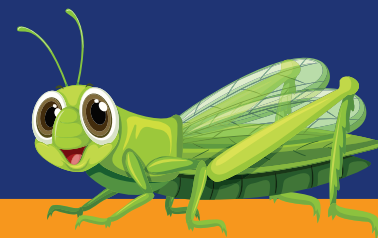


# Chemical Release Investigation Kit & Template (CRIKT)

## A STEP-BY-STEP GUIDE FOR LOCAL HEALTH DEPARTMENTS TO RESPOND TO EMERGENCY CHEMICAL RELEASES



*“ALL RESPONSES START AND END LOCAL”*

Please note: Due to the fast-moving nature of chemical incidents and emergencies, the following epidemiologic investigation steps should occur in the order that makes the most sense for the investigation at hand. Please note health department personnel should only participate in onsite emergency response activities unless they have appropriate knowledge, skills, abilities, training, and equipment to protect themselves and add value to response activities. If appropriate control measures are known and available, they should be initiated before an epidemiologic investigation is launched.

## 1. Be Prepared

Engage in your Local Emergency Planning Committee (LEPC) meetings to build partners in the private sector, public sector, and emergency responders in your jurisdiction. Through the LEPC, health officials can learn about facilities that store or process certain materials above threshold quantities. The most important reason for health departments to participate in LEPCs is planning and integrating the health department's jurisdictions, roles, and capabilities into existing incident command systems across public and private sectors. To find the contact for your Local Emergency Planning Committee: [click here](#).

Incorporate a chemical emergency scenario into your local health department's epidemiology team or LEPC training and preparedness capacity building.

For resources to help your local health department meet CDC's Public Health Emergency Preparedness and Response Capabilities, [click here](#) or contact a member of your [Public Health Preparedness & Response \(PHP&R\) regional team](#).

For CDC's guide for what to do if you are involved in a chemical emergency, [click here](#).

For background on the Incident Command System utilized by state and federal partners, consider completing the following FEMA coursework available [here](#). PHP&R guidance recommends all personnel take ICS-100 and ICS-200 courses, and leadership personnel take IS-700 and IS-800 as well.

- ICS-100: Introduction to the Incident Command System
- ICS-200: ICS for Single Resources and Initial Action Incidents
- IS-700: National Incident Management System, An Introduction
- IS-800: National Response Framework, An Introduction

For information on specific Chemical Agents please view resources below:

1. [NCDHHS Fact Sheets](#)
2. [CDC's A to Z List of Chemical Agents](#)
3. [NIOSH Pocket Guide to Chemical Hazards](#)
4. [US DOT Emergency Response Guidebook for First Responders](#)
5. [ATSDR Toxic Substances Profile](#)

Be familiar with other resources available to you including:

1. The National Pesticide Information Center: 1-800-858-7378 | [npic@ace.orst.edu](mailto:npic@ace.orst.edu)
2. Poison Control: 1-800-222-1222

## STATE SUPPORT

The [Public Health Preparedness & Response](#) and [Occupational and Environmental Epidemiology](#) branches at NCDHHS are available for training, subject matter expertise, and investigation support. **PHPR can be reached at (888) 820-0520 for on-call support. Occupational and Environmental Epidemiology Branch (OEEB) can be reached at (919) 695-2662**

OEEB includes environmental epidemiologists, a public health physician, industrial hygienists, a health educator, an occupational health nurse, and toxicologists. To learn more about OEEB, [click here](#).

PHP&R has four regional PHP&R field offices staffed with planning consultants, training and exercise facilitators, industrial hygienists, pharmacists, and program support specialists to work with county public health officials. For more information on PPHR: [click here](#).

## 2. Look for Signs of a Chemical Release

To assess and identify individuals who are affected, exposed, or potentially exposed to harmful agents during incidents, information sources may include an increase in ED visits or NCDETECT, concerned citizen calls, 911 calls, or contact from other agencies.

The Epi CASE toolkit can help with a rapid assessment of this information. To view the toolkit, [click here](#).

