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# **Hazardous Materials Tabletop Exercises Manual**

*July 2006*



**FEMA**

## TABLE OF CONTENTS

Exercise Introduction .....	1
Purpose.....	1
Exercise Goal and Objectives .....	2
Exercise Participants.....	2
Exercise Materials.....	2
Exercise Assumptions.....	3
Preexercise Activities.....	5
Reviewing the Exercise Materials .....	5
Room Setup .....	6
Conducting the Exercises .....	7
Debriefing the Exercise.....	8
 <b>Tabletop Exercise 1: Fixed-Facility Incident</b>	
Background Information and Incident Scenario .....	1-1
Map: South Hamden Township and the Village of Hope Springs .....	1-2
Scenario Messages .....	1-3
 <b>Tabletop Exercise 1: Supplemental Materials</b>	
Material Safety Data Sheet: Chlorine.....	1-11
 <b>Exercise 1: Evaluator's Worksheets .....</b>	<b>1-18</b>
 <b>Appendix A: Participant Copies of Messages</b>	
Participant Copies of Messages .....	A-1
Background Information and Incident Scenario .....	A-2
Message 1 .....	A-3
Message 2 .....	A-3
Message 3 .....	A-3
Message 4 .....	A-4
Message 5 .....	A-4
Message 6 .....	A-4
Message 7 .....	A-5
Message 8 .....	A-5
 <b>Tabletop Exercise 2: Highway Incident</b>	
Background Information and Incident Scenario .....	2-1
Map: Hamilton County and the Unincorporated Suburb of Greenville .....	2-2
Scenario Messages .....	2-3
 <b>Tabletop Exercise 2: Supplemental Materials</b>	
Material Safety Data Sheet: Acetone.....	2-11
Bill of Lading .....	2-21
 <b>Exercise 2: Evaluator's Worksheets .....</b>	<b>2-22</b>

## TABLE OF CONTENTS (CONTINUED)

**Appendix B: Participant Copies of Messages**

Participant Copies of Messages .....	B-1
Background Information and Incident Scenario .....	B-2
Message 1 .....	B-3
Message 2 .....	B-3
Message 3 .....	B-3
Message 4 .....	B-4
Message 5 .....	B-4
Message 6 .....	B-4
Message 7 .....	B-5
Message 8 .....	B-5

**Tabletop Exercise 3: Rail Incident**

Background Information and Incident Scenario .....	3-1
Map: City of Westport, New Columbia .....	3-2
Scenario Messages .....	3-3

**Tabletop Exercise 3: Supplemental Materials**

Material Safety Data Sheet: Chlorine.....	3-13
Material Safety Data Sheet: Potassium Hydroxide .....	3-20
Material Safety Data Sheet: Sodium Chlorate .....	3-29
Chlorine Waybill.....	3-37
Potassium Hydroxide Waybill .....	3-39
Sodium Chlorate Waybill.....	3-41
Train Consist.....	3-43

**Exercise 3: Evaluator's Worksheets .....3-46****Appendix C: Participant Copies of Messages**

Participant Copies of Messages .....	C-1
Background Information and Incident Scenario .....	C-2
Message 1 .....	C-3
Message 2 .....	C-3
Message 3 .....	C-3
Message 4 .....	C-4
Message 5 .....	C-4
Message 6 .....	C-5
Message 7 .....	C-6
Message 8 .....	C-6

### EXERCISE INTRODUCTION

#### PURPOSE

These tabletop exercises are intended to provide an opportunity for communities to test their ability to respond to hazardous materials (HazMat) incidents. The exercises provide the opportunity to identify the response and coordination issues that could arise during a variety of hazardous materials scenarios and make the decisions to resolve those issues.

This Manual includes the exercise instructions, objectives, and other exercise materials for three hazardous materials exercises:

- Exercise 1, Fixed Facility in a rural area, describes an accident involving chlorine in a water treatment plant.
- Exercise 2, Highway Accident, is set in a suburban area. The exercise describes an acetone release resulting from a highway incident.
- Exercise 3, Rail Accident, is set in an urban area, and involves the release of chlorine from a rail accident.

The exercises simplify and sequence the events during a period of time that, in reality, would be characterized by a series of complex issues occurring nearly simultaneously. All incidents are presented as unfolding events with the initial incident scenarios introducing the emergency and new information being introduced by means of injected messages throughout the exercises.

The scenarios and injects presented in this exercise are not intended to reflect a jurisdiction's political context, but the participants should consider how political issues might influence their actions and decisions.

### EXERCISE GOAL AND OBJECTIVES

The goals of these exercises are to:

- Validate coordination and communications capabilities for HazMat incidents.
- Verify policies and procedures for responding to hazardous materials incidents.
- Identify the overall strengths and weaknesses of hazardous materials plans.

At the end of this exercise, the participants should be able to:

- Demonstrate the ability to direct, coordinate, and control emergency activities using the Incident Command System (ICS).
- Demonstrate the ability to alert, mobilize, and activate personnel for emergency response and maintain operations until the situation is brought under control.
- Demonstrate the ability to mobilize, track, and demobilize equipment, people, and other resources in support of emergency operations.
- Develop and maintain coordinated action plans to accomplish operational objectives.
- Identify and implement appropriate actions to protect emergency workers and the public.
- Coordinate and disseminate timely and accurate information to the media and the public.

### EXERCISE PARTICIPANTS

The target audience for these exercises is first responders to hazardous materials incidents. Other personnel may be required based on State law and/or local requirements.

### EXERCISE MATERIALS

This Manual includes all of the information that the Exercise Controller will need to schedule, set up, and facilitate the exercises. The Manual includes:

- The overall purpose and scope of the exercises.
- A description of the pre-exercise activities required to prepare for the exercises.
- Instructions for conducting the exercises.
- Instructions for debriefing the exercises.
- The three exercises and supplemental materials.
- Exercise evaluation worksheets.
- Copies of the exercise scenarios and messages to distribute to the exercise participants.

### EXERCISE MATERIALS (CONTINUED)

Each exercise section of the Manual includes:

- An exercise introduction.
- Background information on the exercise scenario, including a written description of the scenario and maps.
- The exercise scenario, all required injects, and a description of the expected participant response.
- Supplemental information that the participants may request to help them make decisions during the exercise (e.g., Materials Safety Data Sheets (MSDSs)).
- Copies of the evaluation worksheets.

### EXERCISE ASSUMPTIONS

These exercises are based on the following assumptions:

1. Jurisdictions have an up-to-date Hazardous Materials Annex (or a Hazardous Materials Plan that conforms to the requirements of the Superfund Amendments and Reauthorization Act (SARA) Title III; and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and the Emergency Planning and Community Right-to-Know Act (EPCRA)).

CERCLA information can be found at: <http://www.epa.gov/superfund/action/law/cercla.htm>.

EPCRA information can be found at: <http://es.epa.gov/techinfo/facts/pro-act6.html>.

2. Exercise participants whose responsibility it is to manage hazardous materials responses are knowledgeable of Department of Transportation (DOT) placarding and labeling requirements and the National Fire Protection Association (NFPA) 704 Diamond.

DOT placarding and labeling requirements can be found at: [www.dot.gov](http://www.dot.gov).

NFPA 704 Diamond information can be found at: [www.nfpa.org](http://www.nfpa.org).

3. Exercise participants whose responsibility it is to manage hazardous materials responses are familiar with and able to use the *Emergency Response Guidebook (ERG)*.
4. Exercise participants must be trained to the appropriate level in ICS and hazardous materials response as required by the Occupational Safety and Health Administration (OSHA) and the NFPA.
5. The Controller must have specialized knowledge in HazMat and HazMat response.

### EXERCISE ASSUMPTIONS (CONTINUED)

6. Exercise participants whose responsibility it is to manage HazMat responses are familiar with the ICS and the requirements of the National Incident Management System (NIMS) and OSHA regulations, 29 CFR Part 1910.120 to implement ICS on all domestic responses. This information can be found at the following Web addresses:

ICS courses: <http://www.training.fema.gov/EMIWeb/IS/crslist.asp>.

NIMS documents: <http://www.fema.gov/emergency/nims/index.shtm>.

29 CFR Part 1910: [http://www.access.gpo.gov/nara/cfr/waisidx\\_03/29cfr1910\\_03.html](http://www.access.gpo.gov/nara/cfr/waisidx_03/29cfr1910_03.html)

Note that the participants should assume the resources for these exercises are those that are typically available for HazMat incidents.

### PRE-EXERCISE ACTIVITIES

The Controller (or other exercise coordinator) must complete several pre-exercise activities to ensure that the exercises run as smoothly as possible. These activities involve:

- Establishing a date for the exercise. Select a date far enough in advance of the exercise to allow the participants enough time to arrange their schedules. Allow at least 1 month's lead time between the time the participants are notified and the scheduled exercise date.
- Arrange for a meeting room. Reserve an exercise room that is large enough to accommodate all exercise participants comfortably. (Refer to each exercise for a list of recommended participants.)
- Invite the participants. After setting a date and ensuring that a room is available, prepare a written invitation to all potential exercise participants. The invitation should include:
  - The date and location of the exercise.
  - Starting and ending times.
  - Directions to the site, if necessary.
  - Guidance about what to bring to the exercise (e.g., the jurisdiction's Emergency Operations Plan (EOP), the ERG, agency policies and/or procedures, etc.)
  - A telephone number and/or e-mail address in case the potential participants have questions.

The invitation should also include a request that the participants reply stating whether they will attend the exercise and, if not, who will represent their agencies.

### REVIEWING THE EXERCISE MATERIALS

Before conducting any exercise, be sure to review the exercise background information, the timeframes for conducting the exercise, and all other exercise materials thoroughly. To make the exercise more realistic, feel free to tailor the exercise description, maps, and other materials to the jurisdiction.

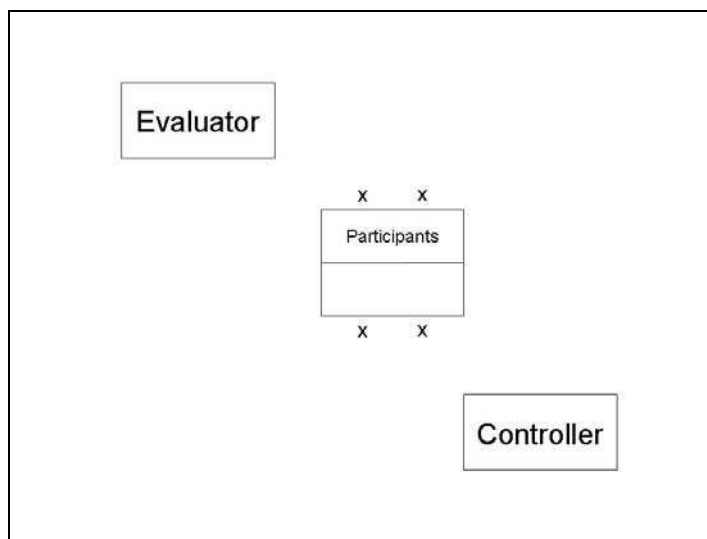
Supplemental exercise materials are included. These materials include information such as MSDSs, the train consist for the rail accident, and a bill of lading for the truck transportation incident. Be sure to make at least one copy of all supplemental materials for the selected exercise so that they can be provided to the participants, if requested. Encourage the participants to ask questions and request supplemental information throughout the exercise.

Because the Controller is critical to exercise success, he or she should also review and become familiar with the jurisdiction's Hazardous Materials Annex or Plan as well as local policies and procedures required for a HazMat response.

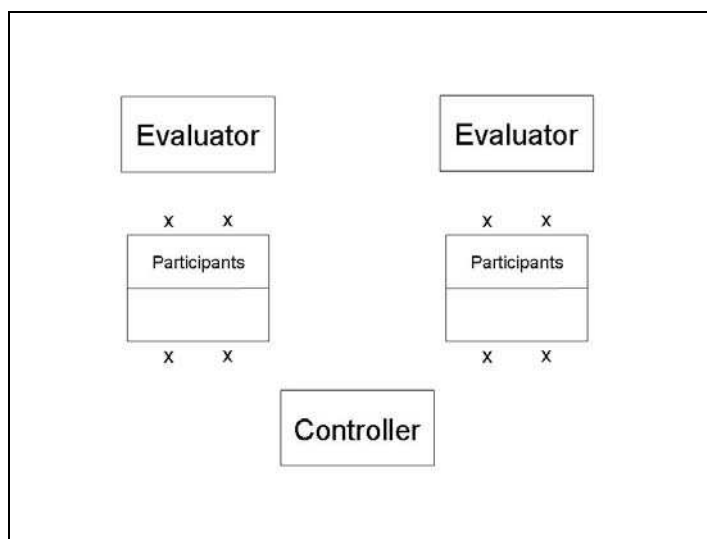


### ROOM SETUP

On the day of the exercise, plan to arrive at least 1 hour before the exercise is scheduled to begin. Ensure that the room is set up so that the participants can see and speak to each other and review the exercise materials, the jurisdiction's EOP, policies, procedures, and other documentation. If possible, set up the tables in the center of the room to allow the Evaluator(s) and Controller to pass on all sides of the tables. The Controller needs to observe responses and general progression of the exercise in order to ensure goals and objectives are met. The Evaluator(s) needs to assess the actions taken and document the appropriateness of these actions. Also, all participants should be seated so that they have an unobstructed view of the Controller who is providing verbal interjections to guide the play. The suggested room setup for a single group is shown below.



If more than one jurisdiction is participating in the tabletop at the same time, set up the room so that all groups can work without noise or other interference from the other groups.



### CONDUCTING THE EXERCISES

All exercises are designed to be presented as traditional tabletop exercises, with the Exercise Controller presenting the exercise scenario, then presenting prescribed messages to generate problems throughout the course of the exercise. The scenarios allow the Controller the flexibility to adapt the exercises to the skill levels of the participants.

Follow the steps below to conduct the exercises.

1. Begin each exercise by providing the “rules of play” to the participants. (See each exercise for the rules of play.) Answer any questions that the participants have about the rules of play before continuing.
2. Establish the context for the exercise by distributing the exercise scenario and reading it and the background information to the participants.
3. After providing the scenario, allow the participants time to review it individually and as a group. (Suggested timeframes are provided with each exercise.)
4. At designated intervals throughout the exercise, provide the specified message, either orally or in writing, to the participants. Participant versions of the messages are included in the Appendix that follows each exercise. After receiving each message, the participants should consider the information presented individually and as a group. Note that the participants may receive multiple messages simultaneously and must work together to prioritize and resolve the issues.
5. At the end of the allotted exercise timeframe, the Exercise Controller should, with the assistance of the Evaluator, debrief the group. Debriefing instructions are included in this Manual.

The Controller’s primary responsibility is to facilitate the exercise, keep the exercise on track, and answer questions intended to clarify information contained in the scenario or message. The Controller is also responsible for maintaining the official exercise clock. If necessary, the Controller can direct corrective actions and make decisions regarding any significant deviations in the scenario caused by unexpected developments in the course of the exercise. The Controller should *not* lead the exercise discussion.

The success of these exercises depends on the involvement of all participants. Tell the participants that they should not leave the room during an exercise unless absolutely necessary, and ask all to ensure that their cell phones and pagers are turned off or set to vibrate.

Each exercise is designed to be completed in approximately 3 hours, but will vary depending on the number of players and situations encountered.

### DEBRIEFING THE EXERCISES

At the conclusion of the exercise, the Controller will debrief the exercise participants, with the assistance of the Exercise Evaluator(s). The purpose of the debriefing is to provide immediate feedback to the exercise participants on:

- Whether the exercise objectives were met.
- Areas that worked well during the exercise as well as those that require attention by way of revision to the jurisdiction's plan, policies, or procedures; potential training needs, etc.

The debriefing should also serve to solicit feedback, suggestions, and strategies from the exercise participants.

Make the debriefing as interactive as possible. Also, get the participants' input before providing feedback from the Evaluator. For example, ask the participants for their impressions of the exercise and what they learned by participating. Then, follow the steps below to debrief the exercise:

1. Read the exercise objective.
2. Ask the participants whether they achieved the objective. Ask for additional comments, suggestions, and strategies for lessons learned, mitigation strategies, and areas of improvement, if appropriate.
3. Ask the Evaluator to provide his or her rating of whether the objective was achieved, together with the feedback about why he or she rated the objective that way.
4. Provide constructive feedback about how to make improvements in the areas related to the objective. Be sure to keep the discussion positive.
5. Allow the participants to comment on the evaluation and your suggestions.

Repeat this procedure until all of the objectives have been covered.

Finally, distribute the Tabletop Exercise Evaluation forms. These forms are designed to collect information from all exercise participants, the Controller, and the Evaluator to gain their general impressions on and feedback from the exercise. Ask the participants to complete the form, and complete a form yourself. Be sure to collect the forms before the participants leave the exercise room. Use the feedback to improve the conduct of future exercises.

**Note:** Do not try to resolve every issue during the debriefing. It is more important that the participants understand and record areas where improvement is required and identify a basic strategy for making the improvements after the exercise.

## **Tabletop Exercise 1: Fixed-Facility Incident**

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**BACKGROUND INFORMATION AND INCIDENT SCENARIO**

**Background Information**

South Hamden Township is a rural area at the southernmost end of Landis County, New Columbia. The township includes the village of Hope Springs, which is surrounded by a golf course, schools, farmland, and the newer residential communities of Lilly, Misty Acres, and Sugar Mountain. A map of the area is provided on the following page. The township also has several significant businesses including a butter processing plant.

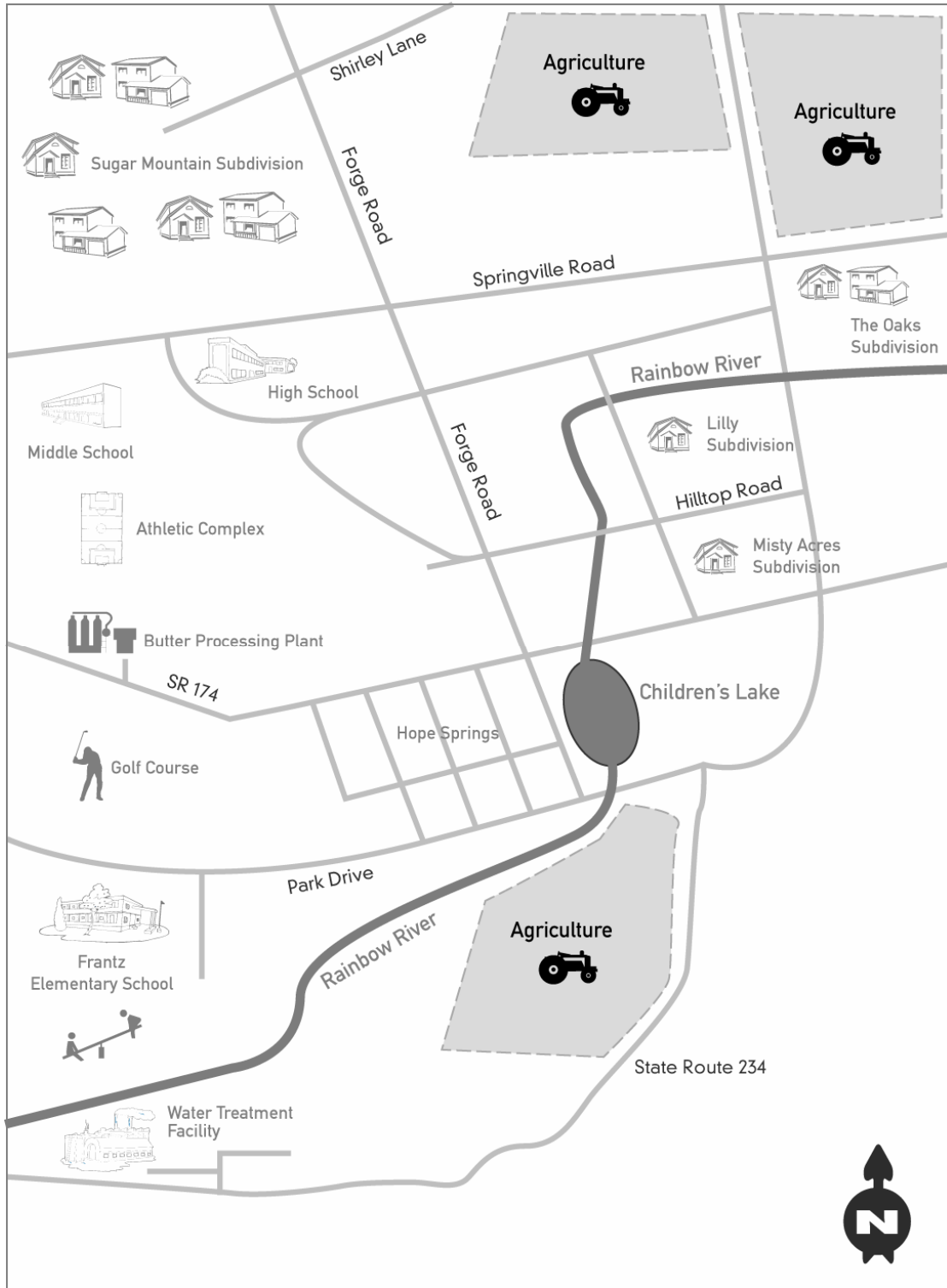
Hope Springs was so named because of its location atop the third largest natural aquifer in the country. Rainbow River is fed by 34 springs, which produce more than 24 million gallons of water each day. The water is used for drinking in Hope Springs and the northeastern end of the township.

