

Hazardous Materials Response

A Guide to Aid Local Health Directors and Staff in
Planning For and Responding to Hazardous Materials
Releases

2018



The Connecticut Department of Public Health
Environmental and Occupational Health
Assessment Program



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I. Introduction

This guide is for state and local health department staff who must make difficult decisions to protect public health and property during emergencies involving hazardous material releases. Although Connecticut is a small state without the heavy industry of many larger states, the Connecticut Department of Energy and Environmental Protection (DEEP) responds to more than 2,000 incidents in a typical year. Approximately 60% of these incidents are petroleum products like gasoline and fuel oil, and 20% are non-petroleum chemicals, many of which are highly toxic. Of the 48 toxic chemicals frequently released in Connecticut, 13 have human toxicities that range from moderate to extreme.

Emergencies involving hazardous materials (hazmat) can be particularly challenging for public health staff. Chemical releases may not only be overt, like an overturned truck spilling fuel oil onto a highway, but also covert, such as a leaking underground storage tank releasing gasoline over a long period of time into groundwater. Covert releases in particular make it difficult to determine the exact start of a public health emergency since the event may have been continuing for a significant amount of time before it is discovered. The exact number of exposed individuals in such an incident may also be unknown even long after it is discovered. Chemical emergencies can continue for long periods of time as well, far longer than the simple containment and removal of the initial release. Property can become contaminated resulting in long-term exposure potential with the need for extended remediation efforts. Food and groundwater can become contaminated causing disruption of people's lives and potential harm to individuals far from the initial release site. Health departments need to provide vital input not only on immediate response efforts to these problems but also provide advice on the longer-term implications of the spill and cleanup.

The concept of a guidance document on the public health response to emergencies is not new. The Centers for Disease Control and Prevention (CDC) released the *Public Health Emergency Response Guide for State, Local and Tribal Health Directors* (PHERG) in 2005 (updated in 2011) as a reference tool for health professionals who are responsible for initiating the public health response within the first 24 hours following an emergency or disaster. It provides valuable recommendations on the functions and tasks that should be undertaken following an emergency event with an emphasis on integrating health department activities into the overall response effort. It also contains guidance that is applicable to specific types of incidents, such as floods, earthquakes, and acts of terrorism. The guide divides response efforts into multiple response time frames (immediate, intermediate and extended) and provides templates for some of the documentation that health departments may need. In addition to the CDC guide, a broader federal report was released in 2007 by the U.S. Department of Health and Human Services (DHHS) called *Public Health Emergency Response, A Guide for Leaders and Responders*. Rather than being focused on the specific actions of a health director during an emergency, the DHHS guide details federal resources that are available for different emergency events. The information provided is more of a broad overview with specific links to other documents or websites that have greater detail and places an emphasis on

terrorism-related events. The document primarily discusses intentional events such as the release of a biological or chemical agent, although references to natural disasters are also made and most of the information would be applicable to any emergency.

This guide is designed to complement existing public health response documents by providing guidance specific to chemical accidents and emergencies. The Department of Public Health's (DPH) Disaster Field Manual for Public Health Practitioners is one such document, which focuses more closely on directly responding to emergency events. This document is more general in its recommendations with advice on *planning*, *response* and *recovery* activities that public health staff may be called upon to do in the event of an emergency resulting from an accidental or intentional release of a hazardous material. It provides a list of activities that should help to make your response efforts more efficient, effective and better mesh with efforts of other responding agencies. It is important to remember though, that this guide is not a substitute for emergency preparedness activities and is not intended to replace existing emergency operations plans, procedures, or guidelines within any jurisdiction's health department.

Additional Resources

- CDC Public Health Emergency Response Guide for State, Local and Tribal Health Directors
(<https://emergency.cdc.gov/planning/responseguide.asp>)
- DHHS Public Health Emergency Response, A Guide for Leaders and Responders
(<https://www.hsdl.org/?view&did=481394>)
- The National Response Framework (FEMA)
(<https://www.fema.gov/media-library/assets/documents/32230>)
- The National Incident Management System (FEMA)
(<https://www.fema.gov/media-library/assets/documents/148019>)
- The Incident Command System (FEMA)
(<https://training.fema.gov/emiweb/is/icsresource/index.htm>)
- Emergency Support Function #10 – Oil and Hazardous Materials Response Annex (FEMA)
(<http://www.fema.gov/pdf/emergency/nrf/nrf-esf-10.pdf>)

II. Preparation and Planning

Critical Activities at a Glance...

1. Develop and maintain the ability to respond to a chemical emergency
2. Identify and get to know the people that you would be likely to work with during a chemical emergency; have a contact list ready to go in case of an emergency
3. Participate in your Local Emergency Planning Committee
4. Identify the facilities that use and store hazardous materials in your community and neighboring communities
5. Get a copy of the Emergency Action Plan and Fire Prevention Plan for any facility in your jurisdiction that has significant quantities of hazardous materials
6. Get training in basic toxicology principles and at least awareness level hazmat emergency response procedures
7. Collect fact sheets, Safety Data Sheets and other critical information on chemicals that are found in your area
8. Identify electronic resources that have information you may need during your response efforts
9. Develop a list of vulnerable populations in your community such as nursing homes, daycares, schools, hospitals, etc. and mark them on a map of the area

II. Preparation and Planning

Chemical releases occur every day in Connecticut. Although most are minor, the potential always exists for an event that would severely strain the public health system. In order for you to effectively respond to a chemical emergency you must engage in preparedness activities prior to the event. Public health preparedness means putting in place programs to respond quickly and effectively to threats endangering the health of the public. The following lists some of the activities health departments should perform to prepare for an emergency involving hazardous materials. Over time you will likely identify other preparedness activities you need to perform that are more specific to your community and needs.

1. Develop and maintain the ability to respond to an emergency

In order to respond to an emergency, local health departments must have basic systems and capabilities in place. Public health capacity is created by either having a particular capability in-house or through agreements established with other state and local partners.