**In the population look for usual increase in the frequency of people experiencing any of the following symptoms:**

- **Trauma:** bone fractures, contusions, lacerations, musculoskeletal pain, ear drum punctures, etc.
- **Respiratory:** breathing problems/difficulties, pneumonitis, cough, wheezing, sore throat, chemical bronchitis
- **Eye irritation:** runny, tearing, redness, or burning eyes
- **Gastrointestinal Symptoms:** nausea, vomiting, abdominal pain, heartburn, cramps, or diarrhea
- **Heat Stress:** exposure to high temperatures accompanied by cramps, nausea, dizziness, stroke, muscle fatigue, exhaustion, dehydration, elevated blood pressure, heart palpitation or weakness
- **Thermal Burn:** exposure to fire, heat radiation, or electricity accompanied by tissue damage, blistering, or redness of the skin, throat, eyes or mouth
- **Chemical Burn:** exposure to chemicals accompanied by symptoms such as tissue damage, blistering, or redness of the skin, throat, eyes or mouth
- **Skin Irritation:** itchiness, redness, skin rash, stress rash, blister, or contact dermatitis
- **Dizziness or central nervous system (CNS) symptoms:** dizziness, fainting, passing out, lightheadedness, ataxia, numbness, tingling, or twitching
- **Headache:** perceived internal pain, ache or soreness originating in any part of the head excluding pain in teeth and ears or superficial irritation of skin and scalp
- **Cardiac Symptoms:** cardiac arrest, heart attack, palpitation, chest pain/angina, and heart-related tightness of chest

**Other signs to look out for in the population:**

- **Pattern of victims:** outdoors, the people experiencing symptoms are likely to be distributed downwind from the release. Indoors, air ventilation systems will distribute chemicals, resulting in injuries throughout a facility
- **Illness in a localized area:** more people than normal will be ill in specific areas, either indoors or outdoors, depending on where the agent was released



## Ecosystem Impacts in the environment, look for:



**Water:** Be aware for sheens or discoloration on water from chemical spills including gasoline. Look for dead or dying birds, fish or other aquatic life, and lack of normal insect activity. Check for fish kills, but do not touch dead fish or other aquatic life.



**Land:** Be aware of dust or powder with unnatural or differing colorations from surroundings. Be aware of dead, discolored, or withered plants that appear suddenly. Do not touch these areas.



**Air/Odors:** Be aware of unexplained odors. Smells may be fruity, flowery, sharp, or pungent. Odor will be completely out of character with its surroundings. Be aware of clouds or fog-like conditions that do not align with surrounding weather conditions. Avoid these areas.

For information on categories of chemicals grouped by possible health and ecosystem impacts, [click here](#).

## 3. Evaluate the Release

### NOTIFICATION TO DHHS AND PROCEDURE

PHP&R and OEEB provide 24-hour, seven day a week availability for subject matter expertise to the preparedness system in North Carolina. Calls are intended for use during significant and complex environmental or occupational emergency incidents.

• PHP&R can be reached at (888) 820-0520

• OEEB can be reached at (919) 695-2662

### IS IT A RELEASE OR THREAT OF RELEASE?

**During an initial notification call, the following information will be collected if known:**

- Summary of the incident
- Name, Title, and Agency of Caller
- Contact Phone Number and Email
- Date and Time of Incident
- Number of fatalities
- Number of injuries
- Potential Number Exposed
- Condition of Exposed (symptoms, hospitalized, etc.)
- Action Items

**Public Health Preparedness and Response (PHP&R) will set up a call with partners to notify of the event and coordinate any needed response. Parties on the conference call may include as needed:**

- Occupational and Environmental Epidemiology Branch (OEEB)
- Communicable Disease Branch
- Epidemiology Section Chief
- Epidemiology Deputy Section Chief
- Local Health Department
- County Emergency Operations
- NC Emergency Operations Center
- Office of Emergency Medical Services (OEMS)
- Public Health Public Information Officer
- State Laboratory of Public Health
- NC Immunization Branch On-Call Nurse
- OEMS Hospital Preparedness Program (HPP)
- Private sector partners including facility owners or managers
- Department of Environmental Quality (DEQ) Emergency Response Coordinator
- FBI Weapons of Mass Destruction Coordinator
- Local or State Law Enforcement



