Chapter 13 – Hazard Communication

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13.1 Foreword
The County of Santa Clara is committed to protecting county employees from exposure to hazardous materials in the workplace. This Hazard Communication Program describes proper use of hazardous materials in the work place so that employees, supervisors, and visitors can work together to ensure everyone’s safety.

13.2 Introduction
“Hazard Communication” as defined by California law is limited in scope to hazardous materials such as solvents, pesticides, and flammable liquids. This document does not include communication regarding other worksite hazards such as mechanical hazards, electricity, disease exposure, etc. These hazards are covered in other documents contained in the County’s Occupational Injury and Illness Prevention Program.

This document describes the County's Hazard Communication Program, including signs and labels, Material Safety Data Sheets, and training.

This Program will help supervisors compile work site-specific information to share with their employees. It will help employees understand how to protect themselves from exposure to hazardous materials at their work sites.

13.3 Hazard Communication Requirements
California has two primary laws governing hazard communication:

The general Hazard Communication Regulation\(^1\) enforced by Cal/OSHA applies to all California employers whose employees may be exposed to hazardous materials except for pesticides found in the workplace under normal or reasonably foreseeable emergency conditions (i.e., spill or release of a chemical).

Hazard communication for pesticides is required under a separate law\(^2\) enforced by the County Agriculture Commissioner. Since “pesticides” include all disinfectants used in clinics, hospitals, etc., many County operations use pesticides daily.

These two laws requiring a hazard communication program are very similar, and \textit{this document incorporates the requirements of both laws}.

As a California employer, the County must provide and maintain this program in all work areas where employees may be exposed to hazardous materials or pesticides.

13.3.1 Exclusions
Federal hazardous materials regulations do not require additional labeling for food and alcohol, drug and additive products, and consumer products.

The following materials are exempt from the Cal/OSHA and Agriculture regulations:

\(^1\) \textit{California Administrative Code, Title 8, section 5194}

\(^2\) \textit{California Code of Regulation, Division 6, Chapter 3, subchapter 2, article 1}
• Hazardous Wastes (regulated by EPA and others - see the sources listed at the end of this document for more information).

• Tobacco Products.

• Wood and Wood Products (not exempt are hazardous materials used in association with wood or wood dust).

• Articles (manufactured items). Not exempt are hazardous materials used in the article.

• Food, drugs and cosmetics kept by employees for personal use.

• Retail Trade Establishments (except for processing and repair work areas).

• Consumer products sold at retail for personal use. If a retail product is used at work, regulations apply.

13.3.2 Written Hazard Communication Program
The law requires a written Hazard Communication Program (this document). The Program should be concise, understandable, accurate and must contain:

• Labeling, Material Safety Data Sheets, and Employee Training.

• A list of hazardous materials in the workplace.

• Hazards of non-routine tasks.

• Hazards of chemicals in unlabeled pipes.

• The protection of contract employees.

• Pesticide application records.

13.4 Roles and Responsibilities
Everyone has a role to play in the Hazard Communication Program. This section outlines the roles and responsibilities of all County employees.

13.4.1 Health Department (Environmental Health Services)
• Enforces various laws governing the storage and use of hazardous materials.

13.4.2 Agency/Department Head
• Ensures that supervisors implement the Hazard Communication Program.

13.4.3 First Line Supervisor
• Completes and maintains the written Hazard Communication Program for each worksite.
• Keeps an up to date Material Safety Data Sheet for each product containing a hazardous material, and makes these sheets available to employees. The MSDS will be the most current one supplied by the manufacturer, importer or distributor. Supervisors may use the sample MSDS request letter (Appendix A) to request a MSDS from a manufacturer or distributor.

• Maintains a complete inventory of products containing hazardous materials used at the work area. The inventory Sheet shown in Appendix B may be used for this purpose.

• Prevents the use or distribution of products containing a hazardous material until containers are clearly labeled, hazard warnings are affixed, and the name and address of the manufacturer has been listed.

• Takes special precaution with pesticides (See Appendix C).

• Completes a hazardous materials implementation checklist (Appendix D) to assure full compliance with the Hazard Communication program.

• Ensures that employees are trained specifically about the proper handling of hazardous materials in their work area.

• Provides employees with protective equipment and clothing as needed.

• Makes sure that employees use protective equipment and clothing when they work with hazardous materials.

• Works with GSA Risk Management to determine whether a respiratory protection program is needed if Material Safety Data Sheets or other information indicates that a material poses a respiratory hazard.

13.4.4 Employee
• Remains alert for potential hazards of materials at their work sites, and tells his or her supervisor of suspected hazards.

• Understands and refers to Material Safety Data Sheets for specific hazards of materials he or she works with.

• Follows safe work practices (including the use of protective equipment and clothing) when working with hazardous materials.

• Actively participates in training concerning hazardous materials.

13.4.5 Purchasing
• Upon request, provides the name and address of manufacturers of products bought through GSA Purchasing. Forwards MSDSs to the user department.

13.4.6 ESA Risk Management
• Inspects work areas.

• Helps supervisors conduct or arrange for on-site training for employees.
• Prepares and maintains the Countywide Written Hazard Communication Program.

13.4.7 Facility Manager
• Provides information on hazardous materials to contractors who might encounter such materials while performing maintenance, repairs, or minor construction at the facility.

13.5 Hazard Determination

13.5.1 Hazardous materials
What causes a material to be classified as hazardous? Manufacturers and importers assess the physical and health hazards of their products in accordance with federal and state regulations to determine whether or not a product is hazardous.

OSHA has adopted the following definition: "The term hazardous material means a material which has one or more of the following characteristics:

1) has a flash point below 140°F., closed cup, or is subject to spontaneous heating;
2) has a threshold limit value below 500 ppm for gases and vapors, below 500 mg/m for fumes, and below 25 mppcf for dusts;
3) a single dose oral LD50 below 500 mg/kg;
4) is subject to polymerization with the release of large amounts of energy;
5) is a strong oxidizing or reducing agent;
6) causes first degree burns to skin in short time exposure, or is systemically toxic by skin contact; or
7) in the course of normal operations, may produce dusts, gases, fumes, vapors, mists, or smokes that have one or more of the above characteristics."

Hazardous materials are listed in:

• The Director's List of Hazardous Substances (Section 339 of Title 8, California Administrative Code).
• Threshold Limit Values for Chemical Substances in the Work Environment, American Conference of Governmental Industrial Hygienists (ACGIH), 1984.
• National Toxicology Program (NTP), Third Annual Report on Carcinogens, 1983.
• International Agency for Research on Cancer (IARC), Monographs, Vols, 1-34.

A hazardous material can also include any other material that presents a physical or health hazard(s) as determined by scientific evidence.
You can also tell if a material is hazardous by reviewing the information provided by the manufacturer. If the label indicates a hazard or if the product comes with a Material Safety Data Sheet, you should consider the product to be hazardous. (Manufacturers and importers must label hazardous materials and ship them with a Material Safety Data Sheet.)

NOTE: Sometimes Material Safety Data Sheets are lost or not provided. If you do not receive a Material Safety Data Sheet do not assume a material is safe. If you are in doubt as to the safety of a material, contact the manufacturer or one of the resources listed at the end of this document.

13.5.2 Pesticides

How can you tell if a material is a pesticide? Pesticides are required by the Environmental Protection Agency to list an “EPA Registration Number” on the container. Therefore, if you see “EPA Reg. No.” on the container, you know it is a pesticide. Also, if the product claims to “kill germs” it is a pesticide since disinfectants are pesticides.

A WORD OF CAUTION: some manufacturers avoid regulation by selling products commonly used as disinfectants (such as bleach) without registering them as pesticides. These products will say, “cleans”, brightens”, etc. (anything but “kills germs”). The label will not include an EPA Registration Number. It is illegal to use such a “cleaner” as a disinfectant.

It is against County policy for employees to bring pesticides into the workplace. The only County employees authorized to apply pesticides on County property must have this element written into their job description as part of their duties.

Appendix C contains additional information on pesticide use.

13.5.3 Exposure Assessment

The first task in the workplace is an exposure assessment to identify harmful airborne contaminants, their extent and magnitude, and how to control them. We must ensure that employee exposure does not exceed permissible concentrations. This often requires a person who is professionally trained to evaluate the processes and procedures and to conduct exposure monitoring. The evaluation of the respiratory hazard(s) shall include a reasonable estimate of employee exposures to respiratory hazards and an identification of the contaminant’s chemical state and physical form. (Where the evaluation cannot identify or reasonably estimate the employee exposure, the atmosphere shall be considered to be immediately dangerous to life and health (IDLH)). Results of these evaluations are to be documented. Additional evaluations are necessary if exposures change due to new materials, process changes or other conditions increasing the degree of employee exposure or stress.

