perishables. These items may spoil and float over the house, causing a foul odor. Even if not covered by water, cardboard containers will absorb moisture from the humidity in the house.
- **Remove doors and drawers from lower cabinets and doorways.** These are easily warped by water and damaged by water pressure. Lay large doors on sawhorses or cement blocks and stack small items on them and out of reach of flood water.
- **Lift curtains and draperies up and tie lower sections to upper sections with twine.** If possible, remove curtains and draperies out of any room that will flood. They will likely mildew even if not wet because of excess moisture in the room.
- **Remove clothing and shoes from closets and drawers.** Try to get out at least enough for several wearings. Items will likely mildew even if not wet because of the moisture content of the air.
- **Encase anything that won't float in large plastic bags and securely tape them on.** Consider appliances, table legs and other heavy items. Or raise furniture and appliances on sawhorses, cement blocks or other props. Be sure to drill holes in barrels, otherwise they'll float and overturn items stacked on top.
- **Move as much as you can to a dry location.**
- **Prioritize your possessions.** If you have no other means of protecting your possessions, prop or stack more valuable furniture and other items on less valuable pieces.
- **Bring outdoor possessions inside the house or tie them down securely.** This includes lawn furniture, lawn mowers and power tools, garbage cans, tools, signs, container plants and other moveable objects that might be swept away or hurled about.
- **Remove carpet and rugs if time permits.**
- **Block main sewage outlet from house to avoid sewage back-up.**
- **Drive or tow out all vehicle or trailers.**
- **Keep chemicals high.** If floodwater reaches them, chemical concentrates (such as lye, pesticides, etc.) can contaminate flood water and make it more dangerous and difficult to clean up.
- **Turn off the utilities.** Shut off all gas and electric service before leaving your home.

## **After a Flood**

- Proceed with caution
- Coping with stress and suffering

### **After a Flood — Proceed with Caution**

During each flood, families survive and protect many of their belongings and property. However, in the attempt to move back after the flood, injuries and deaths occur because some people disregard safety procedures.

As you approach your flood-damaged home after the water has receded, you must be aware of possible dangers and constantly alert. Remember:

- Everything that has been flooded in the home is now contaminated.
- The electrical system is unsafe until thoroughly tested.
- Appliances are possible shock hazards.
- Flood damaged levers and/or valves may make the gas system dangerous.
- Consider all food and other staples left in the house contaminated.
- Snakes and vermin may have moved into your house.
- Silt and oil may make floors slick.
- Lifting furniture and other heavy items can result in back strain or other injury.

All of these situations occur while your body and mind are stressed as a result of psychological trauma associated with the flood.

Before you re-enter the home after the flood, make sure that all electrical systems have been turned off. Get a utility company representative or qualified electrician to do this. Don't use electrical appliances, lights or gas systems until they've been tested and are safe.

In other words, your home is now a safety hazard. Eliminate unsafe conditions and then proceed in an organized manner to restore the home to its original condition.

## **After a Flood — Coping with Stress and Suffering**

If you and your family members experience stress after the flood, you are not alone. Many people experience mental pain and stress after a disaster. Research indicates that about a third of those who experience severe flooding continue to suffer for four to five years afterwards. The most striking evidence of disturbance is in sleeping — either getting to sleep or staying asleep.

Stress is brought on by fatigue, financial worry, changes in the routine and feeling helpless as you wait - wait for the water to recede; wait for the insurance adjuster; wait in line for assistance; wait for repairmen and contractors; wait for your house and furnishings to dry and wait for your insurance check if you have made a claim. Chances are, the larger the disaster in your community, the longer the delay.

There is a natural desire to make things normal immediately, which is impossible. It will take time - time to clean up; time to make the necessary contacts; and time for your house and furnishings to dry thoroughly. In the meantime, the following suggestions may help you cope with the inevitable stress after the flood:

- Reach out to family members, neighbors and friends. One striking thing in a disaster is a strong desire to unite with others who experience the same or similar loss.
- Talk about your troubles. Sometimes a good talk can help you relieve stress. But, know when to stop. Dwelling on your difficulties and complaining about your situation may make those around you miserable.
- Anger, hurt and shock are normal reactions during disasters. Don't blame yourself or others. Deal with your feelings in positive ways. Try to maintain a sense of humor.
- Accept offers of help and repair if they come your way. Some people have difficulty accepting help without feeling guilty. Disasters can happen. Explain your situation to your creditors, employer, and banker and seek reasonable adjustments. People often feel so trapped and pressured that they may not realize they have choices.
- Don't try to do everything at once. It is easy to become confused and find yourself starting one thing and then another. Make a list of the jobs to be done. Concentrate on one job at a time, if possible.
- Build family strength and support by letting your family know you care and need them. Be sensitive to the needs of young children. Inform teachers and child care workers of your situation so they too can be sensitive to your child's circumstances. Families can and often do become stronger after a crisis if they concentrate on each other and not on their physical surroundings.

