

NIEHS Wildfire Response Training Tool

Protecting Yourself While Responding to Wildfires

Safety and Health Awareness for Responders to Wildfires



How to Use this Training Tool

- This training tool is an **awareness-level health and safety resource for “skilled support personnel”** who will participate in a hazard analysis or cleanup post wildfire.
- This tool will help workers understand at an awareness level: characteristics of what a wildfire and a wildfire response is and how to protect against and control hazards associated with the response, assessment and cleanup activities associated with a wildfire.
- Trainers may use this tool to aid in the development of a wildfire awareness level course or other awareness level materials (fact-sheets, table-top activities, etc.).

Advanced/Additional Training Required for Those Involved in a Wildfire Response

- This training tool does not replace fire fighting specific training, wildfire entrapment training, additional duty specific training, or PPE specific training requirements.
- Regardless of work scope, there are many topics covered in this awareness training tool that have corresponding OSHA standards which must be met in order to safely and legally perform associated job duties.

Contact the NIEHS National Clearinghouse for Worker Safety and Health Training (202-331-7733) for information regarding advanced training for wildfire response.

Working the Fire

- Only certified workers should be allowed to work fire control lines. Areas throughout the U.S. have their own unique fire hazards and require special training. Being asked to assist in controlling fires should come from the fire command only after adequate training and health assessment.



WORKER TRAINING PROGRAM

Employer and Worker Responsibilities

Employers and workers have responsibilities under the OSH Act.

- The Occupational Safety and Health Act requires employers to provide a safe and healthful workplace free of recognized hazards and follow OSHA standards. Employers' responsibilities also include providing training, medical examinations and recordkeeping.
- Workers must follow the employer's safety and health rules and wear or use all required gear and equipment; follow safe work practices for their job, as directed by their employer; report hazardous conditions to a supervisor; and report hazardous conditions to OSHA if employers do not fix them.

MODULE 1

Wildfire Characteristics and General Response Procedures



What is a Wildfire?

A wildfire is an unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

- Most likely will have multiple wildland urban interface areas
- Wildland urban interface (WUI) refers to the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.
- If not controlled, wildfires will destroy whatever is in their path
- May create its own weather patterns

What Makes Wildfires Unique?

- Can move at extremely high rates of speed.
- May have flames anywhere from a few feet high to 200 plus feet high.
- Potential to produce fire tornados causing fires to spread.
- Affected by environmental conditions (fuel, lay of the land, wind, humidity, etc.).
- Potential to produce large amounts of debris.
- May require enormous resources to control and clean up.
- May produce many hazards of which skilled support personnel must be aware.



Risk Factors for Wildfires

**At no time should support personnel be in an active fire location
Low or moderate risk areas may become high risk when working near an active fire**

Specific factors contributing to exceptional wildfires are believed to be the result of:

- years of fire suppression that led to fuels buildup;
- forest management practices that altered natural disturbance regimes;
- extensive expansion of communities and homes into the wildland urban interface (WUI), increasing the complexity of both pre-fire forest management, and management during fires;
- increasing use of wildlands and the likelihood of fire initiation;
- invasive plants that displace the native plant community that differ in flammability;
- outbreaks of native species (e.g., bark beetle) altering fuels; and
- altered climate regimes with longer fire seasons, and hotter draughts.

Fire and Smoldering Debris



- 25% of fire related deaths in the United States are caused by smoldering related to residential home fires.
- Smoldering debris may remain for weeks and could reignite if combined with combustible materials or if oxygen becomes available (i.e. disturbing debris during cleanup operations).
- Exposure to wildfire smoke made up of particulate matter can cause eye, nose, throat, and lung irritation as well as other health impacts.
- Have at least two UL rated 10A-cooling fire extinguishers at every cleanup activity.
- Be aware of the state of the debris you are handling.
- Watch where you step. Hot debris may be under the surface.

NIEHS Wildfire Response Training Tool

MODULE 2

Response Operations Structure



National Incident Management System (NIMS)

- NIMS is designed to:
 - provide a framework for incident management
 - “One mission, one team...”
- Used for ALL types of incidents (mass casualty, planned events).
- First standardized approach to incident management and response.
- Establishes uniform set of procedures to be used by emergency responders at all levels of government to conduct response operations.

Core Elements of NIMS

- Incident Command System (ICS)
- Preparedness (planning, training, exercises, qualifications and certifications of all personnel involved in incidents)
- Communications and Information Management
- Joint Information System
- NIMS Integration Center



Incident Command System (ICS)

- The incident command system will be used to effectively manage emergency situations such as wildfires.
- ICS uses:
 - Unity of command (one person in charge)
 - Span of control to manage personnel (3 - 7 people under one supervisor)
 - Common terms so everyone understands what is being communicated
 - A modular system to manage resources (a system that can expand and contract with the emergency event)





Field-Level Briefings

ICS is used by various jurisdictions and functional agencies, both public and private, to organize field-level incident management operations.

Field-level briefings are delivered to individual resources or crews who are assigned to operational tasks and/or work at or near the incident site.

These briefings will be delivered to individual subordinates, full crews, or multiple crews such as Strike Teams or Task Forces and will occur at the beginning of an operational shift.



Emergencies in the Field

- Ask what first aid support is available during your briefing and be sure you understand where it is located.
- For minor injuries or health concerns go to:
 - Local hospitals or clinics
 - First Aid, EMT or nurse station
- For serious emergencies call 911
 - Know your exact location. Be aware of cell reception area.
- Notify your supervisor about all injuries and emergencies.



Personal Safety Equipment

- Hardhat
- Safety Glasses
- Hearing Protection
- Respirator
- Gloves
- Protective Clothing
- Safety Boots
- Baby Wipes
- First Aid Kit

MODULE 3

Controlling Hazards Created by Wildfire



Physical Environment-Southern Cal.