The geological underlay in and around Hope Springs is primarily limestone. Because of high subsurface water levels and because the limestone base is continually eroded by water movement, the entire area is subject to sink holes.

**Incident Scenario**

It is 11:30 a.m. on Thursday, March 2. The temperature is a mild 68 degrees, and the wind is from the south-southwest at 5 miles per hour, both of which are unusual for this time of year. Many of the residents are outside enjoying the nice weather. Children at the Frantz Elementary School are enjoying outdoor recess time.

SOUTH HAMDEN TOWNSHIP AND THE VILLAGE OF HOPE SPRINGS



**SCENARIO MESSAGES**

<b>Message Number</b>	<b>Exercise Message</b>	<b>Expected Actions</b>
1	<p>The Communications Center has just received a call from the security guard at the water treatment plant. There has been a release of chlorine outside the facility. The alarm is sounding.</p> <p>The security guard at the plant does not know if the release is contained and tells the dispatcher that employees are evacuating.</p>	<ul style="list-style-type: none"><li>▪ Dispatch initial response resources (i.e. fire, police, emergency medical services, and hazard response team).</li></ul>

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
2	<p>The first fire company arrives at the scene at 11:42 a.m. to find a cloud along the ground. The wind direction is taking the cloud toward the Village of Hope Springs.</p> <p>Firefighters notice that the building is placarded with an NFPA 704 Diamond with the markings 4-0-0. There is also an "OXY" in the white area of the diamond.</p>	<ul style="list-style-type: none"><li>▪ Establish the initial incident command structure.</li><li>▪ Complete an initial sizeup.</li><li>▪ Use the ERG to determine the risks posed by chlorine and determine safe distances.</li><li>▪ Establish control zones (hot, warm, and cold) around the incident. Restrict access to the facility.</li><li>▪ Establish initial response priorities (i.e., protect the public and responders, protect property, protect the environment).</li><li>▪ Determine the required Personal Protective Equipment (PPE) for the chemical, and verify that all responders have appropriate PPE.</li><li>▪ Determine additional resource needs and request resources as needed.</li><li>▪ Establish accountability for plant workers and response personnel.</li><li>▪ Make necessary notifications.</li></ul>
<p><b>Message 2 Controller's Note:</b></p> <p>After allowing the participants time to discuss the new information, ask the Incident Commander (IC) to brief the group on:</p> <ol style="list-style-type: none"><li>1. The initial sizeup</li><li>2. The current situation.</li><li>3. The initial response strategy, including response priorities.</li></ol>		



## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
3	<p>It is now 11:54 a.m. The IC has talked to the water plant manager who confirms a leak in a 1-ton chlorine container. The container was punctured when a fork truck operator inadvertently struck it. The operator and two coworkers are unaccounted for.</p> <p>The elementary school principal calls to ask what is needed to protect the students, faculty, and staff.</p> <p>The Communications Center has informed the IC that it has dispatched all available personnel. The estimated time of arrival for the HazMat team is 32 minutes.</p>	<ul style="list-style-type: none"> <li>▪ Notify appropriate agency (agencies) of chemical release.</li> <li>▪ Conduct a safety briefing for all responders, and implement responder safety measures.</li> <li>▪ Request an MSDS.</li> <li>▪ Advise the school to get all children inside, shut doors and windows, turn off ventilation systems, and remain indoors until advised otherwise.</li> <li>▪ Develop a public safety strategy, including in-place sheltering and notification to the public.</li> <li>▪ Appoint a Public Information Officer (PIO) to develop a media release and Emergency Alert System (EAS) message that encompasses what is occurring at the school.</li> <li>▪ Identify a location for a staging area.</li> <li>▪ Determine additional resource needs and process requests.</li> <li>▪ Notify local emergency management personnel and make a determination about whether the Emergency Operations Center (EOC) should be opened.</li> </ul>
<p><b>Message 3 Controller's Notes:</b></p> <p>An MSDS for chlorine is included in the Supplemental Materials section at the end of this exercise. Do not provide them to the participants unless asked.</p> <p>After allowing the participants time to consider the new information and make response decisions, ask the IC and staff to provide a briefing that includes:</p> <ol style="list-style-type: none"> <li>1. Response strategy, tactics, and priorities.</li> <li>2. Objectives, which should include public safety measures.</li> <li>3. Resources requested.</li> <li>4. Strategy to deal with school situation.</li> </ol> <p>Ask the PIO to brief the group on the information that will be included in the media release and the EAS message.</p>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
4	<p>It is now 12 p.m. The wind speed has increased to 10 miles per hour and remains from the south-southwest.</p> <p>Six evacuated workers are having trouble breathing and are complaining of burning of the eyes and throat.</p> <p>Firefighters have reported that they can see that three persons are down in the cloud and appear to be unconscious.</p>	<ul style="list-style-type: none"><li>▪ Triage, provide immediate treatment, and transport the injured personnel.</li><li>▪ Notify the closest medical facility to expect the injured.</li><li>▪ Get an estimate of the timeframe required for dissipation based on the estimated size of the release and projected weather conditions.</li><li>▪ Verify the hot, warm, and cold zones. Adjust the perimeter as necessary to account for the change in wind speed.</li><li>▪ Prepare an EAS bulletin that includes the updated situation status, notice of any additional road closures, evacuation routes, and protective measures for those in the affected area.</li></ul>
<p><b>Message 4 Controller Notes:</b></p> <p>After allowing time for the participants to discuss the new information, ask the IC how the information has changed the response strategy and tactics.</p> <p>Ask the PIO to provide a briefing that includes:</p> <ol style="list-style-type: none"><li>1. The situation status.</li><li>2. Additional road closures.</li><li>3. Evacuation routes.</li><li>4. Personal protective measures.</li></ol>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
5	<p>It is now 12:15 p.m., and the HazMat team arrives at the scene.</p> <p>The chair of the township Board of Supervisors arrives. The supervisor is concerned about the residents and contamination of the Rainbow River and ground water.</p>	<ul style="list-style-type: none"><li>▪ Conduct a briefing for the HazMat team.</li><li>▪ Conduct rescue and containment operations.</li><li>▪ Advise the town supervisor on actions taken to protect people and environment.</li><li>▪ Begin planning for long-term operations including the rotation of personnel and taking care of personal needs (feeding, rest, etc.).</li></ul>
<p><b>Message 6 Controller Notes:</b></p> <p>After allowing the participants time to discuss the new information:</p> <ol style="list-style-type: none"><li>1. Ask the HazMat team members to restate briefing information.</li><li>2. Ask the Operations Chief what strategies and tactics they are employing.</li></ol>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
6	<p>By 12:30 p.m., media representatives begin arriving at the perimeter and are attempting to interview responders. They have requested a spokesperson from the fire department to meet them and appear on camera. They want to know the degree of danger to the school students, the people in the village, and livestock in the area.</p> <p>The Communications Center has notified the IC that it is receiving numerous calls from downwind locations complaining of eye, nose, and throat irritation.</p>	<ul style="list-style-type: none"> <li>▪ Consider a larger evacuation area and determine where the residents should go if experiencing medical problems.</li> <li>▪ Direct the PIO to prepare an EAS message addressing the current situation and providing information for those requiring medical treatment and to meet with media representatives.</li> <li>▪ Establish monitoring around the facility and at offsite locations.</li> <li>▪ Determine if additional resources are necessary, and process the request.</li> </ul>
<p><b>Message 5 Controller's Notes:</b></p> <p>After allowing the participants time to discuss the new information, ask the following questions:</p> <ol style="list-style-type: none"> <li>1. How does this new information change your public information strategy?</li> <li>2. Based on the scenario information and information in the ERG, what resources do you need? How will you process the request?</li> <li>3. How will you handle the issue with the livestock?</li> </ol> <p>Ask the PIO to provide a briefing that covers the information that will be included in the EAS message.</p>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
7	<p>It is 1:25 p.m. The chlorine cloud appears to be dissipating.</p> <p>The crew at the elementary school reports a density of .4 part per million (ppm) of chlorine around the school. The concentration at the edge of the cold zone is .25 ppm.</p> <p>A cleanup contractor has been called and is expected onsite in the morning.</p>	<ul style="list-style-type: none"><li>▪ Advise the school to continue in-place sheltering and provide relevant information that would impact the school population.</li><li>▪ Ensure that response personnel are rested, hydrated, etc.</li><li>▪ Consult with technicians monitoring air conditions.</li><li>▪ Prepare and disseminate a media release to provide updated information on the situation including status of sheltering.</li></ul>
<p><b>Message 7 Controller Notes:</b></p> <p>After allowing the participants time to discuss the new information, ask:</p> <ol style="list-style-type: none"><li>1. The PIO to describe the information that would be included in the latest media release.</li><li>2. The IC to describe how deactivation planning will be accomplished.</li></ol>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
8	<p>It is 3 p.m.</p> <p>The bodies of the three workers at the plant have been retrieved. All others have been accounted for, treated, and released.</p> <p>The National Weather Service (NWS) forecasts that a cold front will be passing through within the next several hours and with that will come a return to more normal temperatures. The wind is expected to shift to the northwest and increase to 15 to 20 miles per hour, dissipating the remaining chlorine.</p> <p>Contaminant levels are now at .15 ppm throughout the area.</p>	<ul style="list-style-type: none"><li>▪ Make necessary notifications regarding fatalities (i.e. coroner, medical examiner, police, regulatory agencies).</li><li>▪ Begin reentry planning, including any advisories that are expected to remain in effect after reentry.</li><li>▪ Begin deactivation planning, including debriefings.</li><li>▪ Release personnel as incident status permits.</li><li>▪ Notify public of incident termination.</li><li>▪ Release the elementary school population.</li></ul>

## **Tabletop Exercise 1: Supplemental Materials**

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## MATERIAL SAFETY DATA SHEET

ISSUED: 10/23/97

## CHLORINE

REVISED: 11/01/99

**SECTION I - PRODUCT IDENTIFICATION**

Telephone No.:  
Transportation Emergency No.:  
CHEMTREC: (800) 424-9300  
Medical Emergency No.:  
POISON CENTER: (216) 379-8562

Chemical Family: Halogen  
Chemical Name/Synonyms: Chlorine  
Trade Mark: None  
Formula: Cl<sub>2</sub>; (Cl-Cl)  
C.A.S. Registry No.: 7782-50-5

TSCA Inventory Status: All ingredients are listed on the USEPA's TSCA inventory  
Canadian Domestic Substances List Status: All ingredients have been nominated or are eligible for inclusion.

Workplace Hazardous Materials Information System (WHMIS) Classification: C,E

Product Use: Various Applications

SARA 313 Information: This product contains a toxic chemical or chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

**SECTION II - HAZARDOUS INGREDIENTS**

Hazard Summary Statement: WARNING! HIGHLY TOXIC. CORROSIVE. May be fatal if inhaled. Strong oxidizer. Most combustibles will burn in chlorine as they do in oxygen. Read entire Material Safety Data Sheet (MSDS).

<u>Material</u>	<u>C.A.S. Number</u>	<u>Amount in Product</u>	<u>ACGIH TLV-TWA</u>	<u>OSHA PEL-TWA</u>
Chlorine <sup>1,2,4,5,6</sup>	7782-50-5	> 99.5%	0.5 ppm 1 ppm short term exposure limit (STEL)	1 ppm - ceiling

**N.A. - Not Applicable****N.E. - Not Established *Legislative Footnotes***

<sup>1</sup> Ingredient listed on SARA Section 313 List of Toxic Chemicals.

<sup>2</sup> Ingredient listed on the *Pennsylvania Hazardous Substances List*.

<sup>3</sup> Ingredient listed on the California listing of *Chemicals Known to the State to Cause Cancer or Reproductive Toxicity*.

<sup>4</sup> Ingredient listed on the *Massachusetts Substance List*.

<sup>5</sup> *Workplace Hazardous Materials Information System* ingredient found on the Ingredient Disclosure List - Canada.

<sup>6</sup> Ingredient listed on the *New Jersey Right to Know Hazardous Substance List*.



### Notes:

**TLV-TWA** - Threshold Limit Value - Time Weighted Average guideline for concentration of the chemical substance in the ambient workplace air. (The skin notation calls attention to the skin as an additional significant route of absorption of the listed chemical.) American Conference of Governmental Industrial Hygienists (ACGIH).

**OSHA PEL** - OSHA Permissible Exposure Limit, 8-hour TWA. 29 CFR 1910.1000, Transitional Limits column, Table Z-1-A, Table Z-2, and Table Z-3.

### **SECTION III - PHYSICAL DATA**

Appearance: Greenish-yellow gas or amber liquid	Specific Gravity: Dry Gas (2.48 @ 0°C) Liquid (1.47 @ 0/4°C)
Odor: Pungent, suffocating bleach like odor	Melting Point: -101°C (-150°F)
Percent Volatiles: >99.5	Molecular Weight: 70.9
Solubility in Water: Slight	Vapor Pressure: 73 psia @ 50°F
Physical State: Gas (liquid under pressure)	Vapor Density: 2.5 (Air=1)

### **SECTION IV - FIRE & EXPLOSION HAZARD DATA**

**Flash Point:** Test is not applicable to gases. Not combustible. Chlorine can support combustion and is a serious fire risk.

**Flammable Limits in Air:** Not Applicable

### **Note:**

**Flash Point:** The lowest initial temperature of air passing around the specimen at which sufficient combustible gas is evolved to be ignited by a small external pilot flame.

**Extinguishing Media:** For small fires use dry chemical or carbon dioxide. For large fires use water spray, fog or foam.

**Special Firefighting Procedures:** Wear full face positive pressure self-contained breathing apparatus (SCBA). Wear full protective gear to prevent all body contact (moisture or water and chlorine can form hydrochloric and hypochlorous acids which are corrosive). Personnel not having suitable protection must leave the area to prevent exposure to toxic gases from the fire. Use water to keep fire-exposed containers cool (if containers are not leaking). Use water spray to direct escaping gas away from workers if it is necessary to stop the flow of gas. In enclosed or poorly ventilated areas, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations.

**Unusual Fire and Explosion Hazards:** Chlorine and water can be very corrosive. Corrosion of metal containers can make leaks worse. Although non-flammable, chlorine is a strong oxidizer and will support the burning of most combustible materials. Flammable gases and vapors can form explosive mixtures with chlorine. Chlorine can react violently when in contact with many materials and generate heat with possible flammable or explosive vapors. Chlorine gas is heavier than air and will collect in low-lying areas.

**Explosive Characteristics:** Containers heated by fire can explode.

### **SECTION V – Reactivity**

Stability: Stable

Hazardous Polymerization: Will not occur.

Hazardous Decomposition Products: Hydrogen chloride may form from chlorine in the presence of water vapor.

CAUTION! Oxidizer. Extremely reactive.

Incompatibility (Materials to Avoid): Chlorine is extremely reactive. Liquid or gaseous chlorine can react violently with many combustible materials and other chemicals, including water. Metal halides, carbon, finely divided metals and sulfides can accelerate the rate of chlorine reactions. Hydrocarbon gases, e.g., methane, acetylene, ethylene or ethane, can react explosively if initiated by sunlight or a catalyst. Liquid or solid hydrocarbons, e.g., natural or synthetic rubbers, naphtha, turpentine, gasoline, fuel gas, lubricating oils, greases or waxes, can react violently. Metals, e.g., finely powdered aluminum, brass, copper, manganese, tin, steel and iron, can react vigorously or explosively with chlorine. Nitrogen compounds, e.g., ammonia and other nitrogen compounds, can react with chlorine to form highly explosive nitrogen trichloride. Non-metals, (MSDS - Chlorine) Page 3 of 8 e.g., phosphorous, boron, activated carbon and silicon can ignite on contact with gaseous chlorine at room temperature. Certain concentrations of chlorine-hydrogen can explode by spark ignition. Chlorine is strongly corrosive to most metals in the presence of moisture. Copper may burn spontaneously. Chlorine reacts with most metals at high temperatures. Titanium will burn at ambient temperature in the presence of dry chlorine.

### **SECTION VI - HEALTH HAZARD DATA**

Threshold Limit Value: See Section II.

Primary Routes of Exposure: Inhalation, skin and eye contact.

Effects of Overexposure:

*Acute:* Low concentrations of chlorine can cause itching and burning of the eyes, nose, throat and respiratory tract. At high concentrations chlorine is a respiratory poison. Irritant effects become severe and may be accompanied by tearing of the eyes, headache, coughing, choking, chest pain, shortness of breath, dizziness, nausea, vomiting, unconsciousness and death. Bronchitis and accumulation of fluid in the lungs (chemical pneumonia) may occur hours after exposure to high levels. Liquid as well as vapor contact can cause irritation, burns and blisters. Ingestion can cause nausea and severe burns of the mouth, esophagus and stomach.

*Chronic:* Prolonged or repeated overexposure may result in many or all of the effects reported for acute exposure (including pulmonary function effects).

Emergency and First Aid Procedures:

Inhalation (of process emissions): Take proper precautions to ensure rescuer safety before attempting rescue (wear appropriate protective equipment and utilize the "buddy system"). Remove source of chlorine or move victim to fresh air. If breathing has stopped, trained personnel should immediately begin artificial respiration or, if the heart has stopped, cardiopulmonary resuscitation (CPR). Avoid mouth-to-mouth contact. Oxygen may be beneficial if administered by a person trained in its use, preferably on a physician's advice. Obtain medical attention immediately.

Eye Contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 20 minutes while the eyelid(s) are open. Take care not to rinse contaminated water into the non-affected eye. If irritation persists, obtain medical attention immediately.

Skin Contact: As quickly as possible, flush contaminated area with lukewarm, gently running water for at least 20 minutes. Under running water, remove contaminated clothing, shoes, and leather watchbands and belts. If irritation persists, obtain medical attention immediately. Completely decontaminate clothing, shoes and leather goods before re-use, or, discard.

Ingestion: Not an anticipated hazard.

### **SECTION VII - SPILL & LEAK PROCEDURE**

Steps to be taken in case material is released or spilled: Restrict access to the area until completion of the cleanup. Issue a warning: POISON GAS. DO NOT TOUCH SPILLED LIQUID. Do not use water on a chlorine leak (corrosion of the container can occur, increasing the leak). Shut off leak if safe to do so. Wear NIOSH/MSHA-approved, self-contained, full-face, positive pressure respirator and full protective clothing capable of protection from both liquid and gas phases. Persons without suitable respiratory and body protection must leave the area.

The following evacuation guide was developed by the U.S. Department of Transportation (DOT): Spill or leak from a smaller container or small leak from a tank - isolate in all directions 250 feet. Large spill from a tank or from a number of containers - first, isolate 520 feet in all directions; secondly, evacuate in a downwind direction 1.3 miles wide and 2.0 miles long. Keep upwind from leak. Vapors are heavier than air and pockets of chlorine are likely to be trapped in low-lying areas. Use water spray on the chlorine vapor cloud to reduce vapors. Do not flush into public sewer or water systems. Chlorine can be neutralized with caustic soda or soda ash.

Alkaline solutions for absorbing chlorine can be prepared as follows:

For 100 pound containers: 125 lbs. of caustic soda and 40 gallons of water For 2,000 pound containers: 2,500 lbs. of caustic soda and 800 gallons of water For 100 pound containers: 300 lbs. of soda ash and 100 gallons of water For 2,000 pound containers: 6,000 lbs. of soda ash and 2,000 gallons of water

**CAUTION:** Observe appropriate safety precautions for handling alkaline chemicals. Heat will be generated during the neutralization process.

Waste Disposal Method: Due to its inherent properties, hazardous conditions may result if the material is managed improperly. It is recommended that any containerized waste chlorine be managed as hazardous waste in accordance with all applicable federal, state, and local health and environmental laws and regulations.

### **SECTION VIII - SPECIAL PROTECTION INFORMATION**

Ventilation: Effective exhaust ventilation should always be provided to draw fumes or vapors away from workers to prevent routine inhalation. Ventilation should be adequate to maintain the ambient workplace atmosphere below the legislated levels listed in Section II.

Respiratory Protection: Use NIOSH approved acid gas cartridge or canister respirator for routine work purposes when concentrations are above the permissible exposure limits. Use full facepiece respirators when concentrations are irritating to the eyes. A cartridge-type escape respirator should be carried at all times when handling chlorine for escape only in case of a spill or leak. Re-enter area only with NIOSH approved, self-contained breathing apparatus with full facepiece. The respiratory use limitations made by

NIOSH or the manufacturer must be observed. Respiratory protection programs must be in accordance with 29 CFR 1910.134.

Eye/Face Protection: Non-ventilated chemical safety goggles or a full face shield.

Skin Protection: Wear impervious gloves, coveralls, boots and/or other resistance protective clothing. Safety shower/eyewash fountain should be readily available in the work area. Some operations may require the use of an impervious full-body encapsulating suit and respiratory protection.

**Note:** Neoprene, polyvinyl chloride (PVC), Viton, and chlorinated polyethylene show good resistance to chlorine.

Additional: Do not eat, drink or smoke in work areas. Maintain good housekeeping.

### **SECTION IX - SPECIAL PRECAUTIONS**

Material Handling: Do not use near welding operations, flames or hot surfaces. Move cylinders by hand truck or cart designed for that purpose. Do not lift cylinders by their caps. Do not handle cylinders with oily hands. Secure cylinders in place in an upright position at all times. Do not drop cylinders or permit them to strike each other. Leave valve cap on cylinder until cylinder is secured and ready for use. Close all valves when not in actual use. Insure valves on gas cylinders are fully opened when gas is used. Open and shut valves at least once a day while cylinder is in use to avoid valve "freezing". Use smallest possible amounts in designated areas with adequate ventilation. Have emergency equipment for fires, spills and leaks readily available. Wash thoroughly after handling product. Provide a safety shower/eyewash station in handling area. An emergency contingency program should be developed for facilities handling chlorine.