## Restoring Vital Services

- Flood-damaged electrical appliances
- Cleaning electric motors and generators
- Air conditioning and heating equipment
  - General cleaning, drying and renovation
  - Condensing units, air handlers, single package air conditioners
  - Thermostats
  - Gas furnaces
  - Electric furnaces, duct heaters, supplementary resistance heaters
- Purifying your water supply
- Salvaging flood-damaged food
  - Salvaging frozen foods
- Flooded walls
- Floors and carpets
  - Pads and underlay
  - Wood floors
  - Vinyl and tile-covered floors
- Wood furniture, woodwork and cabinets
  - Cleanser/conditioner recipe
  - Cloudy spots
  - Mildew
- Mattresses
- Pillows
- Clothing and linens
- Kitchenware
- Books and valuable papers
- Care of flooded vegetable gardens
- Flood damage in ornamental plants in the home landscape
- Automobiles and other vehicles
  - Washing
  - Reconditioning
- Small engines
- For further information

## Restoring Vital Services — Flood-damaged Electric Appliances

When you return to a flood-damaged home, do not turn on any household mechanical equipment before you are sure it is clean, dry and that rotating parts turn freely without obstruction. Starting this equipment prematurely may ruin it.

Examine motors of pumps, refrigerators, freezers, washing machines, vacuum cleaners, food mixers and other household equipment before starting.

Thoroughly clean automatic washing machines before using. Open gear housings and clean the shaft and gears with kerosene. Wipe all parts with a clean cloth. Grit, not readily seen by the eye, may cause wear to moving parts when they are put into operation.

Clean all parts without forcing dirt into bearings. Wipe metal surfaces with a rag wet with kerosene to remove dirt. Coat with light machine oil to prevent further rusting. Before using, oil the bearings. Using a soft cloth, dry all surfaces.

In refrigerators and food freezers, the compressors, including motors, are hermetically sealed: They cannot be cleaned or checked, but their construction should rule out internal damage due to immersion in flood water. Refer to air conditioning equipment section for more information.

Clean controls on flooded electrical equipment with clean water, then dry thoroughly and spray with Graybar CRC 2-26 or Electro-Dry or other similar product.

## **Standby Electric Generators for Emergency Power**

Any farm with mechanically ventilated production facilities, bulk milk handling equipment, mechanical feeding equipment, or facilities requiring constant and continuous heat (such as brooders) needs an emergency source of power. On such a farm, a standby electric generator would be a good investment, possibly preventing costly losses during a power failure.

### **Types of Generators**

Standby generators are either engine driven or tractor driven. Either type can be stationary or portable. Engine driven units can be either manual or automatic start; gasoline, LP gas (bottled gas) and diesel fueled engines are available.

Generators must provide the same type of power at the same voltage and frequency as that supplied by power lines. This is usually 120/240 volts, single phase, 60-cycle alternating current (AC). For generators up to 15 kilowatts an air-cooled engine is often used. For generators larger than 15 kilowatts, a liquid-cooled engine is necessary. Two to 2 1/4 hp engine capacity with the proper drive system must be available for each 1,000 watts of generator output.

### **Size of Generators**

A full-load system will handle the entire farmstead load. Automatic engine powered full-load systems will begin to furnish power immediately, or up to 30 seconds after the power is off.

Smaller and less expensive part-load systems may be enough to handle essential equipment during an emergency. Power-take-off (PTO) generators are about half as costly as engine operated units. Under a part-load system, only the most essential equipment is operated at one time. For most farms this would be adequate, provided the generator is sized to start the largest motor. For example, the milk cooler or ventilation fan would need to be operated continuously, but the operation of the silo unloader and mechanical feeding system could be postponed until the milking chores are completed. PTO units can be mounted on a trailer.

## **Installation**

Wiring and equipment must be installed in accordance with the National Electrical Code, local ordinances, and the requirements of the power supplier.

It is especially important to have the proper equipment for disconnecting the generator from public utility lines. Most companies require the installation of a double-pole double-throw transfer switch or its equivalent for this purpose.

Check with your electrician or power supply representative for installation instructions and inspection.

## **Location and Safety Features**

Large engine generators should be located in a building - preferably a heated building.

Inlet and outlet air ducts must be large enough to carry off excess heat. Air inlets and outlets should be at least  $\frac{1}{2}$  square foot open for each 1,000 watts of generator capacity to carry off excess heat.

Combustion fumes must be carried outdoors safely. Exhaust pipes must be at least 6 inches from the combustible material.

## **Operation**

An automatic standby unit should start automatically when power fail, and stop when power is restored. When using an engine driven generator with a manual start, or when using a tractor driven unit, follow this procedure when power fails:

1. Call your power supplier and advise them of the conditions.
2. Turn off or disconnect all electrical equipment.
3. Position the tractor or engine for belt or PTO drive.

4. Start the unit and bring the generator up to proper speed (1,800 or 3,600 rps.). Check on arrangement to carry off exhaust fumes. Be sure there is no danger of fire. The voltmeter will indicate when the generator is ready to carry the load.
5. Put the transfer switch in the generator position.
6. Start the largest electrical motor first, adding other loads when each is up to operating speed. Do not add too much too fast. If the generator cuts out for any reason, repeat steps 2, 4, and 5.
7. Check the voltmeter frequently. If voltage falls below 200 volts for 240 volt service or below 100 volts for 120 volt service, reduce the load on the generator by turning off some electrical equipment.
8. When commercial power is restored, put the transfer switch in normal power position. Then stop the standby unit.