13.5.4 Determine if There Are Safe Alternatives to Hazardous Materials

Full compliance with hazardous materials regulations can be time consuming and costly. There are a variety of forms, laws, and regulatory agencies that govern the use, storage, and disposal of hazardous materials.

Before committing themselves to a course of action to ensure full compliance with these laws and regulations, supervisors should consider eliminating hazardous materials from the work place altogether.

Many County operations are reducing or eliminating the use of hazardous materials by:

- Modifying work practices to eliminate the use of hazardous materials.
• Substituting non-hazardous alternatives.

• Contracting out certain occasionally performed tasks that require hazardous materials.

By eliminating hazardous materials, you will also free yourself from the need for this Hazard Communication Program. **Most important, you will be providing a safer work place for yourself and your employees.**

Once the supervisor decides they no longer need a hazardous material, the supervisor cannot simply place it in the trash to get rid of it -- even if it is a small amount, such as a can of spray paint. Neither is it proper to use a household hazardous waste disposal program to dispose of materials that have been used or stored at a work site. Contact one of the information sources listed at the end of this chapter for advice on how to properly dispose of hazardous materials and how to reduce or eliminate the use of such materials in the future.

**13.6 Labels and Signs**

**13.6.1 Original Containers**

When you receive a hazardous substance, the supplier's original containers should have a label providing the following information:

- Identity of the hazardous material(s).
- Hazard warning statements.
- Name and address of the chemical manufacturer or importer.

Supervisors must never allow employees to use a hazardous material until:

1) The contents of containers are clearly labeled.

2) Appropriate hazard warnings are noted

3) The name and address of the manufacturer are listed.

**13.6.2 Secondary Containers**

Secondary containers are containers other than the original container provided by the manufacturer.

Supervisors need to make sure that employees who transfer hazardous materials from the original containers to portable or stationary containers label these secondary containers with:

- The identity of the material.
- The hazard warning statement.
- The person or department responsible for the material.

Supervisors must make sure that all labels are legible, in English and prominently displayed on the container.
An alternative to labeling individual stationary containers is the use of signs, placards, process sheets, batch tickets or other written materials - as long as the alternative method identifies the containers and conveys the information listed above.
13.6.3 Sample Label

Methyl Ethyl Ketone
(2-Buanone, CAS 78-93-3)

Danger! Extremely Flammable Liquid.

May cause respiratory tract irritation. May cause central nervous system effects. May cause severe eye and skin irritation with possible burns. May cause digestive tract irritation with nausea, vomiting, and diarrhea. May cause fetal effects. **Target Organs:** Central nervous system.

13.6.4 National Fire Rating (NFR) Labels

This labeling system is used to warn firefighters and other personnel about the properties of various materials. The system uses a numerical rating as follows:

**HEALTH HAZARD**
- 4 – Deadly
- 3 – Extreme danger
- 2 – Hazardous
- 1 – Slightly hazardous
- 0 – Normal material

**FIRE HAZARD**
- Flash point
  - 4 – Below 73°F
  - 3 – Below 100°F
  - 2 – Below 200°F
  - 1 – Above 200°F
  - 0 – Will not burn

**REACTIVITY**
- 4 – May detonate
- 3 – Shock and heat may detonate
- 2 – Violent chemical change
- 1 – Unstable if heated
- 0 – Stable
13.6.5 Hazard Severity
The severity of the hazard determines the signal word (main heading) of a sign or label. Headings are as follows:

**Danger** indicates a high probability of death or severe injury.

**Warning** indicates some probability of death or serious injury.

**Caution** indicates moderate or minor injury.

**Notice** states a policy or other information. Does not indicate a hazard.

13.6.6 Shipping Labels
Hazardous materials that are shipped and the vehicles that transport them must be labeled according to international guidelines. Vehicles must display placards that contain a four-digit chemical identification code designated by the U.S. Department of Transportation. If you transport hazardous materials in a County vehicle, make sure that the vehicle displays the correct placard.

*Note: You must poses a hazardous endorsement on your driver's license, participate in the DMV “Pull Program” and the placarded vehicle needs to be in the CHP “BIT” program to transport placardable amounts of hazardous material.*

13.6.7 Unlabeled Pipes
Only employees authorized by GSA shall work on unlabeled pipes that contain hazardous materials. If you are one of these employees, you must contact the GSA plumbing shop (299-3074) for the following information before starting work:

- The hazardous material in the pipe.
- Hazards of this substance.
- Safety precautions you must take.

13.6.8 Warning Signs
1. General. Post warning notices where pesticides or containers labeled “danger” or “warning” are stored. The notices must be visible to anyone approaching the storage area.

2. The County has adopted procedures for notifying building occupants when pesticides are used in or around County facilities. These procedures go beyond the requirements of the law and are included in Appendix E. Supervisors are to follow the procedures in Appendix E whenever pesticides will be used to control pests in or around your facility.

13.7 Inventory of Hazardous Substances
Each department supervisor must maintain a current list of all hazardous materials in their work place. This list can serve as a checkpoint to ensure that all hazardous materials in the workplace have appropriate MSDSs and labels. (Supervisors may compile a list for the workplace as a whole or for individual work areas.)
The inventory should be kept in front of the MSDSs for the department so that it will be readily available to employees (Employees can use the inventory to refer to the specific information on each listed substance from the MSDS). Include the following information on the inventory:

- Name of the hazardous material (trade name or chemical name).
- Manufacturer name and address.
- Process or operation where used.
- Check if an MSDS is on file (yes/no) or list the date the supervisor requested it.

Supervisors may use the inventory form as provided in Appendix B, or they may use their own inventory sheets.

13.8 Records of Pesticide Use

Supervisors must keep track of your pesticide use, even if such use consists of wiping down a sink daily with a disinfectant. Agriculture laws refer to this as a “Pesticide Use Record”; Cal/OSHA calls it a “Housekeeping Schedule”3. Appendix F contains a generic procedure intended to comply with both the federal and state pesticide use standards. Supervisors must make sure that a record is posted wherever pesticides (including disinfectants) are used.

13.9 Material Safety Data Sheets

A Material Safety Data Sheet (MSDS) provides information on the safety of a hazardous material. Supervisors can use this information to establish proper work procedures and teach their employees how to handle hazardous materials safely. The law requires Manufacturers to develop MSDSs for each hazardous material based on the Hazard Determination Information, and to include the MSDS when they ship the product.

13.9.1 Contents

Manufacturer’s are allowed use any design format and subject order when preparing the MSDS for a product they manufacture or distribute. However, the MSDS should cover the 14 major subject areas listed below. Some manufacturers prepare more thorough and complete MSDSs than other manufacturers. If the MSDS is blank or has only a trade name and several “N/A’s” (not applicable) on it, you may have to contact the manufacturer or another source for hazard information. Most MSDSs have some information on all of the below listed subject areas. By cross checking the information in various sections, you can usually determine what you need to know about the hazards of the material.

The mandatory items for inclusion in the MSDS are:

1. Trade name (product identity, same as used on the label).
2. Chemical and common name of each hazardous ingredient.
3. The physical and chemical properties such as vapor pressure, flash point, and solubility of the chemical(s).

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3 California Code of Regulations, Title 8, section 5193 (Bloodborne Pathogens)
4. The physical hazards such as fire, explosion and dangerous chemical reactions.

5. The specific acute (short term) and chronic (long term) health hazards, including the signs and symptoms of illness and medical conditions (use simple or lay terms) which may be aggravated by exposure.

6. The potential routes of entry of the hazardous material(s) into the body.

7. The permissible exposure limits published and/or recommended limits for the hazardous substance(s) (OSHA Permissible Exposure Limit (PEL) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) listings) and any other limit recommended by the manufacturer.

8. If the hazardous substance(s) is listed as a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer or the Occupational Safety and Health Administration (OSHA).

9. The precautions necessary for safe handling, use and storage, including the protective measures for repair and maintenance of equipment.

10. The known control measures, including engineering, work practices and personal protective equipment necessary to protect against the hazards.

11. Emergency and spill clean-up procedures.

12. First aid procedures.

13. The date of preparation of the MSDS or the date of the last change in contents.

14. The name, address and phone number of the party responsible for preparing the MSDS.

The law requires Manufacturers to update the MSDS within three months of learning that new hazard data is available that affects the MSDS information.

**13.9.2 Distribution**

Supervisors should review incoming data sheets for new and significant health or safety information, and pass any new information on to the affected employees within 30 days.

- Review MSDSs for completeness. If an MSDS is missing or obviously incomplete, request a new one from the manufacturer. If the manufacturer is unwilling to provide a complete MSDS, notify OSEC.

- Once you are sure an MSDS is current and complete, make it available to your employees for review. The easiest way to do this is to place it in a binder and keep the binder easily accessible at the work site.