Storage: Store in steel pressure cylinders in a cool, dry area outdoors or in well-ventilated, detached or segregated areas of noncombustible construction. Keep out of direct sunlight and away from heat and ignition sources. Cylinder temperatures should never exceed 51°C (125°F). Isolate from incompatible materials. Store cylinders upright on a level floor secured in position and protected from physical damage. Use corrosion resistant lighting and ventilation systems in the storage area. Keep cylinder valve cover on. Label empty cylinders. Store full cylinders separately from empty cylinders. Avoid storing cylinders for more than six months. Comply with applicable regulations for the storage and handling of compressed gases.

### **SECTION X - HAZARD CODES**

NFPA  
(National Fire Protection Association)

Health: 4  
Flammability: 0  
Reactivity: 0 OXY  
Special:

Key:

0 = Insignificant  
1 = Slight  
2 = Moderate  
3 = High  
4 = Extreme

(MSDS - Chlorine)

HMIS  
(Hazardous Materials Identification System)

Health: 3  
Flammability: 0  
Reactivity: Personal Protection: 0 X\*

\* See MSDS for specified protection

### **USER'S RESPONSIBILITY**

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of the user's operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained within this bulletin should be provided to the user's employees or customers. \_\_\_\_\_ must rely upon the user to utilize this information to develop appropriate work practice guidelines and employee instructional programs for his or her operation.

### **DISCLAIMER OF LIABILITY**

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this material. Information contained herein is believed to be true and accurate but all statements or suggestions are made without warranty, expressed or implied, regarding the accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof. Compliance with all applicable federal, state and local laws and regulations remains the responsibility of the user.

**SHIPPING INFORMATION**

**IDENTIFICATION - DOMESTIC TRANSPORTATION**

Proper Shipping Name (172.101(c)): **Chlorine**  
(Technical Name(s)) 172.203(k): **N/A**  
Hazard Class 172.101(d): **2.3**  
UN/NA# 172.101(e): **UN 1017**  
Haz. Substance 171.8: **RQ (Chlorine)**  
Reportable Quantity (Appendix A to 172.101): **10 LB**  
Inhalation Hazard 172.2a(b): **Zone B, Poison-Inhalation Hazard, Marine Pollutant**  
Package Code 172.101(f): **N/A**  
Placarded: **Poison Gas**

**PACKAGING (Part 173)**

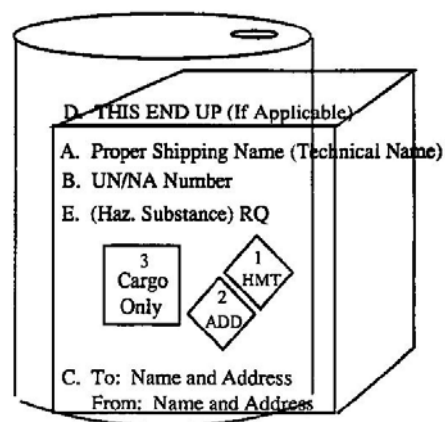
- Packaging Section (172.101(i)) - Col. 8(a): None  
Col. 8(b): 173.304  
Col. 8(c): 173.314, 173.315
- General Packaging Section - General 173.24                      Hazard Class: **POISON GAS**

**MARKING**

- A. Proper Shipping Name (172.301(a))                      (Technical Name) (172.301(b))  
B. UN/NA Number (172.301(a))  
C. Name & Address (172.301(d))  
D. THIS END UP (172.312(a))  
E. Hazardous Substance RQ (Name) (172.324)  
ORM Designation (172.316(a)) Inhalation  
Hazard (172.313(a))

**DOMESTIC LABELING**

- 1 HMT LABELS (172.400)
- 2 Additional Subsidiary Hazard (172.402(a)):  
8 (Corrosive)



**DANGEROUS GOODS DETERMINATION (38th Edition) IATA**

- Air Transport of This Material if Forbidden (Passenger and Cargo)

## **Exercise 1: Evaluator's Worksheets**

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## EXERCISE 1 EVALUATOR'S WORKSHEETS

**Instructions:** Use the worksheets below as a guide to evaluating team performance on Tabletop Exercise 1.

<b>Objective 1: Demonstrate the ability to direct, coordinate, and control emergency activities using ICS.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Establish the initial incident command structure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Conduct a briefing for the HazMat team?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Conduct rescue operations and containment of the leak?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			
<b>Objective 2: Demonstrate the ability to alert and activate personnel for emergency response and maintain operations until the situation is brought under control.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Dispatch initial response resources in a timely manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Make necessary notifications?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request air-monitoring technicians?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			



## EXERCISE 1 EVALUATOR'S WORKSHEETS (CONTINUED)

<b>Objective 3: Demonstrate the ability to mobilize, track, and demobilize equipment, people, and other resources in support of emergency operations.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Determine resource needs and request resources as needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify a location for a staging area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine additional resource needs and process requests?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Consult with technicians monitoring air conditions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Release personnel as incident status permits.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			
<b>Objective 4: Develop and maintain a coordinated action plan to accomplish operational objectives.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Complete an initial sizeup?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish initial response priorities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Plan for long-term operations, including the rotation of personnel and taking care of personal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Begin reentry planning, including any advisories that are expected to remain in effect after reentry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Begin deactivation planning, including debriefings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			

## EXERCISE 1 EVALUATOR'S WORKSHEETS (CONTINUED)

<b>Objective 5: Identify and implement appropriate actions to protect emergency workers and the public.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Use the ERG to determine the risks posed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish control zones around the incident?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine the required PPE and verify that all responders have appropriate PPE?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish accountability of plant workers and response personnel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Conduct a safety briefing for all responders and implement responder safety measures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request an MSDS?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Advise the school to get all children inside, shut doors and windows, turn off the ventilation system, and remain indoors until advised otherwise?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Develop a public safety strategy, including in-place sheltering and notification to the public?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify local emergency management personnel and make a determination about whether the EOC should be opened?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Triage, provide immediate treatment, and transport the injured personnel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify the closest medical facility to expect the injured?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Get an estimate of the timeframe required for dissipation based on the estimated size of the release and projected weather conditions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Verify the hot, warm, and cold zones and adjust the perimeter as necessary?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Consider a larger evacuation area and determine where the residents should go if experiencing medical problems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Ensure that response personnel are rested, hydrated, etc.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## EXERCISE 1 EVALUATOR'S WORKSHEETS (CONTINUED)

**Objective 5:** Identify and implement appropriate actions to protect emergency workers and the public.

**Comments:**

**Objective 6:** Coordinate and disseminate timely and accurate information to the media and the public.

Did the participants. . .	Yes	No	Not Observed
▪ Appoint a Public Information Officer to develop media releases and EAS messages?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Prepare an EAS bulletin that includes the updated situation status, notice of any additional road closures, evacuation routes, and protective measures for those in the affected area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Advise the supervisor on actions taken to protect people and the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Prepare updated EAS messages to update the public on the situation as it evolved?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Keep the school informed of relevant information that would impact the school population?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Make necessary notifications regarding fatalities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify the public of incident termination?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comments:**

## **Appendix A: Participant Copies of Messages**

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**PARTICIPANT COPIES OF MESSAGES**

This appendix includes copies of the exercise messages that you can copy and distribute to the exercise participants. Each message is included on its own page for your ease in copying.

**BACKGROUND INFORMATION AND INCIDENT SCENARIO**

**Background Information**

South Hamden Township is a rural area at the southernmost end of Landis County, New Columbia. The township includes the village of Hope Springs, which is surrounded by a golf course, schools, farmland, and the newer residential communities of Lilly, Misty Acres, and Sugar Mountain. A map of the area is provided on the following page. The township also has several significant businesses including a butter processing plant.

Hope Springs was so named because of its location atop the third largest natural aquifer in the country. Rainbow River is fed by 34 springs, which produce more than 24 million gallons of water each day. The water is used for drinking in Hope Springs and the northeastern end of the township.

The geological underlay in and around Hope Springs is primarily limestone. Because of high subsurface water levels and because the limestone base is continually eroded by water movement, the entire area is subject to sink holes.

**Incident Scenario**

It is 11:30 a.m. on Thursday, March 2. The temperature is a mild 68 degrees, and the wind is from the south-southwest at 5 miles per hour, both of which are unusual for this time of year. Many of the residents are outside enjoying the nice weather. Children at the Frantz Elementary School are enjoying outdoor recess time.

### MESSAGE 1

The Communications Center has just received a call from the security guard at the water treatment plant. There has been a release of chlorine outside the facility. The alarm is sounding.

The security guard at the plant does not know if the release is contained and tells the dispatcher that employees are evacuating.



### MESSAGE 2

The first fire company arrives at the scene at 11:42 a.m. to find a cloud along the ground. The wind direction is taking the cloud toward the Village of Hope Springs.

Firefighters notice that the building is placarded with an NFPA 704 Diamond with the markings 4-0-0. There is also an "OXY" in the white area of the diamond.



### MESSAGE 3

It is now 11:54 a.m. The Incident Commander (IC) has talked to the water plant manager who confirms a leak in a 1-ton chlorine container. The container was punctured when a fork truck operator inadvertently struck it. The operator and two coworkers are unaccounted for.

The elementary school principal calls to ask what is needed to protect the students, faculty, and staff.

The Communications Center has informed the IC that it has dispatched all available personnel. The estimated time of arrival for the HazMat team is 32 minutes.

### MESSAGE 4

It is now 12 p.m. The wind speed has increased to 10 miles per hour and remains from the south-southwest.

Six evacuated workers are having trouble breathing and are complaining of burning of the eyes and throat.

Firefighters have reported that they can see that three persons are down in the cloud and appear to be unconscious.



### MESSAGE 5

It is now 12:15 p.m., and the HazMat team arrives at the scene.

The chair of the township Board of Supervisors arrives. The supervisor is concerned about the residents and contamination of the Rainbow River and ground water.



### MESSAGE 6

By 12:30 p.m., media representatives begin arriving at the perimeter and are attempting to interview responders. They have requested a spokesperson from the fire department to meet them and appear on camera. They want to know the degree of danger to the school students, the people in the village, and livestock in the area.

The Communications Center has notified the IC that it is receiving numerous calls from downwind locations complaining of eye, nose, and throat irritation.



**MESSAGE 7**

It is 1:25 p.m. The chlorine cloud appears to be dissipating.

The crew at the elementary school reports a density of .4 part per million (ppm) of chlorine around the school. The concentration at the edge of the cold zone is .25 ppm.

A cleanup contractor has been called and is expected onsite in the morning.



**MESSAGE 8**

It is 3 p.m.

The bodies of the three workers at the plant have been retrieved. All others have been accounted for, treated, and released.

The National Weather Service (NWS) forecasts that a cold front will be passing through within the next several hours and with that will come a return to more normal temperatures. The wind is expected to shift to the northwest and increase to 15 to 20 miles per hour, dissipating the remaining chlorine.

Contaminant levels are now at .15 ppm throughout the area.

## **Tabletop Exercise 2: Highway Incident**

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### BACKGROUND INFORMATION AND INCIDENT SCENARIO

#### Background Information

Greenville is an unincorporated suburb near the western boundary of thriving Hamilton County, New Columbia. Greenville covers 9.2 square miles and has a population of 48,552. The suburb's demographics mirror the rest of the county. Its location at the western edge of the county enhances its function as a residential area, with a moderate amount of commercial zoning and very little light-industrial zoning. Only 12 percent of Greenville's residents both live and work in the suburb. Because of its gateway location, Greenville's transportation system also serves as a pass-through to counties to the west.

An east-west Interstate highway, I-44, passes through Greenville, connecting with the east-west four-lane divided arterial, U.S. Route 27. The Average Annual Daily Traffic (AADT) for I-44 westbound is 58,000, with 81 percent of this traffic running at peak hours. Numerous local side roads connect with Route 27, which serves as a major commuter route through this end of the county.

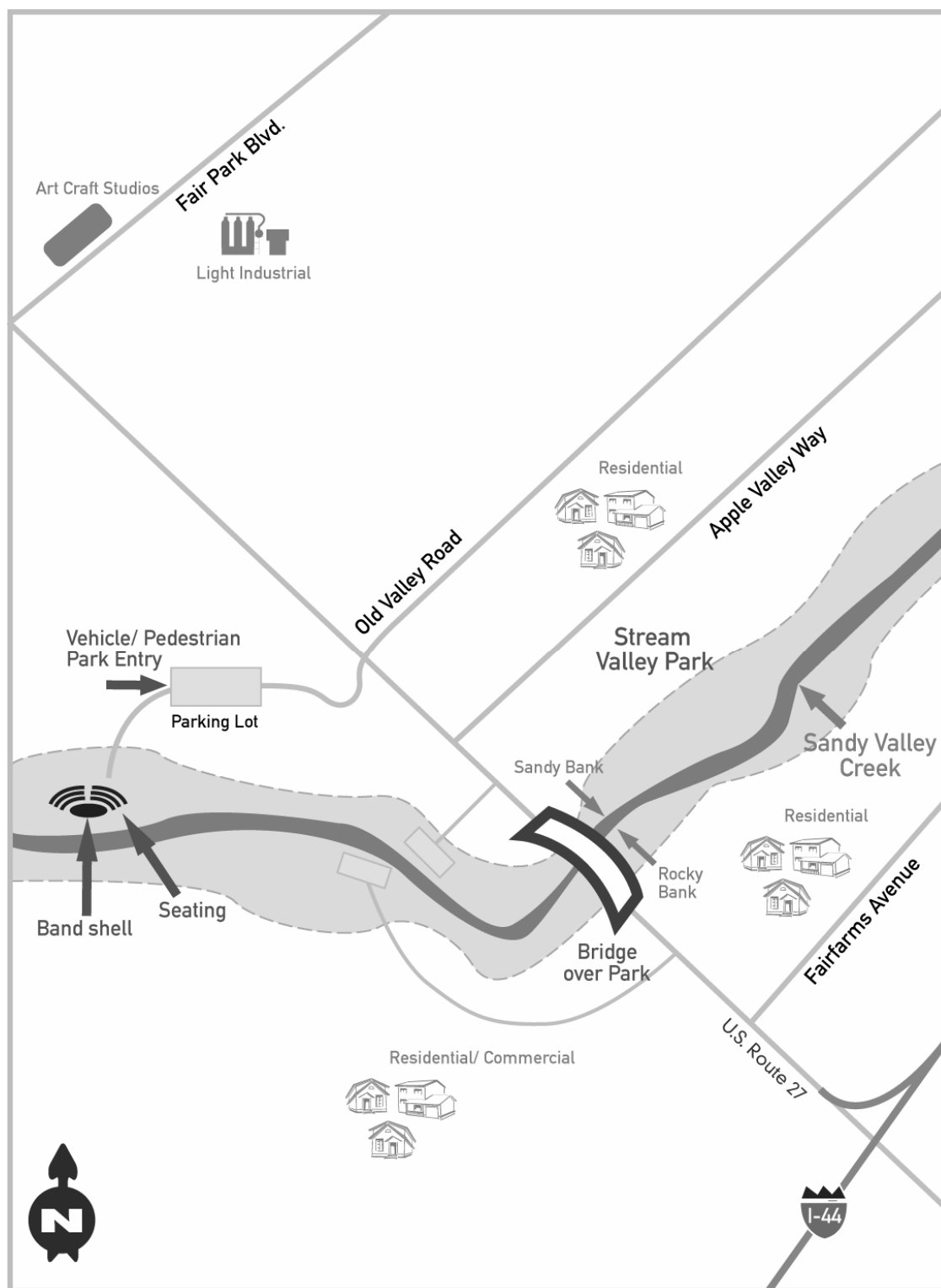
Stream Valley Park passes through the center of Greenville. The park is a well-used. The Sandy Valley Creek runs through the park, with a high rocky bank on one side and a sand-like silt bank on the other side. Route 27 passes over the Sandy Valley Park.

#### Incident Scenario

It is 5:45 p.m. on Friday, August 21. The temperature is a stifling 84 degrees, and the humidity is 78 percent. The weather forecast for Greenville calls for evening thunderstorms developing from the west. The sun is causing difficulties for commuters driving westbound on Route 27. A troop of Boy Scouts is cooking hotdogs and hamburgers over open flames at Sandy Valley Park, while many others are enjoying recreational activities at the park. Several children are playing in the shade under the bridge and a group of teenagers is lounging nearby.

A tractor trailer has just exited the ramp from eastbound I-44, and merged into westbound traffic on Route 27. The truck is carrying twenty 55-gallon closed-head steel drums of liquid acetone. The truck veers to the right and slams into the bridge abutment just after the intersection of Route 27 and Fairfarms Avenue. The people hear the sound of screeching tires and look up to witness the collision of the truck.

HAMILTON COUNTY AND THE UNINCORPORATED SUBURB OF GREENVILLE



**SCENARIO MESSAGES**

<b>Message Number</b>	<b>Exercise Message</b>	<b>Expected Actions</b>
1	At 5:53, a call comes into the county 9-1-1 Communications Center. The call is from an off-duty police officer traveling in a private vehicle westbound in traffic on Route 27. The police officer reports that a truck has crashed. The officer is attempting to ascertain the condition of the occupants and identify the placard on the side of the truck. The officer will call back with updated information.	<ul style="list-style-type: none"><li>▪ Dispatch initial response resources (i.e. fire, EMS, and police).</li><li>▪ Alert HazMat team(s) for possible response.</li><li>▪ From a safe distance, the officer on the scene conducts a situational assessment and completes an initial sizeup.</li></ul>

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
2	<p>At 5:57 p.m., the police officer places another call to the Communications Center reporting that there is a red placard with the number 3. A liquid is pouring from the back of the truck contaminating the water and people below. The liquid has a pungent sweet odor. Motorists are attempting to drive through the accident area while gawking at the accident. The officer also reports that people in the vicinity of the bridge have been exposed to the liquid.</p> <p>Musicians and early spectators have arrived at the band shell in the park area downstream from the bridge for the scheduled Friday evening concert, which begins at 7 p.m. As usual during rush hour, a traffic helicopter hovers overhead reporting on the situation at the bridge.</p> <p>The first fire and rescue personnel arrive at the scene at 6:01 p.m.</p>	<ul style="list-style-type: none"> <li>▪ Officer on the scene conducts a briefing for the arriving responders.</li> <li>▪ Establish the initial incident command structure.</li> <li>▪ Use the ERG to determine the risks posed and begin protective actions (protect the public and responders, protect property, protect the environment).</li> <li>▪ Request dispatch of HazMat team(s) to the scene.</li> <li>▪ Determine the required Personal Protective Equipment (PPE) for the chemical, and verify that all responders have appropriate PPE.</li> <li>▪ Notify appropriate regulatory agencies and elected officials of chemical release.</li> <li>▪ Establish a perimeter around the scene.</li> <li>▪ Deploy additional resources for traffic control and spill containment, if needed.</li> <li>▪ Determine the number and condition of victims on the highway and in the park.</li> <li>▪ Tell the PIO to develop a media release that includes a Water Advisory.</li> </ul>
<p><b>Message 2 Controller's Note:</b></p> <p>After allowing the participants time to discuss the new information, ask the IC to brief the group on:</p> <ol style="list-style-type: none"> <li>1. The initial sizeup</li> <li>2. The current situation.</li> <li>3. The initial response strategy, including response priorities.</li> </ol> <p>Ask the PIO to brief the group on the information that will be included in the media release.</p>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
3	<p>At 6:20 p.m., the HazMat team arrives to find several victims that include small children contaminated with the liquid product.</p> <p>Additional traffic control and spill containment resources are also arriving at the scene.</p> <p>The fire department and police departments lack interoperable radios and cannot communicate.</p>	<ul style="list-style-type: none"><li>▪ Conduct triage, establish decontamination process, provide immediate medical treatment, and transport.</li><li>▪ Notify the closest medical facility to expect the victims.</li><li>▪ Relocate people at the park to a safe distance uphill and upwind.</li><li>▪ Extinguish Boy Scout campfire and check for other sources of ignition.</li><li>▪ Stop the leak, set up spill containment, and dike the Sandy Valley Creek.</li><li>▪ Establish traffic control and begin interviewing victims and witnesses to gather information relative to the accident.</li><li>▪ Resolve the communication problem between fire and police (i.e. swap radios, set up joint command center, relay messages through dispatch)</li></ul>
<p><b>Message 3 Controller's Note:</b></p> <p>After allowing the participants time to discuss the new information, ask the EMS Officer to brief the group on:</p> <ol style="list-style-type: none"><li>1. The triage and treatment of initial victims.</li><li>2. Notification to medical facilities.</li></ol> <p>Ask the IC to report on police operations and spill containment.</p>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
4	<p>It is now 6:30 p.m. The driver and his companion remain in the truck and both appear to be unconscious. Hospital personnel request further information regarding the chemical involved.</p> <p>Parents and other concerned citizens are arriving at the scene and are demanding information on their loved ones. A reporter from the local television station is asking questions regarding the condition of the victims and driver. The reporter wants to know who is at fault and the identity of the truck owner and operator.</p>	<ul style="list-style-type: none"><li>▪ Extricate victims in the truck and retrieve bill of lading/MSDS.</li><li>▪ Restrict access to the accident scene.</li><li>▪ Request supporting information from the truck owner.</li><li>▪ Determine additional resource needs and process the requests.</li></ul>
<p><b>Message 4 Controller's Notes:</b></p> <p>A bill of lading/MSDS for the chemical involved in the spill is included in the Supplemental Materials section at the end of this exercise. Do not provide it to the participants unless asked. The MSDS describes PPE requirements for exposure to this chemical.</p>		



## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
5	<p>By 6:35 p.m., the benches at the band shell are full of concert-goers, and additional spectators have taken positions on blankets along the terraced bank. Cars are still arriving for the concert, clogging the inbound lane of Old Valley Road.</p> <p>A rumor is circulating among the people at the concert that the truck was hijacked and deliberately crashed to disperse a highly toxic chemical into the Sandy Valley Creek. The creek is a main source of drinking water for Hamilton County. People at the concert are starting to leave in mass and creating additional traffic problems. These people are also calling 911 to report their exposures to the chemical and to find out what to do.</p>	<ul style="list-style-type: none"><li>▪ Deploy rumor-control personnel to the band shell area.</li><li>▪ Prepare an EAS bulletin that includes a disclaimer about the toxic release and an updated report of the situation.</li><li>▪ Expand the perimeter in all directions around the incident site.</li></ul>
<p><b>Message 5 Controller Notes:</b></p> <p>After allowing time for the participants to discuss the new information, ask the participants how the panic at the band shell has changed:</p> <ol style="list-style-type: none"><li>1. Response strategy, tactics, and priorities.</li><li>2. Objectives, which should include public safety measures.</li><li>3. Resources requested.</li></ol> <p>Ask the PIO to provide a briefing that includes:</p> <ol style="list-style-type: none"><li>1. The rumor control and situation status, including the accidental nature of the chemical spill.</li><li>2. Additional road closures.</li></ol>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
6	<p>It is now 7:15 p.m. Route 27 remains closed to traffic from Fairfarms Avenue to Apple Valley Way as there is liquid remaining on the roadway. The intact barrels remain in the truck.</p> <p>A number of residents have attempted to enter the perimeter. Some have camcorders to record the event.</p> <p>The Communications Center advises the IC that the communications system is being overloaded with 911 calls from people who are inquiring about the terrorist incident and the whereabouts of family members who may have been in the area at the time of the accident.</p>	<ul style="list-style-type: none"><li>▪ Request additional resources if needed to assist with highway cleanup and off-loading of remaining chemicals from the truck.</li><li>▪ Ensure appropriate disposal of contaminated materials.</li><li>▪ Establish monitoring at the highway site and plan for monitoring in the park area.</li><li>▪ Develop a media release requesting people use 911 only for emergency calls and to stay away from the accident area to avoid further traffic congestion.</li></ul>
<p><b>Message 6 Controller Notes:</b></p> <p>After allowing the participants time to discuss the new information, ask the participants:</p> <ol style="list-style-type: none"><li>1. What is the best way to restrict area residents who are attracted to the scene at the highway site?</li><li>2. What is the best way to get out your message to the public?</li></ol>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
7	<p>At 7:35 p.m., nearby residents are complaining to responders of breathing problems and are requesting help.</p> <p>Dispatch has informed the IC that there has been a four-car pile up with entrapment on I-44 and requests uncommitted fire and police resources be diverted to the new incident.</p> <p>An issue has been raised by motorists about the structural integrity of the bridge.</p> <p>Several motorists on Route 27 and intersecting roads have abandoned their cars in the roadway (no gas, overheating, driver anger, etc.).</p>	<ul style="list-style-type: none"><li>▪ Contact dispatch and request deployment of additional EMS resources to assist people with breathing problems.</li><li>▪ Notify the closest medical facility to expect the additional victims.</li><li>▪ Coordinate with the technicians to monitor air and water conditions.</li><li>▪ Redeploy uncommitted resources to accident on I-44.</li><li>▪ Request professional evaluation of the safety of the bridge.</li><li>▪ Police request motorists return to cars and await resources to assist them. (tow trucks, gasoline, etc.)</li></ul>
<p><b>Message 7 Controller Notes:</b></p> <p>After allowing the participants time to discuss the new information, ask:</p> <ol style="list-style-type: none"><li>1. The police official to describe the best way to deal with the abandoned vehicles.</li><li>2. The IC to describe who and what will be provided to assist with the I-44 incident.</li></ol>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
8	<p>It is 9:15 p.m., August 21. Darkness has fallen and the NWS has issued a Severe Thunderstorm Watch for Hamilton County until midnight.</p> <p>The damaged truck has been impounded for further investigation. The undamaged barrels have been off loaded and are being transported to the original destination.</p> <p>Three motorists who had been affected by the chemical fumes from the spill on Route 27 have been treated and released from the hospital.</p> <p>Hospital officials confirmed all patients have been treated and released.</p> <p>A hazardous-waste removal company is taking over clean up of the site.</p> <p>Contaminant readings for the Sandy Valley Creek are within safe limits.</p>	<ul style="list-style-type: none"><li>▪ Monitor responder safety throughout the cleanup process.</li><li>▪ Begin reentry planning for the park area, including any advisories that are expected to remain in effect after reentry.</li><li>▪ Continue deactivation planning. Begin deactivating personnel when the incident status permits.</li><li>▪ Issue final press release indicating termination of command and the successful response.</li></ul>

## **Tabletop Exercise 2: Supplemental Materials**

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## SAMPLE

MSDS Number: **A0446** \* \* \* \* \* Effective Date: **05/20/04** \* \* \* \* \* Supersedes: **02/12/04****MSDS****Material Safety Data Sheet**24 Hour Emergency Telephone:  
CHEMTREC: 1-800-424-9300National Response in Canada  
CANUTEC: 613-996-6666Outside U.S. and Canada  
Chemtrec: 703-527-3887**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.**ACETONE****1. Product Identification****Synonyms:** Dimethylketone; 2-propanone; dimethylketal**CAS No.:** 67-64-1**Molecular Weight:** 58.08**Chemical Formula:** (CH<sub>3</sub>)<sub>2</sub>CO**Product Codes:**5008, 5018, 5356, 5580, 9001, 9002, 9003, 9004, 9005, 9006, 9007, 9008, 9009,  
9010, 9015, 9024, 9036, 9125, 9254, 9271, A134, V655Mallinckrodt: 0018, 2432, 2435, 2437, 2438, 2440, 2443, 2445, 2850, H451, H580,  
H981**2. Composition/Information on Ingredients**

Ingredient	CAS No	Percent	Hazardous
-----	-----	-----	-----
Acetone	67-64-1	99 - 100%	Yes

<b>SAMPLE</b>
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### 3. Hazards Identification

#### Emergency Overview

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**DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.**

**SAF-T-DATA<sup>(tm)</sup>** Ratings (Provided here for your convenience)

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Health Rating: 2 - Moderate

Flammability Rating: 3 - Severe (Flammable)

Reactivity Rating: 0 - None

Contact Rating: 3 - Severe

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;  
PROPER GLOVES; CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

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#### Potential Health Effects

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**Inhalation:**

Inhalation of vapors irritates the respiratory tract. May cause coughing, dizziness, dullness, and headache. Higher concentrations can produce central nervous system depression, narcosis, and unconsciousness.

**Ingestion:**

Swallowing small amounts is not likely to produce harmful effects. Ingestion of larger amounts may produce abdominal pain, nausea and vomiting. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms are expected to parallel inhalation.

**Skin Contact:**

Irritating due to defatting action on skin. Causes redness, pain, drying and cracking of the skin.

**Eye Contact:**

Vapors are irritating to the eyes. Splashes may cause severe irritation, with stinging, tearing, redness and pain.

**Chronic Exposure:**

Prolonged or repeated skin contact may produce severe irritation or dermatitis.

**Aggravation of Pre-existing Conditions:**

Use of alcoholic beverages enhances toxic effects. Exposure may increase the toxic potential of chlorinated hydrocarbons, such as chloroform, trichloroethane.

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<b>SAMPLE</b>
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#### 4. First Aid Measures

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:**

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.

**Skin Contact:**

Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

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#### 5. Fire Fighting Measures

**Fire:**

Flash point: -20C (-4F) CC

Autoignition temperature: 465C (869F)

Flammable limits in air % by volume:

lcl: 2.5; ucl: 12.8

Extremely Flammable Liquid and Vapor! Vapor may cause flash fire.

**Explosion:**

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. This material may produce a floating fire hazard. Sensitive to static discharge.

**Fire Extinguishing Media:**

Dry chemical, alcohol foam or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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<b>SAMPLE</b>
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## 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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## 7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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<b>SAMPLE</b>
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## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

Acetone:

-OSHA Permissible Exposure Limit (PEL):

1000 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):

500 ppm (TWA), 750 ppm (STEL) A4 - not classifiable as a human carcinogen

### **Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

### **Personal Respirators (NIOSH Approved):**

If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

### **Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

### **Eye Protection:**

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

<b>SAMPLE</b>
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**9. Physical and Chemical Properties****Appearance:**

Clear, colorless, volatile liquid.

**Odor:**

Fragrant, mint-like

**Solubility:**

Miscible in all proportions in water.

**Specific Gravity:**

0.79 @ 20C/4C

**pH:**

No information found.

**% Volatiles by volume @ 21C (70F):**

100

**Boiling Point:**

56.5C (133F) @ 760 mm Hg

**Melting Point:**

-95C (-139F)

**Vapor Density (Air=1):**

2.0

**Vapor Pressure (mm Hg):**

400 @ 39.5C (104F)

**Evaporation Rate (BuAc=1):**

ca. 7.7

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**10. Stability and Reactivity****Stability:**

Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**

Carbon dioxide and carbon monoxide may form when heated to decomposition.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Concentrated nitric and sulfuric acid mixtures, oxidizing materials, chloroform, alkalis, chlorine compounds, acids, potassium t-butoxide.

**Conditions to Avoid:**

Heat, flames, ignition sources and incompatibles.

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<b>SAMPLE</b>
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**11. Toxicological Information**

Oral rat LD50: 5800 mg/kg; Inhalation rat LC50: 50,100mg/m3; Irritation eye rabbit, Standard Draize, 20 mg severe; investigated as a tumorigen, mutagen, reproductive effector.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
-----			
Acetone (67-64-1)	No	No	None

**12. Ecological Information****Environmental Fate:**

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into water, this material is expected to readily biodegrade. When released to water, this material is expected to quickly evaporate. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be moderately degraded by photolysis. When released into the air, this material is expected to be readily removed from the atmosphere by wet deposition.

**Environmental Toxicity:**

This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

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**13. Disposal Considerations**

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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<b>SAMPLE</b>
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**14. Transport Information****Domestic (Land, D.O.T.)****Proper Shipping Name:** ACETONE**Hazard Class:** 3**UN/NA:** UN1090**Packing Group:** II**International (Water, I.M.O.)****Proper Shipping Name:** ACETONE**Hazard Class:** 3**UN/NA:** UN1090**Packing Group:** II**Information reported for product/size:** 188L**15. Regulatory Information**

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan	Australia
Acetone (67-64-1)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	Korea	DSL	NDSL	Phil.
Acetone (67-64-1)	Yes	Yes	No	Yes

-----\Federal, State &amp; International Regulations - Part 1\-----

Ingredient	RQ	TPQ	List	Chemical Catg.
Acetone (67-64-1)	No	No	Yes	No

-----\Federal, State &amp; International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8 (d)
Acetone (67-64-1)	5000	U002	No

<b>SAMPLE</b>
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Chemical Weapons Convention: No      TSCA 12(b): No      CDTA: Yes  
SARA 311/312: Acute: Yes      Chronic: No      Fire: Yes Pressure: No  
Reactivity: No      (Pure / Liquid)

**Australian Hazchem Code:** 2[Y]E

**Poison Schedule:** None allocated.

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **3** Reactivity: **0**

**Label Hazard Warning:**

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

**Label Precautions:**

Keep away from heat, sparks and flame.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Avoid breathing vapor.

Avoid contact with eyes, skin and clothing.

**Label First Aid:**

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

<b><i>SAMPLE</i></b>
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**Disclaimer:**

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The information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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## BILL OF LADING (EXCERPT)

Date: August 20, 2006		<b>BILL OF LADING</b>		Page 1					
<b>SHIP FROM</b>			Bill of Lading Number: 8137294A						
Name: Address: City/State/Zip: SID#: _____ FOB: <input type="checkbox"/>									
<b>SHIP TO</b>			<b>CARRIER NAME:</b> Johnson's Hazmat Carriers						
Name: _____ Location#: _____ Address: City/State/Zip: CID#: _____ FOB: <input type="checkbox"/>									
<b>THIRD PARTY FREIGHT CHARGES BILL TO:</b>			<b>SCAC:</b>  <b>Pro number:</b>  <b>Freight Charge Terms:</b> ( <i>freight charges are prepaid unless marked otherwise</i> ) Prepaid <u>  X  </u> Collect <u>      </u> 3 <sup>rd</sup> Party <u>      </u>						
Name: N/A Address:  City/State/Zip:									
<b>SPECIAL INSTRUCTIONS:</b>			<input type="checkbox"/> (check box)      Master Bill of Lading: with attached underlying Bills of Lading						
Deliver to loading dock, warehouse #1									
<b>CUSTOMER ORDER INFORMATION</b>									
<b>CUSTOMER ORDER NUMBER</b>		<b>#PKGS</b>	<b>WEIGHT</b>	<b>PALLET/S LIP (CIRCLE ONE)</b>	<b>ADDITIONAL SHIPPER INFO</b>				
224AY89302		20	1550	Y <b>(N)</b>					
				Y    N					
				Y    N					
				Y    N					
				Y    N					
<b>CARRIER INFORMATION</b>									
<b>HANDLING UNIT</b>		<b>PACKAGE</b>		<b>WEIGHT</b>	<b>H.M. (X)</b>	<b>COMMODITY DESCRIPTION</b>	<b>LTL ONLY</b>		
<b>QTY</b>	<b>TYPE</b>	<b>QTY</b>	<b>TYPE</b>			<small>Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation with ordinary care. See Section 2(e) or NMFC Item 360</small>	<b>NNFC #</b>	<b>CLASS</b>	
20	BBL			1550	X	Acetone UN1090		III	
<b>GRAND TOTAL</b>									
Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property as follows: "The agreed or declared value of the property is specifically stated by the shipper to be not exceeding _____ per _____.						<b>COD Amount: \$ N/A</b> <b>Fee Terms:</b> Collect: <input type="checkbox"/> Prepaid: <input checked="" type="checkbox"/> <b>Customer check acceptable:</b> <input type="checkbox"/>			
<b>NOTE: Liability Limitation for loss or damage in this shipment may be applicable. See 49 U.S.C. §14706©(1)(A) and (B).</b>									
RECEIVED subject to individually determined rates or contracts that have been agreed upon in writing between the carrier and shipper. If applicable, otherwise to the rates, classifications and rules that have been established by the carrier and are available to the shipper, on request, and to all applicable state and federal regulations.						The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.			
<b>SHIPPER SIGNATURE/DATE</b>				<b>Trailer Loaded:</b>		<b>Freight Counted:</b>		<b>CARRIER SIGNATURE / PICKUP DATE</b>	
This is certify that the above named materials are properly classified, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the DOT.				<input checked="" type="checkbox"/> By Shipper <input type="checkbox"/> By Driver		<input type="checkbox"/> By Shipper <input type="checkbox"/> By Driver/ pallets said to contain <input checked="" type="checkbox"/> By Driver/ Pieces		Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and/or carrier has the DOT emergency response guidebook or equivalent documentation in the vehicle.  Property described above is received in good order, except as noted.	



## **Exercise 2: Evaluator's Worksheets**

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## EXERCISE 2 EVALUATOR'S WORKSHEETS

**Instructions:** Use the worksheets below as a guide to evaluating team performance on Tabletop Exercise 2.

<b>Objective 1: Demonstrate the ability to direct, coordinate, and control emergency activities using ICS.</b>			
	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
Did the participants. . .			
▪ Establish the initial incident command structure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Conduct an initial briefing for the arriving responders?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Stop the leak, set up spill containment, and dike the Sandy Valley Creek?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Resolve the communication problem between fire and police?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Ensure appropriate disposal of contaminated materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Redeploy uncommitted resources to the accident on I-44?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Direct the police to request motorists to return to their cars and await resources to assist them?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Comments:</u></b>			

## EXERCISE 2 EVALUATOR'S WORKSHEETS (CONTINUED)

<b>Objective 2: Demonstrate the ability to alert and activate personnel for emergency response and maintain operations until the situation is brought under control.</b>			
	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
Did the participants. . .			
▪ Dispatch initial response resources in a timely manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify appropriate regulatory agencies and elected officials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine resource needs and process the requests?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request additional resources if needed to assist with highway cleanup and off-loading of the remaining chemicals from the truck?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Contact dispatch and request deployment of additional EMS resources to assist people with breathing problems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request a professional evaluation of the safety of the bridge?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			

## EXERCISE 2 EVALUATOR'S WORKSHEETS (CONTINUED)

<b>Objective 3: Demonstrate the ability to mobilize, track, and demobilize equipment, people, and other resources in support of emergency operations.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Determine resource needs and request resources as needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request dispatch of HazMat teams to the scene?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify a location for a staging area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine additional resource needs and process requests?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Deploy additional resources for traffic control and spill containment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			
<b>Objective 4: Develop and maintain a coordinated action plan to accomplish operational objectives.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Complete an initial sizeup?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish initial response priorities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Plan for long-term operations, including the rotation of personnel and taking care of personal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Begin reentry planning for the park area, including any advisories that are expected to remain in effect after reentry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Begin deactivation planning?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Begin deactivating personnel when the incident status permits?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			

## EXERCISE 2 EVALUATOR'S WORKSHEETS (CONTINUED)

<b>Objective 5: Identify and implement appropriate actions to protect emergency workers and the public.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Use the ERG to determine the risks posed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish a perimeter around the incident?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine the required PPE and verify that all responders have appropriate PPE?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine the number and conditions of victims on the highway and in the park?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Triage, provide immediate treatment, and transport the injured personnel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify the closest medical facility to expect the injured?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Relocate people at the park to a safe distance uphill and upwind?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Extinguish the Boy Scout campfire and check for other sources of ignition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify local emergency management personnel and make a determination about whether the EOC should be opened?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Extricate victims in the truck, retrieve the bill of lading and MSDS, and request supporting information from the truck owner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Restrict access to the accident scene?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Expand the perimeter as necessary in all directions around the incident site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish monitoring at the highway site and plan for monitoring in the park area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Coordinate with the technicians to monitor air and water conditions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Monitor responder safety throughout the cleanup process?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## EXERCISE 2 EVALUATOR'S WORKSHEETS (CONTINUED)

**Objective 5:** Identify and implement appropriate actions to protect emergency workers and the public.

**Comments:**

**Objective 6:** Coordinate and disseminate timely and accurate information to the media and the public.

Did the participants. . .	Yes	No	Not Observed
▪ Make necessary notifications?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Appoint a PIO to develop media releases and EAS messages?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Prepare an EAS bulletin that includes a Water Advisory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Deploy rumor-control personnel to the band shell area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Prepare updated EAS message that includes a disclaimer about the toxic release and an updated report of the situation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Develop a media release requesting people use 911 only for emergency calls and to stay away from the accident area to avoid further congestion?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Issue a final media release indicating the termination of command and a successful response?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comments:**

## **Appendix B: Participant Copies of Messages**

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**PARTICIPANT COPIES OF MESSAGES**

This appendix includes copies of the exercise messages that you can copy and distribute to the exercise participants. Each message is included on its own page for your ease in copying.



**BACKGROUND INFORMATION AND INCIDENT SCENARIO**

**Background Information**

Greenville is an unincorporated suburb near the western boundary of thriving Hamilton County, New Columbia. Greenville covers 9.2 square miles and has a population of 48,552. The suburb's demographics mirror the rest of the county. Its location at the western edge of the county enhances its function as a residential area, with a moderate amount of commercial zoning and very little light-industrial zoning. Only 12 percent of Greenville's residents both live and work in the suburb. Because of its gateway location, Greenville's transportation system also serves as a pass-through to counties to the west.

An east-west Interstate highway, I-44, passes through Greenville, connecting with the east-west four-lane divided arterial, U.S. Route 27. The Average Annual Daily Traffic (AADT) for I-44 westbound is 58,000, with 81 percent of this traffic running at peak hours. Numerous local side roads connect with Route 27, which serves as a major commuter route through this end of the county.

Stream Valley Park passes through the center of Greenville. The park is well-used. The Sandy Valley Creek runs through the park, with a high rocky bank on one side and a sand-like silt bank on the other side. Route 27 passes over the Sandy Valley Park.

**Incident Scenario**

It is 5:45 p.m. on Friday, August 21. The temperature is a stifling 84 degrees, and the humidity is 78 percent. The weather forecast for Greenville calls for evening thunderstorms developing from the west. The sun is causing difficulties for commuters driving westbound on Route 27. A troop of Boy Scouts is cooking hotdogs and hamburgers over open flames at Sandy Valley Park, while many others are enjoying recreational activities at the park. Several children are playing in the shade under the bridge and a group of teenagers is lounging nearby.

A tractor trailer has just exited the ramp from eastbound I-44, and merged into westbound traffic on Route 27. The truck is carrying twenty 55-gallon closed-head steel drums of liquid acetone. The truck veers to the right and slams into the bridge abutment just after the intersection of Route 27 and Fairfarms Avenue. The people hear the sound of screeching tires and look up to witness the collision of the truck.