## **Maintenance**

Keep the unit clean and in good running order at all times so it will be ready for immediate use. Dust and dirt accumulations on the motor can cause it to overheat when operated.

Follow maintenance instructions in manufacturers' manual. A short operation at set intervals will keep the engine in good operating condition. Regularly scheduled warm-ups are necessary to keep a standby engine in working order.

## **Restoring Vital Services — Air Conditioning and Heating Equipment**

Equipment flooded with fresh water can often be saved. Normally, equipment flooded with salt water must be replaced.

Immediately disconnect all power from equipment and make no attempt to operate the equipment until it has been checked by a qualified electrician. If service is not available, the following steps may be followed:

### **General cleaning, drying and renovation**

1. Wash all parts of the equipment with clear water or with water and detergent (do not use products with ammonia) if the equipment is covered with mud and silt. Air-dry equipment for at least three days.

2. Flood motors and transformers with clear water, and then anhydrous alcohol. Allow to air-dry, then place in an oven warmed to not over 250 degrees fahrenheit for several hours or clean with Graybar CRC 2-26, Electro-Dry or another similar product. Re-oil all motor bearings before using equipment.
3. Replace switches or any electrical part that has corroded or rusted to the extent that improper operation might result. Replace all submerged parts that function as final safeties, such as a high-pressure switch, limit switches or external compressor overloads.
4. Replace all capacitors (phenolic-cased).
5. Disconnect and drain cables and conduits. Use a brush and anhydrous alcohol to thoroughly clean wire leads and terminals to a corrosion-free condition and air-dry.
6. Flush and brush clean tun capacitors (oil-filled, sealed case) and dry with a cloth. Put particular emphasis in the terminal area. ***Do not place capacitors in an oven.***
7. Flush insulation and air seals with clear water and allow to air dry before operating the equipment. (Replace any fiberglass insulation).
8. Clean all terminal boards thoroughly on both sides, flush with clear water, and then anhydrous alcohol, and allow to air dry completely.
9. Spray all wiring and component areas of the washed and dried equipment with Graybar CRC 2-26, Electro-Dry or some other similar product to reduce electrical leakage and prevent future corrosion.

### **Condensing units, air handlers, single package air conditioners**

1. Replace all external compressor overloads.
2. Flush the compressor terminal box with anhydrous alcohol. Brush metal-glass terminals with anhydrous alcohol. Glass or terminal insulation areas must be absolutely clean. Spray the cleaned and dried terminal area with Graybar CRC 2-26, Electro-Dry or other similar product.
3. Check drain pans and drain piping for obstructions and free drainage.

### **Thermostats**

1. Replace thermostats or clean them with anhydrous alcohol and allow them to air dry.
2. Check operation and calibration carefully on the thermostats that were not replaced.

## **Gas Furnaces**

1. Replace all gas valves.
2. Drain all furnace piping, including manifold and drip legs. Flush and dry all pilot and main burner orifices and their associated tubing.
3. Flush main burners with clear water and wipe dry. Make sure all burner ports and slots are free of any debris or rust.
4. Re-oil blower bearings on belt drive furnaces prior to start up.

## **Electric furnaces, duct heaters, supplementary resistance heaters**

1. Open coil heating elements — flush heating elements with clean water and wipe dry.
2. Replace calrod heating elements. (Moisture migrates into and impregnates the oxide that surrounds the heating wire. Drying at low temperature is not advisable as these pockets, if vaporized, can become pockets of high pressure gas that can rupture the sheath.)
3. Replace any limit switches or sequencers that are sealed and cannot be visually inspected.
4. Spray wash and dry control area of electric heater with Graybar CRC 2-26, Electro-Dry or other similar product.

After renovation service has been completed, it is imperative that the equipment be completely dry and checked for electrical leakage with an Ohm meter. The equipment should also be checked for proper electrical grounding prior to application of power and start up.

## **Restoring Vital Services — Purifying Your Water Wupply**

Flood waters carry silt, raw sewage, oil and chemical wastes. The filth and disease organisms that flourish in flood waters may have been deposited anywhere. They contaminate water supplies, making them unsafe for human and animal use.

*After a flood, consider all water sources contaminated until proven safe.* Until your local water, utility or public health department declares your water source safe, you must purify all water that is used for drinking, cooking and for washing eating and cooking utensils, as well as the water used for washing hands, body and kitchen and bathroom surfaces.

Do not use water that has a dark color, an odor or floating material.

## **To disinfect water supply, use ONE of the following:**

1. Boil water vigorously for 10 minutes.
2. Add 8 drops of liquid chlorine (household laundry) bleach per gallon of water. (Be sure the bleach contains 4 to 6 percent sodium hypochlorite as its only active ingredient.)
3. Add 12 drops of tincture of iodine per gallon of water.
4. Add water purification tablets (available at most drug and sporting goods stores) according to directions on package.