- Employees should be instructed to immediately notify the supervisor if the employee notices that an MSDS is not available or new hazardous materials in use do not have an MSDS.
13.9.3 How to obtain an MSDS

GSA Purchasing will forward copies of any MSDS received for products they buy. When you buy a hazardous material directly without going through GSA Purchasing, you must get your own MSDS. To obtain an MSDS, call the manufacturer or use the sample MSDS request letter provided in Appendix A. Until the MSDS arrives, use a copy of the label and any warning as a temporary measure. Ask for an MSDS whenever you order a hazardous material.
Exception: Some pesticides may not have an MSDS. If this is true for a pesticide you use, you must have written documentation from the manufacturer that an MSDS is not available, and have either a copy of the pesticide label available, or keep a sheet that includes:

- The trade name (product identity, same as on the label).
- The chemical and common name of each chemical listed on the label.
- Physical and health hazards.
- The precautions necessary for safe handling, use and storage.
- First aid procedures.

Supervisors must make sure that for every hazardous material, an MSDS or other required information is kept at the worksite and made available to employees, employee representatives and physicians upon request.
13.9.4 Understanding a Material Safety Data Sheet

Although material safety data sheets may vary in length and appearance, many of them follow the general pattern of the Federal Form shown here. The form has eight sections; each section has line-by-line information. The content of each individual section is described below.

<table>
<thead>
<tr>
<th>Section I</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer's Name</strong></td>
<td><strong>Emergency Telephone Number</strong></td>
</tr>
<tr>
<td><strong>Address (Number, Street, City, State, and Zip Code)</strong></td>
<td><strong>Telephone Number for Information</strong></td>
</tr>
<tr>
<td><strong>Date Prepared</strong></td>
<td><strong>Signature of Preparer (optional)</strong></td>
</tr>
</tbody>
</table>

- **Identity** The product name. Synonyms may also be listed.
- **Manufacturer's name** The manufacturer of the product is listed along with the manufacturer's address.
- **Emergency Telephone number** The telephone number provided to people outside of the manufacturer who must respond to a chemical emergency -- a spill, explosion, fire or leak.
This section lists hazardous ingredients found in the product and the identity of the product. The hazardous ingredients are listed by chemical name, and the approximate percentage of each hazardous ingredient is included. The Threshold Limit Value (if it exists) is given for each ingredient.

- **OSHA PEL** Permissible Exposure Limit. The legally enforced exposure limit for a material established by OSHA. The PEL indicates the permissible concentration of air contaminants to which nearly all workers may be repeatedly exposed eight hours a day, forty hours a week, over a working lifetime (30 years) without adverse health effects.

- **ACGIH TLV** Threshold Limit Value; an American Conference of Governmental Industrial Hygienists (ACGIH) term, referring to airborne concentrations of materials. These concentrations--expressed as TLV- TWA (Time Weighted Average) TLV-STEL (Short Time Exposure Limit) or TLV-C (Ceiling)--represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect.

If the concentration of the material in the mixture is 1% or greater and/or has a TLV (Threshold Limit Value) or a PEL (Permissible Exposure Limit), check the following sections:

- Section III - Physical /Chemical Characteristics. All of this section should be filled in if the material is a solvent, catalyst or vehicle.

- Section IV - Fire and Explosion Hazard Data. All of this section should be filled in with either numbers or procedures if the material is either a solvent, catalyst, vehicle, oxidizer, or explosive metal.

- Section V - Reactivity Data. This section should be filled out if the material is a catalyst, a polymer, a copolymer, a concentrated acid, base or other reactive material. Also, a chemical may be incompatible with some other substance(s). Those material(s) should be listed on the "incompatibility" line.

- Section VI - Health Hazard Data. If a substance has a TLV, it most likely presents a health hazard. Be sure the "effects of overexposure" line lists both the long term (chronic) and short-term (acute) consequences of exposure. This is especially true for materials that have some sort of toxic rating, such as LD50, either in Section I or Section II.

- Section VII - Precautions for Safe Handling and Use. If the chemical has a TLV, procedures to follow in event of a spill or leak should be specified. If the substance is flammable, highly reactive, corrosive, explosive or has some other dangerous properties, this section must have information on special handling and storage.

- Section VIII - Control Measures. If the substance has a TLV, this section should always have information in it. The material will either pose a breathing hazard and/or skin or eye hazard. This section must give information on protection against any or all of these kinds of exposures.

- **Percent** Describes the percent by weight or volume of each ingredient listed.
### Section III - Physical/Chemical Characteristics

<table>
<thead>
<tr>
<th>Boiling Point</th>
<th>Specific Gravity ($H_2O = 1$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapor Pressure (mm Hg)</td>
<td>Meeting Point</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>Evaporation Rate (Butyl Acetate = 1)</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td></td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td></td>
</tr>
</tbody>
</table>

- **Boiling Point** refers to the temperature, in degrees Fahrenheit (°F), at which a liquid changes into a vapor, generally at a pressure of 1 atmosphere. For mixtures or process streams, the initial boiling point or boiling range may be given. Flammable materials with low boiling points generally present special fire hazards.

- **Vapor Pressure** A high vapor pressure indicates that a liquid will evaporate easily. The term "volatile" is used to describe such a liquid. This is important to know because it indicates that air concentrations can build up quickly when you use the material in its liquid form. Materials with high vapor pressures can be especially hazardous if you are working with them in an enclosed area or in an area with poor air circulation.

  Vapor pressures are measured in torr units or millimeters of mercury (mm Hg) at a certain temperature. Xylene with a vapor pressure of 10 mm Hg at 27-32° C and toluene with a vapor pressure of 36 mm Hg at 30° C, for instance, the use of which can lead to hazardous air concentrations. However, even materials with lower vapor pressures may pose an inhalation hazard because of the method of handling (for example, spraying versus brushing) also affects the concentration in air.

- **Vapor Density** is the relative density or weight of a vapor or gas compared with an equal volume of air. If the vapor density of a material is less than one, it will tend to rise in air; if the vapor density is greater than one, it will fall in air. Substances with high vapor densities pose a particular problem because they will collect in the bottom of tanks.

- **Solubility in Water** refers to the percentage by weight of a material that can be dissolved in water. Less than 0.1% is considered negligible; 0.1 - 1% is slight; 1 - 10% is moderate; more than 10% is appreciable; and if it can be dissolved in all proportions, it has complete solubility. Solubility information is useful in determining effective fire extinguishing methods and spill cleanup procedures.

- **Appearance and odor** may help you identify the substance you are working with. Do not rely on odor to indicate whether there is a hazardous concentration of the material in air. Some materials can reach hazardous levels and not have noticeable odor(s).

- **Specific Gravity** refers to the ratio of how dense the material is compared to water. For insoluble materials, a ratio of less than one means the material is lighter than water and will float on the surface. If the ratio is greater than one, the insoluble material will sink. Most flammable liquids (but not all) are lighter than water.

- **Melting Point** The temperature at which a solid material changes to a liquid state. For mixtures, the melting range may be given.

- **Evaporation rate** is the rate at which the material evaporates compared to butyl acetate (which evaporates very slowly). If a material has an evaporation rate greater than one, it evaporates more easily than butyl acetate; if the rate is less than one, it evaporates more slowly than butyl acetate.
The information in the Physical/Chemical Characteristics section is useful for the control of toxic vapors. Boiling point, vapor density, percent volatile, vapor pressure and evaporation rate are all useful for designing proper ventilation systems. This information also helps prevent fires and spills by assisting those who design facilities, select containment and fire fighting equipment, and write emergency procedures.

Make these checks: The boiling point, vapor pressure, percent volatile and evaporation rate are all characteristic of a material that gives off vapors into the air. If one of these characteristics has been listed, all of them should be filled out.

If a material has a percent volatile greater than 10%, a boiling point below 100º C and a vapor pressure over 5 or 6 mm Hg, check the following sections for information. These sections must be filled out in this case.

1. Check the TLV in Section II. A low TLV (i.e., less than 10) means the material can be very hazardous. You may be better off using a highly volatile material, like acetone, with a high TLV, than a less volatile material like benzene with a low TLV. In fact, a useful way to compare the hazards of solvents when selecting a solvent to use is to divide the evaporation rate by the TLV and see which one is higher and therefore more hazardous.

2. In Section IV, check to see that the Flash Point and Flammable Limits are filled out. A substance with a vapor pressure of over 5 mm Hg at room temperature and an evaporation rate of greater than 1, a flash point of less than 140º F, and a low Lower Explosive Limit (LEL) (less than 2%) can be a dangerous fire hazard, especially if the percent volatile is also high.

3. Check Section VI under "signs and symptoms of exposure" to see if breathing the vapors of the material can be harmful.

4. Make sure that there are some recommendations for storage and handling in Section VII, Precautions for Safe Handling and Use, especially if the substance has a vapor density that is heavier than air.

Check Section VIII, Control Measures, to see whether there are recommendations for respiratory protection and/or ventilation controls. If the material has a TLV and is volatile, this section must be filled out.
This section provides information on the material’s potential for fire and explosion. It also lists any special precautions that should be taken during fire-fighting.