## During the conference call, the following questions and topics might be discussed for information gathering and identifying action items:

### Chemical Release/Sewage (Liquid)

- What was released?
  - If a pesticide is involved, was NC Department of Agriculture notified?
- How much was released?
- Were there any exposures to the chemical?
- Were there any injuries or symptoms reported and was anyone taken to the hospital?
- Were any evacuations carried out?
- What actions are being taken/have been taken to mitigate or secure the release?
- How long is the chemical expected to take to disperse in the air/water?
- Where is the release located? Did it release into a body of water?
  - Is the body of water a drinking water source?
  - Is the area a recreational area?
    - What type of recreation?
    - Any observable fish kills?
  - Are there any residences nearby?
    - Are any wells nearby?
- Have there been any environmental measures taken? Environmental measures may include: putting out fires, stopping liquids from flowing off site, and for indoor events, ventilation.
- Have there been any environmental measurements (sampling, testing, or monitoring)?
- Is environmental sampling, testing, or monitoring planned?
  - In either case, using best available information describe who, what, where, when, how, how many, how long, why samples were collected, and results if known.
  - If air monitoring (continuous real-time sampling) was conducted, describe who, what, where, when, how, the number, duration, and why samples were collected along with the types of instruments that were used, and the results.
  - If samples were collected that need laboratory analysis (testing), indicate the laboratory, type of tests, and when results will be available.
- If sampling or testing has been or will be conducted, what are the pre-determined criteria to interpret the results. For example, in air there are:
  - Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (regulatory, for workplaces and based on an 8-hour time-weighted average exposure or 15-minute, short-term exposure limit),
  - National Institute for Occupational Safety & Health (NIOSH) Recommended Exposure Limits (nonregulatory for workplaces, based on 8-hour time-weighted average or 15-minute, short-term exposure limit)
  - For OSHA PEL (permissible exposure limits) and NIOSH REL (recommended exposure limits) see [NIOSH Pocket Guide to Chemical Hazards](#)
  - [Acute Exposure Guidelines](#) (AEGL) to protect the public
  - Agency for Toxic Substances and Disease Registry (ATSDR) [Minimum Risk Levels for Acute, Intermediate, and Chronic exposures](#) for the public
  - When no authoritative guidance is available, pre-determined criteria to interpret results can still be developed and documented
- Is there a plan to release results of sampling or testing to the community?



## Chemical Release (Gas)

- All of the above questions
- Is the release indoors or outdoors? (If indoors, were there carbon monoxide or smoke alarms triggered by the release?)
- Which direction is the wind blowing?
  - Are there any weather changes expected?
  - Is the gas heavier or lighter than air?
- Is the gas flammable?
- Proximity to residential areas?

## Suspicious Substance?

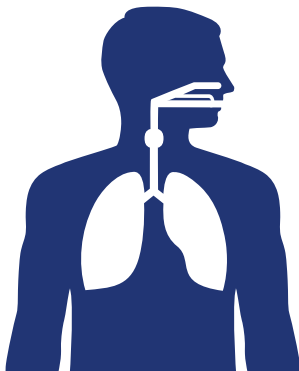
- Was the LHD notified of the incident?
- Where was the substance found?
  - Were there any exposures?
  - Did the substance contact additional surfaces?
    - Did a person who came into contact with the substance touch additional surfaces?
- Were there any observable symptoms associated with exposure to the substance?
- Did the substance leave a residue?
- Were there any exposures to the first responders?