- Core public health capabilities include:
 - Communication systems that allow local health department staff to provide accurate and timely information to the public and responding organizations;
 - Epidemiology/surveillance activities to identify changes and patterns in community health allowing detection of covert releases;
 - Access to and expertise in public health information systems such as Health Alert Network (HAN), CDC's EPI-X System and the Environmental Public Health Tracking System (EPHT); and,
 - A competent and well-trained public health workforce with at least a basic understanding of hazardous materials.

2. Identify and get to know the people that you would be likely to work with during a chemical emergency

Develop good working relationships with local and regional emergency responders, establishing mutual aid agreements where possible. Your contact list should include people from:

- Local fire department
- Regional HAZMAT response team
- Facilities that use and store hazardous chemicals
- Schools
- Nursing homes
- Hospitals

- State agencies: Department of Public Health (DPH), DEEP, and the Department of Emergency Services and Public Protection (DESPP)

Chemical emergencies will have many technical aspects, from potential health risks from exposure to long-term cleanup efforts. Although you probably have a list of contacts in the all-hazards emergency response plan for your program, you should develop a specific list of hazmat subject matter experts (SMEs) in a contacts database that will be readily available when you need it. This list should include SMEs in the following areas:

- Environmental and clinical toxicology
- Industrial hygiene
- Laboratory chemical analysis
- Debris management
- Asbestos-related issues
- Environmental sampling and cleanup

Appendix B provides a list of state and federal contacts that will be useful during a hazardous materials incident. This list is not comprehensive and you should include local and regional contacts.

3. Participate in your Local Emergency Planning Committee

The purpose of a local emergency planning committee (LEPC) is to form a partnership between local government and industry to enhance hazardous materials emergency preparedness and response. Membership comes from the local area and the federal Emergency Planning Community Right to Know Act (EPCRA) indicates it is to be made up of (at a minimum):

- Elected officials
- Police, fire, civil defense, and public health professionals
- Environment, transportation, and hospital officials
- Facility representatives
- Representatives from community groups and the media

Connecticut LEPCs are required to perform a variety of duties including:

- Require local facilities to provide information on hazardous materials used and stored there as required by EPCRA
- Conduct a hazard analysis of hazmat used and stored at facilities in the LEPCs jurisdiction, identifying extremely hazardous substances, impacts from potential releases, and hazmat transportation routes through the community
- Develop a community emergency response plan that details community hazards and procedures that will be followed if an emergency occurs
- Develop evacuation plans, including provisions for a precautionary evacuation and alternative traffic routes
- Develop training programs for local responders and medical personnel

Local health directors should participate in LEPCs and obtain the local emergency plan for use during exercises or a real event.

You can find out more information on LEPCs at the Connecticut State Emergency Response Commission (SERC) website (<http://www.ct.gov/serc/>) and USEPA's EPCRA website (<https://www.epa.gov/epcra>).

4. Identify the facilities that use and store hazardous materials in your community and neighboring communities

- Contact your Local Emergency Planning Committee (LEPC) and obtain any lists of facilities and hazardous materials inventories as well as identified routes for hazmat shipping through your community.
- If there is no active LEPC in your area or a hazards analysis has not been conducted, an alternative approach would be to obtain the Emergency Planning Community Right to Know Act (EPCRA) Tier 2 database maintained by DEEP.
- The Tier 2 database can be obtained either by calling DEEP's Emergency Response and Spill Prevention Division (ERSPD) or making the request via email (dep.ctepcra@ct.gov). Data are submitted to DEEP on a yearly basis with a due date of March 1st, although updates and corrections are made by many facilities throughout the year.
- EPCRA requires each facility that uses or stores hazardous substances above a substance-specific threshold to submit hazardous chemical inventory forms and Safety Data Sheets (SDSs, formerly MSDSs) to the LEPC, the State Emergency Response Commission (SERC) and the local fire department.
- The Tier 2 database is viewed in a free software program developed by United States Environmental Protection Agency (USEPA) and the National Oceanic and Atmospheric Administration (NOAA) called the *Computer-Aided Management of Emergency Operations* (CAMEO). CAMEO is a suite of applications designed to assist communities to plan for and respond to chemical emergencies. The CAMEO suite includes a database, Geographical Information System (GIS) viewer and simple dispersion modeling program. The CAMEO database program is easy to use and can quickly identify all the facilities that have filed a Tier 2 report in your community. USEPA has a downloadable guide that provides an easy-to-follow tutorial on using CAMEO and the website has information on classroom courses to receive introductory and advanced training in its use. Training is also occasionally provided in Connecticut and around the country. Check the CAMEO website (<https://www.epa.gov/cameo>) for details.

5. Get a copy of the Emergency Action Plan and Fire Prevention Plan for any facility in your jurisdiction that has significant quantities of hazardous materials

OSHA requires that employers with more than 10 employees have written Emergency Action Plans and Fire Prevention Plans. Local Health Departments should obtain copies of these plans for large facilities with significant quantities of hazardous materials. Periodically it would be wise to take some time to verify that the plans for the facilities with the most hazardous substances keep their plans updated.

6. Get training in basic toxicology principles and at least awareness level hazmat emergency response procedures

You don't have to be a toxicologist to respond to chemical emergencies but it is important that you have a basic understanding of the toxicological principles and emergency response procedures for a hazardous materials incident. You should get at least awareness level hazardous materials training, preferably seeking advanced training depending on your program responsibilities. TrainConnecticut (<http://ct.train.org>) and the Federal Emergency Management Agency's (FEMA) National Training and Education Division website (<http://www.firstrespondertraining.gov>) are good places to search for online or classroom courses. Local health directors should also develop policies and procedures and train staff to protect their health and safety when they are responding to chemical incidents. Assistance with developing these policies can be obtained from the DPH Occupational Health Unit and/or the Connecticut Occupational Safety and Health Administration (CONN-OSHA) Consultation Program.