If you are working with flammables, solvents, peroxides, explosives, metal dusts and other unstable materials, this section is important. If the product does not pose a fire hazard, it should be so stated in this section.

- **Flash Point and Method Used** Flash point is the lowest temperature at which the vapor above the surface of the material will burst into flame if ignited. Since flash points vary according to how they are obtained, the methods used are also listed. Tag Closed Cup (TCC), Pensky-Martens Closed Cup (PMCC) and Setash (SETA) are those used most extensively. Flash point and autoignition should be listed in temperature degrees Fahrenheit or Centigrade (°F or °C), or both. Liquids with flashpoints below 140°C are specially classified liquids by OSHA and require special precautions. Check Section IX, Special Precautions, to see what they are.

- **Flammable Limits** When flammable vapors are mixed with air in the proper proportions, the mixture can be ignited by a spark or flame. The range of concentrations over which the flash will occur is designated by the lower explosive limits (LEL) and the upper explosive limit (UEL). Flammable limits (explosive limits) are expressed in percent by volume of vapor in air.

- **Extinguishing Media** The selection of fire extinguishing media is based on the type of chemical, its physical properties and flammable characteristics. The most common types of extinguishing media are water, CO2, dry chemical and foam.

- **Special Fire Fighting Procedures and Precautions** General fire fighting methods are not described but special or "exception to the rule" procedures are listed.

- **Unusual Fire and Explosion Hazards** Described are hazards associated with a chemical reaction or change in chemical form or composition that might occur under heat or fire conditions. Also described are hazards that may need to be considered while extinguishing fire with one of the available types of extinguishing media.
This section describes the general reactivity of the material, conditions to avoid to prevent an unwanted reaction and toxic materials emitted from the reaction.

- **Stability** This section indicates whether the material is susceptible to dangerous decomposition and under what conditions it might occur.

- **Conditions to Avoid** Describes conditions to avoid (i.e., temperature extremes, jarring, inappropriate storage, etc.).

- **Incompatibility** Lists reactive materials to avoid.

- **Hazardous Decomposition Products** should list products released if the material is exposed to aging, heating, burning, oxidation or allowed to react. The product's shelf life should also be listed in this section when applicable. Although some materials are innocuous in their original form, when they are exposed to conditions such as aging, burning, etc., they may form hazardous products.

- **Hazardous Polymerization.** Polymerization is a chemical reaction in which two or more small molecules combine to form larger molecules that contain repeating structural units of the original molecules. A hazardous polymerization is the above reaction, with an uncontrolled release of energy.
Section VI - Health Hazard Data

<table>
<thead>
<tr>
<th>Route(s) of Entry:</th>
<th>Inhalation?</th>
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<tr>
<th>Carcinogenicity:</th>
<th>NTP?</th>
<th>IARC Monographs?</th>
<th>OSHA Regulated?</th>
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<table>
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<tr>
<th>Signs and Symptoms of Exposure</th>
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<tbody>
<tr>
<td>Medical Conditions</td>
<td>Generally Aggravated by Exposure</td>
</tr>
<tr>
<td>Emergency and First Aid Procedures</td>
<td></td>
</tr>
</tbody>
</table>

- **Routes of Entry** should list common routes of exposure, usually inhalation or absorption by the skin. This heading should contain information about the potential hazard from absorption of the product, the severity of the effect and the basis for that determination. The basis might be animal studies, analogy with similar products or human exposure. Typical comments might be:

  - Skin contact, single short contact -- no adverse effects likely.
  - Prolonged or repeated skin contact -- mild irritation and possible some blistering.
  - Eye contact -- some pain and transient irritation. No corneal scarring.

  Check to see if Section II lists TLV’s for any of the ingredients. If TLV’s are listed there, they should also be listed in this section; make sure the numbers are the same. If the substance is a mixture of several compounds and the TLV for the mixture is listed in this section, this is only appropriate if all of the ingredients in the mixture contributing to the TLV have the same harmful health effects, such as solvent vapors that cause drowsiness and unconsciousness. Check Section III for this information.

If inhalation is the primary route of exposure, check:

  - Section III because this section can help you determine how great the hazard might be. Chemicals with high vapor pressure and volatility usually pose more of an inhalation problem than chemicals with low vapor pressure and low volatility.
  - Section VIII because this section should give information on proper respiratory protective devices (with type specified and/or necessary ventilation requirements). If skin contact or absorption is a problem, Section VIII should list proper protective equipment (gloves, eye and skin protection).

- **Health Hazards** should list chronic and acute effects. Many MSDSs lack information on chronic effects.

- **Carcinogenicity** should include the following:

  - **NTP** is the National Toxicology Program, which publishes an [Annual Report on Carcinogens](#).
  - **IARC** is the International Agency for Research on Cancer, which publishes [Monographs](#), a listing of potential carcinogens.
  - Whether or not the material is regulated by OSHA.

- **ppm** Parts per million (by volume). This is a unit of measure for gases and vapors indicating parts of the material per million parts of air. 10,000 ppm is 1.0% by volume in air.

- **mg/m³** Milligrams per cubic meter. This is a unit of measure for dusts, gases, vapors and mists indicating milligrams of the material in one cubic meter of air.
• **Signs and Symptoms of Exposure** should indicate relevant signs, symptoms and diseases that could result from acute and chronic exposures to hazardous materials.

• Emergency and First Aid Procedures should contain treatment information that paramedics and individuals trained in first aid could use. Any material with a TLV should have emergency first aid procedures listed for acute exposures, especially if the material has a low TLV. Check Section IV to see if the chemical presents any unusual fire or explosive hazards.
Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

<table>
<thead>
<tr>
<th>Waste Disposal Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precautions to Be Taken in Handling and Storing</td>
</tr>
<tr>
<td>Other Precautions</td>
</tr>
</tbody>
</table>

This section describes methods for proper handling of spills and leaks and disposal.

- **Spill and Leak Protection** This describes methods for control and clean-up of spills or leaks. Appropriate materials, equipment and personal protective clothing are also listed.

- **Waste Disposal** Describes the accepted methods for disposing of excess, used or spilled material. This section should state if labeling and special handling of clean-up residue is needed. The appropriate method of disposal (sanitary landfill, incineration, etc.) should also be included.
Section VIII - Control Measures

Respiratory Protection (Specify Type)

<table>
<thead>
<tr>
<th>Ventilation</th>
<th>Local Exhaust</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mechanical (General)</td>
</tr>
</tbody>
</table>

Protective Gloves | Eye Protection

Other Protective Clothing or Equipment

Work/Hygienic Practices

- **Respiratory Protection** Information and general statements regarding respiratory protection requirements.
  
  - Check Section VI to see if inhalation is a probable means of overexposure.
  
  - Check Section III to see how volatile the substance is, to determine the potential degree of hazard.

If respirators are required or recommended, the type and class should be stated, such as "supplied air" or "organic vapor cartridges", or suitable for dust more toxic than lead, etc. NOTE: You must be fit tested by a medical professional before using a respirator - see the County’s Respiratory Protection Program for details.

- **Ventilation** Lists the type of ventilation requirements, if needed, when using the product.

  Check Sections II, III and V, volatility and route of exposure to assess the degree of inhalation hazard. If the material is very volatile and the TLV is low, local exhaust ventilation, which captures contaminants at the point where they are generated is probably the most effective control. Mechanical, general or dilution ventilation is not recommended for chemicals with a low TLV, especially if they are highly volatile or have a high evaporation rate.

- **Protective Gloves and Eye Protection** Indicates the appropriate gloves and eyeware, if needed, to prevent contact with the material.

  - Check Section II for TLV of material and Section VI to determine if the skin is a primary route of exposure.
  
  - If gloves are recommended, the type should be specified. Check Sections II and III for chemical ingredients and characteristics to make sure proper gloves are being recommended.
  
  - Check Section VI for information regarding hazards to the eye. First aid procedures may be listed, such as flooding with water. If splashes may occur, eye protection and eyewash stations should be recommended.

- **Other Protective Clothing or Equipment** Any additional protective measures or equipment recommended to prevent exposure are listed here. If protective clothing is required, the type and material of that clothing should be indicated.

- **Work/Hygienic Practices** This section describes any additional or special precautions you should consider during handling and storage of the material. Cleaning and/or disposal of contaminated clothing, handling procedures, storage information, etc., may be discussed.
13.10 Trade Secrets
Manufacturers or importers may withhold the specific identity of a chemical if they are protecting a bona fide trade secret and have notified the Director of the California Department of Industrial Relations.

A trade secret cannot include chemical identity information that is already discoverable through laboratory qualitative analysis. All sections of an MSDS except the specific chemical identity must be completed. The rules provide specific conditions for trade secret release and for holding the information confidential.