Thoroughly mix these solutions and let the water stand at least 30 minutes before using. To help eliminate the flat taste of boiled water, pour the water back and forth several times between two clean containers.

Remember, always use clean or purified water in washing any parts of the body — hands, feet, etc., that have come in contact with flood-contaminated surfaces. Follow this practice until your water supply has been declared safe.

## **Restoring Vital Services — Salvaging Flood-damaged Food**

Flood-damaged foods may not be safe to eat.

Destroy the following foods if they've been covered by flood water:

- Fresh fruits and vegetables.
- Foods in cardboard or paper cartons.
- Foods in bags, such as rice and flour.
- Foods, liquids or beverages in crown-capped bottles or containers with pull-tops, corks or screw caps. These include canned foods in glass jars whether you bought them or canned them yourself.

If there is danger of contamination from industrial waste, the Food and Drug Administration recommends destroying all foods that were covered with water, including those sealed in unopened cans. Otherwise, foods in sealed cans may be safe to eat if the cans don't have bulges or leaks, but you must disinfect the cans before you open them.

To disinfect cans, first remove the labels and wash the containers with soap or detergent. Then rinse in a chlorine bleach solution using two tablespoons of household laundry bleach to each gallon of water. Rinse the containers in clean water, dry and re-label them. The cans can also be sterilized by covering with water and boiling for at least 10 minutes.

## **Salvaging Frozen Foods**

During power failure, frozen or refrigerated foods which have warmed to above refrigeration temperatures (above 40-45 degrees farenheit) for two to three hours may not be safe to eat. Foods in a freezer without power, however, may stay frozen from one to three days, depending on these conditions:

- if the door remains closed,
- if the freezer is mostly full,
- if the temperature outside is moderate,
- and if the freezer is large and well insulated.

Foods that have thawed completely and warmed to temperatures of 40 degrees farenheit or higher are not likely to be fit for re-freezing and should be cooked or eaten immediately or discarded. After cooking, items can then be re-frozen. Partially thawed frozen foods with ice crystals may be re-frozen safely.

Dry ice can be added to the freezer to keep the temperature below freezing; 25 pounds of dry ice in a 10 cubic foot, half-full freezer should hold the temperature below freezing for two to three days. Allow from two-and-a-half to three pounds of dry ice per cubic foot of space. More will be needed for an upright model, because dry ice should be placed on each shelf.

Place dry ice on boards or heavy paper on top of the packages and do not open freezer more than necessary. If freezer is an upright one, place dry ice on each shelf. Don't handle dry ice with bare hands, because it can cause burns. To further help keep foods cold, the freezer compartment can be wrapped with blankets, quilts or some other covering. If you put blankets or other coverings on the freezer, be careful not to cover the air-vent openings. If the power comes on, ventilation will be needed.

## **Restoring Vital Services — Flooded Walls**

One of the first things you should do when re-entering the house after a flood is open windows to allow air circulation. If fans and air handlers have been serviced and electricity has been restored, use them to move air through the house and improve drying conditions.

If a home has been flooded, even for a short period of time, the walls may be damaged. Many wall coverings will appear to have withstood the flood well, at least initially. Surfaces such as sheetrock and paneling that have not been flooded for long periods could weather the flood well. However, where the water remains for several days, there is a possibility that sheetrock will carry the water, through capillary action, up through the wall, in many instances to the ceiling, far above the level of flooding.

In the case of paneled walls that have been flooded for several days, the layers of paneling may separate. If the panel is made of pressed board, the entire panel may come apart as the water softens the glue. However, on most homes that have not been flooded for a long time, the primary concern will be removal of the wet insulation material from the walls and the drying that needs to take place once it is removed.

Fiberglass insulation holds water for a very long period of time. Walls that outwardly appear to dry have been opened as long as six months after a flood and the insulation was as wet as it was when it was first flooded. The water provides an ideal environment for decay-causing bacteria to grow in the wall. It may take several months or years, but these bacteria and the decay they cause may eventually cause structural damage.

Wet fiberglass insulation can also cause mildew and musty odors throughout the house.

Vinyl-covered wallpaper prevents the wall surface from drying since water can't escape through the impermeable surface. Bacteria may feed on the wet wallpaper paste and cause discoloration and deterioration between the wallpaper and the sheetrock.

Several of these effects may not be visible right after the flood, but steps need to be taken immediately to avoid severe problems later.

- First, open the wall to at least the level of the flooding. A circular saw can be used on sheetrock walls to cut in a straight line around the wall at the level of flooding. Be careful not to cut into electrical wiring.
- If the walls are paneled, remove the baseboard and pry the paneling loose. Prop the paneling away from the wall, remove the insulation and let the paneling dry in that position. This could eliminate the need for buying new paneling material.
- Remove the wet insulation from all walls. Then wash the walls thoroughly, using disinfectant. A three- gallon garden sprayer works well. One cup of household laundry chlorine bleach to a gallon of water can be used as a disinfectant.
- Spray the wall cavities thoroughly and allow the walls to stay open for a month to six weeks to allow thorough drying before re-insulation and covering.
- At this point, you may want to consider different materials for the wall, if there is a possibility of future flooding. A type of insulation and wall covering that will withstand flood waters without the need to open wall cavities afterward can be used.
- Another possibility is to replace flood damaged walls with a wainscoting, assuming the level of flooding is no higher than three or four feet above the floor.