### MESSAGE 1

At 5:53 p.m., a call comes into the county 9-1-1 Communications Center. The call is from an off-duty police officer traveling in a private vehicle westbound in traffic on Route 27. The police officer reports that a truck has crashed. The officer is attempting to ascertain the condition of the occupants and identify the placard on the side of the truck. The officer will call back with updated information.



### MESSAGE 2

At 5:57 p.m., the police officer places another call to the Communications Center reporting that there is a red placard with the number 3. A liquid is pouring from the back of the truck contaminating the water and people below. The liquid has a pungent sweet odor. Motorists are attempting to drive through the accident area while gawking at the accident. The officer also reports that people in the vicinity of the bridge have been exposed to the liquid.

Musicians and early spectators have arrived at the band shell in the park area downstream from the bridge for the scheduled Friday evening concert, which begins at 7 p.m. As usual during rush hour, a traffic helicopter hovers overhead reporting on the situation at the bridge.

The first fire and rescue personnel arrive at the scene at 6:01.



### MESSAGE 3

At 6:20 p.m., the HazMat team arrives to find several victims that include small children contaminated with the liquid product.

Additional traffic control and spill containment resources are also arriving at the scene.

The fire department and police departments lack interoperable radios and cannot communicate.

### MESSAGE 4

It is now 6:30 p.m., the driver and his companion remain in the truck and both appear to be unconscious. Hospital personnel request further information regarding the chemical involved.

Parents and other concerned citizens are arriving at the scene and are demanding information on their loved ones. A reporter from the local television station is asking questions regarding the condition of the victims and driver. The reporter wants to know who is at fault and the identity of the truck owner and operator.



### MESSAGE 5

By 6:35 p.m., the benches at the band shell are full of concert-goers, and additional spectators have taken positions on blankets along the terraced bank. Cars are still arriving for the concert, clogging the inbound lane of Old Valley Road.

A rumor is circulating among the people at the concert that the truck was hijacked and deliberately crashed to disperse a highly toxic chemical into the Sandy Valley Creek. The creek is a main source of drinking water for Hamilton county. People at the concert are starting to leave in mass and creating additional traffic problems. These people are also calling 911 to report their exposures to the chemical and to find out what to do.



### MESSAGE 6

It is now 7:15 p.m. Route 27 remains closed to traffic from Fairfarms Avenue to Apple Valley Way as there is liquid remaining on the roadway. The intact barrels remain in the truck.

A number of residents have attempted to enter the perimeter. Some have camcorders to record the event.

The Communications Center advises the IC that the communications system is being overloaded with 911 calls from people who are inquiring about the terrorist incident and the whereabouts of family members who may have been in the area at the time of the accident.

**MESSAGE 7**

At 7:35 p.m., nearby residents are complaining to responders of breathing problems and are requesting help.

Dispatch has informed the IC that there has been a four-car pile up with entrapment on I-44 and requests uncommitted fire and police resources be diverted to the new incident.

An issue has been raised by motorists about the structural integrity of the bridge.

Several motorists on Route 27 and intersecting roads have abandoned their cars in the roadway (no gas, overheating, driver anger, etc.).



**MESSAGE 8**

It is 9:15 p.m., August 21. Darkness has fallen and the NWS has issued a Severe Thunderstorm Watch for Hamilton County until midnight.

The damaged truck has been impounded for further investigation. The undamaged barrels have been off-loaded and are being transported to the original destination.

Three motorists who had been affected by the chemical fumes from the spill on Route 27 have been treated and released from the hospital.

Hospital officials confirmed all patients have been treated and released.

A hazardous-waste removal company is taking over clean up of the site.

Contaminant readings for the Sandy Valley Creek are within safe limits.

## **Tabletop Exercise 3: Rail Incident**

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### BACKGROUND INFORMATION AND INCIDENT SCENARIO

#### Background Information

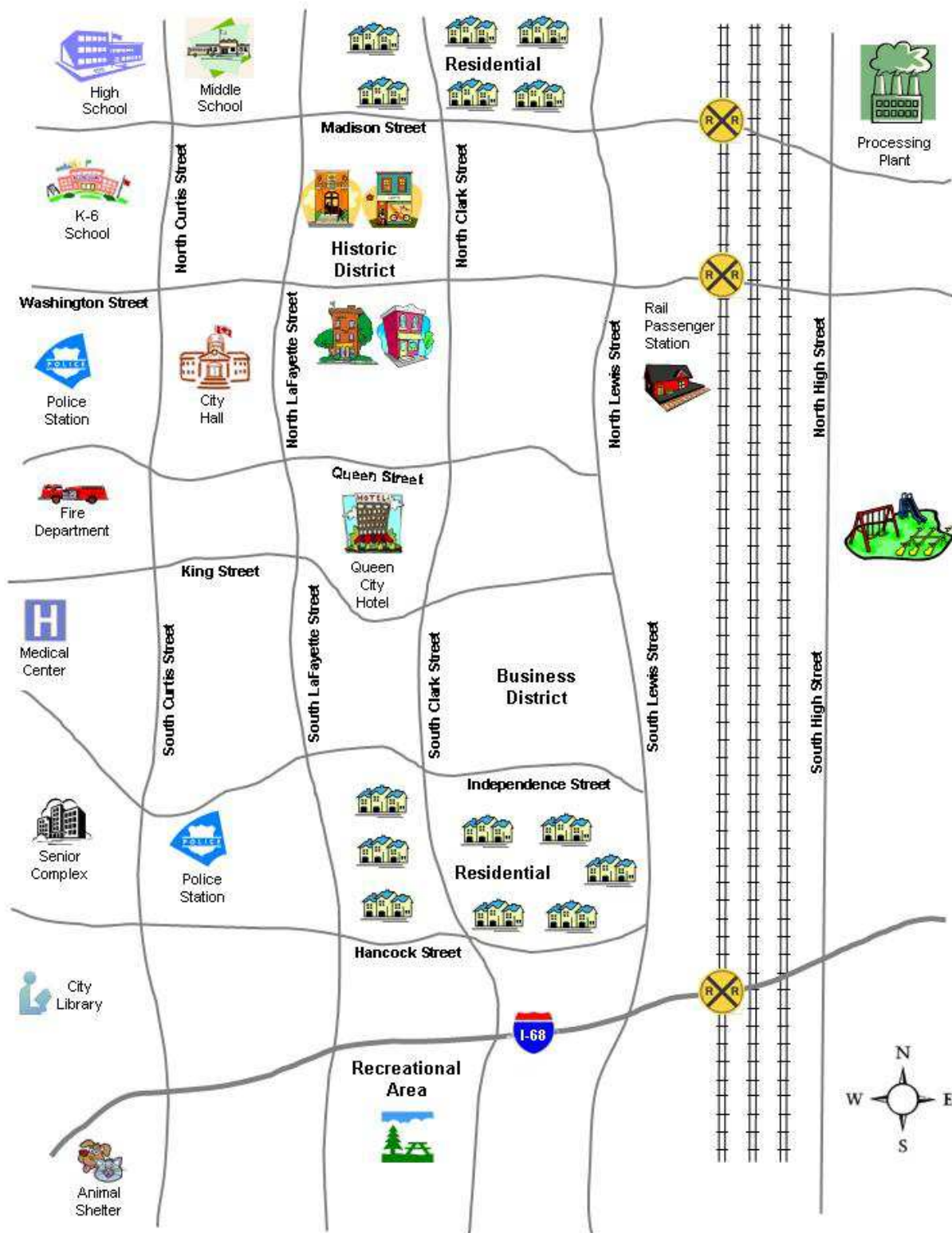
Westport, with a population of 55,000 (which can nearly double during tourist season), covers 18 square miles. The city has two hospitals and a large outpatient medical center. The city is an important three-track rail stop with extensive engine servicing and repair. The stop also includes food and other facilities for passenger trains. The city has a bustling historical district that draws visitors from all across the Nation.

#### Incident Scenario

It is 12:30 p.m. on Saturday, September 28. The temperature is an unusually warm 80 degrees, with a light southerly wind. Westport's Fall Art Fest is in full swing, with the historical district hosting a renowned art show featuring novice and accomplished artists. In addition to art, the festival also features gourmet food tasting and light harvest-style fare. Crafters, artisans, food vendors, and Historical Society members in costumes representing the city's heyday populate the eight-block downtown area. North Clark Street is blocked for an antique car show, and Westport Fire Company is hosting a display of antique fire trucks. The Chamber has contracted several bus companies to shuttle visitors to and from remote parking areas. This being an election year, the Governor of New Columbia, along with a State Senator and the district's State Representative, will ensure a large crowd on the steps of City Hall at the corner of Washington and South LaFayette Streets, as they appear for an old-fashioned political rally, scheduled for 3 p.m. Special police details have been established at the downtown railroad grade crossings to ensure motorist and pedestrian safety.

A four-engine freight train northbound and pulling 42 cars, hauling everything from fiberboard to hazardous materials, has entered Westport's southern city limits and is proceeding at 20 miles per hour toward the grade crossing with Washington Street. The train collides with a four-door car filled with passengers trying to cross over the tracks to the festival. Spectators hear the screech of the locomotive's wheels as the emergency brakes are applied. They watch, as if in slow motion, as several cars of the train begin to derail and the automobile is pushed down the tracks.

CITY OF WESTPORT, NEW COLUMBIA



**SCENARIO MESSAGES**

<b>Message Number</b>	<b>Exercise Message</b>	<b>Expected Actions</b>
1	<p>It is 12:33 p.m. A police officer on traffic detail radios to the dispatch center that a train has collided with a car at the Washington Street crossing. The officer tells the dispatcher that a cloud of greenish smoke is coming from beneath a derailed car.</p> <p>Some people in the area are running toward the scene of the accident to see what is happening.</p>	<ul style="list-style-type: none"><li>▪ Dispatch initial response resources (i.e. fire, police, EMS, and hazardous materials team(s)).</li></ul>



## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
2	<p>At 12:35, the Communications Center is receiving many calls from the downtown area stating that a greenish-yellow cloud is coming from the train wreck. There are many reports of people having difficulty breathing and some appear to be unconscious.</p> <p>Other reports are coming in of fatalities in the car and perhaps on the train. A local news reporter attending the festival is describing people running from the downtown area with hands folded over their faces coughing violently.</p> <p>First responders approach the area to find a large cloud emanating from the wreckage and people rushing away from the scene indicating they smell a bleach-like odor.</p>	<ul style="list-style-type: none"><li>▪ Establish the initial incident command structure.</li><li>▪ Complete an initial sizeup and set up staging area(s).</li><li>▪ Use the ERG to determine the risks posed by the hazards and safe distances.</li><li>▪ Contact the railroad company for a copy of the train consist.</li><li>▪ Order evacuation of the hazard area per ERG guidelines and establish control zones (hot, warm, cold).</li><li>▪ Request additional resources to assist with the evacuation.</li><li>▪ Notify appropriate regulatory agencies and elected officials.</li><li>▪ Request PIO prepare an EAS message that includes evacuation and sheltering information. Activate other public warning systems.</li><li>▪ Determine appropriate PPE level and verify all responders have these resources and are using them (Note: relocate untrained persons or responders lacking appropriate PPE).</li><li>▪ Establish accountability for the train crew, automobile occupants, emergency response personnel, and others in the affected area.</li><li>▪ Set up decontamination process and treatment stations.</li><li>▪ HazMat team enters the scene to gather information on extent of damage and casualties.</li></ul>

**SCENARIO MESSAGES (CONTINUED)**

**Message 2 Controller's Note:**

After allowing the participants time to discuss the new information, ask the IC to brief the group on:

1. The initial sizeup
2. The current situation.
3. The initial response strategy, including response priorities.

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
3	<p>At 12:47 p.m., the HazMat team discovers there are 6 fatalities and 15 people who need immediate assistance.</p> <p>The chemical continues to leak and appears to be the result of a catastrophic rupture to the pressurized tank.</p> <p>Reports of major telephone and electrical outages.</p> <p>Traffic on the surrounding streets comes to a halt as motorists are trying to navigate through the area.</p> <p>People are showing up at emergency rooms and other medical facilities complaining of burning eyes and nose, lung irritation and inflammation, sore throats, difficulty breathing, wheezing, coughing up yellow or green sputum, nose bleeds, headaches and dizziness, depression, and anxiety.</p>	<ul style="list-style-type: none"><li>▪ Triage, decontaminate, treat, and transport the victims to medical facility(ies).</li><li>▪ Notify medical facility(ies) to expect numerous casualties.</li><li>▪ Make necessary notifications regarding the fatalities (coroner or medical examiner).</li><li>▪ Request specialists to stop the chemical leak.</li><li>▪ Deploy chemical monitoring devices.</li><li>▪ Have PIO brief media and update EAS messages including protective measures for the public (i.e. evacuation, sheltering in place).</li><li>▪ Activate the EOC.</li><li>▪ Request EOC establish a Helpline that people can call for assistance.</li></ul>
<b>Message 3 Controller's Notes:</b>  Ask the PIO to brief the group on what will be included in the media release and the EAS message.		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
4	<p>The time is now 12:55 p.m. Crowds of panicking visitors are attempting to leave the area and seek shelter and information.</p> <p>The city Dispatch Center informs the IC of the expected 1:30 p.m. arrival of a northbound passenger train.</p> <p>Responders assisting with the evacuation report that there are numerous people who need special transportation (i.e. wheelchair bound, on oxygen, bed ridden, hearing and visually impaired,)</p> <p>The mayor wants to know what he should tell residents in his upcoming news briefing. Specifically, the mayor wants to know the number of fatalities and injured, what chemical is involved, what people are to do, who is at fault, and how long it will be until people can go back in the area</p> <p>The leak is proving to be a real challenge and projections are that it is going to take at least another 24 hours before there is significant change in the toxicity of the air.</p> <p>A fight has ensued among motorists who are frustrated at having to sit in a huge traffic backup.</p>	<ul style="list-style-type: none"> <li>▪ Determine expected arrival of those deployed for containment and offloading operations.</li> <li>▪ Instruct EOC to activate shelters and provide information on locations to responders and public. Also need to ensure shelter provisions are in place for a minimum of 24 hours.</li> <li>▪ Request EOC set up telephone number and safe area where victims' relatives can obtain information on the status of their loved ones.</li> <li>▪ Ensure the railroad company has taken steps to halt all incoming train traffic.</li> <li>▪ Request resources to assist with special needs evacuation.</li> <li>▪ Task PIO or other appropriate staff with providing information to the mayor.</li> <li>▪ Evaluate the need for additional resources to deal with traffic control (portable road signs, redirect traffic flow patterns, and limit access).</li> </ul>
<p><b>Message 4 Controller Notes:</b></p> <p>After allowing time for the participants to discuss the new information, ask the IC and other responders to provide a situational assessment for the following:</p> <ol style="list-style-type: none"> <li>1. Response strategy, tactics, and priorities.</li> <li>2. Operational objectives, which should now include law enforcement and public safety measures.</li> </ol>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
5	<p>By 2 p.m., the IC has received copies of the train consist. The ruptured tank car contains 180,000 pounds of chlorine. According to the consist, two cars behind the chlorine car are involved in the derailment. One car contains 205,180 pounds of potassium hydroxide and the other contains 20,000 pounds of sodium chlorate.</p> <p>The railroad company response team arrives at 2:30 p.m. to help with the leak containment and offloading.</p> <p>There is much concern about the release of chlorine into the ground water because of the magnitude of the leak at the site of the rupture.</p> <p>Hospitals are reporting that they cannot take any more patients.</p> <p>A responder reports that there is a puncture in his suit and he needs a backup.</p> <p>The evacuation of special needs groups is progressing slowly.</p> <p>The leak continues even with best efforts to stop it.</p>	<ul style="list-style-type: none"> <li>▪ Investigate other two rail cars containing hazardous materials to determine if they are ruptured.</li> <li>▪ Consult ERG and consist to gather information about the potassium hydroxide and sodium chlorate chemicals.</li> <li>▪ Determine additional resource needs and process requests.</li> <li>▪ Request that the environmental agency be notified of possible water contamination and request assistance in dealing with the problem.</li> <li>▪ Brief railroad responders and develop joint strategy for containment and offloading.</li> <li>▪ Request EOC coordinate with hospitals in surrounding jurisdictions to accept and treat patients.</li> <li>▪ Request PIO issue message about where medical treatment for those exposed to the chemical is available.</li> <li>▪ Deploy backup resources for HazMat team personnel.</li> </ul>
<p><b>Message 5 Controller's Notes:</b></p> <p>Ask the IC to brief the participants on the current response efforts.</p> <p>Ask the PIO to provide a briefing that includes:</p> <ol style="list-style-type: none"> <li>1. Where victims can receive treatment.</li> <li>2. What is being done about the accident and when the problem is going to be resolved.</li> <li>3. What shelters are operating and where they are located.</li> </ol>		

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
6	<p>At 5:30 p.m., news media are gathering at the perimeter of the scene. One newscaster interviews a family who plans to catch the northbound passenger train schedule to arrive at 6:20 p.m. Based on this report, the newscaster speculates that another accident is soon to occur and reports this as part of a live broadcast.</p> <p>It is determined by responders who examined the wreckage that the other derailed cars, while damaged, are not compromised.</p> <p>PIOs from the various government and private organizations involved in the response are freelancing and putting out conflicting information.</p> <p>Many people are showing up at the scene and want to know about loved ones that they speculate were in the area at the time of the accident.</p> <p>Response personnel from EPA, National Transportation Safety Board (NTSB), United States Department of Transportation (USDOT), and Federal Railroad Administration begin arriving at the scene around 6 p.m. and each one wants to speak with the IC.</p> <p>Several reports are coming into the Dispatch Center concerning pets that are wheezing and having difficulty breathing.</p> <p>It is now estimated that it will be at least 3 days before people can return to their homes. Victims are complaining that they do not want to stay in shelters nor leave their pets behind. They are asking if the company should not do something about this situation as it is not their fault they had to leave their homes.</p> <p>Representatives from surrounding jurisdictions have dispatched unsolicited resources to the scene and are interfering with response operations.</p>	<ul style="list-style-type: none"> <li>▪ Advise PIO that a Joint Information Center (JIC) needs to be set up and include all PIOs. The JIC is responsible for putting out approved and unified messages.</li> <li>▪ Advise friends and relatives on how they can obtain status information on their loved ones.</li> <li>▪ Brief private and governments officials and coordinate efforts of all response agencies.</li> <li>▪ Request EOC resolve the pet problem in coordination with area veterinarians and those who assist animals in times of disaster.</li> <li>▪ Notify the railroad company of victims' needs for private shelter, food, and other amenities.</li> <li>▪ Direct resource manager to resolve the unsolicited resource issue.</li> </ul>

**SCENARIO MESSAGES (CONTINUED)**

**Message 6 Controller Notes:**

MSDSs for the chemicals involved in the incident are included in the Supplemental Materials section at the end of this exercise. Do not provide them to the participants unless asked.

After allowing the participants time to consider the new information and make response decisions, ask the Resource Manager to provide a briefing that includes:

1. How to handle the issue with unsolicited resources?
2. How to prevent this in the future?
3. Why did the situation arise?

Ask the IC to describe how the briefing and coordination efforts with private and government representatives are being handled.

Ask the PIO to describe the JIC operations.

## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
7	<p>At 9:05 p.m., the city officials want to know if it is time to request a Federal Disaster Declaration. It is expected it will be 48 hours until the air will reach safe levels and the costs of responding to the event are escalating.</p> <p>There is a rumor circulating that the railroad company has representatives at the scene dispensing emergency assistance money. The crowds are growing and the lines are getting long.</p> <p>A responder brings it to the IC's attention that the monitors in use are not designed to show actual levels of chlorine in the ambient air.</p> <p>Concerns are being voiced about chlorine infiltrating dwellings in the area. The school system has also requested the fire department thoroughly inspect each school following the incident.</p> <p>The direction of the wind has changed and the speed has increased to 20 mph. Heavy rains have started to fall. People outside of the immediate evacuation area are now calling 911 to report greenish-yellow clouds approaching their homes. The command post and a shelter are located in this direction.</p>	<ul style="list-style-type: none"> <li>▪ Obtain required monitors to replace those in use at various monitoring sites.</li> <li>▪ Re-evaluate areas at risk. Based on new assessment, develop and implement revised evacuation strategy.</li> <li>▪ Relocate Incident Command Post and shelter outside the risk area.</li> <li>▪ Assign a liaison to work with school officials to develop a reentry plan that includes safety checks.</li> <li>▪ Plan for possible transfer-of-command.</li> <li>▪ Begin planning for long-term operations, including the rotation of personnel and taking care of personnel needs (feeding, rest, etc.)</li> <li>▪ City officials will need to determine whether or not to request State and Federal assistance. Responders may need to supply information in support of an official request.</li> </ul>
<p><b>Message 7 Controller Notes:</b></p> <p>Ask the outgoing IC to provide a possible transfer-of-command briefing.</p> <p>Ask the Operations Chief how the new weather conditions will impact operations.</p> <p>Ask the PIO what, if anything, can be done to control the rumors such as the one about free money.</p>		



## SCENARIO MESSAGES (CONTINUED)

Message Number	Exercise Message	Expected Actions
8	<p>At 11:15 p.m., first responders are in need of additional supplies for decontaminating personnel and equipment.</p> <p>Issues are being raised by responders and the public regarding the long-term effects of chlorine exposure.</p> <p>Residents are complaining about the lack of railroad crossing arm devices and warning lights at the intersection of Washington Street that may have prevented the accident.</p> <p>The railroad company has contacted the IC to let him know the clean up contractor has arrived. The contractors would like to know if there are any local disposal sites in the area.</p> <p>At midnight, the IC is advised that there has been a small accident during the off-loading procedure releasing an additional amount of chlorine.</p>	<ul style="list-style-type: none"><li>▪ Determine specific supply needs and process request to obtain these expeditiously.</li><li>▪ Monitor responder safety throughout the entire response.</li><li>▪ Consult with the technicians to monitor air quality.</li><li>▪ Begin deactivation planning, including stress debriefings for all personnel. Begin deactivating personnel only when incident status permits.</li><li>▪ Begin reentry planning.</li><li>▪ Notify the EOC of the indefinite timetable for reentry and sheltering.</li><li>▪ Prepare and disseminate a media release to provide updated information on chlorine exposure and the current situation.</li><li>▪ Consult with railroad officials concerning the extent of additional damage from the latest incident.</li></ul>

## **Tabletop Exercise 3: Supplemental Materials**

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## MATERIAL SAFETY DATA SHEET

ISSUED: 10/23/97

## CHLORINE

REVISED: 11/01/99

**SECTION I - PRODUCT IDENTIFICATION**

Telephone No.:  
Transportation Emergency No.:  
CHEMTREC: (800) 424-9300  
Medical Emergency No.:  
POISON CENTER: (216) 379-8562

Chemical Family: Halogen  
Chemical Name/Synonyms: Chlorine  
Trade Mark: None  
Formula: Cl<sub>2</sub>; (Cl-Cl)  
C.A.S. Registry No.: 7782-50-5

TSCA Inventory Status: All ingredients are listed on the USEPA's TSCA inventory  
Canadian Domestic Substances List Status: All ingredients have been nominated or are eligible for inclusion.

