

Oklahoma Baptist Disaster Relief



Mud-Out Training Manual

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Mud-out Manual

Introduction

Mud-Out is a term referring to the removal of debris from private residences where water has flooded the home. Most everything in the house may be destroyed or left un-useable, depending on the height of the floodwater. The objective of Oklahoma Baptist Volunteers is to get the house cleared of wet debris so it will dry out and be suitable for reconstruction as soon as possible. A typical sequence of events might be as follows: 1- The Oklahoma Baptist Coordinator for Mud-Out work is notified to organize Mud-Out teams. 2- A Blue-Cap team leader and team members are told to report to a central location with their personal gear. 3- All mud-out equipment, transportation and provisions are moved from the central location to the disaster site. 4- Some person with a flooded home makes a request for help to the Baptist Disaster Relief Team. 5- An Assessor evaluates the situation and obtains a signature approval of the home owner to do the work. 6- A Blue Cap Supervisor will pick up an approved work request from the Incident Command Post and arrange with the home-owner to do the work. As part of the Mud-Out team, each member will be expected to follow the leadership of a Blue Cap, who has training and experience in Mud-Out Work.

Safety Considerations

The Blue Cap has the primary responsibility for making decisions about safety, crew members must be his primary concern. Each member must know their own health situation and physical limitations. Many well-intentioned volunteers have been injured simply because they did not pay attention to their limitations. You must pace yourself and monitor your condition. Fatigue often leads to poor judgments and injuries. Team members will be assigned to work in pairs. This is critical as the blue-cap cannot observe everyone inside a house at any specific time.

Hazards – The Blue-Cap as well as each team member must be alert to note potential hazards. These may include rusty nails, sharp objects, insulation dust, mold and mildew, chemicals- both liquid and dry, electric and phone lines, leaking gas, standing water, fire hazards, leaning and weak structures.

Safety Equipment – The Blue-Cap must be diligent to enforce the wearing of safety equipment and clothing appropriate to the observed conditions, such as:

- Hard hat at all work situations, yellow for team members and blue for the leader.
- Goggles when working in blowing dust or falling and possible loose debris
- Canister mask under very dusty, moldy or gas conditions
- Fiber face respirator, N-95 under short duration work or moderate conditions.
- Whistle (for signaling others)
- Rubber boots or hard soled shoes or boots (no tennis shoes)
- Heavy duty leather gloves, rubber gloves if work is wet

Safe Work Procedures and Rules

To assure Safe Working Procedures the Blue-cap team leader must monitor the work conditions and length of exposure of all team members. In some situations a team may be split and rotated. Team members must drink plenty of water to maintain their electrolyte and body fluids. A specific break time will be observed by all team members as often as needed, but some individual members may need more frequent breaks. Effective work may require more frequent breaks under extreme work conditions. Some procedures and rules for work will include the following:

1. Be sure all utilities have been cut off before entering a damaged building, especially in wet areas. Stand on dry area (board or ladder) while turning electrical switch off in wet area.
2. When entering a disaster area, assume the area is contaminated. Graves may have been open; septic and sewer systems overflow. There is also the possibility that LP gas tanks may be loose and leaking. LP gas gathers close to the ground.
3. Normally stepping on a rusty nail would bring the risk of tetanus. In a flood situation, the nail could also carry hepatitis or potentially deadly diseases. Therefore, anyone responding to a flood disaster must have a current tetanus shot and should consider getting hepatitis shots.
4. It is common in disasters to encounter wild and domestic animals. Snakes and insects may be in spaces you would not expect them. Never reach into a space you cannot see into. Be cautious of dogs and cats, especially if they appear abnormal.
5. Examine structures for damage before entering or working – floors, overhead, walls, loose objects that may fall. If there is question about the integrity of a building, stop any work and notify building authorities for approval before continuing.
6. Ventilate closed rooms or buildings before beginning to work. Do not linger in areas where gas fumes are present. Be especially careful about flames or sparks where fumes are detected.
7. Avoid sites where asbestos, gas fumes, leaning trees and other hazards are evident.
8. Gather up all tools and equipment when leaving a work site. Be aware that flood debris that has been removed from a house and stacked along the street for later pick-up presents a hazard for any one especially children.
9. In flooded areas probe ahead for holes or submerged objects. Use a wood pole with a dry handle. Always watch your footing on ladders or other slick or wet areas.
10. Avoid fatigue. Do not work on ladders or scaffolds or operate machinery when tired or on medications that cause drowsiness.
11. Wear proper clothing. In debris areas wear heavy shoes, gloves, hard hats, full length pants and long sleeve shirts. Protect yourself against the sun or cold. Wear properly fitted safety equipment as required or provided.