- The Land
 - Steep hills to flat and coastal areas
 - Low grass to full canopy tree areas
- The Climate (October/November)
 - Arid, dry climate
 - 75° F+ day
 - 55° F night
 - Strong wildfire risk factors



Health and Safety Plans (HASP)

- OSHA has set regulations that require Health and Safety Plans (HASP) to protect workers involved in any work site.* The HASP serves as a guide for employers and workers to follow during their daily operations to prevent the spread of contamination, injury, and death. **Review your HASP before you start work!**



*OSHA, 29 CFR 1910.120, HAZWOPER

HASP (continued)

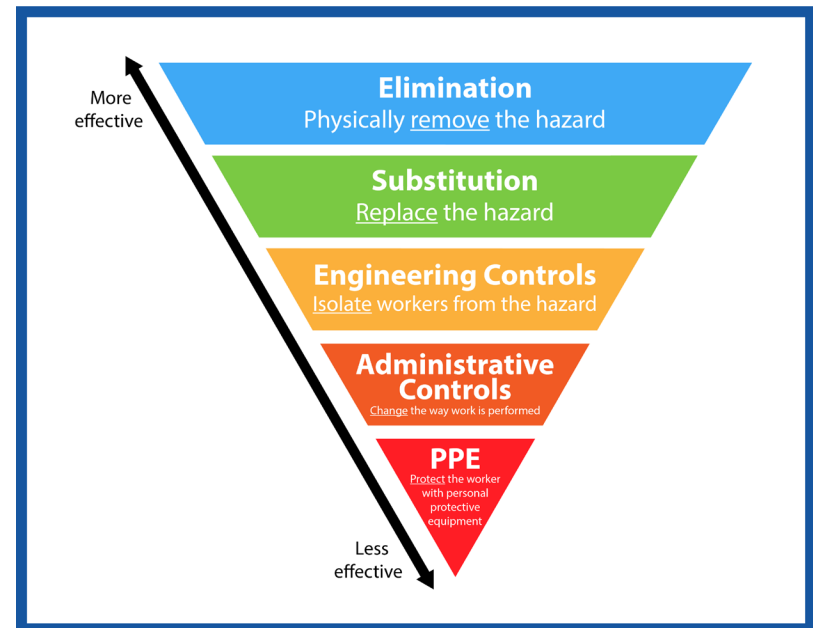
This document covers some HASP sections that will be used on the worksites during a wildfire cleanup. The site safety section includes general information from several of the HASP sections listed below.

Any HASPs must cover all of the following:

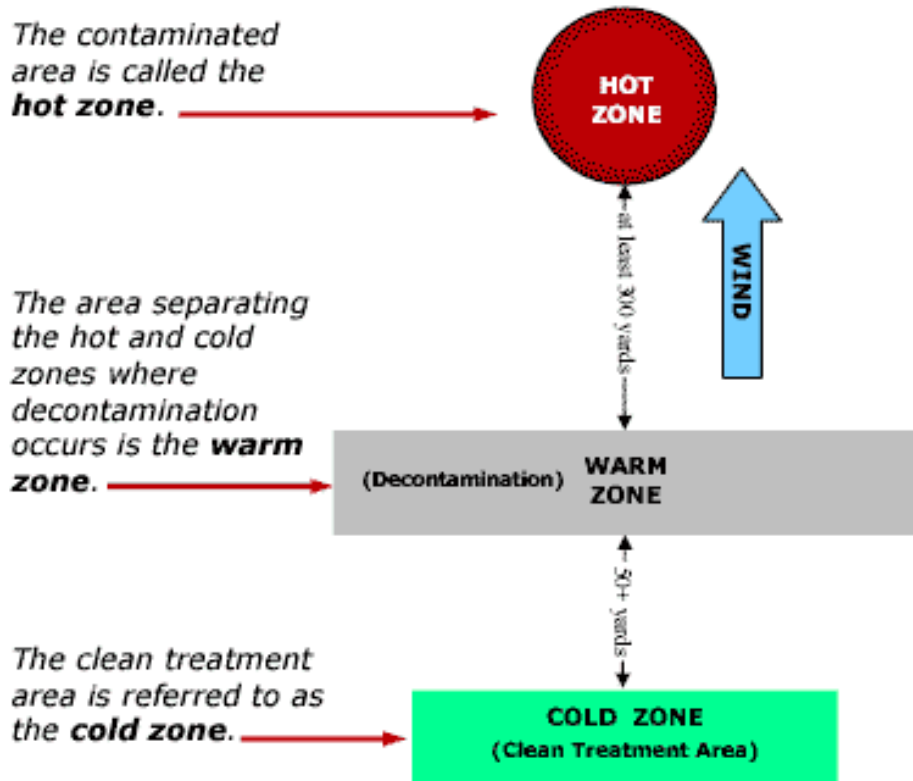
- Introduction
- Key Personnel
- Hazard Assessment
- Training
- PPE
- Temperature Extremes
- Medical Surveillance
- Exposure Monitoring and Air Sampling
- Site Control
- Decontamination
- Emergency Response/Contingency Plan
- Emergency Action Plan
- Confined Space Entry
- Spill Containment

Hierarchy of Controls

- When dealing with health and safety hazards try to control them by using the hierarchy of controls:
 - Eliminate hazard
(move a loud generator away)
 - Engineering controls
(use wet methods to control dust)
 - Administrative controls
(perform heavy work during the cooler parts of the day, follow safe work practices)
 - PPE
(respirators, gloves, steel toe and sole footwear)



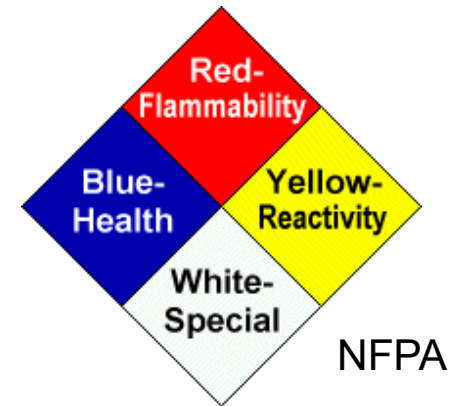
Site Control



- Site control is a key element in controlling the risk from hazards presented at a chemical release or disaster.
- Consists of the following components:
 - Control zones (see image to left)
 - HASP
 - Communication
 - Emergency Plan
 - Site Map
 - Use of “Buddy System”

Hazardous Materials and Hazard Communication

- Due to the fire, you may find dislodged or damaged tanks, drums, pipes, and equipment which may contain hazardous materials.
- Do not handle unidentified or damaged containers-report these to your supervisor.
- Understand Department of Transportation (DOT) placards and labels and their related hazards.
- Understand Safety Data Sheets (SDS). Follow where appropriate.
- NFPA 704M warning labels may also be useful in the field.
- Specific Hazard Communication training is required for any potential chemicals that you may come in contact with.