Each home will require different techniques and procedures to restore it to a liveable condition.

Qualified workers to make these repairs may be hard to find at this time because of the large amount of work needed to be done immediately. Use caution in selecting workmen, and use only those who are experienced and reputable.

## **Restoring Vital Services — Floors and Carpets**

Carpets and rugs soaked by flood water are often discarded, but many can be saved. They may be best cleaned by professionals. If you do the work yourself, pull up the carpet and pad and take them outside if possible. Drape small carpets over clotheslines, sawhorses, automobiles or on concrete driveways.

Flush soil and silt out of the carpet or rug by spraying clear water with a hose and spray nozzle. If the soil has been mashed into the carpet, add detergent. Either sprinkle a little dry laundry detergent over the surface or pour/sprinkle on diluted liquid detergent. Work this into the carpet with a machine, a broom or a brush. Rinse well with a solution of 1 gallon of water and 2 tablespoons of liquid household laundry chlorine bleach. The bleach will help discourage mildew and odors. *Do not add bleach if the carpet is wool.*

Let the carpet dry completely before installing. It may shrink, but since most fibers used today are synthetic, this may not be a problem. If the carpet shrinks, consider banding it around the perimeter with a contrasting or harmonizing color.

### **Pads and underlay**

The carpet pad or underlay may need to be replaced if it is a hair mat or a jute-type pad. Waffle weave and foam or rubber type pads can be reused, but they are difficult to handle. For foam or rubber types, it may be necessary to squeeze the water by hand, a little at a time, or push or roll out the water by pressing it with boards or a heavy roller. Water will seep through waffle weave pads, so a shake is generally all that is necessary.

Before replacing carpets, rugs and pads or underlay, be sure walls are dry and floors are clean and dry. To prevent mildew and musty odor on concrete sub floor, wash with a solution of three quarts of warm water, one quart of household laundry chlorine bleach and about half-cup of household detergent. Rinse well with clear water. Allow to dry thoroughly before replacing carpet and pad.

### **Wood floors**

Wood floors that were under water for several days will probably warp, split or bow. Floors that were under water for a short time can sometimes be restored after they are thoroughly dry. It's a good idea to remove one board every few feet so that as the wood swells there will be room for expansion. This will help reduce buckling of the boards. When the floor is dry, replace the boards you removed.

After the swelling disappears and the floors are dry, ridges may appear. You may be able to remove these ridges with a plane, then sand the entire floor smooth.

If wood floors have mildewed, scrub with a mild alkali such as washing soda or an all-purpose cleaner containing trisodium phosphate (4 to 6 tablespoons to a gallon of water) or wipe with a solution of one cup of household laundry chlorine bleach and a gallon of water. Rinse well with clear water and buff dry with absorbent cloths or toweling.

## **Vinyl and tile-covered floors**

Resilient and other floor tiles may not be ruined if water remained for a short period of time. However, if the underlayment was plywood, water could cause the veneer sheets to separate. In this case, you may need to rebuild the floor. Loose ceramic or vinyl tiles can sometimes be removed and then re-cemented after the tiles and floor have dried.

## **Restoring Vital Services — Wood Furniture, Woodwork and Cabinets**

Remove drawers and doors from wood furniture and cabinets as soon as possible. If drawers and doors are stuck tight, take off the back and try pushing them out. Sometimes the board that backs a dresser or similar piece of furniture is thin and may warp. This may need to be replaced. Save the original for a pattern.

Next, hose or wash off loose soil. If necessary, use a brush and sudsy water to remove soil. Rinse away suds with clear water and dry with a cloth.

Let furniture and cabinets dry slowly out of direct sunlight. Slow drying will help reduce warping and splitting. Depending on how long the furniture was soaked by flood waters and the age and condition of the pieces, it may take from several weeks to several months for the piece to dry completely.

Provide plenty of ventilation. Use fans, heaters or dehumidifiers to keep the moist air moving and lower the humidity. Allow at least twice as much time for total drying as it takes for all visible signs of moisture to disappear. This will allow for internal drying.

After the furniture has dried completely, it may be possible to clean it without having to refinish it. To clean, wipe every surface with mineral spirits, synthetic turpentine or a cleanser-conditioner. Use a commercial cleaner or make your own. (See recipe below) Always test first on a spot that doesn't show (apply, wipe and let dry) to be sure product makes the finish on the piece look better, not worse.