Manufacturers or importers must release the actual chemical identity to health and safety professionals (including, in the County’s case, GSA Risk Management) under both emergency and non-emergency conditions.

13.11 Pesticide Information Leaflets
The California Department of Pesticide Regulation issues Pesticide Safety Information Series (PSIS) leaflets as a training aid for employers. One PSIS, the one covering pesticide hazard communication requirements, is included in this document as Appendix C. Complete this leaflet for your facility and post it at a central work site location such as the Safety Center.

Contact the County Agriculture Commissioner at 299-2172 for more information.

13.12 Hazardous Non-Routine Tasks
During non-routine tasks, you may be exposed to hazardous materials that you are not exposed to during your normal work duties.

An example is an office manager who must contain some liquid toner that spilled from an old copier during an earthquake.

Supervisors should try to anticipate non-routine tasks that may involve exposure to hazardous materials, list those tasks on a separate sheet and place it with the inventory of hazardous materials.

Give employees information about such tasks before they begin to do them. This information will include:

- Specific hazards.
- Protective/safety measures.
- Hazard reduction measures the County has taken (such as ventilation, specialized containers, etc.).

13.13 Contractors and Visitors
It is the County’s responsibility to protect contract employees (who are under the day-to-day direction of the County) from hazards that are under the County’s control.

To ensure the safety of outside contractors working in this facility, it is the responsibility of the County representative to the contractor to provide contractors the following information before they begin their work:

- Hazardous materials to which they may be exposed while on the job site.
- Precautions and appropriate protective measures the workers must take to protect themselves from exposure.
Conversely, the work of a contractor may require that measures be taken to protect County employees from hazardous materials under the contractor’s control. Therefore, to ensure the safety of County employees, the contractor must provide the cognizant government first line supervisor with the following information:

- Hazardous materials to which County employees may be exposed.
- To supply MSDS(s) for hazardous materials used.
- Precautions and appropriate measures County employees should take to lessen the possibility of exposure.

In addition, outside contractors hired to perform work on or in County facilities must check in with the appropriate Facility Manager, County Building Operations, Facility Maintenance or Construction Services department prior to starting any work.

13.14 Training
Supervisors must train (or arrange for someone else to train) their employees how to manage hazardous materials at their work sites. Training must be provided at the time of initial assignment and whenever a new hazardous material is introduced into the workplace.

13.14.1 Training records
Prior to the training, supervisors should prepare (or have the trainer prepare) a training record that includes:

- The date of the training.
- A summary of the training.
- A list of the hazardous materials covered.
- The signatures and job titles of the employees attending.
- The trainer’s signature.
- Your signature.
- The names of those employees who were absent.

Keep the training record at the work site for three years, and make it available upon request to employees, their doctors, and employee representatives.

13.14.2 Training Content:
Prior to the training, the instructor must prepare an outline and handouts (if needed). The training must include the items on the following checklist:

- A summary of the requirements of the Hazard Communication Regulation.
- The elements of this Written Hazard Communication Program Document.
- Where this document, MSDSs, pesticide information bulletins, and records are kept.
- An explanation of an MSDS.
❑ How to read and understand labels and MSDSs, including hazard classifications such as flammable, reactive, etc.

❑ A review of individual product labels.

❑ An explanation of the hazard information provided by the MSDS for each material employees may be exposed to at the work site.

❑ Operations at the work site that may expose employees to hazardous materials.

❑ How to correctly use, store, and dispose of these materials.

❑ Steps the County has taken to lessen or prevent exposure to these materials.

❑ Methods and protective equipment that employees can use to lessen or prevent exposure to these materials.

❑ The importance of washing up before eating, drinking, smoking, applying hand lotion, etc.

❑ Methods and observation techniques (such as appearance and odor) used to determine the presence or release of hazardous materials in the work site.

❑ Symptoms of exposure.

❑ First aid procedures (including decontamination) to follow if employees are exposed to hazardous materials because of spills, fires, etc.

❑ Emergency and spill clean-up procedures, including locations of fire extinguishers and clean-up equipment.

❑ How to get medical treatment.

❑ Non-routine tasks that involve hazardous materials.

❑ How contractors working on the premises will be informed of hazardous materials they might encounter.

❑ An explanation of how employees have the right:

   - to personally receive information regarding hazardous materials to which they may be exposed.

   - for their physician or collective bargaining agent to receive information regarding hazardous materials to which the employee may be exposed.

   - against discharge or other discrimination due to the employee's exercise of his or her rights under the Hazardous Substances Information and Training Act.

13.15 Glossary

**Acute Effect** - An adverse effect on a human or animal body with severe symptoms developing rapidly and coming quickly to a crisis. Also see "chronic."

**Acute Toxicity** - The adverse (acute) effects resulting from a single dose of or exposure to a substance. Ordinarily used to denote effects in experimental animals.
ACGIH - American Conference of Governmental Industrial Hygienists; an organization of professional personnel in governmental agencies or educational institutions engaged in occupational safety and health programs. ACGIH develops and publishes recommended occupational exposure limits (see TLV) for hundreds of chemical substances and physical agents.

ANSI - American National Standards Institute; a privately funded, voluntary membership organization that identifies industrial and public needs for national standards and coordinates development of such standards.

API - American Petroleum Institute; voluntary membership organization of the petroleum industry. API publishes recommended practices for industry related design, installation and operating practices.

Asphyxiant - A vapor or gas that can cause unconsciousness or death by suffocation (lack of oxygen).

ASTM - American Society for Testing and Materials; voluntary membership organization; the world's largest source of voluntary consensus standards for materials, products, systems and services.

Boiling Point - The temperature at which a liquid changes to a vapor state, at a given pressure; usually expressed in degrees Fahrenheit at sea level pressure (760mm Hg, or one atmosphere). For mixtures, the initial boiling point or the boiling range may be given. Flammable materials with low boiling points generally present special fire hazards.

"C" or Ceiling - The maximum allowable human exposure limit for an airborne substance; not to be exceeded even momentarily. Also see "PEL" and "TLV."

CAA - Clean Air Act; federal law enacted to regulate/reduce air pollution. Administered by EPA.

Carcinogen - A substance or agent capable of causing or producing cancer in mammals.

C.A.S. - Chemical Abstracts Service; a Columbus, Ohio organization which indexes information published in "Chemical Abstracts" by the American Chemical Society and provides index guides by which information about particular substances may be located in the "Abstracts" when needed. "C.A.S. Numbers" identify specific chemicals.

cc - cubic centimeter; a volume measurement in the metric system, equal in capacity to one milliliter (ml).

CHEMTREC - Chemical Transportation Emergency Center; a national center established by the Chemical Manufacturers Association to relay emergency information during chemical transportation emergencies. (800-424-9300).

Chronic Effect - An adverse effect on a human or animal body, with symptoms which develop slowly over a long period of time or which recur frequently. Also see "acute."
**Chronic Toxicity** - Adverse (chronic) effects resulting from repeated doses of or exposures to a substance over a relatively prolonged period of time. Ordinarily used to denote effects in experimental animals.

**CWA** - Clean Water Act; federal law enacted to regulate/reduce water pollution. Administered by EPA.

**CO** - Carbon monoxide, a colorless, odorless, flammable and very toxic gas produced by the incomplete combustion of carbon; also a by-product of many chemical processes.

**CO₂** - Carbon dioxide, a heavy, colorless gas, produced by the combustion and decomposition of organic substances and as a by-product of many chemical processes. CO₂ will not burn, and is relatively non-toxic (although high concentrations, especially in confined spaces, can create hazardous oxygen-deficient environments).

**COC** - Cleveland Open Cup; a flash point test method.

**Combustible** - certain liquids that will burn, having a flash point of 100°F (37.8°C) or higher. Also see "flammable." Non-liquid substances such as wood and paper are classified as "ordinary combustibles".

**Concentration** - The relative amount of a substance when combined or mixed with other substances.

**Corrosive** - As defined by DOT, a corrosive material is a liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact or--in the case of leakage from its packaging--a liquid that has a severe corrosion rate on steel.

**CPSC** - Consumer Products Safety Commission; federal agency with responsibility for regulating hazardous materials when they appear in consumer goods.

**Cutaneous Toxicity** - See "Dermal Toxicity".

** Decomposition** - Breakdown of a material or substance (by heat, chemical reaction, electrolysis, decay or other processes) into parts or elements or simpler compounds.

**Dermal** - Used on or applied to the skin.

**Dermal Toxicity** - Adverse effects resulting from skin exposure to a substance. Ordinarily used to denote effects in experimental animals.

**DHHS** - U. S. Department of Health and Human Services.

**DOL** - U.S. Department of Labor; includes the Occupational Safety and Health Administration (OSHA).
**DOT** - U. S. Department of Transportation.