DOT



OSHA

Hazardous Materials Associated with Commercial and Residential Wildfire Debris

- Asbestos
- Ash
- Compressed gas cylinders and propane cylinders
- Gasoline cans (and other fuel containers)
- Bulk chemicals & chemical containers
- Lead acid batteries
- Paints and thinners
- Bulk pesticides
- Bulk fertilizers
- Moldy materials
- Munitions
- Laboratory equipment
- Lead
- Electrical Transformers
- Air conditioners
- Large metal appliances and equipment
- Automobiles
- Fire retardants
- Transformers
- Petroleum products found in many modern materials

Fire Retardants

In general, fire retardants reduce the flammability of materials by either blocking the fire physically or by initiating a chemical reaction that stops the fire.

- The human health effects from fire retardants are not well known.
- Some ingredients may cause cancer.
- Fire retardants may persist in the environment for weeks to months.
- Reduce exposure to fire retardants when workers may be exposed, i.e., during application or cleanup.



Dusts Containing Fire Retardant, Ash, Asbestos, Silica and Other Toxins

- Try to apply the following engineering controls in addition to wearing a respirator:
 - Wet methods
 - Ash approved HEPA vacuum
- Minimize particulate matter (dust) production:
 - Do not use a vacuum that is not approved for ash and that does not contain a HEPA filter
 - Do not aggressively dry sweep
 - Avoid walking in single file lines-those behind the leader may become covered in particulate matter



*Wetted debris during clean up of 2007
Angora wildfire*

Dusts Containing Fire Retardant, Ash, Asbestos, Silica and Other Toxins (cont.)

- Wearing NIOSH-approved respirators:
 - **If in doubt about respirators, see your supervisor**
 - An N-95 or greater respirator may be acceptable for some activities
 - Use an elastomeric, half-mask respirator with N,R, or P-100 series filters if asbestos, ash or fire retardants may be present
 - If airborne contaminants are causing eye irritation, full-face respirators with P-100 organic vapor/acid gas (OV/AG) combination cartridges should be used
 - Surgical masks or face gaiters should **not** be used because they do not provide adequate protection
 - Replace filters when breathing becomes difficult or you detect an odor through organic vapor cartridges



½ face respirator with P-100/OV/AG cartridges

Special Rules for Respirators

- Make sure you are medically cleared to wear your chosen respirator.
- Make sure you received the required training.
- Make sure you are fit tested for your respirator.
- Inspect your respirator each time you put it on and take it off.
- Perform a user seal check each time you put it on.
- Clean your elastomeric respirator at least once a day in accordance with manufacturers recommendations.
- Store elastomeric respirators in a clean bag.
- If your respirator becomes damaged or fails to function, stop work and retrieve a new one.

**OSHA respiratory protection
standard, 29 CFR 1910.134**

Electrical Hazards

- Four main types of electrical injuries seen in fire cleanup:
 - Electric shock
 - Burns
 - Falls caused by contact with electricity
 - Electrocutation
- Avoid working with electricity in wet environments. If this must be done, use equipment approved for wet conditions.
- Electrical cords and outlets must meet OSHA standards.
- Use double insulated tools.
- Use Ground Fault Circuit Interrupters (GFCIs) on all power tools and cords as close to the panel as possible.
- Do not re-energize electrical systems or use electrical equipment that has been in a fire or wet until it has been evaluated by a qualified electrician.



Portable GFCI.

Electrical, Overhead Power Lines, Downed Electrical Wires, Cables

- Treat all power lines and cables as energized until proven otherwise.
- Use appropriately grounded low-voltage equipment.
- Stay clear of downed and damaged electrical lines.
- Don't touch a person, animal, or object that is in touch with a power line.



Hazardous Utilities

- Look for overhead power lines and buried power line indicators. Post warning signs.
- Contact utilities for buried power line locations.
- Stay at least 10 feet away from overhead power lines.
- Unless you know otherwise, assume that overhead lines are energized.
- Get the owner or operator of the lines to de-energize and ground lines when working near them.
- Other protective measures include guarding or insulating the lines.
- Use non-conductive wood or fiberglass ladders when working near power lines.

Structural Integrity

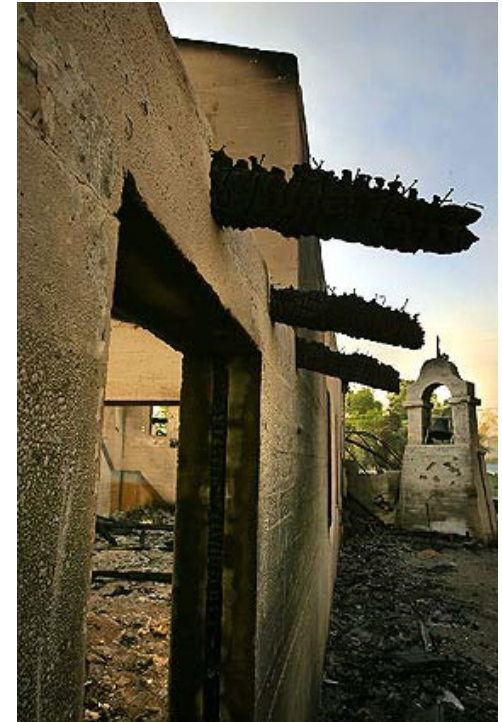
- Fires can weaken and damage many types of structures.
- Never assume that fire-damaged structures or ground are stable - have it **certified safe** by a registered professional structural engineer or architect.
- Assume all stairs, floors and roofs are unsafe until inspected.
- Watch out for unstable ground or flooring that could give way and collapse.