### **Cleanser/Conditioner Recipe**

**Mix in glass jar with tight lid:**

- 3 parts (3/4 cup) boiled linseed oil (buy boiled oil — DO NOT BOIL AT HOME)
- 1 part (1/4 cup) gum turpentine (not synthetic)

### **To use the cleanser/conditioner:**

Protect work area with sheets or dropcloths. Open windows or work outside. *Do not smoke or ignite matches in the work area.*

- Pour a little hot water in a cup or can placed on a saucer.
- Pour just enough cleanser/conditioner into the cup or can to cover the surface of the water. Do not stir.
- Dip cloth into oily surface floating on top of water and rub small area of furniture surface at a time. Use toothbrush on carved areas and grooves. For areas that appear to have a buildup of dirt, dip 3/0 steel wool pad into cleaner and rub lightly with the grain of the wood.
- Dip a fresh cloth into clear, warm water. Wring cloth and wipe surface.
- Finish by wiping surface with a clean, dry cloth.

**IMPORTANT NOTE:** Discard cleanser mixture when the water cools off and start again with fresh hot water and cleanser. Don't reheat; this mixture is flammable. You can store the unused mixture indefinitely in the tightly closed container. Shake well before using. After cleaning, if finish looks acceptable, apply furniture polish, oil or wax. If the finish is not acceptable, furniture may have to be refinished.

### **Cloudy spots**

White spots and a cloudy film on wooden furniture may develop from dampness even though the pieces are not in water. If the entire surface is cloudy, rub with a cloth dipped in turpentine, camphorated oil or a soft pad dipped in mayonnaise. Immediately wipe dry. If this doesn't work, dip 3/0 steel wool in oil — linseed, olive, mineral or lemon — and rub gently with the wood grain.

For very deep spots, pour a drop or two of ammonia on a damp cloth and wipe furniture surface; wipe dry with a clean cloth at once. Cigarette ashes or salt rubbed into the fingertip or a cork then rubbed onto the spot may remove spots. After the spots are removed, apply polish, wax or oil. In some cases, it may be possible to remove spots without refinishing.

### **Mildew**

Thoroughly clean mildewed furniture, woodwork and other wooden parts of structures by scrubbing them with a mild alkali, such as washing soda or an all-purpose cleaner containing trisodium phosphate (4 to 6 tablespoons to gallon of water) or with a household cleaner that states that it sanitizes or destroys bacteria. Paint and grocery stores and janitorial supply houses sell these products under various trade names.

After cleaning, rinse well with clear water and allow the wood to dry thoroughly. If the mold has grown into the wood under paint or varnish, it may be necessary to scrub the wood first with an abrasive cleaner. Then wash with a solution containing one cup of

household laundry chlorine bleach to a gallon of water. Finally, rinse the wood well with clear water and dry thoroughly. If reapplying paint, choose one that is mildew resistant or inhibits mildew growth.

## **Restoring Vital Services — Mattresses**

Mattresses soaked in flood waters should be discarded. Usually they cannot be adequately cleaned and dried by home methods and saved. If the outside of the mattress is only slightly damp, brush off surface soil and wipe with a cloth wrung out of diluted alcohol (1 cup denatured or rubbing alcohol and 1 cup water) to discourage mildew.

## **Restoring Vital Services — Pillows**

Most foam, fiberfill, or feather pillows can be washed in the machine. Wash them two-at-a-time so the washer tub will be balanced. Don't dry foam pillows in the clothes dryer.

If ticking on feather pillows is in poor condition, empty feathers into large pillow slip bag and wash the ticking and the feathers separately. If the ticking is in good condition, open a few inches of the seam in opposite corners of the pillow. Sew loosely by hand so water can get in and out without letting the feathers out. Feather pillows can be dried in a dryer or on the clothesline. Shake pillows often to unlump feathers.

## **Restoring Vital Services — Clothing and linens**

As soon as possible, separate wet items so colors won't run together. Sort items that can be washed from those that ordinarily would be dry-cleaned. Allow items that should be dry-cleaned to dry slowly at room temperature, away from direct heat. Shake, brush or vacuum off loose dirt before dry-cleaning.

Rinse mud-stained washable fabrics in cool water until no more loose dirt can be rinsed out. Use a bucket or tub, not the washing machine, so extra dirt won't get into the machine. Or dry first and scrape the mud off before rinsing.

When you are ready to wash, sort items by color, if possible. Fill washer with warm, not hot, water. *Hot water may set red and yellow clay stains.* Add plenty of detergent (follow detergent instructions for heavily soiled garments). To kill germs and help remove stains (especially mildew) on white items, add one-half to 1 cup of household laundry chlorine bleach. Do not pour bleach directly on top of clothes. Mix bleach with the wash water, then add clothes or linens. Excess chlorine can weaken fibers and clothes may disintegrate in the wash process.

Most items, except wool, silk, feathers and foam, can be bleached (follow directions for bleach test on bleach bottle if unsure), or disinfect laundry with pine oil or phenolic disinfectants according to label directions. It may be best to wash very delicate and/or

very large, bulky items by hand in basin, sink or tub. Roll small items in a towel to remove extra water before drying.

Glass fiber curtains and draperies (unless label says machine washable) should not be machine washed and dried. Instead, wash in large tub or bathtub. Add plenty of mild detergent or soap. Do not add bleach. Swish and soak. Rinse well. Be sure to rinse tub afterwards to remove glass fibers. Rehang curtains at windows while still damp. Smooth gently into shape.