12. Provide sufficient lighting in work areas – daylight or artificial. Look first into areas before entering. Check for glass, nails, or other sharp and protruding objects.
13. Be aware of where other volunteers are located and be concerned for their safety before throwing something out a window or using equipment. Using rope or cord, drag downed lines away from debris removal sites.
14. Assume fallen electrical lines are live until notified by utility companies that current is off. This includes phone and cable lines that may be shorted against hot electric lines. Continue to use caution because of possible improper use of electric generators in nearby homes.
15. Prevent health hazards by immediately removing decayed food items or chemicals from the house.
16. Only experienced persons should operate power machinery. Follow safety requirements when refueling is taking place.
17. Designate a first aid and equipment coordinator.
18. Make safety and hygiene a priority. Get adequate rest, fluids, and nourishment so you can achieve maximum effectiveness.
19. Personal decontamination as appropriate for each location
 - a. After a days work- clean equipment, tools, shovels, boots, and shoes with a power washer before removing and discarding your Tyvex suit.
 - b. Where appropriate keep clean clothes in a plastic bag on work site.
 - c. Wash exposed areas of body (normally head, arms, feet and face) in bleach solution (2 tablespoons of bleach per one gallon of water).
 - d. Take a shower and dress in clean clothes after a days work.
 - e. Place contaminated clothes in a plastic bag and put them in a designated location to be washed in disinfectant–very important.
20. Lifting should always be done in a way that protects the back from strain or other injury. Remember the buddy system and seek help when needed. To lift safely:
 - Bend your knees and squat.
 - Keep the load close to your body.
 - Keep your back straight.
 - Push up with your legs.
21. Experienced Blue-Cap Work leaders with hazardous waste training should be available to direct the Mud-Out work.

Helpful Hints

- Wear suitable rain gear, rubber boots and face mask or goggles while spraying or pressure washing.
- Use heavy rubber gloves and wear goggles when handling bleach and other disinfectants.
- Wear latex gloves with work gloves over them for normal work.
- Work within your strengths and limitations, Take at least one 10 minute break each hour or more frequent if necessary.
- Use hand sanitizer before consuming anything or wash hands with bleach and water mix. (one tablespoon bleach to one gallon water).
- Disinfect tools used each day upon completion of work. At the end of the day, **dispose of all used mop heads, sponges and Tyvex suits.**
- Do not drink water in area until verified safe.
- Eat regularly and increase water intake according to heat and workload. Take snacks and water to site.
- Rest when you can. Some people can work longer than others. Gauge yourself. Do not be intimidated by what others do if it affects your strength and usefulness. Sleeping may be difficult. Keep the Blue Cap informed.
- Dispose of any articles that are punctured (such as gloves and boots).
- Do not open refrigerators and freezers at a debris site. Bind doors to keep them shut.
- If you are unfamiliar with motorized tools, do not attempt to use them until properly trained.
- If basement is flooded allow professionals to pump out water. When done by volunteers this may cause structure to collapse or simply to refill.
- Make safety a priority so that you can achieve maximum effectiveness, not only for you and your buddy but also your team.
- Dry and spray metal tools with oil each day.

Mud-Out Procedures Directed by the Blue Cap Leader

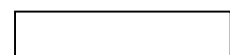
1. Carefully explain to the homeowner what we do when we mud out a home. A release and assessment form, see attachments, has already been completed by an Assessor.
2. Explain to the homeowner the health hazard that may be present if the interior walls have been affected by the water.
3. While team members are getting dressed out and prepared for work the team leader should walk through the house to determine how best to proceed with the work.
4. Allow homeowner to decide which articles are to be salvaged and which are to be thrown away. This is a good time to have a time of prayer with the home owner and team.
5. Do Not allow team members to rush in, be sure that windows and doors are open and fans are going if needed. Use the buddy system and assign only two people to each room.
6. Be sensitive to homeowner's loss when removing the debris and putting it out on the street curb. Sort debris on the curb into environmental groups i. e. appliances, furniture, canned food items, house-hold chemical and medicines, paint and solvents.
7. When all furniture and appliances are removed, determine how much wall and floor removal is necessary. Leave all hard wood flooring for removal by reconstruction crews. Carefully measure and cut dry walls at least 12 inches above the mold or moisture level.
8. Use a backpack sprayer with a mix of ½ cup bleach per gallon water to treat wet areas where contamination is obvious and drying will be slow.
9. Remove warped wall paneling, moldy drywall and wet insulation. Be careful to pull nails in hall ways and traffic areas to prevent injury and snagging of Tyvex suits.
10. Removal of cabinets is necessary to remove any wet dry wall behind them. Leave cabinets above water line for reconstruction crews.
11. All items in up stair areas should be left for later determination by the owner.
12. Advise owner to let area dry thoroughly before beginning repairs.
13. To sanitize: use one tablespoon bleach to one gallon water. This is recommended for hands or dishes and does not need to be rinsed off again..
14. Limit power washing to very contaminated areas, do not rewet areas already dry.