**EPA** - U. S. Environmental Protection Agency.

**Epidemiology** - The science that deals with the study of disease in a general population.

**Evaporation Rate** - The rate at which a particular material will vaporize (evaporate).

**FDA** - The U. S. Food and Drug Administration.

**FIFRA** - Federal Insecticide, Fungicide and Rodenticide Act; (administered by EPA).

**Flash Point** - The temperature at which a liquid will give off enough flammable vapor to ignite.

**Flammable** - a liquid with a flash point below 100°F (37.8°C). Solids that will ignite readily or are liable to cause fires under ordinary conditions are classified as "flammable solids." Also see "combustible."

**Formula** - The conventional scientific designation for a material (water is H\textsubscript{2}O, etc.)

**General exhaust** - A system for exhausting air from a general work area. Also see "local exhaust."

\( g \) - gram; a metric unit of weight. One ounce is about 28.4 grams.

\( g/kg \) - grams per kilogram; used in toxicology to indicate the grams of substance per kilogram of body weight.

**Hazardous Material** - Any substance or mixture capable of producing adverse effects on the health or safety of a human being.

**Incompatible** - Materials that could cause dangerous reactions from direct contact with one another.

**Ingestion** - Taking a substance in through the mouth.

**Inhalation** - Breathing in a substance.

**Inhibitor** - A chemical that is added to another substance to prevent an unwanted chemical change from occurring.

**Internal Standard** - A Shell term for an exposure standard.
**Irritant** - A substance that, by contact in sufficient concentration for a sufficient period of time, will cause an inflammatory response or reaction of the eye, skin or respiratory system. The contact may be a single exposure or multiple exposures.

**Irritating** - A liquid or solid substance which upon contact with fire or when exposed to air gives off dangerous or intensely irritating fumes (not including poisonous materials).

**kg** - Kilogram; a metric unit of weight, about 2.2 U.S. pounds.

**Liter** - a metric unit of capacity. A U.S. quart is about 9/10 of a liter.

**LC** - Lethal concentration; a concentration of a substance being tested that will kill a test animal.

**LC50** - Lethal concentration; the concentration of a material in air which is expected to kill 50% of a group of test animals when administered as a single exposure (usually 1 or 4 hours).

**LD** - Lethal dose; a concentration of a substance being tested that will kill a test animal.

**LD50** - Lethal dose; a single dose (by mouth or skin) of a material which is expected to kill 50 percent of a group of test animals.

**LEL**, or LFL - Lower explosive limit or lower flammable limit of a vapor or gas; the lowest concentration in air that will produce a flash of fire when an ignition source is present.

**Local Exhaust** - A system for capturing and exhausting air at the point where the contaminants are produced.

**m³** - Cubic meter, or stere; a metric measure of volume, about 35.3 cubic feet or 1.3 cubic yards.

**Melting point** - The temperature at which a solid substance changes to a liquid state. For mixtures, the melting range may be given.

**Mechanical exhaust** - A powered device, such as a fan, for exhausting contaminants.

**mg** - Milligram; a metric unit of weight. There are 1,000 milligrams in one gram (g) of a substance.

**mg/kg** - Milligrams per kilogram; an expression of toxicological dose. See "g/kg".

**mg/m³** - Milligrams per cubic meter; a unit for measuring concentrations of dusts, gases or mists in air.
**ml** - Milliliter; a metric unit of capacity, equal in volume to one cubic centimeter (cc), or about 1/16 of a cubic inch. There are 1,000 milliliters in one liter (L).

**mmHg** - Millimeters (mm) of mercury (Hg); a unit of measurement for low pressures or partial vacuums.

**mppcf** - Million particles per cubic foot; was used for measuring particles of a substance suspended in air.

**MSHA** - The Mining Safety and Health Administration of the U.S. Department of the Interior.

**Mutagen** - A substance or agent capable of altering the genetic material in a living cells.

**NRC** - National Response Center; a notification center in the Coast Guard Building in Washington, D.C., with a toll-free telephone number (1-800-424-8802) which must be called when significant oil or chemical spills or other environmentally-related accidents occur.

**NFPA** - National Fire Protection Association; an international voluntary membership organization to promote/improve fire protection and prevention and establish safeguards against loss of life and property by fire.

**Public Health Service** - U.S. Department of Health and Human Services (DHHS); federal agency which—among other activities—tests and certifies respiratory protective devices and air sampling detector tubes, recommends occupational exposure limits for various substances and assists OSHA and MSHA in occupational safety and health investigations and research.

**Olfactory** - relating to the sense of smell.

**Oral** - used in or taken into the body through the mouth.

**Oral Toxicity** - Adverse effects resulting from taking a substance into the body via the mouth.

**OSHA** - Occupational Safety and Health Administration of the U.S. Department of Labor.

**Oxidation** - a reaction in which a substance combines with oxygen provided by an oxidizer or oxidizing agent.

**Oxidizer** - a substance that yields oxygen readily to stimulate the combustion (oxidation) of organic matter.

**Oxidizing Agent** - A chemical or substance that brings about an oxidation reaction.

**PEL** - Permissible exposure limit. May be a time weighted average (TWA) limit or a maximum concentration exposure limit.
% Volatile - Percent volatile by volume; the percentage of a liquid or solid (by volume) that will evaporate at an ambient temperature (usually 70°F).

PMCC - Pensky-Martens Closed Cup; a flash point test method.

Poison, Class A - Poisonous gases or liquids of such nature that a very small amount of the gas, or vapor of the liquid, mixed with air is dangerous.

Poison, Class B - Poisons or irritating materials--which are known or presumed to be a hazard during transportation.

Polymerization - A chemical reaction in which one or more small molecules combine to form larger molecules. A hazardous polymerization is such a reaction which takes place at a rate which releases large amounts of energy. If hazardous polymerization can occur with a given material, the MSDS usually will list conditions which could start the reaction and--since the material usually contains a polymerization inhibitor--the expected time period before the inhibitor is used up.

ppm - Parts per million; a unit for measuring the concentration of a gas or vapor in air--parts (by volume) of the gas or vapor in a million parts of air. Also used to indicate the concentration of particular substance in a liquid or solid.

ppb - Parts per billion. Usually used to express measurements of extremely low concentrations of unusually toxic materials.

psi - Pounds per square inch; for MSDS purposes, a unit for measuring the pressure a material exerts on the walls of a confining vessel or enclosure.

Reaction - A chemical transformation or change.

Reactivity - A description of the tendency of a substance to undergo chemical reaction with the release of energy.

Reducing agent - The chemical or substance that combines with oxygen or loses electrons to the reaction.

Respiratory system - The lungs and air passages, plus the associated nervous and circulatory supply.

RCRA - Resource Conservation and Recovery Act; federal environmental legislation, administered by EPA, aimed at controlling the generation, treating, storage, transportation and disposal of hazardous wastes.

Sensitizer - A substance which on first exposure causes little or no reaction in man or test animals, but which on repeated exposure may cause a marked response not necessarily limited to the contact site. Skin sensitization is the most common form of sensitization in the industrial setting, although respiratory sensitization to a few chemicals is also known to occur.
**SETA** - Setaflash Closed Tester; a flash point test method.

**Signal word** - A word such a “danger” or “caution” that indicates on a sign or label the degree of hazard.

"**Skin**" - A notation, sometimes used with PEL or TLV exposure data; indicates that the stated substance may be absorbed by the skin, mucous membranes and eyes--either airborne or by direct contact--and that this additional exposure must be considered part of the total exposure to avoid exceeding the PEL or TLV for that substance.

**Skin Sensitizer** - See "Sensitizer".

**Skin Toxicity** - See "Dermal Toxicity".

**Solubility in water** - A term expressing the percentage of a material (by weight) that will dissolve in water.

**Species** - the test animals--usually rats, mice or rabbits--which were used to obtain toxicity test data.

**Specific gravity** - The weight of a material compared to the weight of a equal volume of water; an expression of the density (or heaviness) of the material.

**Stability** - An expression of the ability of a material to remain unchanged. For MSDS purposes, a material is stable if it remains in the same form under expected and reasonable conditions of storage or use. Conditions which may cause instability (dangerous change) are stated--examples, temperatures above 150°F, shock from dropping.

**STEL** - Short term exposure limit.

**Synonym** - Another name or names by which a material is known. Methyl alcohol, for example, is also known as methanol, or wood alcohol.

**TCC** - Tag (Tagliabue) Closed Cup; a flash point test method.

**Teratogen** - A substance or agent to which exposure of a pregnant female can result in malformations in the fetus.

**TLV** - Threshold Limit Value; the airborne concentration of a material to which nearly all persons can be exposed day after day, without adverse effects. ACGIH expresses TLV's in three ways:

1) **TLV-TWA**: the allowable Time Weighted Average concentration for a normal 8-hour workday or 40-hour work week.
2) **TLV-STEL**: the Short-Term Exposure Limit, or maximum concentration for a continuous 15-minute exposure period (maximum of four such periods per day, with at least 60 minutes between exposure periods, and provided that the daily TLV-TWA is not exceeded).