Leave immediately if you hear shifting or unusual noises - A COLLAPSE MAY BE OCCURRING

Structural Integrity (cont.)

- OSHA requires walls or floor to be shored or braced before demolition if workers are within structure. Cut off, cap or control all service utility lines outside the building before demolition work is started. Notify appropriate utility company in advance.
- If it is necessary to maintain any utilities during demolition, such lines shall be temporarily relocated and protected.
- Determine if any hazardous substances have been on the property. Remove any found hazardous substance before demolition.
- Do not cut or remove any structural or load-supporting members on any floor until all stories above such a floor have been demolished and removed.



Debris Piles and Unstable Surfaces

- Only walk and work on surfaces you know are stable.
- Look for smoldering material on or beneath the surface.
- Use other ways to get to work surfaces, such as bucket trucks.
- Erect scaffolding and manlift equipment on stable surfaces and anchor it to stable structures.
- Wear protective equipment provided, including hard hats, safety glasses, leather gloves and safety shoes that have toe protection, slip resistant soles, and are puncture resistant.
- Use fall protection with lifelines tied off to suitable anchorage points, including bucket trucks, whenever possible.
- Watch for fall hazards to other levels.



Confined Spaces

What is a Confined Space (CS)?

- Space with limited access and egress
- Large enough for bodily entry
- Not designed for occupancy
- Examples: boiler, pit, septic tank, utility vault, well, basement and trench



What hazards make it a permit required CS?

- Oxygen deficiency
- Entrapment
- Engulfment
- Hazardous atmosphere
- Any other recognized, serious health or safety hazard



Your Safety Officer Must Approve Confined Space Entry!!!!

Confined Spaces (continued)

Before you enter a confined space your supervisor must:

- Entry permit should be developed and signed by the supervisor
- Make sure you and the attendant are trained.
- Ventilate and monitor for hazardous atmosphere.
- Lock out or tag out all energy sources in the space.
- Issue appropriate PPE, possibly including self-contained breathing apparatus (SCBA).
- Establish barriers to external traffic such as vehicles and pedestrians.
- Provide ladders or similar equipment for safe entry and exit in the space.
- Provide good communications equipment and alarm systems.
- Have rescue equipment and trained rescue personnel nearby.

If caused by structural collapse, have space certified safe by a registered professional engineer or architect before you enter!!!

Flying Debris and Material Handling

- Wear personal protective equipment, including hard hats, safety shoes, safety glasses, and work gloves.
- Do not stand or walk under loads being hoisted by cranes and other heavy equipment. Be sure all rigging equipment is inspected and properly hitched to a load before it is hoisted. This includes slings, hooks, shackles, etc.
- Stay away from heavy equipment in swing radius.
- Make sure that you have an up-to-date tetanus immunization.

Carbon Monoxide (CO) Exposure

Carbon Monoxide has no warning properties; it is a colorless odorless gas

- **CO may be present with:**
 - Any activity using gasoline, diesel or propane-powered machinery
 - Work near operating equipment
 - Debris reduction sites
 - Work near hot work (cutting, welding) especially in confined spaces
- **To control CO exposures:**
 - Do not use gas/diesel powered equipment indoors or in enclosed areas
 - Use forced air ventilation
 - CO monitoring and testing must be done

Symptoms: Headache, dizziness, drowsiness, or nausea progressing to vomiting, loss of consciousness. Prolonged or high exposure can lead to coma or death. If you experience any of these symptoms where CO may be present - **LEAVE AREA IMMEDIATELY**

Portable Generators



Hazards include:

- Carbon monoxide poisoning
- Electrocution from backfeed

If it is necessary to use a portable generator, follow manufacturer's recommendations and specifications:

- Use a qualified electrician to assist in installation and start-up activities
- If using gasoline- and diesel-powered portable generators, switch the main breaker or fuse on the service panel to the “off” position before starting the generator
- Do not use on or in wet surfaces
- Do not operate in rain unless the generator can be kept dry
- When refueling, turn off and wait for motor to cool or use appropriate funnel to prevent spills onto hot engine
- Do not use indoors or in temporary or permanent shelter

Ergonomics

Ergonomics is the arranging of the work environment and task methods to reduce injury and fatigue in workers. An example is using roller conveyors on which objects can slide to eliminate unnecessary lifting.

To help prevent injury during a wildfire response, if possible:

- Use proper machinery to assist in lifting materials
- If proper equipment is not available, use teams of two or more to move bulky objects
- Avoid lifting any material that weighs more than 50 pounds per person
- Avoid repetitive motions
- Avoid use of excessive force
- Avoid awkward postures
- Employer must have policies to reduce worker exposure to excessive heat or cold

Heat Related Illness

Signs and symptoms workers experience from heat.



Heat Rash	Heat Cramps/Fainting	Heat Exhaustion	Heat Stroke
<ul style="list-style-type: none"> • Red cluster of pimples or small blisters, usually on neck, upper chest, groin, under breasts, in elbow creases. • Extensive areas of skin that do not sweat on heat exposure, but present gooseflesh appearance that subsides with cool environments. 	<ul style="list-style-type: none"> • Muscle cramps, pain, or spasms in the abdomen, arms, or legs. • Fainting, dizziness, or light-headedness after standing or suddenly rising from a sitting/lying position 	<ul style="list-style-type: none"> • Headache • Nausea • Dizziness, weakness • Irritability • Thirst, heavy sweating • Elevated body temperature • Decreased urine output 	<ul style="list-style-type: none"> • Confusion, altered mental state, slurred speech, loss of consciousness • Hot, dry skin or profuse sweating • Seizures • Very high body temperatures • Fatal if treatment delayed

Heat Stress (continued)

- Drink regularly even if you don't feel thirsty. Drink sports drinks, instead of water, if you can. Avoid alcohol, caffeinated drinks, or heavy meals.
- Know the signs of heat-related illnesses.
- Monitor yourself and coworkers, use the buddy-system. Use monitoring such as aural temperature readings using an ear thermometer.
- Block out direct sun or other heat sources and shelter in shaded areas.
- Use cooling fans/air-conditioning and rest regularly.
- Wear lightweight, light-colored, loose-fitting clothes and a hat if available. Get medical help for symptoms such as altered vital signs, confusion, profuse sweating, excessive fatigue, or rapid heartbeat.
- Implement appropriate work-rest schedule.