Workplace Hazardous Materials Information System (WHMIS) Classification: C,E

Product Use: Various Applications

SARA 313 Information: This product contains a toxic chemical or chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

**SECTION II - HAZARDOUS INGREDIENTS**

Hazard Summary Statement: WARNING! HIGHLY TOXIC. CORROSIVE. May be fatal if inhaled. Strong oxidizer. Most combustibles will burn in chlorine as they do in oxygen. Read entire Material Safety Data Sheet (MSDS).

<u>Material</u>	<u>C.A.S. Number</u>	<u>Amount in Product</u>	<u>ACGIH TLV-TWA</u>	<u>OSHA PEL-TWA</u>
Chlorine <sup>1,2,4,5,6</sup>	7782-50-5	> 99.5%	0.5 ppm 1 ppm short term exposure limit (STEL)	1 ppm - ceiling

**N.A. - Not Applicable****N.E. - Not Established *Legislative Footnotes***

<sup>1</sup> Ingredient listed on SARA Section 313 List of Toxic Chemicals.

<sup>2</sup> Ingredient listed on the *Pennsylvania Hazardous Substances List*.

<sup>3</sup> Ingredient listed on the California listing of *Chemicals Known to the State to Cause Cancer or Reproductive Toxicity*.

<sup>4</sup> Ingredient listed on the *Massachusetts Substance List*.

<sup>5</sup> *Workplace Hazardous Materials Information System* ingredient found on the Ingredient Disclosure List - Canada.

<sup>6</sup> Ingredient listed on the *New Jersey Right to Know Hazardous Substance List*.

### Notes:

**TLV-TWA** - Threshold Limit Value - Time Weighted Average guideline for concentration of the chemical substance in the ambient workplace air. (The skin notation calls attention to the skin as an additional significant route of absorption of the listed chemical.) American Conference of Governmental Industrial Hygienists (ACGIH).

**OSHA PEL** - OSHA Permissible Exposure Limit, 8-hour TWA. 29 CFR 1910.1000, Transitional Limits column, Table Z-1-A, Table Z-2, and Table Z-3.

### **SECTION III - PHYSICAL DATA**

Appearance: Greenish-yellow gas or amber liquid	Specific Gravity: Dry Gas (2.48 @ 0°C) Liquid (1.47 @ 0/4°C)
Odor: Pungent, suffocating bleach like odor	Melting Point: -101°C (-150°F)
Percent Volatiles: >99.5	Molecular Weight: 70.9
Solubility in Water: Slight	Vapor Pressure: 73 psia @ 50°F
Physical State: Gas (liquid under pressure)	Vapor Density: 2.5 (Air=1)

### **SECTION IV - FIRE & EXPLOSION HAZARD DATA**

**Flash Point:** Test is not applicable to gases. Not combustible. Chlorine can support combustion and is a serious fire risk.

**Flammable Limits in Air:** Not Applicable

### **Note:**

**Flash Point:** The lowest initial temperature of air passing around the specimen at which sufficient combustible gas is evolved to be ignited by a small external pilot flame.

**Extinguishing Media:** For small fires use dry chemical or carbon dioxide. For large fires use water spray, fog or foam.

**Special Firefighting Procedures:** Wear full face positive pressure self-contained breathing apparatus (SCBA). Wear full protective gear to prevent all body contact (moisture or water and chlorine can form hydrochloric and hypochlorous acids which are corrosive). Personnel not having suitable protection must leave the area to prevent exposure to toxic gases from the fire. Use water to keep fire-exposed containers cool (if containers are not leaking). Use water spray to direct escaping gas away from workers if it is necessary to stop the flow of gas. In enclosed or poorly ventilated areas, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations.

**Unusual Fire and Explosion Hazards:** Chlorine and water can be very corrosive. Corrosion of metal containers can make leaks worse. Although non-flammable, chlorine is a strong oxidizer and will support the burning of most combustible materials. Flammable gases and vapors can form explosive mixtures with chlorine. Chlorine can react violently when in contact with many materials and generate heat with possible flammable or explosive vapors. Chlorine gas is heavier than air and will collect in low-lying areas.

**Explosive Characteristics:** Containers heated by fire can explode.

### **SECTION V – Reactivity**

Stability: Stable

Hazardous Polymerization: Will not occur.

Hazardous Decomposition Products: Hydrogen chloride may form from chlorine in the presence of water vapor.

CAUTION! Oxidizer. Extremely reactive.

Incompatibility (Materials to Avoid): Chlorine is extremely reactive. Liquid or gaseous chlorine can react violently with many combustible materials and other chemicals, including water. Metal halides, carbon, finely divided metals and sulfides can accelerate the rate of chlorine reactions. Hydrocarbon gases, e.g., methane, acetylene, ethylene or ethane, can react explosively if initiated by sunlight or a catalyst. Liquid or solid hydrocarbons, e.g., natural or synthetic rubbers, naphtha, turpentine, gasoline, fuel gas, lubricating oils, greases or waxes, can react violently. Metals, e.g., finely powdered aluminum, brass, copper, manganese, tin, steel and iron, can react vigorously or explosively with chlorine. Nitrogen compounds, e.g., ammonia and other nitrogen compounds, can react with chlorine to form highly explosive nitrogen trichloride. Non-metals, (MSDS - Chlorine) Page 3 of 8 e.g., phosphorous, boron, activated carbon and silicon can ignite on contact with gaseous chlorine at room temperature. Certain concentrations of chlorine-hydrogen can explode by spark ignition. Chlorine is strongly corrosive to most metals in the presence of moisture. Copper may burn spontaneously. Chlorine reacts with most metals at high temperatures. Titanium will burn at ambient temperature in the presence of dry chlorine.

### **SECTION VI - HEALTH HAZARD DATA**

Threshold Limit Value: See Section II.

Primary Routes of Exposure: Inhalation, skin and eye contact.

Effects of Overexposure:

*Acute:* Low concentrations of chlorine can cause itching and burning of the eyes, nose, throat and respiratory tract. At high concentrations chlorine is a respiratory poison. Irritant effects become severe and may be accompanied by tearing of the eyes, headache, coughing, choking, chest pain, shortness of breath, dizziness, nausea, vomiting, unconsciousness and death. Bronchitis and accumulation of fluid in the lungs (chemical pneumonia) may occur hours after exposure to high levels. Liquid as well as vapor contact can cause irritation, burns and blisters. Ingestion can cause nausea and severe burns of the mouth, esophagus and stomach.

*Chronic:* Prolonged or repeated overexposure may result in many or all of the effects reported for acute exposure (including pulmonary function effects).

Emergency and First Aid Procedures:

Inhalation (of process emissions): Take proper precautions to ensure rescuer safety before attempting rescue (wear appropriate protective equipment and utilize the "buddy system"). Remove source of chlorine or move victim to fresh air. If breathing has stopped, trained personnel should immediately begin artificial respiration or, if the heart has stopped, cardiopulmonary resuscitation (CPR). Avoid mouth-to-mouth contact. Oxygen may be beneficial if administered by a person trained in its use, preferably on a physician's advice. Obtain medical attention immediately.

Eye Contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 20 minutes while the eyelid(s) are open. Take care not to rinse contaminated water into the non-affected eye. If irritation persists, obtain medical attention immediately.

Skin Contact: As quickly as possible, flush contaminated area with lukewarm, gently running water for at least 20 minutes. Under running water, remove contaminated clothing, shoes, and leather watchbands and belts. If irritation persists, obtain medical attention immediately. Completely decontaminate clothing, shoes and leather goods before re-use, or, discard.

Ingestion: Not an anticipated hazard.

### **SECTION VII - SPILL & LEAK PROCEDURE**

Steps to be taken in case material is released or spilled: Restrict access to the area until completion of the cleanup. Issue a warning: POISON GAS. DO NOT TOUCH SPILLED LIQUID. Do not use water on a chlorine leak (corrosion of the container can occur, increasing the leak). Shut off leak if safe to do so. Wear NIOSH/MSHA-approved, self-contained, full-face, positive pressure respirator and full protective clothing capable of protection from both liquid and gas phases. Persons without suitable respiratory and body protection must leave the area.

The following evacuation guide was developed by the U.S. Department of Transportation (DOT): Spill or leak from a smaller container or small leak from a tank - isolate in all directions 250 feet. Large spill from a tank or from a number of containers - first, isolate 520 feet in all directions; secondly, evacuate in a downwind direction 1.3 miles wide and 2.0 miles long. Keep upwind from leak. Vapors are heavier than air and pockets of chlorine are likely to be trapped in low-lying areas. Use water spray on the chlorine vapor cloud to reduce vapors. Do not flush into public sewer or water systems. Chlorine can be neutralized with caustic soda or soda ash.

Alkaline solutions for absorbing chlorine can be prepared as follows:

For 100 pound containers: 125 lbs. of caustic soda and 40 gallons of water For 2,000 pound containers: 2,500 lbs. of caustic soda and 800 gallons of water For 100 pound containers: 300 lbs. of soda ash and 100 gallons of water For 2,000 pound containers: 6,000 lbs. of soda ash and 2,000 gallons of water

**CAUTION:** Observe appropriate safety precautions for handling alkaline chemicals. Heat will be generated during the neutralization process.

Waste Disposal Method: Due to its inherent properties, hazardous conditions may result if the material is managed improperly. It is recommended that any containerized waste chlorine be managed as hazardous waste in accordance with all applicable federal, state, and local health and environmental laws and regulations.

### **SECTION VIII - SPECIAL PROTECTION INFORMATION**

Ventilation: Effective exhaust ventilation should always be provided to draw fumes or vapors away from workers to prevent routine inhalation. Ventilation should be adequate to maintain the ambient workplace atmosphere below the legislated levels listed in Section II.

Respiratory Protection: Use NIOSH approved acid gas cartridge or canister respirator for routine work purposes when concentrations are above the permissible exposure limits. Use full facepiece respirators when concentrations are irritating to the eyes. A cartridge-type escape respirator should be carried at all times when handling chlorine for escape only in case of a spill or leak. Re-enter area only with NIOSH approved, self-contained breathing apparatus with full facepiece. The respiratory use limitations made by NIOSH or the manufacturer must be observed. Respiratory protection programs must be in accordance with 29 CFR 1910.134.

Eye/Face Protection: Non-ventilated chemical safety goggles or a full face shield.

Skin Protection: Wear impervious gloves, coveralls, boots and/or other resistance protective clothing. Safety shower/eyewash fountain should be readily available in the work area. Some operations may require the use of an impervious full-body encapsulating suit and respiratory protection.

**Note**: Neoprene, polyvinyl chloride (PVC), Viton, and chlorinated polyethylene show good resistance to chlorine.

Additional: Do not eat, drink or smoke in work areas. Maintain good housekeeping.

### **SECTION IX - SPECIAL PRECAUTIONS**

Material Handling: Do not use near welding operations, flames or hot surfaces. Move cylinders by hand truck or cart designed for that purpose. Do not lift cylinders by their caps. Do not handle cylinders with oily hands. Secure cylinders in place in an upright position at all times. Do not drop cylinders or permit them to strike each other. Leave valve cap on cylinder until cylinder is secured and ready for use. Close all valves when not in actual use. Insure valves on gas cylinders are fully opened when gas is used. Open and shut valves at least once a day while cylinder is in use to avoid valve "freezing". Use smallest possible amounts in designated areas with adequate ventilation. Have emergency equipment for fires, spills and leaks readily available. Wash thoroughly after handling product. Provide a safety shower/eyewash station in handling area. An emergency contingency program should be developed for facilities handling chlorine.

Storage: Store in steel pressure cylinders in a cool, dry area outdoors or in well-ventilated, detached or segregated areas of noncombustible construction. Keep out of direct sunlight and away from heat and ignition sources. Cylinder temperatures should never exceed 51°C (125 F). Isolate from incompatible materials. Store cylinders upright on a level floor secured in position and protected from physical damage. Use corrosion resistant lighting and ventilation systems in the storage area. Keep cylinder valve cover on. Label empty cylinders. Store full cylinders separately from empty cylinders. Avoid storing cylinders for more than six months. Comply with applicable regulations for the storage and handling of compressed gases.

### **SECTION X - HAZARD CODES**

#### NFPA

(National Fire Protection Association)

Health: 4  
Flammability: 0  
Reactivity: 0 OXY  
Special:

#### HMIS

(Hazardous Materials Identification System)

Health: 3  
Flammability: 0  
Reactivity: Personal Protection: 0 X\*

#### Key:

0 = Insignificant

1 = Slight

2 = Moderate

3 = High

4 = Extreme

(MSDS - Chlorine)

\* See MSDS for specified protection

### **USER'S RESPONSIBILITY**

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of the user's operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained within this bulletin should be provided to the user's employees or customers.

### **DISCLAIMER OF LIABILITY**

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this material. Information contained herein is believed to be true and accurate but all statements or suggestions are made without warranty, expressed or implied, regarding the accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof. Compliance with all applicable federal, state and local laws and regulations remains the responsibility of the user.



**SHIPPING INFORMATION**

**IDENTIFICATION - DOMESTIC TRANSPORTATION**

Proper Shipping Name (172.101(c)): **Chlorine**  
(Technical Name(s)) 172.203(k): **N/A**  
Hazard Class 172.101(d): **2.3**  
UN/NA# 172.101(e): **UN 1017**  
Haz. Substance 171.8: **RQ (Chlorine)**  
Reportable Quantity (Appendix A to 172.101): **10 LB**  
Inhalation Hazard 172.2a(b): **Zone B, Poison-Inhalation Hazard, Marine Pollutant**  
Package Code 172.101(f): **N/A**  
Placarded: **Poison Gas**

**PACKAGING (Part 173)**

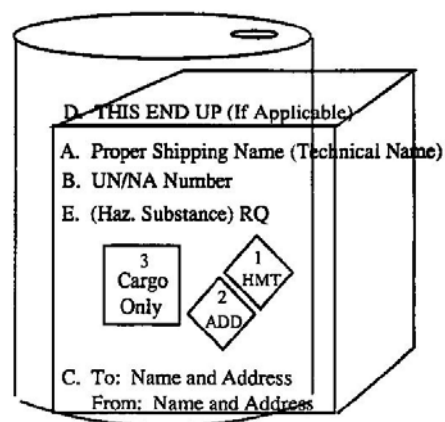
- Packaging Section (172.101(i)) - Col. 8(a): None  
Col. 8(b): 173.304  
Col. 8(c): 173.314, 173.315
- General Packaging Section - General 173.24                      Hazard Class: **POISON GAS**

**MARKING**

- A. Proper Shipping Name (172.301(a))                      (Technical Name) (172.301(b))  
B. UN/NA Number (172.301(a))  
C. Name & Address (172.301(d))  
D. THIS END UP (172.312(a))  
E. Hazardous Substance RQ (Name) (172.324)  
ORM Designation (172.316(a)) Inhalation  
Hazard (172.313(a))

**DOMESTIC LABELING**

- 3 HMT LABELS (172.400)  
4 Additional Subsidiary Hazard (172.402(a)):  
8 (Corrosive)



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**DANGEROUS GOODS DETERMINATION (38th Edition) IATA**

- Air Transport of This Material if Forbidden (Passenger and Cargo)

SAMPLE

MSDS Number: **P5887** \* \* \* \* \* Effective Date: **08/18/05** \* \* \* \* \* Supersedes: **08/10/04****MSDS****Material Safety Data Sheet**24 Hour Emergency Telephone:  
CHEMTREC: 1-800-424-9300National Response in Canada  
CANUTEC: 613-996-6666Outside U.S. and Canada  
Chemtrec: 703-527-3887**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# POTASSIUM HYDROXIDE (10 - 45%) Solutions and Concentrates

## 1. Product Identification

**Synonyms:** Caustic potash - liquid or solutions; Potassium hydrate**CAS No.:** 1310-58-3 (Potassium hydroxide)**Molecular Weight:** 56.11**Chemical Formula:** KOH (10 - 45% in water)**Product Codes:**

## 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Potassium Hydroxide	1310-58-3	10 - 45%	Yes
Water	7732-18-5	55 - 90%	No

<b>SAMPLE</b>
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### 3. Hazards Identification

#### Emergency Overview

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**POISON! DANGER! CORROSIVE. CAUSES SEVERE BURNS TO SKIN, EYES, RESPIRATORY TRACT, AND GASTROINTESTINAL TRACT. MATERIAL IS EXTREMELY DESTRUCTIVE TO ALL BODY TISSUES. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED.**

**SAF-T-DATA<sup>(tm)</sup>** Ratings (Provided here for your convenience)

-----

Health Rating: 3 - Severe (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 4 - Extreme (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White Stripe (Store Separately)

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#### Potential Health Effects

-----

##### Inhalation:

Respiratory tract irritant, may cause serious burns on acute contact. Severe injury is usually avoided by the self-limiting coughing and sneezing symptoms.

##### Ingestion:

Toxic! Corrosive to mucous membranes and may cause perforation of the esophagus and stomach. Abdominal pain, nausea, vomiting, general gastrointestinal upset can be expected.

##### Skin Contact:

Irritant, possibly corrosive if contact is prolonged. Soreness, redness, destruction of skin may result.

##### Eye Contact:

Irritant, possibly corrosive to eye tissues. Tearing, redness, pain, impaired vision are symptoms.

##### Chronic Exposure:

Development of a defatting dermatitis on prolonged contact with potassium hydroxide has been reported. Continued irritation may lead to increased susceptibility to respiratory illness.

##### Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired kidney or respiratory function may be more susceptible to the effects of the substance.

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<b>SAMPLE</b>
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#### 4. First Aid Measures

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:**

DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

#### 5. Fire Fighting Measures

**Fire:**

Not considered to be a fire hazard.

**Explosion:**

Not considered to be an explosion hazard.

**Fire Extinguishing Media:**

Use any means suitable for extinguishing surrounding fire. Avoid direct contact of liquid with water.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

#### 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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<b>SAMPLE</b>
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## 7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area. Protect against physical damage. Separate from acids and alkalis. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

For Potassium Hydroxide [1310-58-3]:

- OSHA Permissible Exposure Limit (PEL):

2 mg/m<sup>3</sup> Ceiling

- ACGIH Threshold Limit value (TLV):

2 mg/m<sup>3</sup> Ceiling

### **Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

### **Personal Respirators (NIOSH Approved):**

If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

### **Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

### **Eye Protection:**

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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<b>SAMPLE</b>
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**9. Physical and Chemical Properties****Appearance:**

Clear, colorless solution.

**Odor:**

Odorless.

**Solubility:**

Completely soluble in water.

**Specific Gravity:**

10% Solution:1.1 - to- 45% Solution:1.45

**pH:**

13.5 (0.1 molar solution)

**% Volatiles by volume @ 21C (70F):**

90 (as water)

**Boiling Point:**

10% Solution:101C (213F) to 45% Solution: 132C (270F)

**Melting Point:**

10% Solution:-3C (27F) to 45% Solution -29C (-20F).

**Vapor Density (Air=1):**

No information found.

**Vapor Pressure (mm Hg):**

10% Solution: No Information Found - to - 45% Solution: 2 @ 20C (68F)

**Evaporation Rate (BuAc=1):**

No information found.

---

**10. Stability and Reactivity****Stability:**

Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**

Potassium oxide.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Strong acids, aluminum, tin, zinc, chlorinated hydrocarbons, acetone.

**Conditions to Avoid:**

Heat, incompatibles.