7. Collect fact sheets, SDSs and other critical information on chemicals that are found in your area

Your LEPC should have obtained lists of substances used and stored in your community by facilities as well as SDSs for these chemicals. If your LEPC is not active, you can easily obtain SDSs and basic toxicology information from the internet. These should be kept on hand pending an emergency.

- There are many free SDS websites available such as the SDS Provider (<http://www.sdsprovider.com/>)
- Compile important toxicology and cleanup information prior to a hazmat release for the most common/largest quantity hazardous materials listed in your community.
- Basic toxicology information can be gathered from a variety of sites including Toxnet (<http://toxnet.nlm.nih.gov/>) and ATSDR's ToxFAQs/ToxProfiles (<https://www.atsdr.cdc.gov/substances/index.asp>)

Contact the Environmental and Occupational Health Assessment Program (EOHA) at DPH for further guidance assessing the health effects of chemicals and any questions you might have on SDSs.

8. Identify electronic resources that you may need in your response efforts

Fortunately, finding information online about the health effects of hazardous material releases for all but the most obscure substances is relatively easy. The difficulty now is sifting through the blizzard of websites to find the ones with the most and best information. The following information sources will give you much of what you need. Always remember that what you read online may be factually incorrect or outdated. It's best to stay with information from more reliable sources, such as government agencies, whenever possible.

WISER – The Wireless Information System for Emergency Responders (<http://wiser.nlm.nih.gov/>)

WISER, a software program developed and maintained by the National Library of Medicine (NLM) is one of the best sources of information for responding to hazardous materials incidents. It is designed to provide critical chemical, biological and radiological information for rapid decision-making. A broad array of information is included such as basic chemical information, medical treatment recommendations, hazardous material handling and environmental effects data. The program can be installed on a variety of platforms including Windows-based PCs and mobile phones with Google's Android and Apple's iOS. For other platforms, an online version can be accessed via the WISER website. Some of its key characteristics:

- Provides information on over 400 substances including chemical, biological and radiological materials
- Provides occupational and acute emergency response health guidelines (Threshold Limit Values (TLVs), Permissible Exposure Limits (PELs), Acute Exposure Guideline Levels (AEGLs), Immediately Dangerous to Life and Health (IDLH), etc.)
- Links directly to other National Library of Medicine websites such as the Hazardous Substances Data Bank (part of the TOXNET site) to provide additional information if needed
- If internet access is available and an address is provided, WISER will show a map of the area with protective action distance marked off (initial isolation and evacuation area)
- Includes a protocol for helping you to identify an unknown substance based on physical properties, patient symptoms, National Fire Prevention Association (NFPA) 704 hazard values, substance categories, and transport type

- Includes a built-in copy of Department of Transportation's (DOT) Emergency Response Guidebook (ERG) 2016 and the Weapons of Mass Destruction (WMD) Response Guidebook

Although public health staff are not first responders, WISER is one-stop-shopping for hazardous materials information.

CAMEO Chemicals

[\(https://cameochemicals.noaa.gov/\)](https://cameochemicals.noaa.gov/)

You may encounter situations where chemicals have been mixed (or may become mixed); potentially producing a hazardous situation where, for example, a toxic gas could be released or the resulting mixture could become unstable and potentially explode. CAMEO Chemicals a website and tool from the National Oceanic and Atmospheric Administration (NOAA), provides you the opportunity to both obtain information about chemicals as well as to virtually mix different substances and find out what dangers might arise. The reactivity database includes thousands of chemicals and has an easy to use interface. Caution should be exercised when using this software since it is predicting the results based on chemical properties and mathematical algorithms.

The Emergency Response Guidebook 2016

<https://www.phmsa.dot.gov/hazmat/erg/emergency-response-guidebook-erg>

The Emergency Response Guide (ERG) 2016 was developed jointly by the US Department of Transportation, Transport Canada, and the Secretariat of Communications and Transportation of Mexico for use by firefighters, police, and other emergency services personnel who may be the first to arrive at the scene of a transportation incident involving a hazardous material. It is not a guide that provides detailed information about hazardous substances like WISER, but is instead focused on identifying the specific or generic classification of the material(s) involved in the incident and providing information to allow first responders to protect themselves and the general public during an incident. The ERG2016 is a part of WISER and can be opened by clicking on the 'Explore Tools' button on the task bar and then clicking on 'Emergency Response Guidebook 2016.' The ERG is available for download free of charge and is also available for purchase as a book from online booksellers and other sources. The ERG is updated every three to four years.

The Household Products Database

[\(http://hpd.nlm.nih.gov/\)](http://hpd.nlm.nih.gov/)

One limitation of WISER and online databases like the Hazardous Substances Data Bank is that they provide information on specific substances while many releases involve commercial products that are a formulation made up of different hazardous and non-hazardous substances. The hazardous products database was developed to address this by linking over 10,000 consumer brands to the health effects listed in

SDSs provided by manufacturers. The site allows you to research products based on product name, product type, manufacturer, ingredient, or health effects. The database provides a variety of useful information including:

- Chemical ingredients and their percentage in specific brands
- Manufacturer and contact information
- Acute and chronic effects of chemical ingredients
- Links to other online information that is available

Information in the Household Products Database is from a variety of publicly available sources including brand-specific labels and SDSs.

The Hazardous Substances Data Bank (HSDB)

(<https://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>)

Part of the National Library of Medicine's Toxicology Data Network (TOXNET), HSDB is a toxicology database that provides information on potentially hazardous chemicals. It provides information on human exposure, industrial hygiene, emergency handling procedures, environmental fate, regulatory requirements, nanomaterials, and related areas. TOXNET also has many other databases of information useful to individuals responding to a chemical incident.

Radiation Emergency Medical Management (REMM)

(<http://www.remm.nlm.gov/>)

This website provides information on the handling and treatment of radiological casualties as well as information about radioactive materials. Although designed for physicians, this site provides useful information for any person with a technical background trying to handle a radiation emergency.