## **Restoring Vital Services — Kitchenware**

Sterilize cookware, dishes and utensils before they are used again. Wash away soil in hot, sudsy water. Soak plastic, glass, porcelain and enamelware items for 10 minutes in a solution of 1 tablespoon liquid chlorine laundry bleach to each gallon of hot water.

Rinse well. Do not use chlorine solution on silverware, metal dishes or chipped enamel. Instead, scrub and scour with hot, sudsy water and scouring pad. Fill metal and boil-safe utensils with water or place in water. Bring to near boil for five minutes to sterilize items. To brighten aluminum pans, add water till almost full. Add 1/4 cup vinegar or 2 tablespoons cream of tartar for each quart of water and boil for ten to fifteen minutes.

Remove rust from cooking utensils by scouring with steel wool. After scouring and sterilizing, rub items with unsalted cooking oil, fat or shortening. Heat at a low temperature in the oven or on the range for at least 30 minutes.

## **Restoring Vital Services — Books and Valuable Papers**

Books and valuable papers soaked by flood waters may be put in a freezer to keep them from mildewing until you have time to clean and dry them carefully. Place sheets of wax paper between layers of paper bundles or books to make later separation easy.

When you are ready to work on papers and books stored in the freezer, remove a few of them at a time. Separate them carefully while still partially frozen. Wipe book covers with a cloth wrung out of a solution of one part rubbing or denatured alcohol and one part water. Sprinkling cornstarch or talcum powder on pages may help absorb water. Place books on end and spread the pages fanlike to air dry. If the pages begin curling, close books and press papers flat for a time, then again open or separate to continue drying. Alternate drying and pressing until items are completely dry. After drying, shake out book pages to remove excess powder or cornstarch. Wipe vinyl and leather book covers with a very light coating of petroleum jelly or leather or vinyl dressing.

## **Restoring Vital Services — Care of Flooded Vegetable Gardens**

There is little that can be done to save a vegetable garden that has been flooded. Whether or not the plants survive and live will depend to a large extent on how long the garden remained flooded. Most vegetables cannot tolerate standing water for any length of time.

If possible, provide some means of draining any excess water from the garden immediately after flooding. This means digging ditches or furrows that will allow water to drain away from the garden.

As soon as the soil dries enough, work the ground to break away any crust that may have formed. Try to wash away any soil film that has settled on the leaves of the plants. You should know within a week if the plants are going to live. If they do survive, you will probably need to spray fungicides and insecticides to control diseases and insects. It will probably be necessary to side-dress most crops with nitrogen since floodwaters probably leached much of the original application of nitrogen away.

## **Restoring Vital Services — Flood Damage to Ornamental Plants in the Home Landscape**

Flood damage to ornamental plants from rising water generally is not extensive. Most of the damage that occurs results from water standing about the root system for several days. If flood waters recede in two to three days, generally no damage is done to trees and shrubs.

However, if floods occur at the time of year when the temperatures are very high, the plants may be subjected to scald and death of the root system. This doesn't happen very often because most floods occur in mild weather. An exception would be rising water during a hurricane in coastal areas.

No special precautions can be taken for plants because it's not practical and in fact, is injurious to plants to dig them up and put them in containers to keep them from being flooded. Usually, other property commands a higher priority when it comes to flood protection.

After flood water has receded, wash the silt or mud from the leaves. This does not have to be done immediately and, in many instances, if the silt or debris is allowed to dry on the leaves, much of it will fall from the plant leaf surfaces as it dries. What is left can be hosed down from the leaves.

Plants standing in water for several days are put under stress, so it is important that they be kept free of insect and disease pests during the subsequent growing season. Nor should they be allowed to undergo stress during any dry periods following the flood.

Some of the root systems might have been damaged by standing waters during the flood period. These plants will generally recover, but they do not have the capacity for water absorption that they had before the flood; therefore, it is important that they be given adequate water during the summer and fall droughts when the temperatures are high and there is not enough rainfall to supply an inch of rain a week. This may mean watering the plants every four or five days. Give them a soaking to wet the soil a depth of 6 to 8 inches. If plants are watered and kept free of insect and disease pests, their chances of survival even after a flood are very high.

The same may not be said for plants growing in containers or pots. Such plants are not as well adapted to oxygen starvation caused by flood waters as are plants growing in soils. Container plants should be moved high enough so that flood waters do not reach their root systems. If this is done, no damage will occur to the container grown plants, provided they are given water during their stay out of the flood waters.

## **Restoring Vital Services — Automobiles**

If at all possible, move automobiles, trucks and other vehicles to higher ground before floodwater inundates your property. If you must drive in water, take care and drive slowly, as brakes, transmissions and engines could be damaged.

If your automobile is flooded out, it may be reconditioned, but will take time, patience and money. It should be restored to safe condition by reliable automotive repairmen.