Debris Removal Operations



Hazards include:

- Overhead power lines
- Traffic issues
- Congested, bottle-neck areas
- Working on potentially unstable ground/surfaces
- Modified trailer used to haul oversized load debris
- No traffic control (direction)
- Low visibility from smoke and/or ash

Heavy Equipment Use

The following are the types of heavy equipment that may be used during a wildfire cleanup:

- Front end loaders
- Excavators/backhoes
- Forklifts
- Bobcats
- ATVs
- Tractors
- Cranes
- Trailers
- Dump trucks



Heavy Equipment Use (continued)

- OSHA requires machinery to be inspected by a qualified worker before each use.
- Be alert to the activities around you.
- Do not direct equipment unless trained to do so.
- Do not walk under or through areas where heavy equipment is lifting objects or behind equipment.
- Do not climb onto or ride loads being lifted or moved. Do not ride on equipment or in bucket.
- Pay attention to extremely sloped terrain.
- Do not exceed the load capacity of lifting equipment.



OSHA Focus Four Topics

OSHA identified four hazards that are responsible for the majority of losses:

- Fall Hazards
- Caught-In-Between Hazards
- Struck-By Hazards
- Electrical Hazards



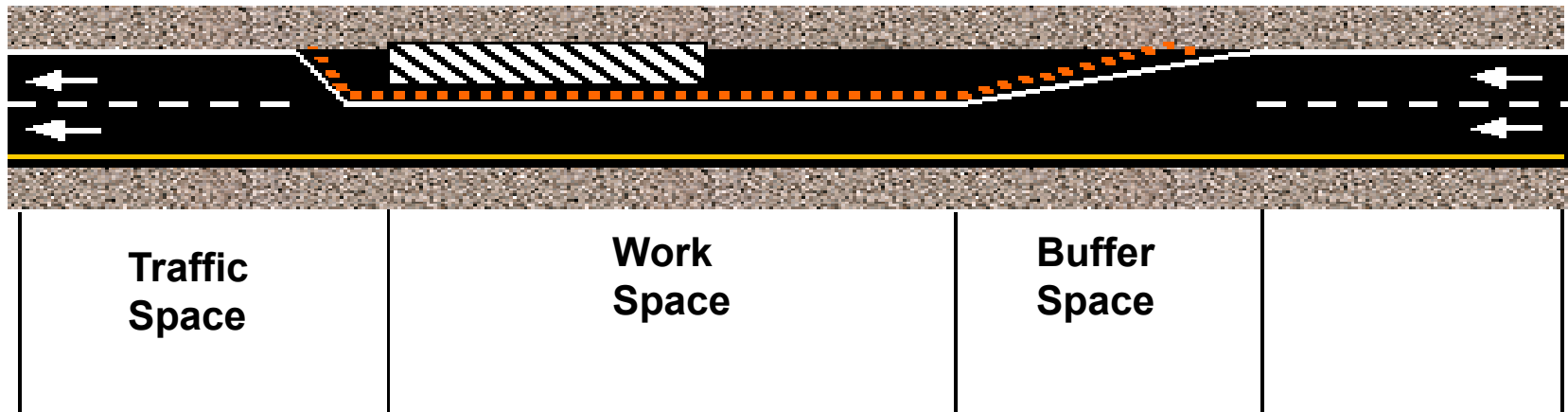
Driving and Traffic Issues

- Worksites must be posted with legible traffic signs at points of hazard. Flag persons or Flaggers are used when signs, signals, and barricades do not provide adequate protection for workers. Traffic issues workers may experience include:
 - Heavy traffic
 - Inexperienced or poor drivers
 - Poor visibility due to smoke and ash
 - Rapidly changing routes due to fire encroachment.
- Those working near traffic should wear high visibility clothing or PPE.



Road Work Zone Safety

- There must be a traffic control plan for the movement of vehicles.
- Traffic Control Devices should be used inside the work zone.
- Flaggers and others providing temporary traffic control should wear high visibility, reflective clothing.
- Flagger stations should be illuminated.
- Flaggers should be trained/certified and use the signaling methods required by the authority in charge.



Component Parts of a Temporary Traffic Control Zone



NIEHS Wildfire Response Training Tool

MODULE 4

Controlling other Task-specific Hazards During a Wildfire Cleanup

Operating a Chain Saw

- Operate, adjust, and maintain the saw according to manufacturer's instructions.
- Properly sharpen chain saw chains and properly lubricate the bar and chain with bar and chain oil.
- Operator should periodically check and adjust the tension of the chain saw blade to ensure good cutting action.
- Choose the proper size of chain saw to match the job.
- Include safety features such as a chain brake, front and rear hand guards, stop switch, chain catcher and a spark arrester.