# 4. Establish the Existence of a Cluster of Illness or Exposure

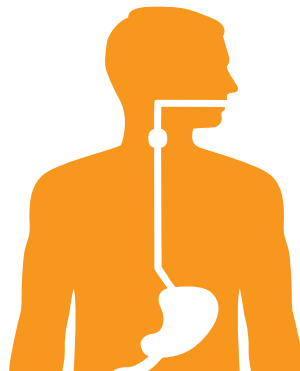
## EXPOSURE INFORMATION

- Were there any exposures to the chemical?
- Were there any injuries or symptoms reported and was anyone taken to the hospital?
- Interview responders and any exposed individuals

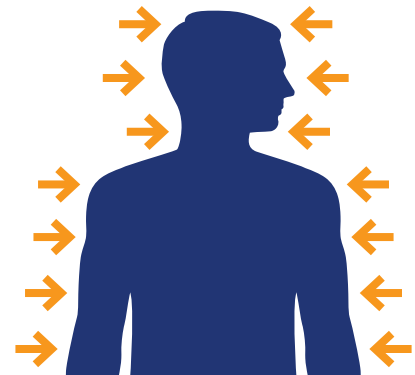
## IDENTIFY ROUTE OF HUMAN CHEMICAL EXPOSURE



Inhalation



Ingestion



Dermal (Skin)



## CONSTRUCT A WORKING CASE DEFINITION

If exposure or illness is observed, then a working case definition should be constructed containing **person, place, and time**.



**Person:** Specify what signs or symptoms that are cause for concern and biologically linked to the exposure of concern



**Place:** Specify the geographic location of the event to help focus your investigation



**Time:** Specify the period of concern for symptom onset to occur. This can be measured by days or hours as dictated by the incident.

Example of a working case definition: A **probable case** is defined as a student attending X high school with onset of fever and cough between September 7 and 23, 2019 with no other positive diagnostic test.

## CONSTRUCT A LINE LIST

NCDHHS line list templates can be found [here](#).

## CASE FINDING

- Work with local medical facilities, local incident management team, and first responders to identify cases. The role of the Local Health Department might include:
- Working with your designated contact at local hospitals or a public health epidemiologist (PHE) to determine total number injured, hospitalized, ED visits, and deceased
- Accessing NC DETECT, North Carolina's state syndromic surveillance system for additional information: [click here](#) or call 919.843.2361
- Working with medical providers to interview other exposed individuals for symptoms related to the exposure
- In consultation with emergency responders on the scene urging symptomatic individuals, especially children, to see their healthcare provider or seek other medical evaluations as appropriate.
- As cases are found, ensuring interviews of exposed individuals are completed to identify any symptoms related to the exposure. Interviews can be completed by a medical provider or other public health responder
  - Predetermined interview questionnaires should be used when possible for consistency and possible automation into database systems.



# 5. Implement Control and Prevention Measures

## MITIGATE AND PREVENT ADDITIONAL EXPOSURES

- Work with response team to decide on measures to protect citizens and surrounding communities
- Work with your Public Information Officer to inform residents and businesses of the exposure through local emergency notification system, local TV, radio and in person, if necessary. Points to include:
  - Location of release and exposures
  - Geographic area affected
  - Shelter-in-place instructions
  - Where to evacuate, if needed
  - Where to find a shelter
  - Where to seek medical care
  - Where to find additional information
- Coordinate with your local incident management team and local health director to determine when it is safe to revisit or re-enter residences and businesses
- Consult with PHP&R and OEEB to discuss next steps to prevent additional exposures

## ROUTINE CONTROL MEASURES

- Determine if a health advisory should be issued for the impacted area and any additional areas for which the health advisory will be applicable.
  - Assign points of contact for developing health advisory language and communicating the health advisory to the public.
  - Establish conditions for the removal of the health advisory.
- Communicate the following control measures with residents and business owners. Control measures may include but are not limited to: evacuation of the area, shelter in place, environmental sampling or remediation, or health or recreational advisories. Explain how long control measures will be in place, who they apply to, and what steps will remove health advisories.
- NCDHHS Communications Office is available to assist local health departments as needed at **919-855-4840**

# 6. Initiate or Maintain Surveillance

- If surveillance has not been ongoing, now is the time to initiate active surveillance
- If surveillance was initiated as part of case finding efforts, it should be continued