The amount of reconditioning depends on how high the water got and how long the vehicle was flooded. Most vehicles can take only about one foot of flood water before damage occurs. Flood water contains silt and other debris and possibly salt. These contaminants seep into every opening and are difficult to remove.

If you are going to recondition the vehicle yourself, the following suggestions should be helpful but are not all-inclusive.

### **Washing**

Start by removing the battery to avoid electrical shorts.

Wash and clean the vehicle inside and out and under the hood as soon as possible. Be careful not to let excessive water pressure damage parts of the vehicle and try not to get water into the engine air intake. Allow the vehicle to dry thoroughly. Use hair dryers and fans to help dry the vehicle, being careful of over heating and observing electrical safety.

Upholstery needs special care (which can be found in other sections of this publication). Wet upholstery tears easily, so handle with care. Remove cushions, seats, carpets, rugs and door panels, and dry and clean outside the vehicle if possible. After they are dry, you might want to use a vacuum cleaner on them. Be sure these items are totally dry before

re-installing them in the vehicle. When the cushions, etc. are out of the vehicle, clean the interior thoroughly and let it dry.

## **Reconditioning**

The engine, power train and electrical components will require careful reconditioning. The following steps are suggested:

1. The battery will be "dead" if submerged and probably will not recharge. A new battery will be needed. Do not install a new battery until the power train has been reconditioned.
2. Crankcase oil, gear box oils, etc., should be drained and replaced. Filters should be replaced also. Change the crankcase oil and filter again after a few hours of operation to remove residual dirt and water. Then change at normal service intervals.
3. Remove the spark plugs and drain the water out of the cylinders. Clean and regap the old plugs or gap and use new ones. Spray or place rust inhibitor or lubricant in the cylinders. Do not replace the spark plugs until the engine is turned over several times to make sure the cylinders are free of water.
4. Remove the starter and alternator and dry them completely. An electric hair dryer may work well for this task. Re-install and observe for proper operation. If they don't operate properly, have them rebuilt or replaced.
5. Using an electric hair dryer or fan, thoroughly dry all electrical components and connectors. Good cleaning and drying will salvage most electrical parts without replacement. Under-the-dash electrical parts are going to be hard to dry properly. A radio or other audio equipment will probably have to be replaced. Electric motors that are not waterproof will be difficult to dry and probably will have to be replaced.
6. Remove the air cleaner. If you are lucky, the air cleaner filter will have kept the carburetor fairly clean. Clean the filter housing and replace filter with a new one. Drain carburetor fuel lines and fuel tank completely. Dry, reconnect and install new filters and add clean fresh fuel.
7. Drain and replace hydraulic fluids and filters. It may be advisable to have a qualified automatic transmission repairman recondition the transmission prior to operation. After a short break-in period, change the fluid and filter again to remove residual dirt from the system. Drain and replace the power steering fluid.
8. The brake fluid should be drained and replaced and the brakes completely serviced to assure proper operation.

9. The radiator is watertight and is probably in good shape. Wash out cooling fins and drain and replace fluids.
10. Install the battery. After one last check, crank the engine a few times with spark plugs and coil wire removed. Then install the plugs and turn the engine over against compression a few times. Again, check the engine for problems. Replace the coil wire and crank the engine after you are satisfied all components have been reconditioned properly. Observe gauges and engine sounds and appearances to verify everything is performing properly.

## **Restoring Vital Services — Small Engines**

Small engines are those used on lawnmowers, motorbikes, tillers, etc. They are usually gasoline powered and are usually less than 20 horsepower in size. Electric motors are referred to as "motors" and are not considered to be an engine under this section.

Avoid letting water flood a small engine if possible. They are frequently portable and should be moved to higher ground. Be certain that your water pump with a small engine is not water flooded at a critical time. The pump may be needed to protect property from flood waters.

If a small engine is water flooded, water will filter into all openings. The engine cannot and will not start until it is properly reconditioned.

### **To recondition water flooded small engines:**

1. Remove and cleanse or replace the air filter element. Wash foam-type elements in warm soapy water, dry, re-oil and replace in the engine. Some dry types cannot be washed and must be replaced. Oil bath types should be cleansed with a degreaser and refilled with suitable oil.
2. All electrical parts must be cleaned and dried. Remove rust from affected parts of the electrical system. Remove and clean the spark plugs. Drain the cylinders and add a little oil to each cylinder. A moisture remover will be useful.
3. Drain the fuel system completely; dry and clean it and replace it. Fill with fresh, clean gasoline.
4. Drain the fuel system completely; dry and clean it and replace it. Fill with fresh, clean gasoline.
5. Spray or coat all parts with a rust inhibitor. Spot paint as needed. Lubricate the wheels, etc.

## **Restoring Vital Services — For Further Information**

There are many techniques available to the individual to reduce damage associated with flooded as indicated in this site. There are also techniques available to communities, subdivisions, counties and multi-county areas to reduce potential flooding. Both state and federal agencies have programs which may be appropriate to assist local areas in preventing or reducing flood damages. Contact your local Cooperative Extension office or Civil Defense coordinator for more information.

**\*This is a publication of the Louisiana Cooperative Extension Service**