Operating a Chain Saw (continued)



- **Wear the appropriate protective equipment:**
 - Hard hat with mesh face shield
 - ANSI rated safety glasses
 - Hearing protection
 - Heavy work gloves
 - Cut-resistant legwear (chain saw chaps)
- **Always cut at waist level or below**
- **Avoid contact with power lines**
- **Bystanders or coworkers should remain at least:**
 - 2 tree lengths (at least 150 feet) away from anyone felling a tree
 - 30 feet from anyone operating a chain saw to remove limbs or cut a fallen tree

High Pressure Washers



Safe use guidelines include:

- Inspection of washer
- Training and proper use
- PPE (including insulating rubber boots)
- Hazcom for cleaning agents
- Use with GFCI and proper electrical safety
- Do not use inside any structure including cellars, garages and enclosed areas

Associated hazards include:

- Chemical burns
- Lacerations
- Thermal burns
- Contusions
- Back and shoulder strains
- CO production
- Chemical Penetration
- Projectile Production
- Electric shock

Hand and Portable Power Tools

Hand Tools

- Inspect tools in accordance with manufacturer's specifications
- Take damaged tools out of service
- Use only sharp tools
- Use proper hand glove protection



Portable Power Tools

- Inspect tools in accordance with manufacturer's specifications
- Use with sharp blades
- Use with GFCI
- Use with proper gauge electric cord
- Use double insulated tools
- Always wear ANSI rated safety eye protection
- Use proper hand glove protection

Personal Protective Equipment (PPE)

Depending upon your work site's PPE program and assigned job task, any of the following PPE may be required:

- Protective clothing ranging from standard coveralls to a chemical resistant suit with hood and booties.
- Respirator ranging from an N-95 to a powered air purifying respirator for high exposure and strenuous work. In rare cases an atmosphere supplying respirator may be required.
- Protective footwear with steel toe and insole. A chemical resistant boot or outer boot may be required for some work.

PPE (continued)

- Disposable cut/abrasive resistant work glove. A chemical resistant glove may be required for some work.
- Fully enclosed goggles (better for ash) or safety glasses.
- Ear protection in noisy areas.
- Head protection and face shields.
- If you are working near downed power lines:
 - Nomex clothing compliant with NFPA 1971, rubber gloves, dielectric overshoes and insulated tools
- Be sure to follow your work site's PPE program.

The OSHA PPE standard (29 CFR 1910 Subpart I) must be followed when selecting and implementing PPE.

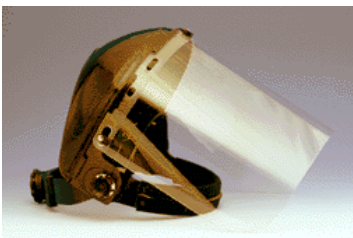
PPE Examples



Safety glasses



Wildland goggles



Face Shield



Level C PPE with tyvek splash suit and APR respirators



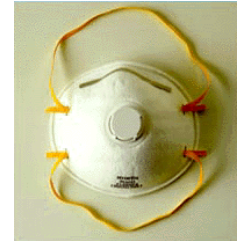
Example of Leather gloves
Courtesy Kirkwood



Example of Nitrile gloves
Courtesy Kirkwood



Wildfire helmet



N95 Respirator



1/2 face APR



Full face APR



PAPR

Decontamination (Decon)

Depending on your job task, you may come in contact with hazardous materials which will require you to be decontaminated

- Decon is the process of removing, destroying, or reducing the activity of materials such as ash, asbestos, or toxic chemicals that could endanger an individual or the environment.
- Prevents spreading contamination to other locations (like your vehicle or home).
- Site workers who use the site's SOPs are less likely to be contaminated than site workers who do not use these practices.



Decontamination (continued)

- A decontamination plan should include:
 - Training
 - Location and layout of decontamination stations and areas
 - Decontamination methods
 - Required decontamination equipment
 - Standard Operating Procedures (SOPs) to minimize worker contact with contamination during decontamination
 - SOPs for decontamination line personnel
 - Procedures for collection, storage and disposal of clothing equipment and any other materials that have not been completely decontaminated
 - Disposal of PPE and decon solutions as contaminated waste
 - Adequate personal washing stations

Prevent the Spread of Contamination to Your Family and Home

- Bringing home contaminated work clothes or equipment may contaminate your home and place your family at risk.
- Bring a clean change of clothes to the work site.
- Wash work clothes separately, preferably in an employer provided location.



Animals and Insects

- **To protect yourself from mosquitoes:**
 - Use screens on dwellings
 - Wear long pants, socks, and long-sleeved shirts
 - Use insect repellents that contain DEET or Picaridin
- **Beware of wild or stray animals:**
 - Avoid wild or stray animals; call local authorities to handle animals
 - Dispose of dead animals according to local guidelines
 - Wear and clean proper protective clothing when handling carcasses



Animal and Insects (cont.)

- **Be on the alert for snakes or animals that may be hiding in unusual places.**
- If you are bitten:
 - Seek immediate medical attention
 - Try to identify the snake so that if it is poisonous, you can be given the correct antivenom
 - Do not cut the wound or attempt to suck the venom out; contact your local emergency department for further care



Poisonous Plants

- Train workers on hazardous plant recognition
- Use gloves and wear long pants and long-sleeved shirts when possibility of contacting poisonous plants
- *Clothes, shoes, and tools may become contaminated by coming in contact with poisonous plants.*



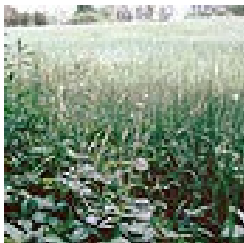
summer



spring



fall



where it grows



it's a bush



it creeps



it climbs



at the beach

General Safety Tips

- Be careful and use safety measures outlined in your worksite's HASP at all times.
- Walking/working surfaces may be wet, slippery and unstable. Spread sand and wear slip resistant footwear if possible, to reduce slips and falls.



General Safety Tips (continued)

- Walking over and handling debris that is unstable can cause cuts, scrapes, bruises, sprains, etc.
- Make sure you have had a current tetanus vaccination.
 - Revaccinate for a dirty wound if current vaccination is over 5 years old
 - If you will be performing direct patient care or otherwise expect to have contact with bodily fluids, get the Hepatitis B vaccine series
- Avoid contact with stagnant water:
 - If exposed to stagnant water, wash and decontaminate yourself and any contaminated equipment immediately
- Use steel toe insole, non-slip footwear.
- Use durable outer gloves when handling debris.
- Wear ear protection for noisy environments.

Bloodborne Hazards

- Use disposable nitrile or similar gloves when handling human remains or assisting those with injuries.
- Do not handle human remains or assist those with injuries without gloved hands. Replace gloves if punctured or torn.
- Use goggles or face shield and mask for handling human remains, recovering deceased. Make sure to wear a respirator.
- Transport human remains in closed, leak-proof, labeled containers.