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<b>SAMPLE</b>
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**11. Toxicological Information**

For potassium hydroxide: Oral rat LD50: 273 mg/kg; Investigated as a mutagen.  
Skin Irritation Data (std Draize, 50 mg/24 H): Human, Severe; Rabbit, Severe. Eye  
Irritation Data(Rabbit, non-std test,1 mg/24 H, rinse): Moderate.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Potassium Hydroxide (1310-58-3)	No	No	None
Water (7732-18-5)	No	No	None

---

**12. Ecological Information****Environmental Fate:**

No information found.

**Environmental Toxicity:**

Potassium Hydroxide: TLm: 80 ppm/Mosquito fish/ 24 hr./ Fresh water

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**13. Disposal Considerations**

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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<b>SAMPLE</b>
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## 14. Transport Information

### Domestic (Land, D.O.T.)

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**Proper Shipping Name:** POTASSIUM HYDROXIDE, SOLUTION

**Hazard Class:** 8

**UN/NA:** UN1814

**Packing Group:** II

### International (Water, I.M.O.)

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**Proper Shipping Name:** POTASSIUM HYDROXIDE, SOLUTION

**Hazard Class:** 8

**UN/NA:** UN1814

**Packing Group:** II

### International (Air, I.C.A.O.)

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**Proper Shipping Name:** POTASSIUM HYDROXIDE, SOLUTION

**Hazard Class:** 8

**UN/NA:** UN1814

**Packing Group:** II



<b>SAMPLE</b>
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**15. Regulatory Information**

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Potassium Hydroxide (1310-58-3)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	DSL	NDSL	Phil.
Potassium Hydroxide (1310-58-3)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
		-SARA 302-	-----SARA 313-----	
Ingredient	RQ	TPQ	List	Chemical Catg.
Potassium Hydroxide (1310-58-3)	No	No	No	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----			
Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8 (d)
Potassium Hydroxide (1310-58-3)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No      TSCA 12(b): No      CDTA: No  
 SARA 311/312: Acute: Yes      Chronic: Yes      Fire: No      Pressure: No  
 Reactivity: Yes      (Pure / Liquid)

**Australian Hazchem Code: 2R****Poison Schedule: S6****WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

<b>SAMPLE</b>
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**16. Other Information**

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **1**

**Label Hazard Warning:**

POISON! DANGER! CORROSIVE. CAUSES SEVERE BURNS TO SKIN, EYES, RESPIRATORY TRACT, AND GASTROINTESTINAL TRACT. MATERIAL IS EXTREMELY DESTRUCTIVE TO ALL BODY TISSUES. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED.

**Label Precautions:**

Do not breathe mist.

Do not get in eyes, on skin, or on clothing.

Avoid breathing mist.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

**Label First Aid:**

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

MSDS Section(s) changed since last revision of document include: 3.

**Disclaimer:**

\*\*\*\*\*

**The information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.**

\*\*\*\*\*

**Prepared by:** Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

## SAMPLE

MSDS Number: **S3314** \* \* \* \* \* Effective Date: **08/10/04** \* \* \* \* \* Supersedes: **11/02/01**

<b>MSDS</b>	<b>Material Safety Data Sheet</b>	24 Hour Emergency Telephone: CHEMTREC: 1-800-424-9300
		National Response in Canada CANUTEC: 613-996-6666
		Outside U.S. And Canada Chemtrec: 703-527-3887
	NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.	

# SODIUM CHLORATE

## 1. Product Identification

**Synonyms:** Soda chlorate; chlorax; chloric acid, sodium salt**CAS No.:** 7775-09-9**Molecular Weight:** 106.44**Chemical Formula:** NaClO<sub>3</sub>**Product Codes:** 3616

## 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sodium Chlorate	7775-09-9	90 - 100%	Yes

<b>SAMPLE</b>
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### 3. Hazards Identification

#### Emergency Overview

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**DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. HARMFUL IF SWALLOWED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. EXPOSURE MAY CAUSE METHEMOGLOBINEMIA, LIVER OR KIDNEY DAMAGE.**

-----

Health Rating: 1 - Slight

Flammability Rating: 0 - None

Reactivity Rating: 3 - Severe (Oxidizer)

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Yellow (Reactive)

-----

#### Potential Health Effects

-----

##### Inhalation:

Inhalation of dust may cause irritation to the respiratory tract; symptoms may include sore throat, coughing, headache, and dizziness.

##### Ingestion:

Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. May cause abdominal pain, hemolysis, methemoglobinemia, cyanosis, anuria, coma, and convulsions. May cause liver and kidney damage. Death may occur from renal failure, generally in 4 days. Estimated lethal dose from 15 to 30 grams.

##### Skin Contact:

Causes irritation to skin. Symptoms include redness, itching, and pain.

##### Eye Contact:

Causes irritation, redness, and pain.

##### Chronic Exposure:

Repeated ingestion of small amounts may cause loss of appetite and weight loss. Chronic exposure may cause kidney effects.

##### Aggravation of Pre-existing Conditions:

No information found.

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<b>SAMPLE</b>
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#### 4. First Aid Measures

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:**

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

**Skin Contact:**

Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

#### 5. Fire Fighting Measures

**Fire:**

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. When heated, it releases oxygen which increases combustion.

**Explosion:**

Contact with oxidizable substances may cause extremely violent combustion. Sealed containers may rupture when heated. Sensitive to mechanical impact. Sensitive to static discharge.

**Fire Extinguishing Media:**

Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

#### 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

---

<b>SAMPLE</b>
---------------

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage and moisture. Isolate from any source of heat or ignition. Avoid storage on wood floors. Separate from incompatibles, combustibles, organic or other readily oxidizable materials. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

None established.

### **Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

### **Personal Respirators (NIOSH Approved):**

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerin, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

### **Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

### **Eye Protection:**

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

<b>SAMPLE</b>
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**9. Physical and Chemical Properties****Appearance:**

White crystals.

**Odor:**

Odorless.

**Solubility:**

100g/100ml water @ 20C (68F).

**Density:**

2.5

**pH:**

Aqueous solution is neutral.

**% Volatiles by volume @ 21C (70F):**

0

**Boiling Point:**

No information found.

**Melting Point:**

248C (478F)

**Vapor Density (Air=1):**

No information found.

**Vapor Pressure (mm Hg):**

No information found.

**Evaporation Rate (BuAc=1):**

No information found.

---

**10. Stability and Reactivity****Stability:**

Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**

May emit toxic chloride fumes when heated to decomposition. May emit toxic chloride fumes and sodium oxide when heated to decomposition.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Aluminum, strong acids, strong reducing agents, organic matter and other oxidizable substances.

**Conditions to Avoid:**

Heat, flame, ignition sources, shock, friction, incompatibles.

---

<b>SAMPLE</b>
---------------

**11. Toxicological Information**

Oral rat LD50: 1200 mg/kg. Skin rabbit LD50: > 10g/kg. Irritation data: skin rabbit 500mg/24 Hr mild. Eye rabbit 10mg mild. Investigated as a mutagen.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
-----			
Sodium Chlorate (7775-09-9)	No	No	None

**12. Ecological Information****Environmental Fate:**

When released into the soil, this material may leach into groundwater.

**Environmental Toxicity:**

No information found.

---

**13. Disposal Considerations**

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

**14. Transport Information****Domestic (Land, D.O.T.)**

-----

**Proper Shipping Name:** SODIUM CHLORATE

**Hazard Class:** 5.1

**UN/NA:** UN1495

**Packing Group:** II

**International (Water, I.M.O.)**

-----

**Proper Shipping Name:** SODIUM CHLORATE

**Hazard Class:** 5.1

**UN/NA:** UN1495

**Packing Group:** II

---



<b>SAMPLE</b>
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**15. Regulatory Information**

```

-----\Chemical Inventory Status - Part 1\-----
Ingredient                                     TSCA   EC     Japan  Australia
-----
Sodium Chlorate (7775-09-9)                 Yes   Yes   Yes     Yes

```

```

-----\Chemical Inventory Status - Part 2\-----

Ingredient                                     Korea  --Canada--
                                           DSL    NDSL   Phil.
-----
Sodium Chlorate (7775-09-9)                 Yes   Yes    No     Yes

```

```

-----\Federal, State & International Regulations - Part 1\-----
-SARA 302-      -SARA 313-----
Ingredient      RQ    TPQ      List  Chemical Catg.
-----
Sodium Chlorate (7775-09-9)      No    No       No     No

```

```

-----\Federal, State & International Regulations - Part 2\-----
-RCRA-      -TSCA-
Ingredient      CERCLA    261.33    8 (d)
-----
Sodium Chlorate (7775-09-9)      No       No       No

```

Chemical Weapons Convention: No      TSCA 12(b): No      CDTA: No  
 SARA 311/312: Acute: Yes      Chronic: Yes      Fire: No      Pressure: No  
 Reactivity: Yes      (Pure / Solid)

**Australian Hazchem Code: 1SE****Poison Schedule:** None allocated.**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

<b>SAMPLE</b>
---------------

**16. Other Information**

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **1** Other: **Oxidizer**

**Label Hazard Warning:**

DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. HARMFUL IF SWALLOWED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. EXPOSURE MAY CAUSE METHEMOGLOBINEMIA, LIVER OR KIDNEY DAMAGE.

**Label Precautions:**

Keep from contact with clothing and other combustible materials.

Store in a tightly closed container.

Remove and wash contaminated clothing promptly.

Wash thoroughly after handling.

Avoid contact with eyes, skin and clothing.

Avoid breathing dust.

Use only with adequate ventilation.

**Label First Aid:**

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases, get medical attention.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

**Disclaimer:**

\*\*\*\*\*

The information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

\*\*\*\*\*

**Prepared by:** Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

# HAZARDOUS MATERIALS TABLETOP EXERCISES MANUAL

\*\*\*\*\*

\* DANGEROUS \*

\*\*\*\*\*

FOR USE IN CONNECTION WITH UNIFORM DOMESTIC STRAIGHT BILL OF LADING ADOPTED BY CARRIERS I OFFICIAL, SOUTHERN WESTERN, AND ILLINOIS CLASSIFICATION TERRITORIES, March 15, 1922, AS AMENDED August 1, 1931, AND JUNE 15, 1941

## THIS MEMORANDUM

IS AN ACKNOWLEDGMENT THAT A BILL OF LADING HAS BEEN ISSUED AND IS NOT THE ORIGINAL BILL OF LADING AND A COPY OR DUPLICATE CONTAINING THE PROPERTY NAMED HEREIN AND IS INTENDED SOLELY FOR FILING OR RECORD.

RECEIVED, SUBJECT TO THE CLASSIFICATION AND TARIFFS IN EFFECT ON THE DATE OF THE ISSUE OF THIS BILL OF LADING.

AT \_\_\_\_\_

FROM \_\_\_\_\_

FROM THE PROPERTY DESCRIBED BELOW, IN APPARENT GOOD ORDER, EXCEPT AS NOTED (CONTENTS AND CONDITION OF CONTENTS UNKNOWN, MARKED, CONSIGNED, AND DESTINED AS INDICATED BELOW, WHICH SAID COMPANY (THE WORD COMPANY BEING UNDERSTOOD THROUGHOUT THIS CONTRACT AS MEANING ANY PERSON OR CORPORATION IN POSSESSION OF THE PROPERTY UNDER THE CONTRACT AGREES TO CARRY TO ITS USUAL PLACE OF DELIVERY AT SAID DESTINATION, IF ON ITS OWN ROAD OR ITS OWN WATER TUG, OTHERWISE TO DELIVER TO ANOTHER CARRIER ON THE ROUTE TO SAID DESTINATION. IT IS MUTUALLY AGREED, AS TO EACH CARRIER OF ALL OR ANY OF SAID PROPERTY OVER ALL OR ANY PORTION OF SAID ROUTE TO DESTINATION, AND AS TO EACH PARTY OR ANY TIME INTERESTED IN ALL OR ANY OF SAID PROPERTY, THAT EVERY SERVICE TO BE PERFORMED HEREUNDER SHALL BE SUBJECT TO ALL THE CONDITIONS NOT PROHIBITED BY LAW, SUBCHAPTER PRINTED OR WRITTEN, HEREIN CONTAINED, INCLUDING THE CONDITIONS ON BACK HEREOF, WHICH ARE HEREBY AGREED TO BY THE SHIPPER AND ACCEPTED FOR HIMSELF AND HIS PERSONS.

(MAIL OR STREET ADDRESS OF CONSIGNEE-FOR PURPOSE OF NOTIFICATION ONLY)

CONSIGNEE TO \_\_\_\_\_

DESTINATION \_\_\_\_\_ STATE OF \_\_\_\_\_ COUNTY OF \_\_\_\_\_

ROUTE \_\_\_\_\_

DELIVERING CARRIER FREIGHT

CAR INITIAL GXTT CAR NO. 3785

NO PACKAGES	DESCRIPTION OF ARTICLES SPECIAL MARKS, AND EXCEPTIONS	COMMODITY CODE NO.	WEIGHT	CLASS OF RATE	CHECK COLUMN
1 T/C	RQ, CHLORINE 2.3. UN1017, POISON GAS DOT-E: 7616 EMERGENCY CONTACT: CHEMTREC 800-424-9300	4904120	180,100 LBS.		

THIS IS TO CERTIFY THAT THE ABOVE DESCRIBED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION, ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

SIGNED: \_\_\_\_\_

IF THE SHIPMENT MOVES BETWEEN TWO PORTS BY A CARRIER BY WATER, THE LAW REQUIRES THAT THE BILL OF LADING SHALL STATE WHETHER IT IS "CARRIER'S OR SHIPPER WEIGHT."

NOTE-WHERE THE RATE IS DEPENDENT ON VALUE, SHIPPERS ARE REQUIRED TO STATE SPECIFICALLY IN WRITING THE AGREED OR DECLARED VALUE OF THE PROPERTY.

THE AGREED OR DECLARED VALUE OF THE PROPERTY IS HEREBY SPECIFICALLY STATED BY THE SHIPPER NOT TO BE EXCEEDED \$ \_\_\_\_\_

\_\_\_\_\_ PER \_\_\_\_\_

\_\_\_\_\_ SHIPPER \_\_\_\_\_ AGENT

PER \_\_\_\_\_ PER \_\_\_\_\_

## CHLORINE WAYBILL

GXTT 3785	WB NO: 800021	04/05	BILL RD: 712	CRL PREPAID
ORIG FSAC: 49097	ON JNCTN RR: CRL		ENTERED BY:	RR AT 99993
ORIG CITY: DALLAS	TX S7S			
SHIPPER: ACME RODUCTS & CHEMICALS INC			6-3-3	SHIPPER ACME PRO/CHEMIC
SHIPPER CITY/STATE:		DALLASCLEVAND	TX	
SHIP NO: Y67360				
DEST CITY: CHICAGO		IL	STA NUMBER	
CONSIGNEE: ACME INTERNATIONAL				
CONSIGNEE CITY/STATE: CHICAGO		IL		
SHIP NO: Y67360				
DEST CITY: CHICAGO		IL	STA NUMBER:	
CONSIGNEE: ACME WEST COAST				
CONSIGNEE CITY/STATE: RICHMOND		CA		
NOTIFY ON ARRIVAL: 717-/258-6440				
ROUTE: CRL -				
COMDTY: 4905414	F GAS	SPL	HND: DAN FG	
PROPER SHIPPING NAME: CHLORINE				
DOT HAZ CLASS:	2.3			
DOT HAZ CLASS:	2.3			
UN/NA NO.: UN1017				
ENDORSEMENT: DANGEROUS				
RQ CHLORINE				
DOT-E: 7616				
CAS: 7782-50-5				
PLACARDED: POISON GAS				
EMERGENCY CONTACT: CHEMTREC		EMERGENCY RESP PHONE: 8004249300		
HM				
HAZMAT STCC=				
000001 UNT CHLORINE		TOTAL: 00180000 00180000		
WEIGH CD: AGREEMENT WEIGHT----DO NOT CORRECT				
MAIL F/B TO: ACME PRODUCTS & CHEMICALS ATTN ACCTS PAYABLE CLEVELAND OH				
OTHER CONTRACTS: CSXT55572				
CUSTOMER ORDER NUMBER: XC66093BP6/006				
END				
END				

# HAZARDOUS MATERIALS TABLETOP EXERCISES MANUAL

\*\*\*\*\*

\* DANGEROUS \*

\*\*\*\*\*

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FROM \_\_\_\_\_

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CONSIGNEE TO \_\_\_\_\_

DESTINATION \_\_\_\_\_ STATE OF \_\_\_\_\_ COUNTY OF \_\_\_\_\_

ROUTE \_\_\_\_\_

DELIVERING CARRIER FREIGHT

CAR INITIAL GXTT CAR NO. 3785

NO PACKAGES	DESCRIPTION OF ARTICLES SPECIAL MARKS, AND EXCEPTIONS	COMMODITY CODE NO.	WEIGHT	CLASS OF RATE	CHECK COLUMN
1 R/C	POTASSIUM HYDROXIDE SOLUTION 8; UN1814, CORROSIVE DOT E:: 10878 EMERGENCY CONTACT: CHEMTREC 800-424-9300	1310583	205,180 LBS		

THIS IS TO CERTIFY THAT THE ABOVE DESCRIBED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION, ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

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\_\_\_\_\_ PER \_\_\_\_\_

\_\_\_\_\_ SHIPPER \_\_\_\_\_ AGENT

PER \_\_\_\_\_ PER \_\_\_\_\_

## POTASSIUM HYDROXIDE WAYBILL

GXTT 3802	WB NO: 800027	04/05	BILL RD: 847	CRL PREPAID
ORIG FSAC: 49097	ON JNCTN RR: CRL		ENTERED BY:	RR AT 9936
ORIG CITY: DALLAS	TX S7S			
SHIPPER: ACME RODUCTS & CHEMICALS INC			6-3-3	SHIPPER ACME PRO/CHEMIC
SHIPPER CITY/STATE:		DALLASCLEVAND	TX	
SHIP NO: Y67360				
DEST CITY: CHICAGO		IL	STA NUMBER	
CONSIGNEE: ACME INTERNATIONAL				
CONSIGNEE CITY/STATE: CHICAGO		IL		
SHIP NO: Y67360				
DEST CITY: CHICAGO		IL	STA NUMBER:	
CONSIGNEE: ACME WEST COAST				
CONSIGNEE CITY/STATE: RICHMOND		CA		
NOTIFY ON ARRIVAL: 717-/258-6440				
ROUTE: CRL -				
COMDTY: 4904120	F SOLUTION	SPL	HND: DAN FG	
PROPER SHIPPING NAME: POTASSIUM HYDROXIDE				
DOT HAZ CLASS:	2.31			
DOT HAZ CLASS:	2.31			
UN/NA NO.: UN1814				
ENDORSEMENT: DANGEROUS				
RQ CHLORINE				
DOT-E: 7616				
CAS: 1310-58-3				
PLACARDED: POISON GAS				
EMERGENCY CONTACT: CHEMTREC		EMERGENCY RESP PHONE: 8004249300		
HAZMAT STCC= 49043860				
000001 UNT POTASSIUM HYDROXIDE		TOTAL: 00205180 00205180		
WEIGH CD: AGREEMENT WEIGHT----DO NOT CORRECT				
MAIL F/B TO: ACME PRODUCTS & CHEMICALS ATTN ACCTS PAYABLE CLEVELAND OH				
OTHER CONTRACTS: CSXT55572				
CUSTOMER ORDER NUMBER: XC66H73BP6/022				
END				
END				

# HAZARDOUS MATERIALS TABLETOP EXERCISES MANUAL

\*\*\*\*\*

\* DANGEROUS \*

\*\*\*\*\*

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CONSIGNEE TO \_\_\_\_\_

DESTINATION \_\_\_\_\_ STATE OF \_\_\_\_\_ COUNTY OF \_\_\_\_\_

ROUTE \_\_\_\_\_

DELIVERING CARRIER FREIGHT

CAR INITIAL GXTT CAR NO. 3785

NO PACKAGES	DESCRIPTION OF ARTICLES SPECIAL MARKS, AND EXCEPTIONS	COMMODITY CODE NO.	WEIGHT	CLASS OF RATE	CHECK COLUMN
1 H/C	SODIUM CHLORATE 5.1, OXIDIZER DOT E: 10985 EMERGENCY CONTACT: CHEMTREC 800-424-9300	77750909	221,400 LBS		

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PER \_\_\_\_\_

SHIPPER \_\_\_\_\_ AGENT \_\_\_\_\_

PER \_\_\_\_\_ PER \_\_\_\_\_

## SODIUM CHLORATE WAYBILL

GXTT 3785	WB NO: 800021	04/05	BILL RD: 772	CRL PREPAID
ORIG FSAC: 49097	ON JNCTN RR: CRL		ENTERED BY:	RR AT 98712
ORIG CITY: DALLAS	TX S7S			
SHIPPER: ACME RODUCTS & CHEMICALS INC			6-3-3	SHIPPER ACME PRO/CHEMIC
SHIPPER CITY/STATE:		DALLASCLEVAND	TX	
SHIP NO: Y67471				
DEST CITY: CHICAGO		IL	STA NUMBER	
CONSIGNEE: ACME INTERNATIONAL				
CONSIGNEE CITY/STATE: CHICAGO		IL		
SHIP NO: Y67471				
DEST CITY: CHICAGO		IL	STA NUMBER:	
CONSIGNEE: ACME WEST COAST				
CONSIGNEE CITY/STATE: RICHMOND		CA		
NOTIFY ON ARRIVAL: 717-/258-6440				
ROUTE: CRL -				
COMDTY: 77750909	F POWDER	SPL	HND: DAN FG	
PROPER SHIPPING NAME: SODIUM CHLORATE				
DOT HAZ CLASS:	5.1			
DOT HAZ CLASS:	5.1			
UN/NA NO.: UN1495				
ENDORSEMENT: DANGEROUS				
RQ CHLORINE				
DOT-E: 3616				
CAS: 7775-09-9				
PLACARDED: OXIDIZER				
EMERGENCY CONTACT: CHEMTREC		EMERGENCY RESP PHONE: 8004249300		
HAZMAT STCC= 4904120				
000001 UNT SODIUM CHLORATE		TOTAL: 00221400 00221400		
WEIGH CD: AGREEMENT WEIGHT----DO NOT CORRECT				
MAIL F/B TO: ACME PRODUCTS & CHEMICALS ATTN ACCTS PAYABLE CLEVELAND OH				
OTHER CONTRACTS: CSXT55572				
CUSTOMER ORDER NUMBER: XC66182BP6/013				
END				
END				