**DRAINING A BASEMENT SHOULD NOT BE DONE BY VOLUNTEERS
(unless properly trained)**

Appendix One

**Mud-Out Equipment List
(for a 20 man team)**

- _____ *Hope in Crisis* tracts, Bibles
- _____ Equipment owners manual
- _____ Fire extinguisher
- _____ First aid kit
- _____ Pressure Washer, Gas-powered , (minimum 1500 psi)
- _____ (4) Water hose,50-foot heavy duty.
- _____ Tyvex suits-50 ea. Med, 100 ea. X Lg. 100 ea. XX Lg. 50 ea. XXX Lg.
- _____ (2) Sump pumps, small electric,
- _____ Generator, 3500-watt with extension cords and floodlights
- _____ Fan, 3ft.electric attic exhaust type.
- _____ Chainsaw,16-inch with spare bar and chain (chaps, helmet, ear and eye protection, gloves)
- _____ Shop vac. heavy duty, wet/dry.
- _____ Gas can, 5-gallon.
- _____ (2) 2 ½-gallon gas cans
- _____ Tool box with basic tools
- _____ (2) wrecking bars (6) crow and (6) pry bars) of assorted lengths
- _____ Reciprocating saw with spare blades
- _____ Circular saw with spare blades
- _____ (1) Drill-electric-½-inch with assorted bits
- _____ (1) Bolt cutter, (6) Claw hammers
- _____ (2) Sledge hammers
- _____ (2) pr. dikes, (2) pr. pliers, (2) pr. channel locks.
- _____ (1) Ax single bit, (1) Ax double bit.
- _____ (2) Hack saws with spare blades
- _____ (4) Wheelbarrows
- _____ (100) pr. work gloves, part fiber and part leather.
- _____ (2) ea. 2 gallon water coolers
- _____ (1) 6ft. step ladder, (2) 4 ft. step ladders, (2) 2ft. step ladders
- _____ (4) 18-inch traffic cones, (10) rolls orange tape.
- _____ (4) Squeegees, heavy duty.
- _____ (6) flat face shovels, (1) Pitch fork, (4) large scoop shovels. (6) round faced shovels.
- _____ (3) Push brooms, plastic not natural fiber.
- _____ (20) pr. Rubber gloves and (20) pr. boots of various sizes.
- _____ (2) Boxes of 100 pr gloves- surgical type, powdered.
- _____ (20) Hard hats, yellow, and (1) blue. (10) pr. goggles, clear.
- _____ (2) Garden sprayers or back-pack sprayers.
- _____ (6) Plastic buckets-five gallon
- _____ (6) Bleach, gallon, 5% (store in double lined containers in trailer)
- _____ (1) Furniture dolly, (1) Appliance dolly
- _____ 300 ea. N-95 fiber face respirators
- _____ 20 ea. Canister face mask. With 40 ea. Replacement canisters.
- _____ (2) Small portable toilets.



Appendix Two

HAZARDOUS SITUATIONS IN MUD-OUT WORK.

Broad-based specific training applicable to disaster relief is not available. This Appendix is an effort to bring information together from various sources and personal experience from recovery activities that will apply specifically to Mud-Out /Recovery activities, where flood water has damaged private homes. The Blue Cap team leader has the primary responsibility for making decisions concerning hazardous waste and safety. The team leader as well as each team member must be alert to note potential hazards and take preventive action. Potential Hazards in a mud-out situation may include any of the following:

1. Fungi are common molds that cause walls and clothes to mildew. Most all species of fungi will turn black as they mature on interior surfaces. Fungi may cause various skin, eye, throat and lung infections. The plant body as well as its reproductive spores spread quickly by air currents when disturbed. Fungi are microscopic and normally combine with bacteria and dust. Fungi can best be detected by sight and smell as it forms mold on damp areas in flooded houses. Safe working conditions consist of wearing protective gear and getting doors and windows open for good air circulation. Spraying the affected areas with a bleach and water solution, (1/2 cup of bleach to one gallon of water) will knock down and temporarily control the fungi but it will soon return if the area remains damp. More extensive chemical control is beyond the scope of volunteers and if needed, must be left up to professionals in the field of mold remediation. The potential for reconstruction depends on the area getting dried out, which will eliminate the fungi problem. The purpose of the mud-out team is to get the wet debris out of the house so the house can dry out quickly. Each team member must be careful to clean hand before eating or drinking and to bathe thoroughly after a day of work.
2. Danger of bacterial poison from molded food products. Some common bacteria that grow rapidly and cause serious problems are staphylococcus, salmonella, and botulism. The bacteria its self is not poisonous. The poisons are produced when bacteria are allowed to multiply rapidly in high organic products under flooded conditions. Our job as disaster relief specialist in mud-out is to change the environment as soon as possible without becoming affected in the process. The poisons produced are often in combination with fungi and can be detected by sight, smell and taste. Wearing protective clothing such as respirators, goggles, boots, rubber gloves and other gear might be required. Some jobs are too extensive for volunteers. For instance, a residence that has been used as a food pantry or semi-commercial kitchen, and the situation has been left to deteriorate for several weeks. Removal of normal household spoiled material can be done by use of heavy plastic bags, but due to security problems the bags must be left open on the curb. Special care must be used to securely close freezers and refrigerators using strong binding material before attempting to move them to a special place on the street. Care should be used in power-washing or bleaching areas in the building to help control bacteria growth after the initial cleanup.
3. FLOOD DAMAGED HOUSEHOLD CHEMICALS AND FOOD PRODUCTS. Containers of various household chemicals and food products are safe under normal conditions, but flooding may result in the rapid breakdown of the container. Gently remove such products to a heavy plastic bag using a shovel. If done by hand, use heavy rubber gloves. Place partly filled bags of such materials in a separate place on the street curb for pick up by debris removal units. Be careful to prevent these bags from being buried under other debris. In some cases it may be necessary to separate the chemical products from the food products. These items may consist of liquid, grain or powder food products. Common house hold products may include cleansers, auto products, paints, strippers, stains and varnishes.
4. PETROLEUM PRODUCTS IN FLOODED SITUATIONS. Gas and various oils may be present in the house or may have arrived from outside sources. Elevated tanks just outside the house are often a source of oil or gas. Valves are normally stuck and require some care in closing. Some plastic boots and gloves are damaged by petroleum products in flooded conditions. Immediate washing of hands and any affected skin area is necessary after coming in contact with such unknown petroleum waste products.
5. STRUCTURE DAMAGE TO FLOODED BUILDINGS. The foundations of any building may be damaged or some part of the structure may no longer be sound. A carpenter's level is an easy way to measure a leaning wall or sagging floor. When in doubt, make a measurement upon starting work and every hour or so thereafter. Lath and plaster walls should not be removed as they are part of the supporting structure. Tongue and groove hardwood flooring should not be removed as such removal will weaken the floor. Neither situation will affect the drying out of the structure. Remember the aim of our Mud-Out Program is to remove such debris that will allow rapid drying of the house.
6. ANIMALS AFFECTED BY FLOODING. House pets are the most commonly observed animals. These animals can be very dangerous after being cooped up in a flooded home for some time. Do not attempt to capture such animals, as this is the responsibility of the homeowner or humane society. Other domestic animals as cows, hogs and horses may

be present in adjacent structures. Again, notify the proper agency to take care of such problems. Our job is to help the home owner get his residence dried out. Wild and feral animals such as snakes, alligators, and spiders can be hiding any place in a flooded home. Working with proper hand tools and personal gear is the most effective control for unexpected contacts with these critters.

7. FERTILIZERS, PESTICIDES, AND HERBICIDES. Large volumes of garden and farm products are often observed in flooded situations. Where possible these items should be left in place. Removal is normally beyond the scope of volunteers and must be left up to professionals.

8. CHEMICALS, METALS AND MEDICINES. This may include such items as mercury, formaldehyde, lead and various medicines. Such items are normally in small amounts and can safely be removed to a special site outside the residence while the debris is being removed. Care should be taken to safeguard these items by returning them to the residents after the work is done. Do not leave these items on the street curb. Contact the proper pick-up agency if possible.

9. DAMAGED UTILITIES OR FAULTY UTILITIES. This may include electric, natural gas, propane gas, water, cable and telephone. One or more of these items will be present in any disaster site. Remember, any metal conductor may be electrified, so use care if movement of such lines is necessary for safe work conditions. In older neighborhoods one can often see evidence of improper utility connections. Sparking and strong gas odors are good evidence of such things, but are often concealed by other damage. An approved work request is our best effort at being safe, but be on guard for home generators and gas being turned on temporarily.

10. MANUFACTURING WASTE AND SPILLS. Work orders will not be approved under these conditions. However such conditions can possibly occur even during an actual recovery activity. Gases from flood damaged equipment may include fluoride, chlorine, nerve, oxidizers, arsenic, sulfides and cyanide. Sight and smell are our best indicators of danger in such conditions. Immediate action to depart from the area should be taken if such problems are suspected or occur.

11. RADIOACTIVE WASTE. If such waste is detected in the process of a recovery activity, it is cause for immediate departure from the site. The proper agency should be notified to clear the area. The equipment to evaluate radiation problems are beyond the effort of volunteers.

12. ASBESTOS. This material is common in older homes, normally in the form of roofing, outside singles and tile flooring. It is normally in solid hard form but can become fibrous in flood situation especially on windy days. Wearing an N-95 respirator even when outside a building is required in areas where older homes are located.