**OSHA Blood Borne Pathogen Standard:
29 CFR 1910.1030**



Excavation Hazards

Search and rescue, structural repair and cleanup operations may require excavation.

- Excavations can create many hazards which must be controlled to safely work around and in them.
- An excavation is any man-made cut, hole, trench, or depression in the earth formed by earth removal.
- A trench is defined as a narrow below-ground excavation that is deeper than it is wide and is no wider than 15 feet.
- The following are potential excavation hazards:
 - Cave in
 - Falls, falling loads
 - Hazardous atmosphere
 - Incidents involving mobile equipment

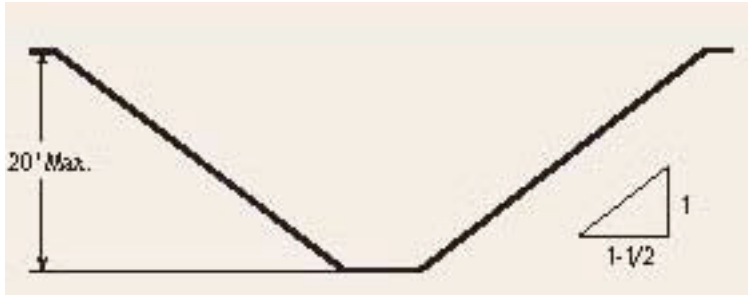


Excavation (continued)

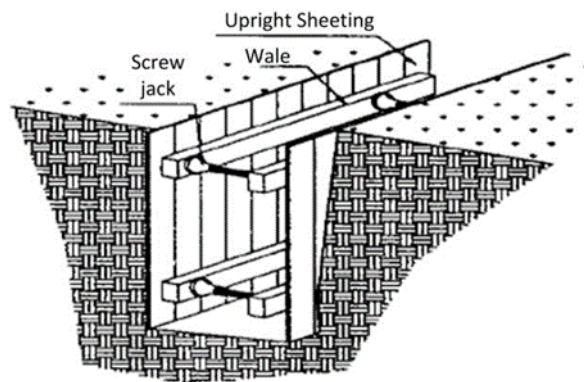
- A competent person must evaluate soil for excavation safety. All excavations/trenches should have safe means for entering and exiting (ladders, safe design, etc.). DO NOT enter an unsafe excavation!
- If an excavation is over 4 feet deep, an emergency exit route/device (i.e., ladder) must be provided which may not be the sides of the excavation. Distance to egress must be 25 feet or less.
- If an excavation is five feet deep or more, one of the following engineering controls must be used:
 - Shoring
 - Shielding
 - Sloping

See OSHA's Trenching and Excavation Factsheet

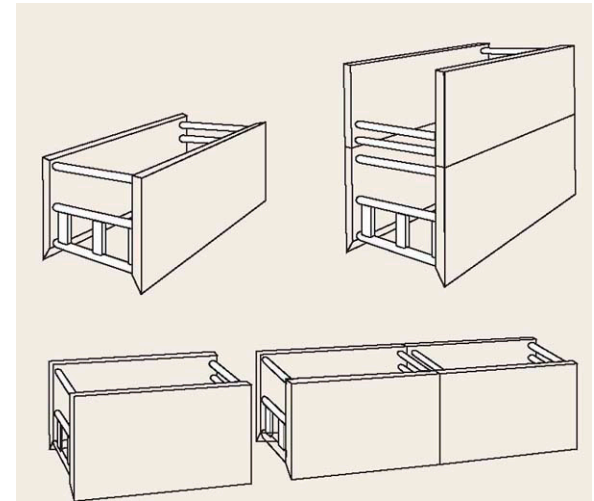
Controlling Excavation Hazards



Sloping in type C soil



Shoring: Single-cylinder hydraulic shores



Shielding

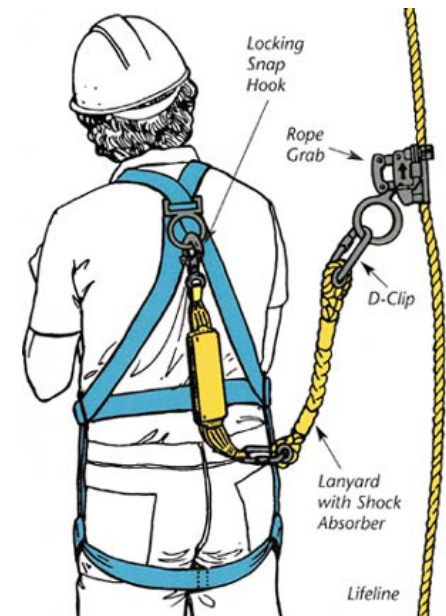
Aerial Lifts

Vehicle-mounted devices used to get a worker to an elevated position, (also called “cherry pickers,” or “boom trucks”).

- Only trained and authorized people may operate the lift.
- Read and understand the safety and operating instructions including all warning decals or labels.
- Check for overhead objects before use.
- Stay far from debris piles, drop-offs, and floor openings.
- Never use near electric lines unless they are deenergized or adequate clearance is maintained.
- Refuel tanks only when the unit is off and charge batteries in a well-ventilated area away from open flames.
- Elevate the lift only when it is on a firm and level surface.
- Whenever working out of an aerial lift, a full body harness must be worn and properly attached to the basket.
- Never drive the aerial lift when it is elevated above the limit the manufacturer considers safe.