9. Develop a list of vulnerable populations in your community such as nursing homes, daycares, schools, hospitals, etc. and mark them on a map of the area

During an emergency, you will likely need to know the location of vulnerable populations around the incident site. Experience has shown that if you have to rely on memory alone to identify daycares, nursing homes, medical clinics and other potentially vulnerable groups of people, some will be forgotten. Identifying potentially vulnerable groups beforehand and having this information easily accessible will speed your response. Marking a map of your community with the location of vulnerable groups as well as facility contact information will speed your response capabilities. If you have the software and technical expertise, creating a GIS map of your community and vulnerable populations would be ideal. Google Maps or Bing Maps are also good resources for identifying the locations of critical infrastructure and vulnerable populations.

10. Monitor a variety of information outlets for hazmat release notifications

DEEP is required to alert local health departments of spill events in the community within 24 hours of notification of the incident. However, DEEP is not always notified of all releases that occur in the state so you will have to monitor a variety of information sources. Other information sources include:

- Mass media (Internet, television, newspapers, and radio)
- Businesses in the community
- The Connecticut Poison Control Center
- DPH
- Residents

Additional Resources

- ATSDR's HazMat Emergency Preparedness Training and Tools for Responders
(<http://www.atsdr.cdc.gov/hazmat-emergency-preparedness.html>)
- CAMEO Software Suite
(<https://www.epa.gov/cameo/cameo-software>)
- CDC Preparation and Planning Site
(<https://emergency.cdc.gov/planning/index.asp>)
- CONN-OSHA Consultation Services
(<https://www.ctdol.state.ct.us/osha/consulti.htm>)
- DPH's Train Connecticut
(<https://ct.train.org/>)
- FEMA Preparedness Links
(<https://www.fema.gov/national-preparedness-resource-library>)
- CT State Emergency Response Commission
(<http://www.ct.gov/serc>)
- OSHA Fire Prevention Plan Regulations
(https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDA RDS&p_id=12887)

III. The Public Health Response

Critical Activities at a Glance...

1. Evaluate the circumstances of the release and decide whether your department is needed in the response
2. Contact key health personnel and coordinate information through the Incident Command System (if established)
3. Notify key health and medical organizations of the situation (if warranted)
4. Identify health-related problems that the release may create and develop an action plan for your response
5. Provide input on key response decisions
6. Assign and deploy resources to address health concerns
7. Respond to requests for assistance and information
8. Communicate risks to responders and the public and assure workers are properly protected
9. Identify special populations in your community and make certain their needs are incorporated into response plans
10. Help coordinate collection of samples and evaluate data
11. Ensure that food and drinking water have not been impacted by the release

III. The Public Health Response

Nearly all chemical releases have the potential to have some kind of impact on public health. It may be minor, impacting only a single individual at the place where the release occurred, or major and widespread, affecting hundreds or thousands of people. Although public health professionals are not typically first responders, public health agencies can play an important role in response and recovery from an event. Whether their role is to quietly collect surveillance data, establish exposure guidelines, answer health questions from the public and first responders, or take an active role in determining what chemical agent caused a mass casualty incident, public health agencies are an important component in the overall emergency response picture.

This section provides guidance on response activities during a significant chemical emergency. It should be used as a reference alongside your existing emergency operations plan and procedures. The steps you follow and the order in which you follow them in will depend on the circumstances of the release. Your response should always be performed in conjunction with other federal, state and local efforts.

1. Evaluate the circumstances of the release and decide whether your department is needed in the response

Not all incidents will need public health involvement. Connecticut has many small chemical releases every day, especially petroleum products and antifreeze released during automobile accidents and home heating oil tank problems. Many of these incidents have minimal health risks and with limited staff, time and money, health departments need to respond to only those incidents where the public is at risk. You will have to base your decision on whether to respond on a variety of factors including:

- The toxicity and physicochemical properties of the released substance
- Size of the release
- Potential for public exposure
- Expected symptoms of exposure
- Potential for food and water impacts
- Nearby populations (sensitive individuals)
- Level of public concern (questions, phone calls)
- Needs of the first responders

2. Contact key health personnel and coordinate information through the Incident Command System (if established)

Following a significant release, you will have to coordinate the public health response both within your department and between other responding organizations. You will need to identify and contact staff with critical response capabilities based on the

nature of the incident. Moderate or large chemical emergencies will typically require inclusion of individuals with varying expertise such as:

- Environmental health and safety
- Occupational health
- Laboratory and field data collection and analysis
- Emergency response
- Risk communication

Local health departments may have some or all of this expertise in-house or may have to contact partners for assistance. Other technical and logistical staff will likely need to be activated as the incident progresses. If the Incident Command System (ICS) has been activated for this event, you will need to determine where the command post is located, who the Incident Commander (IC) is and ensure that your department has been integrated into the ICS structure. You should also make sure that you are aware of your roles and responsibilities under the ICS. For incidents where Unified Command or a Joint Information Center (JIC) have been established, DEEP prefers that a local health representative be stationed at the JIC or Emergency Operations Center (EOC).

3. Notify key health and medical organizations of the situation

Medical providers and hospitals will likely not be aware of an incident taking place in the community. For larger incidents that threaten your community, you will need to establish communications with agencies, facilities and organizations that have a response role in order to warn them of the incident and assess their capacity to assist. Special attention should be paid to their ability to decontaminate victims that may have been exposed to a chemical agent. It would be wise to contact the Connecticut Poison Control Center (CPCC) since they are often contacted by hospitals and emergency responders during an incident where people have been exposed to a toxicant. You can determine what the CPCC has learned about the release and find out what advice they are giving medical providers and exposed individuals. Make certain any advice you are giving is consistent with advice given by the CPCC.