## TRAIN CONSIST

(CARS IN THIS CONSIST COUNT FROM FRONT TO REAR)

001	SP	8639	ENG	N F EF630		SD40M EF
002	SP	7319	ENG	N F EF630		SD402 EF
003	SP	7331	ENG	N B EF630		SD402 EF
004	SP	9218	ENG	N B EF632B		S45TB EF
001	GATX	67880	L	T5D	X	LUBOIL
002	SP	246362	L	A64	X	GYPPRD
003	ACFX	54348	L	C5P	B	PLASTC
004	GOCX	58775	L	C5P	B	PLASTC
005	ACFX	75943	L	T4B	X	KAOLIN
006	GXTT	3785	L	R5C	R	HM
*****						180100 LB
* DANGEROUS						CHLORINE
* *****						
EMERGENCY CONTACT: 1-800-424-9300						
007	CHVX	890269	L	C5P	B	PLASTC
008	UTLX	67850	L	T4C	X	CHEMLS
009	CHVX	280953	L	T5D	X	CHEMLS
010	GATX	26107	L	T5C	H	HM
*****						205180 LB
* DANGEROUS						POTASSIUM HYDROXIDE
* *****						SOLUTIONS
EMERGENCY CONTACT: 1-800-424-9300						
011	BN	222698	L	B24	M	FRTNOS
012	MSDR	81026	L	R5C	R	HM
*****						20,000 LB
* DANGEROUS						SODIUM CHLORATE
* *****						CRYSTALLINE POWDER

# HAZARDOUS MATERIALS TABLETOP EXERCISES MANUAL

EMERGENCY CONTACT: 1-800-424-9300

5.1  
UN14952015  
PACKING GROUP II  
PLACARDED: OXIDIZER  
SHIPPER CONTACT: CHEMTREC  
HAZMAT STCC=

013	UTLX	71366	E	T4C	E	
014	GATX	21291	L	T4C	X	CS OIL
015	CGSX	14	E	T56	E	
016	KCS	122384	L	A7E	X	SHINGL
017	KCS	172292	L	A6E	X	FIBBRD
018	NDM	124103	L	T5C	X	VEGOIL
019	BN	250254	L	A23	X	GYPSUM
020	SSW	79225	L	C3C	X	FIBBRD
021	VCY	181117	L	AB6	X	FIBBRD
022	SSW	59295	L	ABD	X	FIBBRD
023	VCY	172426	L	AB6	X	FIBBRD
024	VCY	172419	L	AB6	X	FOBBRD
028	UTLX	48584	E	T5E	E	
029	PPU	2344	L	G5C	X	STLBAR
030	SPFE	457119	L	R5C	R	CHICKN
031	VCY	25141	L	R5C	R	CHICKN FBO

HAZARDOUS COMMODITIES – EMERGENCY RESPONSE INFORMATION

006 GXTT 3785 - LOAD

CHLORINE

DIVISION 2.3 (POISON GAS)

UN1017

ENVIRONMENTALLY HAZARDOUS SUBSTANCE (MP)

PLACARDED POISON GAS

STCC

4904120

CHLORINE IS A GREENISH YELLOW COMPRESSED GAS THAT IS SHIPPED UNDER PRESSURE AS A LIQUID. IT HAS AN IRRITATING BLEACH LIKE CHOKING ODOR. IT IS IRRITATING AND CORROSIVE TO BODY TISSUE. THE GAS IS HEAVIER THAN AIR AND MAY COLLECT IN LOW-LYING AREAS. IT SINKS AND BOILS IN WATER TO CREATE A POISONOUS, VISIBLE VAPOR CLOUD. IT IS NOT FLAMMABLE, BUT MAY CAUSE FIRE WHEN IN CONTACT WITH COMBUSTIBLES.

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. KEEP PEOPLE AWAY AND AVOID CONTACT WITH LIQUID OR VAPOR. SYMPTOMS FOLLOWING EXPOSURE INCLUDE EYE IRRITATION, SNEEZING, COPIOUS SALIVATION, GENERAL EXCITEMENT AND RESTLESSNESS. IRRITATION MAY PERSIST FOR SEVERAL DAYS. HIGH CONCENTRATIONS CAUSE RESPIRATORY DISTRESS AND VIOLENT COUGHING OFTEN WITH RETCHING. DEATH MAY RESULT FROM SUFFOCATION.

IF MATERIAL ON FIRE

POISONOUS GASES ARE PRODUCED IN FIRES.

STOP FLOW OF GAS IF POSSIBLE.

COOL EXPOSED CONTAINERS AND PROTECT PERSONNEL EFFECTING SHUTOFF WITH WATER

TOXIC PRODUCTS ARE GENERATED WHEN COMBUSTIBLES BURN IN CHLORINE.

IF MATERIALS NOT ON FIRE AND NOT INVOLVED IN FIRE

MAY CAUSE FIRE ON CONTACT WITH COMBUSTIBLES.

MAY BE DANGEROUS IF IT ENIGERS WATER INTAKES.

DILUTE AND DISPERSE DISCHARGE

DO NOT ADD WATER TO UNDISSOLVED MATERIAL

MATERIAL FORMS A CORROSIVE SOLUTION WITH WATER

REACTS VIGOROUSLY WITH MOST METALS AT HIGH TEMPERATURE.

## HAZARDOUS MATERIALS TABLETOP EXERCISES MANUAL

### PERSONNEL PROTECTION

AVOID BREATHING VAPORS  
KEEP UPWIND  
WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS  
WEAR APPROPRIATE CHEMICAL PROTECTIVE CLOTHING  
DO NOT ENTER SPILL AREA UNLESS WEARING APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT.  
WASH AWAY ANY MATERIAL WHICH MAY HAVE CONTACTED THE BODY WITH COPIOUS AMOUNTS OF SOAP AND WATER.

### EVACUATION

IF MATERIAL LEAKING (LARGE DISCHARGE) CONSIDER EVACUATION FROM DOWNWIND AREA BASED ON AMOUNT OF MATERIAL SPILLED, LOCATION, AND WEATHER CONDITIONS.

POTASSIUM HYDROXIDE  
DIVISION 8 (CORROSIVE)  
PLACARDED CORROSIVE  
STCC

UN 1814

1310583

POTASSIUM HYDROXIDE IS A CLEAR, COLORLESS, ODORLESS SOLUTION. IT IS A RESPIRATORY TRACT IRRITANT AND MAY CAUSE SERIOUS BURNS ON ACUTE CONTACT. IT IS CORROSIVE TO MUCOUS MEMBRANES AND MAY CAUSE PERFORATION OF THE ESOPHAGUS AND STOMACH. IT IS A SKIN AND EYE IRRITANT AND MAY BE CORROSIVE IF CONTACT IS PROLONGED. POTASSIUM HYDROXIDE IS NO CONSIDERED TO BE A FIRE OR EXPLOSION HAZARD.

AVOID CONTACT. SYMPTOMS FOLLOWING EXPOSURE INCLUDE EYE IRRITATION, CAUGHING AND SNEEZING, ABDOMINAL PAIN, NAUSEA, VOMITING, AND GENERAL GASTROINTESTINAL UPSET. IF INHALED REMOVE TO FRESH AIR. APPLY OXYGEN, IF BREATHING IS DIFFICULT. IF INGESTED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. IN CASE OF SKIN OR EYE CONTACT, FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

### IF MATERIAL IS ON FIRE

USE ANY MEANS SUITABLE FOR EXTINGUISHING SURROUNDING FIRE. AVOID DIRECT CONTACT OF LIQUID WITH WATER.  
IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

SODIUM CHLORATE  
DIVISION 5.1 (OXIDIZER)  
PLACARDED OXIDIZER  
STCC

UN 1495

77750909

SODIUM CHLORATE IS WHITE, ODORLESS CRYSTALS THAT IS STABLE UNDER ORDINARY CONDITIONS OF USE AND STORAGE. IT MAY EMIT TOXIC CHLORIDE FUMES WHEN HEATED TO DECOMPOSITION. IT IS INCOMPATIBLE WITH ALUMINUM, STRONG ACIDS, STRONG REDUCING AGENTS, ORGANIC MATTER AND OTHER OXIDIZABLE SUBSTANCES. AVOID HEAT, FLAME, IGNITION SOURCES, SHOCK, FRICTION, AND INCOMPATIBLES.

STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. HARMFUL IF SWALLOWED. CAUSES IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. EXPOSURE MAY CAUSE METHEMOGLOBINEMIA, LIVER OR KIDNEY DAMAGE. IF SWALLOWED, INDUCE VOMITING IMMEDIATE AS DIRECTED BY MEDICAL PERSONNEL. IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

### IF MATERIAL IS ON FIRE

USE ANY MEANS SUITABLE FOR EXTINGUISHING SURROUNDING FIRE. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL.  
IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

## **Exercise 3 Evaluator's Worksheets**

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### EXERCISE 3 EVALUATOR'S WORKSHEET

**Instructions:** Use the worksheets below as a guide to evaluating team performance on Tabletop Exercise 3.

<b>Objective 1: Demonstrate the ability to direct, coordinate, and control emergency activities using the ICS.</b>			
	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
Did the participants. . .			
▪ Establish the initial incident command structure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Activate the EOC?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Deploy backup resources for HazMat team personnel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request that the EOC coordinate with hospitals in the surrounding jurisdictions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Brief private sector and government officials and coordinate efforts of all response agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request that the EOC resolve the pet problem in coordination with area veterinarians and those who assist animals in times of disaster.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify the railroad of the victims' needs for shelter, food, and other amenities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Relocate the Incident Command Post and shelter outside the risk area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Assign a liaison to work with school officials to develop a reentry plan that includes safety checks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Provide the information needed by city officials to determine whether to request State and/or Federal assistance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Consult with railroad officials concerning the extent of additional damage from the latest incident?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			

### TABLETOP 3 EVALUATOR'S WORKSHEET (CONTINUED)

<b>Objective 2: Demonstrate the ability to alert and activate personnel for emergency response and maintain operations until the situation is brought under control.</b>			
	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
Did the participants. . .			
▪ Dispatch initial response resources in a timely manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request additional resources to assist with the evacuation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify the appropriate regulatory agencies and elected officials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Make necessary notifications regarding the fatalities, including notification of the environmental agency for possible soil contamination?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request specialists to stop the chemical leak?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine the expected arrival time for those deployed for containment and offloading operations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request resources to assist with evacuation of persons with special needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Direct the resource manager to resolve the unsolicited resource issue?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine specific supply needs and process the request expeditiously?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b><u>Comments:</u></b>			

### TABLETOP 3 EVALUATOR'S GUIDE (CONTINUED)

<b>Objective 3: Demonstrate the ability to mobilize, track, and demobilize equipment, people, and other resources in support of emergency operations.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Determine resource needs and request resources as needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Deploy chemical monitoring devices?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Evaluate the need for additional resources to deal with traffic control?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Obtain required monitors to replace those in use at various monitoring sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>			
<b>Objective 4: Develop and maintain a coordinated action plan to accomplish operational objectives.</b>			
Did the participants. . .	<b>Yes</b>	<b>No</b>	<b>Not Observed</b>
▪ Complete an initial sizeup and set up a staging area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Investigate the other two rail cars containing hazardous materials to determine if they are ruptured?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Brief railroad responders and develop a joint strategy for containment and offloading?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Reevaluate areas at risk and implement a revised evacuation strategy based on the assessment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Plan for a possible transfer of command?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Begin planning for long-term operations, including the rotation of personnel and taking care of personal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Begin reentry planning? Notify the EOC of the indefinite timetable for reentry and sheltering?			
<b>Comments:</b>			

## TABLETOP 3 EVALUATOR'S GUIDE (CONTINUED)

<b>Objective 5: Identify and implement appropriate actions to protect emergency workers and the public.</b>			
Did the participants. . .	Yes	No	Not Observed
▪ Use the ERT to determine the risks posed by the hazards and safe distances?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Order evacuation per ERG guidelines and establish control zones?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Determine the appropriate PPE level, and verify that all responders have these resources and are using them?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish accountability for train crew, automobile occupants, emergency response personnel, and others?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set up decontamination stations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Restrict access to the hot zone to HazMat personnel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Triage, decontaminate, treat, and transport the victims to medical facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Notify medical facility(ies) to expect numerous casualties?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request the EOC establish a helpline that people can call for assistance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Instruct the EOC to activate shelters and provide information on locations to responders and the public?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request the EOC set up a telephone number and safe area where victims' relatives can obtain information on the status of loved ones?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Ensure that the railroad company has taken steps to halt all incoming train traffic?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Monitor responder safety throughout the entire response?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Consult with technicians to monitor air quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## TABLETOP 3 EVALUATOR'S GUIDE (CONTINUED)

**Objective 5:** Identify and implement appropriate actions to protect emergency workers and the public.

**Comments:**

**Objective 6:** Coordinate and disseminate timely and accurate information to the media and the public.

Did the participants. . .	Yes	No	Not Observed
▪ Request the PIO to prepare an EAS message that includes evacuation and sheltering information?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Activate other public warning systems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Have the PIO brief the media and update EAS messages, including protective measures for the public?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Task the PIO or other appropriate staff with providing information to the mayor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Request the PIO to issue a message about where medical treatment is available for those exposed to the chemical?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish a Joint Information Center?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
▪ Prepare and disseminate a media release to provide updated information on chlorine exposure and the current situation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comments:**

## **Appendix C: Participant Copies of Messages**

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**PARTICIPANT COPIES OF MESSAGES**

This appendix includes copies of the exercise messages that you can copy and distribute to the exercise participants. Each message is included on its own page for your ease in copying.

**BACKGROUND INFORMATION AND INCIDENT SCENARIO**

**Background Information**

Westport, with a population of 55,000 (which can nearly double during tourist season), covers 18 square miles. The city has two hospitals and a large outpatient medical center. The city is an important three-track rail stop with extensive engine servicing and repair. The stop also includes food and other facilities for passenger trains. The city has a bustling historical district that draws visitors from all across the Nation.

**Incident Scenario**

It is 12:30 p.m. on Saturday, September 28. The temperature is an unusually warm 80 degrees, with a light southerly wind. Westport's Fall Art Fest is in full swing, with the historical district hosting a renowned art show featuring novice and accomplished artists. In addition to art, the festival also features gourmet food tasting and light harvest-style fare. Crafters, artisans, food vendors, and Historical Society members in costumes representing the city's heyday populate the eight-block downtown area. North Clark Street is blocked for an antique car show, and Westport Fire Company is hosting a display of antique fire trucks. The Chamber has contracted several bus companies to shuttle visitors to and from remote parking areas. This being an election year, the Governor of New Columbia, along with a State Senator and the district's State Representative, will ensure a large crowd on the steps of City Hall at the corner of Washington and South LaFayette Streets, as they appear for an old-fashioned political rally, scheduled for 3 p.m. Special police details have been established at the downtown railroad grade crossings to ensure motorist and pedestrian safety.

A four-engine freight train northbound and pulling 42 cars, hauling everything from fiberboard to hazardous materials, has entered Westport's southern city limits and is proceeding at 20 miles per hour toward the grade crossing with Washington Street. The train collides with a four-door car filled with passengers trying to cross over the tracks to the festival. Spectators hear the screech of the locomotive's wheels as the emergency brakes are applied. They watch, as if in slow motion, as several cars of the train begin to derail and the automobile is pushed down the tracks.

### MESSAGE 1

It is 12:33 p.m. A police officer on traffic detail radios to the Dispatch Center that a train has collided with a car at the Washington Street crossing. The officer tells the dispatcher that a cloud of greenish smoke is coming from beneath a derailed car.

Some people in the area are running toward the scene of the accident to see what is happening.



### MESSAGE 2

At 12:35 p.m., the Communications Center is receiving many calls from the downtown area stating that a greenish-yellow cloud is coming from the train wreck. There are many reports of people having difficulty breathing and some appear to be unconscious.

Other reports are coming in of fatalities in the car and perhaps on the train. A local news reporter attending the festival is describing people running from the downtown area with hands folded over their faces coughing violently.

First responders approach the area to find a large cloud emanating from the wreckage and people rushing away from the scene indicating they smell a bleach like odor.



### MESSAGE 3

At 12:47 p.m., the HazMat team discovers there are 6 fatalities and 15 people who need immediate assistance.

The chemical continues to leak and appears to be the result of a catastrophic rupture to the pressurized tank.

Reports of major telephone and electrical outages.

Traffic on the surrounding streets comes to a halt as motorists are trying to navigate through the area.

People are showing up at emergency rooms and other medical facilities complaining of burning eyes and nose, lung irritation and inflammation, sore throats, difficulty breathing, wheezing, coughing up yellow or green sputum, nose bleeds, headaches and dizziness, depression, and anxiety.

### MESSAGE 4

The time is now 12:55 p.m. Crowds of panicking visitors are attempting to leave the area and seek shelter and information.

The city Dispatch Center informs the IC of the expected 1:30 p.m. arrival of a northbound passenger train.

Responders assisting with the evacuation report that there are numerous people who need special transportation (i.e. wheelchair bound, on oxygen, bed ridden, hearing and visually impaired,)

The mayor wants to know what he should tell residents in his upcoming news briefing. Specifically, the mayor wants to know the number of fatalities and injured, what chemical is involved, what people are to do, who is at fault, and how long will it be until people can go back in the area

The leak is proving to be a real challenge and projections are that it is going to take at least another 24 hours before there is significant change in the toxicity of the air.

A fight has ensued among motorists who are frustrated at having to sit in a huge traffic backup.



### MESSAGE 5

By 2 p.m., the IC has received copies of the train consist. The ruptured tank car contains 180,000 pounds of chlorine. According to the consist, two cars behind the chlorine car are involved in the derailment. One car contains 205,180 pounds of potassium hydroxide and the other contains 20,000 pounds of sodium chlorate.

The railroad company response team arrives at 2:30 p.m. to help with the leak containment and offloading.

There is much concern about the release of chlorine into the ground water because of the magnitude of the leak at the site of the rupture.

Hospitals are reporting that they cannot take any more patients.

A responder reports that there is a puncture in his suit and he needs a backup.

The evacuation of special needs groups is progressing slowly.

The leak continues even with best efforts to stop it.

### MESSAGE 6

At 5:30 p.m., news media are gathering at the perimeter of the scene. One newscaster interviews a family who plans to catch the northbound passenger train schedule to arrive at 6:20 p.m. Based on this report, the newscaster speculates that another accident is soon to occur and reports this as part of a live broadcast.

It is determined by responders who examined the wreckage that the other derailed cars, while damaged, are not compromised.

PIOs from the various government and private organizations involved in the response are freelancing and putting out conflicting information.

Many people are showing up at the scene and want to know about loved ones that they speculate were in the area at the time of the accident.

Response personnel from EPA, National Transportation Safety Board (NTSB), United States Department of Transportation (USDOT), and Federal Railroad Administration begin arriving at the scene around 6 p.m. and each one wants to speak with the IC.

Several reports are coming into the Dispatch Center concerning pets that are wheezing and having difficulty breathing.

It is now estimated that it will be at least 3 days before people can return to their homes. Victims are complaining that they do not want to stay in shelters nor leave their pets behind. They are asking if the company should not do something about this situation as it is not their fault they had to leave their homes.

Representatives from surrounding jurisdictions have dispatched unsolicited resources to the scene and are interfering with response operations.

### MESSAGE 7

At 9:05 p.m., the city officials want to know if it is time to request a Federal Disaster Declaration. It is expected it will be 48 hours until the air will reach safe levels and the costs of responding to the event are escalating.

There is a rumor circulating that the railroad company has representatives at the scene dispensing emergency assistance money. The crowds are growing and the lines are getting long.

A responder brings it to the IC's attention that the monitors in use are not designed to show actual levels of chlorine in the ambient air.

Concerns are being voiced about chlorine infiltrating dwellings in the area. The school system has also requested the fire department thoroughly inspect each school following the incident.

The direction of the wind has changed and the speed has increased to 20 mph. Heavy rains have started to fall. People outside of the immediate evacuation area are now calling 911 to report greenish-yellow clouds approaching their homes. The command post and a shelter are located in this direction.



### MESSAGE 8

It is 11:15 p.m. and first responders are in need of additional supplies for decontaminating personnel and equipment.

Issues are being raised by responders and the public regarding the long-term effects of chlorine exposure.

Residents are complaining about the lack of railroad crossing-arm devices and warning lights at the intersection of Washington Street that may have prevented the accident.

The railroad company has contacted the IC to let him know the clean-up contractor has arrived. The contractors would like to know if there are any local disposal sites in the area.

At midnight, the IC is advised that there has been a small accident during the off-loading procedure releasing an additional amount of chlorine.