Falls from Heights Six Feet and Higher

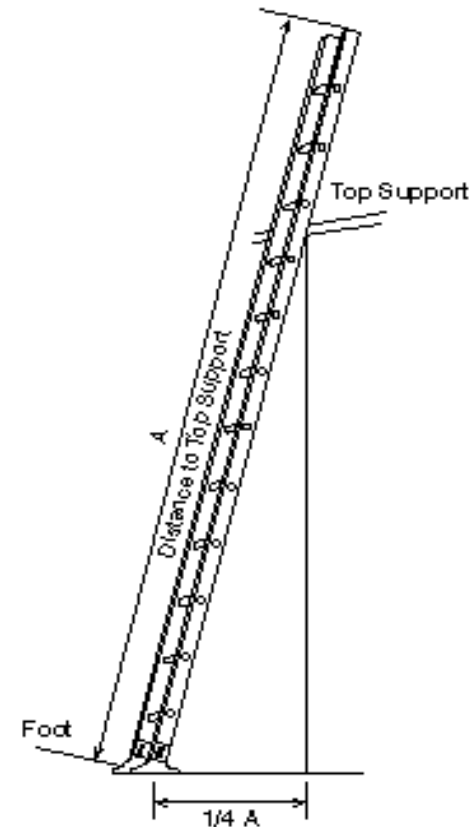
- Employees shall be protected from falls greater than six feet to a lower level.
 - Guardrail Systems
 - Safety Net Systems
 - Fall Arrest Systems (less effective than guardrail and safety net systems)
 - Cover or guard any openings or floor holes as soon as they are created
 - Make sure floor hole covers support two times the weight of employees, equipment, and materials
 - Be careful when stepping into areas that are unstable/uneven or where the surface cannot be visualized (i.e., if covered by water).
- Workers should prevent items from falling onto people below.



Ladder Safety

Ladders can create a falling hazard. Make sure your ladder is secure:

- Position portable ladders so the side rails extend at least 3 feet above the landing.
- Secure side rails at the top to a rigid support and use a grab device when 3 foot extension is not possible.
- Do not apply more weight on the ladder than it is designed to support and make sure that the weight on the ladder will not cause it to slip off its support.
- Before each use, inspect ladders for cracked, broken, or defective parts.
- Use only ladders that comply with OSHA standards.



Noise Exposure

- Wear appropriate hearing protection in noisy work environments.
 - Examples: chainsaws, heavy equipment and blowers
- A worksite is considered noisy if you have to shout to be heard within three feet.
- The OSHA PEL for noise is 90dB.



Ear plugs



Ear muffs

Traumatic Stress

- A traumatic event is a shocking and emotionally overwhelming situation in which an individual perceives actual or threatened death or serious injury.
- Workers responding to a wildfire may experience traumatic stress.
- Reactions to traumatic events will vary, ranging from relatively mild to severe.
- It is common for people to experience anxiety, terror, shock, and upset, as well as emotional numbness and personal or social disconnection.¹



Pay attention to co-workers and how they are being affected by traumatic stress

¹ International Society For Traumatic Stress Studies

Traumatic Stress (continued)

Symptoms and negative effects of Traumatic Stress include:

- Physical illness (headaches, fatigue)
- Unable to function normally on the job
- Depression
- Anxiety
- Making efforts to avoid reminders of a traumatic event
- Marital and family conflict
- Hostility and aggression
- Death through suicide as a reaction to overwhelming stress



How to Cope With Traumatic Stress

Some useful techniques to reduce stress when participating in a response are:

- Take a break from the news.
- Pace yourself and take frequent rest breaks.
- Watch out for each other.
- Be conscious of those around you.
Responders who are exhausted, feeling stressed, or even temporarily distracted may place themselves and others at risk.
- Maintain as normal a schedule as possible.
- Drink plenty of fluids such as water and juices.



Individuals with prolonged traumatic stress (anxiety, depression, etc.) who disrupt their daily functioning should consult with a trained and experienced mental health professional.

Coping With Traumatic Stress (cont.)

- Try to eat a variety of foods and increase your intake of complex carbohydrates (breads, muffins made with whole grains).
- Whenever possible, take breaks away from the work area. Eat and drink in the cleanest area possible.
- Recognize and accept what you cannot change - the chain of command, organizational structure, waiting, equipment failures, etc.
- Talk to people when YOU feel like it. You decide when you want to discuss your experience. Talking about an event may be reliving it. Choose your own comfort level.
- If your employer provides you with formal mental health support, use it!
- Give yourself permission to feel rotten: you are in a difficult situation.
- Recurring thoughts, dreams, or flashbacks are normal - do not try to fight them. They will decrease over time.
- Communicate with your loved ones at home as frequently as possible.

Preparing Your Family for a Wildfire

Create an emergency response preparedness kit containing:

- Water
- Non-perishable food (at least three days worth)
- First aid supplies
- Medications
- Battery powered radio
- Flashlight
- Tools
- Duct tape
- Cash/traveler's checks
- Clothing
- Bedding
- Toiletry items
- Special needs items
- Important documents (i.e., birth certificate, passport, etc.)

Summary

- Proper training is a key component of a safe response.
- The dusts and other chemicals left after a wildfire can be hazardous to human health.
- The hazards and issues covered in this training tool are dynamic and require vigilance and flexibility.
- The key to a safe response is attention to the safety issues of your work environment.
- In addition to the similar physical hazards of a construction or demolition site, there is the added factor of a fire reigniting, toxic dusts and heat stress.

Information Sources

This training tool is based on recommendations from:

- National Institute of Environmental Health Sciences (NIEHS)
- National Institute for Occupational Safety and Health (NIOSH)
- Occupational Safety and Health Administration (OSHA)
- Center for Disease Control and Prevention (CDC)
- Environmental Protection Agency (EPA)
- USDA, Forest Service
- U.S. Fire Administration, FEMA

Factsheets from these agencies and other wildfire resources are available on the NIEHS National Clearinghouse for Worker Safety and Health Training website, <http://tools.niehs.nih.gov/wetp/>.

Why This Training Tool Was Created

This training tool was originally created by the NIEHS National Clearinghouse for Worker Safety and Health Training under contract no. 273-05-C-0017 from the National Institute of Environmental Health Sciences Worker Training Program (WTP). WTP has trained more than four million emergency responders and hazardous waste workers since 1987 to do their jobs safely. WTP is part of the Department of Health and Human Services, which is a cooperating agency under the Worker Safety and Health Support Annex of the National Response Plan. As part of the coordinated effort, WTP created this training tool for those who may be involved in a wildfire cleanup response.