4. Identify health-related problems that the release may create and develop an action plan for your response

Following the release of a hazardous material, one of the first and most important duties of the individuals responding to the event is to ascertain what people could be exposed to and how the exposure would take place. In order for a hazardous substance to cause harm, a series of events must take place starting with the release (a source of contamination) and ending with an exposed population (often referred to as receptors). The route a hazardous material takes from source to receptor and how individuals could potentially be exposed is called the exposure pathway. Pathways will be different depending on the properties of the substance and the circumstances

of the release. Understanding and considering different exposure pathways during a hazardous material release is very important because the efforts of the various responding organizations is, in effect, an attempt to break the links in the chain of events that leads from the release site to the population receptors. If you can stop the exposure pathway at one or more places then you can stop or reduce the harm resulting from the event. Although public health staff are not typically first responders, they are often key players in evaluating the potential exposure pathways from hazardous materials releases. You will have to evaluate both the *direct* exposure pathways as well as the *indirect* pathways. A direct exposure pathway could occur through such routes as:

- Inhalation, such as breathing hazardous vapors in the air
- Dermal contact, such as swimming in contaminated water
- Directly ingesting the released substance, such as consuming locally grown produce that is contaminated with chemical residues

Indirect exposure pathways will be more difficult to identify and could include:

- Chemical release into soil resulting in groundwater contamination and subsequent exposure through ingestion of groundwater from a drinking water well
- Uptake of the chemical by fish residing in contaminated water resulting in people being exposed when the fish are consumed
- Infiltration of a volatile chemical from contaminated soil into homes resulting in inhalation by occupants

Keep in mind that in any release scenario there may be multiple potential pathways of exposure. Each situation will have to be evaluated and the potential exposure pathways identified. If environmental sampling has taken place, get contamination data from DEEP or USEPA. You may be able to obtain modeling data from them to give you predicted exposure levels from different sources such as air plumes, soil and surface water. Following identification of possible exposure pathways, health departments need to develop a response action plan to minimize or eliminate health risks.

5. Provide input on key response decisions

Depending on the size of the release event and the nature of the chemical, you may have to provide advice to the Incident or Unified Commander on ways to limit public exposure. These decisions include:

- Whether people should shelter in place or evacuate
- Whether water supplies are safe to drink
- Whether locally caught fish or locally grown produce can be eaten safely
- How to clean playground equipment and other objects that may have become contaminated

- When the public should or could return to a previously contaminated area

If ICS has been activated, you will need to coordinate with the Incident Commander and the rest of the ICS structure on public health decisions you have to make. Figure 1 shows diagrammatically the types of questions that need to be asked in order to develop a health protective response plan.

6. Assign and deploy resources to address health concerns

Assign responsibilities to staff based on your action plan. Staff duties will likely vary considerably depending on the nature of the event but will likely include:

- Field inspections
- Environmental/potable water sampling
- Risk communication
- Liaison to other response partners
- Analyzing data
- Working with other subject matter experts

You should keep records of all activities related to the incident.

7. Respond to requests for assistance and information

As the emergency progresses, you will likely receive requests for assistance and information from the media, the public and local first responders as well as state agencies like DPH and DEEP. You will have to allocate resources to respond or delegate to other organizations. One of the most important jobs of health professionals during a crisis is to respond to questions from the public and first responders. You may be able to anticipate some of the questions you will get and prepare responses ahead of time. Some questions you may get include:

- How many people are at risk or have been exposed?
- Have the hospitals treated any victims?
- Are there susceptible individuals within the impacted area?
- What environmental samples should be taken?
- What are the health standards/action levels for the chemical(s)?
- What are the proper procedures for sheltering in place?
- Can I let my dog/cat go outside?
- What health effects will the chemical cause?
- Am I at risk?
- Should I get tested for exposure?
- Is there a medical treatment I should get?
- Is there an antidote?