3) **TLV-C**: the Ceiling exposure limit—the concentration that should not be exceeded even instantaneously.

**TOC** - TAG Open Cup; a flash point test method.

**Toxicity** - The sum of adverse effects resulting from exposure to a material, generally by the mouth, skin or respiratory tract.

**Trade Name** - The trademark name or commercial trade name for a material.

**TSCA** - Toxic Substances Control Act; federal environmental legislation, administered by EPA.

**TWA** - Time Weighted Average exposure; the airborne concentration of a material to which a person is exposed, averaged over the total exposure time—generally the total workday (8 to 12 hours). Also see "TLV."

**UEL, or UFL** - Upper explosive limit or upper flammable limit of a vapor or gas; the highest concentration (highest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc or flame) is present. At higher concentrations, the mixture is too "rich" to burn. Also see “LEL”.

**Unstable** - Tending toward decomposition or other unwanted chemical change during normal handling or storage.

**Vapor density** - The weight of a vapor or gas compared to the weight of an equal volume of air; an expression of the density of the vapor or gas. Materials lighter than air (vapor densities less than 1.0) will tend to rise and dissipate; heavier vapor and gases are likely to concentrate in low places.

**Vapor pressure** - The pressure exerted by a saturated vapor above its own liquid in a closed container.

Three facts are important to remember:

1. Vapor pressure of a substance at 100°F will always be higher than the vapor pressure of the substance at 68 F (20°C).

2. Vapor pressures reported on MSDSs in mm Hg are usually very low pressures; 760 mm Hg is equivalent to 14.7 pounds per square inch.

3. The lower the boiling point of a substance, the higher its vapor pressure.
Ventilation - See "general exhaust", "local exhaust" and mechanical ventilation.

13.16 Resources

- For technical assistance in identifying hazardous materials, for assistance in conducting on-site inspections or terminology:
  Occupational Safety and Environmental Compliance 441-4280 or County Environmental Health Services 299-6060.

- For loss prevention information:
  ESA Insurance 392-3460.

- For information about the application of pesticides and disinfectant cleaners:
  County Agricultural Commissioner 299-2172.

- For training information:
  Occupational Safety and Environmental Compliance 441-4280.

13.17 Appendices
Use this sample letter to request an MSDS.

Date: __________________

To: ________________________________________________
   (Chemical Company or Distributor)

Re: MSDS for _________________________________________
   (exact product name, product number, code, etc.)

Please send a copy of your Material Safety Data Sheet (MSDS) for your product, as listed above. This MSDS is required to comply with the State of California Hazard Communication Regulation, Section 5194 of Title 8, California Administrative Code (T8CAC).

Please send the MSDS to: ___________________________________
   (Name )
   _______________________________________________________
   (Address)

If this product does not require an MSDS, please notify us in writing. If you have any questions regarding our request, please contact ________________________________.

Sincerely,

___________________________________________
   (Name)
   __________________________________________
   (Title)
Hazardous Materials Inventory Sheet

Hazardous Materials Inventory for

(work site or area)

SUPERVISORS must keep this list current as new hazardous materials are added to or removed from the work site.

<table>
<thead>
<tr>
<th>Hazardous Substance</th>
<th>Manufacturer Name/ Address</th>
<th>Process/Operation Where Used</th>
<th>MSDS ? Yes</th>
<th>No</th>
<th>Date Requested</th>
</tr>
</thead>
</table>

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PSIS N-8 Page 1
Pesticide Safety Information Series N

#N-8 HAZARD COMMUNICATION FOR EMPLOYEES HANDLING PESTICIDES IN NONCROP SETTINGS*

For more information, please contact the Integrated Pest Management @ 299-4181 ext2194

General:
This handout tells you about your right to know the pesticide dangers at work and about the Department of Pesticide Regulation (DPR) rules on “Hazard Communication” in California. “Hazard Communication” is a program to make sure you know about the dangers at work, how to protect yourself from those dangers, and where to get information about the dangers and safety procedures.

Pesticides are chemicals commonly used on to kill insects, weeds, germs and plant diseases on farms, as well as, in non-agricultural settings (landscape, parks, restaurants or hospitals). Fertilizers are not pesticides.

The label on the pesticide, training, and other forms of warning tell you of the dangers. Your boss must know and tell you (in a language you understand) about the pesticides you will use, and how to protect yourself and safely use them.

Your Rights As An Employee:
By law you must be told about possible dangers where you work. You must also be trained to recognize and avoid those dangers. As an employee you have the following rights:

You have the right to know what pesticides were sprayed and to look at the application records. The required records are kept at:

__________________________
__________________________
__________________________

You have the right to file a complaint about the dangers at work without being punished or fired. Your boss will not be told who filed the complaint.

You have the right to look at Material Safety Data Sheets (MSDS), if available, for each pesticide used. These documents tell you about the pesticides and their dangers.

Your boss must plan ahead for medical care and make sure that you are taken to the doctor if you get sick or hurt because of pesticides at your job. Medical care is available for you at:

__________________________

If you get sick or injured on the job, you have the right to file a claim for worker's compensation.
Workers' compensation will pay for your medical costs, and in some cases, lost pay. Your boss will explain your rights to you. If you need more help in understanding your rights, you may contact the local county agricultural commissioner's office, the local legal aid or worker's rights office, your union or DPR at: Anaheim (714) 680-7800; Fresno (559) 445-5401 or Sacramento (916) 372-6892.

Pesticides are only one kind of danger at your work. Complaints about pesticide dangers should be filed with the county agricultural commissioner. Complaints about other safety problems should be filed with the California Department of Industrial Relations-Cal/OSHA office. The telephone numbers can be found in the government pages of the telephone book.

California Environmental Protection Agency
Department of Pesticide Regulation
830 K Street, Sacramento, California 95814-3510
Training/Education:
Training is one important way to learn about pesticide dangers and how to protect yourself from the pesticide. If you work with pesticides, you must be given training about using pesticides and pesticide equipment safely. The training must occur before you begin to work with pesticides. You must be given refresher training each year to help remind you how to handle pesticides safely. You must know the immediate and long-term dangers the pesticides can cause and how to safely use the pesticides you will work with. Pesticide Safety Information Series (PSIS) handout N-1 tells you everything that must be part of your pesticide training. Extra training is needed if you use respirators (see PSIS handout N-5). All information that was part of your training must be written down and you must sign the paper to show you have been trained, but only after you have finished the training.

You must be told where you can see the work-related papers that must be made available to you (see Table 2). You do not need to ask your boss' permission to look at these records.

Hazard Identification:
The pesticide label tells you what chemicals are in the container, information about the pesticide, first aid, warnings, protective equipment needed and directions for application. Other chemicals, called "inert ingredients", are not usually written on the label. These other ingredients can also make you sick. Doctors who need to know the names of the ingredients to treat you can usually get that information from the company who makes the pesticide or from DPR.

Before a pesticide can be used in California, tests are done to find out about its harmful effects. The pesticide label gives you information on the dangers of using the pesticide. All pesticides are poisonous. If you are exposed, they can harm you or make you sick.

"DANGER" means the pesticide is very poisonous; touching or breathing very small amounts can cause serious harm or sickness.

"WARNING" means moderate danger; it takes exposure to more pesticide to make you sick or hurt.

"CAUTION" means the danger is low; it can still cause harm or sickness, but requires contact to much more pesticide.

In addition, the label also tells you about more specific dangers and the safety measures you need to follow. You must know and follow those precautions.

If the pesticide causes serious eye or skin injury, the label will say something like, "Corrosive, causes eye and skin damage."

If the pesticide can make you very sick, the label will have a skull-and-crossbones symbol and the word "POISON."

Words like "fatal" or "may be fatal if swallowed, inhaled, or absorbed through the skin" also means the pesticide can make you very sick or cause death if you are exposed to too much.

Some labels tell you about other health problems such as cancer or birth defects.

You cannot rely only on the pesticide label to tell you of the dangers. Your boss must have a copy of the MSDS for the pesticide(s) sprayed and must tell you where you can go look at it. Other sources of safety information may include industry trade bulletins, and government hazard alerts and other Pesticide Safety Information Series handouts like this one.
13.17.3 Appendix C: Pesticide Safety Information

PSIS N-8 Page 3

Labels And Other Forms Of Warnings:
In addition to training, there are many other ways that information is given to you (see Table 2 on page 4). The pesticide label tells you how to safely mix and apply the pesticide. The label must be at the your work site when you mix or apply the pesticide. Normally this is the label on the pesticide container. It can also be on a “product bulletin” or other additional labeling. If a service container (any container that is not the original factory container) is used, your boss must make sure that the complete label is at your work site. Service containers must be labeled to identify the pesticide, the signal word (Danger, Warning, Caution), and who is responsible for the container and the pesticide in it.