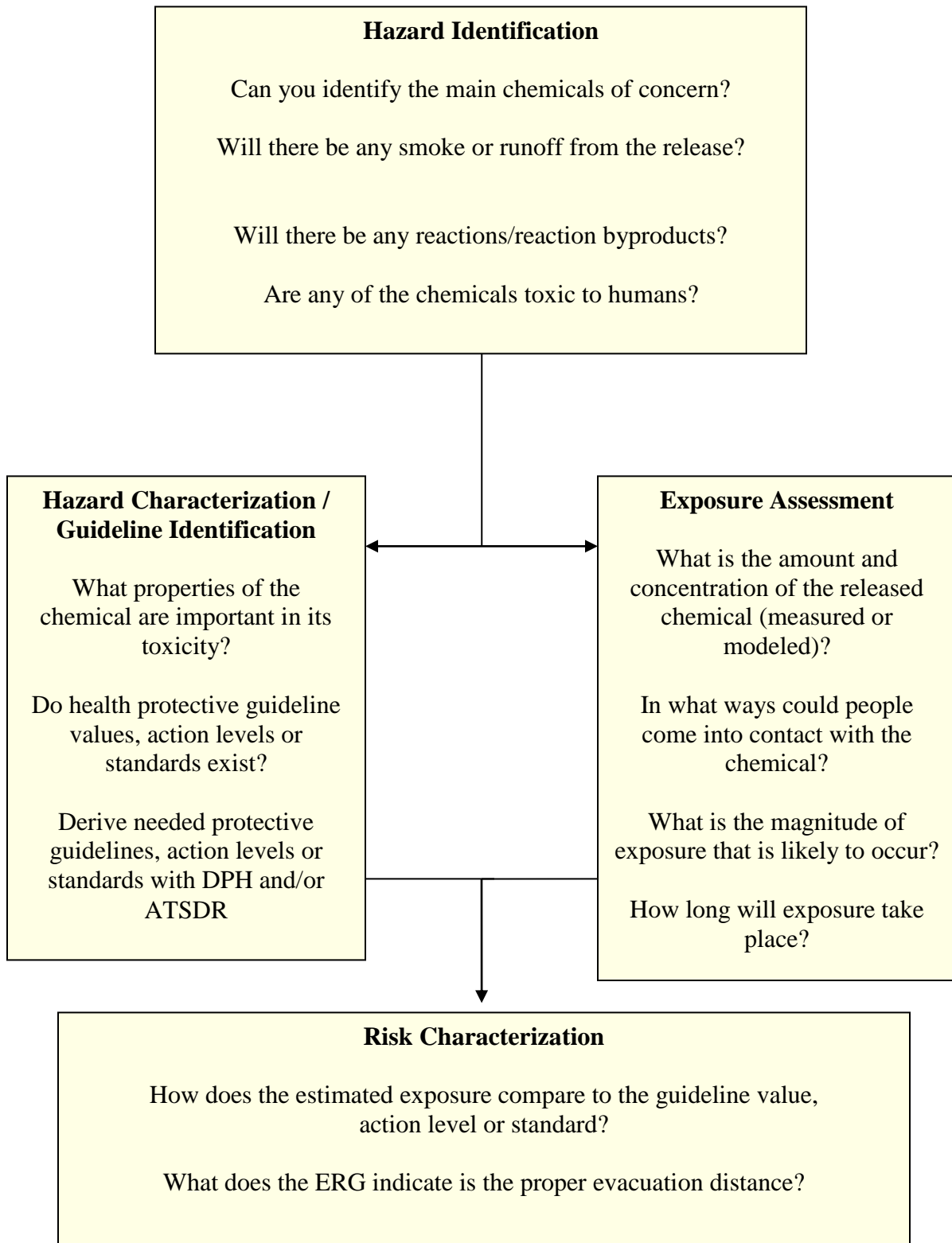


Figure 1. Generic chemical response decision-making tree using the risk assessment paradigm.

8. Communicate risks to responders and the public and assure workers are properly protected

During a chemical emergency, risk communication is essential for health departments to limit fear-driven, ineffective and possibly damaging responses by the public. Local health departments are key risk communicators during a health emergency and may be the main source of risk-related information for the public. Your goal should be to foster trust and confidence in your response efforts and provide the public with the necessary action items to limit their risks of acute or chronic exposure to the chemical. You should develop a risk communication strategy working through the ICS/Unified Command System (UCS) and the JIC (if it has been established). You can find numerous guidance documents on risk communication online. You may find the DHHS document, [*Communicating in a Crisis: Risk Communication Guidelines for Public Officials*](#) very helpful. Resources are also available on the DPH Crisis and Emergency Risk Communication website at <http://www.ct.gov/dph/cwp/view.asp?a=3115&q=422222>. You should designate a single point of contact for risk communication activities. This person may be required to be located at the JIC, if one has been established. Remember that the media can be an important ally in getting your message out to the public.

9. Identify special populations in your community and make certain their needs are incorporated into response plans

A chemical release may result in the need for rapid evacuation of individuals from the affected area or the need to shelter in place. Some individuals within your community may need special assistance or information on handling the emergency. They may include:

- Individuals with disabilities
- Children in schools and daycares
- Residents of long-term care facilities and senior housing
- People in prisons or mental health institutions
- Tourists, migrant workers and other people in your community temporarily
- Non-English-speaking residents

Transportation logistics for individuals with special needs will have to be worked out including the possible need for ambulances to transport them and special accommodations at shelters.

10. Help coordinate collection of samples and evaluate data

Collection and analysis of most chemical samples will likely have to be done through DEEP/EPA or a contractor. If help is needed from local health staff for

environmental sampling of chemical contamination, the EOHA program or DEEP will contact the local health department. Depending on the incident, samples may be taken from private wells, surface water, reservoirs or exposed food items. Sample numbers, locations and handling procedures will be a joint decision made by the local health departments, DPH and DEEP. DPH's EOHA program has equipment for measuring mercury vapor that can be loaned to local health departments if needed (see Appendix B for contact information).

EOHA and ATSDR will likely take the lead on evaluating sampling results although this may depend on the nature of the event and staff availability. Smaller incidents will likely not have significant state or federal government involvement and larger, more severe events may need rapid evaluation and decision-making. In such circumstances local health departments may take the lead on evaluating sample results. You will need to determine whether appropriate health exposure guidelines are available to help ascertain whether a threat to public health exists. Public exposure guidelines are available for many substances. Toxicants that have the potential to be inhaled are likely to be of most immediate concern after a release.

Exposure guidelines that are useful for protection of emergency responders or other members of the public that may receive short-term (acute) exposures to *airborne* toxicants include:

- **Acute Exposure Guideline Levels (AEGLs)** - AEGLs are developed to describe the potential risk to humans resulting from once-in-a-lifetime, or rare, exposure to airborne chemicals. AEGLs represent threshold exposure limits for the general public and are applicable to emergency exposure periods ranging from 10 minutes to 8 hours. AEGLs are considered the best public exposure guidelines because they undergo a rigorous review process and are designed as guidelines for nearly all members of the general public, including sensitive individuals.
- **Emergency Response Planning Guidelines (ERPGs)** – ERPGs are public exposure guidelines below which no adverse health effects are anticipated. Unlike AEGLs, they are guidelines for a one-hour exposure duration only. They also go through a rigorous scientific review process before they are released.
- **Temporary Emergency Exposure Level (TEEL)** - TEELs are temporary levels of concern designed to be used as toxic exposure limits for chemicals for which AEGLs or ERPGs have not yet been defined. They are predicted values based on published data and are not rigorously reviewed like AEGLs or ERPGs. They do not have the scientific defensibility of peer-reviewed guidelines and thus should be used with caution.

AEGLs, ERPGs and TEELs for many substances can be found on the internet (<https://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/protective-action-criteria-chemicals-pacs.html>).

Occupational health guidelines, such as Permissible Exposure Limits (PELs), are also available although they are designed to protect healthy, adult workers that are exposed during a 40-hour workweek. They are not designed to protect the general populace so health professionals should be careful when applying them to spill-related incidents.

Health protective standards and guidelines are also available for other media:

- **Maximum Contaminant Levels for Drinking Water (MCLs)** - National Primary Drinking Water Regulations are legally enforceable health standards that apply to public water systems.
(<http://water.epa.gov/drink/contaminants/index.cfm>)
- **DPH Action Levels for Private Wells** – DPH has developed action levels for a variety of contaminants that can be used to assess the safety of private well water. Contact DPH’s EOHA program for these values (Appendix B).
- **Connecticut's Remediation Standard Regulations (RSRs)** – Provides guidance and standards for determining whether a contaminated site needs remediation. The RSRs contain health-based numeric and narrative standards for the remediation of soil and groundwater. These guidelines are not used for assessing emergency situations but are used to protect against chronic health risks.
(http://www.ct.gov/deep/cwp/view.asp?a=2715&q=325012&deepNav_GID=1626)
- **DPH Action Levels for Fish Consumption** – DPH has action levels for determining whether fish are safe for consumption. These values can be obtained by contacting the EOHA program (Appendix B).
- **FDA Action Levels for Milk and other Food** – The Food and Drug Administration (FDA) has established limits to the amount of poisonous or deleterious chemicals in milk and food. Action levels represent limits at or above which FDA will take legal action to remove products from the market.
(<https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ChemicalContaminantsMetalsNaturalToxinsPesticides/ucm077969.htm>)

11. **Ensure that food and drinking water have not been impacted by the release**

Chemical releases have potential to impact food and drinking water. Solid, liquid and gaseous substances may leave residues on food or contaminate drinking water that may be ingested by the public. Your evaluation of potential exposure routes must include food and water and you should plan to work with state partners such as DPH’s Food Protection Program, the DPH Drinking Water Section, the DPH Private Well Program, EOHA, the DPH Laboratory, the Connecticut Agricultural Experiment Station and DEEP to evaluate potential impacts. In addition to state resources, federal agencies such as ATSDR and USEPA would also likely help to

evaluate health threats from contaminated food and water during and after the emergency.

Additional Resources

- ACToR - EPA's online warehouse of all publicly available chemical toxicity data
(<https://actor.epa.gov/actor/home.xhtml>)
- Organization for Economic Co-operation and Development's eChemPortal
(<http://www.echemportal.org/echemportal/page.action?pageID=0>)
- ATSDR's Medical Management Guidelines
(<https://www.atsdr.cdc.gov/MMG/index.asp>)
- ATSDR's Toxic Substances Portal
(<https://www.atsdr.cdc.gov/substances/index.asp>)
- DPH Crisis and Risk Communication Website
(<http://www.ct.gov/dph/cwp/view.asp?a=3115&q=422222>)
- NIOSH Pocket Guide to Chemical Hazards
(<http://www.cdc.gov/niosh/npg/>)
- Risk Communication Links from CDC
(<https://www.cdc.gov/healthcommunication/risks/index.html>)

IV. Recovering From a Release

Critical Activities at a Glance...

1. Ensure that a risk assessment is conducted to assess the potential for chronic health risks where continued exposures are likely
2. Ensure that sources of long term exposure are removed or controlled
3. Confirm that long-term cleanup efforts are health-protective
4. If needed, initiate a long-term health surveillance system
5. Communicate chronic health risks to the public

IV. Recovering From a Release

Following a moderate or large chemical emergency, after ICS has been deactivated and the first responders have left the scene, you will likely find that there are still health and cleanup-related issues that need to be addressed. Chemical releases can produce soil and sediment contamination that lasts years beyond the event. Chemicals can enter groundwater and become persistent due to a lack of biodegradation from microbes that are present in soil or surface water. Bioaccumulative pollutants can enter the food chain and become a threat to the health of humans and other animals. Following a chemical emergency event, local health departments need to work with DEEP and DPH on any possible long-term recovery activities that need to take place. DEEP's Emergency Response Unit (ERU) will initially remove or minimize any substances that result in direct-exposure health hazards. A follow-up assessment is then made to determine whether long-term remediation is necessary to prevent chronic health risks. Although the ERU will lead initial response activities, another DEEP program may take over and lead remediation efforts depending on the size and nature of the release as well as whether a responsible party has been identified. This section includes a few of the actions you may need to perform to limit or prevent long-term risks to public health.

1. Ensure that a risk assessment is conducted to assess the potential for chronic health risks where continued exposures are likely

If the chemical emergency involves one or more persistent substances, there may be the potential for long-term exposure of residents in your community. You should contact DPH's EOHA program (Appendix B) and work with toxicologists to conduct a health risk assessment. Environmental sampling and the establishment of a health surveillance system may be necessary.

2. Ensure that sources of long term exposure are removed or controlled

You should contact and work with DEEP's ERU and DPH's toxicologists and site assessment staff in DEEP and the EOHA program (Appendix B).

You will probably need to provide input to DEEP and DPH in the development of remediation plans for any contaminated soil and groundwater present. Addressing contamination of public water supplies will be overseen by DPH's Drinking Water Section. Cars, homes, playground equipment, vegetable gardens, etc. may need to be cleaned or evaluated for contamination as well. If an extensive cleanup is required, DEEP may ask USEPA to assist.

3. Confirm that long-term cleanup efforts are health-protective

DEEP, in collaboration with DPH, will take a lead role on determining what samples will be taken and how the cleanup will proceed. Local health departments will likely take the lead on communicating cleanup efforts and risks to local citizens. Although local health departments will not be the lead agency in remediation efforts, they should monitor efforts (oversights and errors can always occur) and communicate results to interested parties. Appendix B provides contact information for DEEP personnel.

4. If needed, initiate a long-term health surveillance system

After a large chemical incident, in some rare instances you may want to establish a surveillance system that involves biomonitoring. A surveillance system allows for the systematic collection, analysis and interpretation of health information related to the event. The main objective of surveillance is to provide information to guide interventions. A health department undertaking the establishment of a surveillance system will want to design and implement the system based on the objectives of the department and the nature of the incident. DPH can assist in establishing and maintaining a surveillance system.

5. Communicate chronic health risks to the public

Although short-term chemical releases will typically produce acute health risks, chemical exposure can cause or contribute to chronic diseases, such as heart disease, kidney disease, sterility, or cancer. Chemical releases that contaminate soil, sediment and/or groundwater have the potential to result in chronic exposure to residents. Hopefully, remediation efforts by DEEP, DPH and the local health departments will limit or prevent chronic exposures, but if some risks remain, they will have to be communicated to residents. DPH's EOHA program and Office of Communications can help with risk communication during an emergency.

Additional Resources

- DEEP Remediation/Site Clean-up Division
(http://www.ct.gov/deep/cwp/view.asp?a=2715&q=324950&deepNav_GID=1626%20)
- DEEP Disaster Debris Management Preparedness
(http://www.ct.gov/deep/cwp/view.asp?a=2718&Q=410492&deepNav_GID=1646%20)
- DHHS Disaster Recovery and Environmental Health
(<http://sis.nlm.nih.gov/enviro/disasterrecovery.html>)
- Oak Ridge National Lab Risk Assessment Information System (RAIS)
(<https://rais.ornl.gov/tutorials/toxvals.html>)
- Public Assistance Debris Management Guide
(<https://www.fema.gov/media-library/assets/documents/25649>)
- Remediation Standard Regulations
(http://www.ct.gov/deep/cwp/view.asp?a=2715&q=325012&deepNav_GID=1626)
- Surveillance for Chemical Emergencies
(<http://emergency.cdc.gov/chemical/surveillance.asp>)
- USEPA Risk Assessment Guidance
(<https://www.epa.gov/risk>)

IV. Appendixes

A. Acronyms

AEGL	Acute Exposure Guideline Level
ATSDR	Agency for Toxic Substances and Disease Registry
CAMEO	Computer-Aided Management of Emergency Operations
CDC	Centers for Disease Control and Prevention
DEEP	Connecticut Department of Energy and Environmental Protection
DESPP	Department of Emergency Services and Public Protection
DPH	Connecticut Department of Public Health
DHHS	U.S. Department of Health and Human Services
DOT	Department of Transportation
EMA	Emergency Management Agency
EMS	Emergency Medical Service
EOC	Emergency Operations Center
EOHA	Environmental and Occupational Health Assessment
EPCRA	Emergency Planning Community Right to Know Act
EPHT	Environmental Public Health Tracking
ERPG	Emergency Response Planning Guidelines
ERG	Emergency Response Guidebook
ERPG	Emergency Response Planning Guidelines
ERU	Emergency Response Unit
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
GIS	Geographical Information System
ICS	Incident Command System
HAZMAT	Hazardous Material
IDLH	Immediately Dangerous to Life or Health
LEPC	Local Emergency Planning Committee
MCL	Maximum Contaminant Level
NIMS	National Incident Management System
NLM	National Library of Medicine
NOAA	National Oceanic and Atmospheric Administration
NFPA	National Fire Protection Association
NRF	National Response Framework
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PHERG	Public Health Emergency Response Guide for State, Local and Tribal Health Directors
REL	Recommended Exposure Limit
RSRs	Remediation Standard Regulations

SARA	Superfund Amendments Reauthorization Act
SDS	Safety Data Sheet
SERC	State Emergency Response Commission
SME	Subject Matter Expert
TEEL	Temporary Emergency Exposure Level
TIC	Toxic Industrial Chemical
TLV	Threshold Limit Value
TWA	Time Weighted Average
UCS	Unified Command System
WISER	Wireless Information System for Emergency Responders
WMD	Weapons of Mass Destruction
USEPA	United States Environmental Protection Agency

B. Important Contacts

CHEMTREC

Contact Number: 800-424-9300, 703-527-3887

Hours of Operation: 24 hours/day

A public service hotline for emergency responders. Provides information on products from a MSDS database and access to product specialists and contact information for manufacturers.

Connecticut Poison Control Center

Contact Number: 800-222-1222

Hours of Operation: 24 hours/day

Provides emergency poison information to members of the public and health care professionals. Information is free and confidential.

ATSDR 24 Hour Emergency Response

Contact Number: (770) 488-7100

Hours of Operation: 24 hours/day

ATSDR Emergency Response Teams are available 24 hours a day, and are comprised of toxicologists, physicians, and other scientists available to assist during an emergency involving hazardous substances in the environment.

Department of Energy and Environmental Protection		
Spill Reporting Hotline (24 hours)	Call to report of hazardous materials releases	860-424-3338 or 866-DEP-SPIL
Emergency Response and Spill Prevention Division	Hazardous material spills response unit	860-424-3338
Remediation Division	Brownfields, RCRA corrective action, remediation issues	860-424-3705
Site Assessment and Support Unit	Leaking underground storage tank issues	424-3376
Air Bureau	Air quality assessment, ambient monitoring, climate and energy, emission inventory, mobile sources	424-3027
Radiation Protection Unit	State liaison with Nuclear Regulatory Commission; Radiation subject matter experts	860-424-3029

DEEP Programs Phone Directory:

https://biznet.ct.gov/AtoZindex/DEEP_AtoZsearch.aspx

Department of Public Health		
Asbestos Program	Asbestos related issues	860-509-7367
Communications	Media and community relations, public education, risk communication	509-7270
Drinking Water Program	Issues related to public drinking water wells	509-7333
Environmental and Occupational Health Assessment Program	Subject matter experts in risk assessment, toxicology, occupational exposures, hazardous waste	509-7740
Food Protection	Foodborne disease outbreaks, food contamination, food establishment sanitation issues	509-7297
Public Health Laboratory	Biological and environmental chemistry services; drinking and surface water testing for inorganic substances	509-6500
Lead Program	Childhood lead exposure	509-7299

DPH Programs Phone Directory:

<http://www.portal.ct.gov/DPH/Communications/Contact-Us/Contact-Us>