Pesticide Safet Signal Words
When possible, keep pesticides in their original container with the original label. Never use food, drink, or household product containers for pesticides.

Most places where pesticides are stored must be locked and posted with warning signs. The signs must be in a language you understand. More information on pesticide storage, transportation and disposal is found in PSIS handout N-2.

In 1986, a law called the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) was passed. Proposition 65 requires California to make a list of chemicals that can cause cancer, birth defects, or other reproductive harm. The Proposition 65 list contains many chemicals, including dyes, solvents, pesticides, drugs, and food additives. If a pesticide is on the Proposition 65 list, your boss must warn you if you might be exposed to enough pesticide to result in a significant risk of cancer, birth defects or other reproductive harm. Your boss may also warn you if a pesticide on the Proposition 65 list has been sprayed, even if health problems are not likely. Your boss is required to keep specific information on each pesticide application. You have a right to look at this information; in your training, you should be told where you can find it. If you are unsure of the location, ask your boss. Table 1 lists pesticides that are on the Proposition 65 list and might be used in California.

Table 1

CURRENTLY REGISTERED PESTICIDES ON THE PROPOSITION 65 LIST

PESTICIDES KNOWN TO THE STATE TO CAUSE CANCER

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>Pesticide</th>
<th>Pesticide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alachlor</td>
<td>Arsenic acid</td>
<td>Arsenic pentoxide</td>
</tr>
<tr>
<td>Arsenic trioxide</td>
<td>Cadmium oxide</td>
<td>Captain</td>
</tr>
<tr>
<td>Chlorothalonil</td>
<td>Chromium acid</td>
<td>Creosote</td>
</tr>
<tr>
<td>Daminic oxide</td>
<td>DDT (dichlorvos)</td>
<td>p-Dichlorobenzene</td>
</tr>
<tr>
<td>1,3-Dichloropropene</td>
<td>Dioctyl phthalate</td>
<td>Dipropyl isocinchomerone (MGK repellent 326)</td>
</tr>
<tr>
<td>Ethylene oxide</td>
<td>Fenoxycarb</td>
<td>Folpet</td>
</tr>
<tr>
<td>Formaldehyde (gas)</td>
<td>Iprodione</td>
<td>Lindane</td>
</tr>
<tr>
<td>Mancozeb</td>
<td>Maneb</td>
<td>Melan sodium</td>
</tr>
<tr>
<td>Melram</td>
<td>Oxadiazon</td>
<td>Oxythioquinox</td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>o-Phenylphenate, sodium</td>
<td>Sodium dimethyl sulfoxide</td>
</tr>
<tr>
<td>o-Phenylphenol Propargile</td>
<td>Pronamide (propyzamide)</td>
<td>Propylene oxide</td>
</tr>
<tr>
<td>Silica aerogel</td>
<td>Sodium dichlorate</td>
<td>Sodium</td>
</tr>
<tr>
<td>Dimethylidithiocarbamate</td>
<td>Thiodi-carb</td>
<td>Vinlozozin</td>
</tr>
</tbody>
</table>

PESTICIDES KNOWN TO THE STATE TO CAUSE BIRTH DEFECTS OR REPRODUCTIVE HARM

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>Pesticide</th>
<th>Pesticide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitraz</td>
<td>Arsenic, pentoxide</td>
<td>Arsenic, trioxide</td>
</tr>
<tr>
<td>Benzyl</td>
<td>Bromacil, lithium salt</td>
<td>Bromoxynil octanoate</td>
</tr>
<tr>
<td>Chlorothalonil</td>
<td>Cyanazine</td>
<td>Cyloate</td>
</tr>
<tr>
<td>2,4-D butyric acid (2,4-DB)</td>
<td>Dichloropropyl</td>
<td>Disodiumcyanodithiocarbometane</td>
</tr>
<tr>
<td>EPTC (ethylidpropylidithiocarbamate)</td>
<td>Ethylene oxide</td>
<td>Fenoxaprop ethyl</td>
</tr>
<tr>
<td>Fluazifop butyl</td>
<td>Fluvalinate</td>
<td>Hydramethylnon</td>
</tr>
<tr>
<td>Linuron</td>
<td>Metam sodium</td>
<td>Meziram</td>
</tr>
<tr>
<td>Methyl bromide (as a structural fumigant)</td>
<td>Myclobutanil</td>
<td>Nabor</td>
</tr>
<tr>
<td>Nicotine</td>
<td>NitropyridinOxadiazon</td>
<td>Oxydemeton-methyl</td>
</tr>
<tr>
<td>Oxythioquinox</td>
<td>Potassiumdimethylidithiocarbamate</td>
<td>Propargile</td>
</tr>
<tr>
<td>ResmethrinSodium fluoroacetate(1080)</td>
<td>Streptomycin sulfates</td>
<td>Thiophanate methyl</td>
</tr>
<tr>
<td>Triadimefon</td>
<td>Tributylin methacrylate</td>
<td>Triton</td>
</tr>
<tr>
<td>Vinclozolin</td>
<td>Warfarin</td>
<td></td>
</tr>
</tbody>
</table>

Note: Proposition 65 does not apply to Government agencies. Additional pesticide information from this series is available at: www.cdpr.ca.gov.
SUPERVISORS can use this checklist to confirm that a Hazard Communication Program is fully implemented at:

______________________________________________
(work area)

❑ Hazardous Substances not essential to this operation have been properly disposed of.
❑ All hazardous materials at the work site are listed, and the list is kept with the MSDSs.
❑ MSDSs for every hazardous material at the work site are kept at the work site.
❑ Pesticide label for every pesticide used are kept at the work site.
❑ MSDSs, pesticide labels, and records are available to employees, their doctors, and employee representatives.
❑ All employees have been trained as described in the Training section of this document.
❑ Training records are complete and current.
❑ Hazards of non-routine tasks have been listed.
❑ Hazards of chemicals in unlabeled pipes, if present, have been identified.
❑ Contract employees have been fully informed and trained as needed.
❑ Employees have or have access to and use the required protective clothing or equipment.
❑ Medical supplies and other safety equipment are kept at the work site.

Checklist Completed by:

______________________________________________
(name of supervisor)

Checklist reviewed by:

______________________________________________
(department head signature)

___________
(date)
The following guidelines should be followed when pest problems arise in or around County facilities. These guidelines are meant to minimize exposure of County employees to chemicals used for pest management, and to ensure employees receive notification of scheduled chemical applications, over and above safeguards mandated by State regulations.

Department Supervisors and Facility Managers play important, although different, roles in the process. Department Supervisors are responsible to respond to employee concerns, act on complaints about pest problems, notify the Facility Manager when pest problems arise, and meet with employees to advise them in advance of chemical applications and provide information about the chemicals that will be used. Facility Managers responsibilities include tasks involving the facility - coordinating department requests for pest control service, contacting and working with the pest control operator and the IPM Coordinator, providing chemical application information to department supervisors and posting chemical application notices at facility entrances and areas where treatment is to occur. The Facility Manager is also responsible for confirming the requested pest control service was performed, and approving the vendor’s invoice for payment. Facility Managers at County owned facilities forward the approved invoice to GSA Building Operations for processing. Facility Managers at leased facilities forward the approved invoice to either the department's fiscal office or to GSA Property Management based on their normal practice.

I. Discovery of Pest Problem

1. Employee(s) notifies his/her supervisor of a suspected pest problem.

2. The Supervisor notifies the Facility Manager of the suspected problem.

3. The Facility Manager meets with the Supervisor and employee(s) to be briefed on specifics of the problem prior to contacting the Pest Control Operator.

II. Identifying Pest and Appropriate Method of Eradication

1. The Facility Manager contacts the County's Pest Control Operator and if necessary the County Integrated Pest Management Coordinator for a site evaluation.

2. The Pest Control Operator tours site with the Facility Manager to confirm the infestation and identify the pest. The Operator recommends the method of eradication they feel will be the least toxic and most effective. Operator may recommend monitoring the situation if the problem, in their estimation, does not warrant immediate action.

3. If the Operator recommends a chemical application, the Facility Manager asks the Operator for copies of the product label(s) and Material Safety Data Sheet(s) of all chemicals that will be used, and any additional precautionary information that should be provided to the facility occupants.

   The Facility Manager also asks the Operator if they know whether or not the facility's HVAC system should be in operation during or after the treatment to flush out any residual chemical fumes. Facility Managers at County owned facilities contact GSA Building Operations to request any changes, if needed, in the facility's normal HVAC system operation schedule to accommodate the chemical treatment. Facility Managers at leased facilities contact either GSA Property Management or the landlord, based on their normal practice regarding facility issues, to request any necessary HVAC operation schedule changes.

4. The Facility Manager advises the Department Supervisor of the Operator's recommendation. If the Operator's recommendation includes chemical application, the Facility Manager provides the Department Supervisor with all chemical labels, MSDSs and precaution information supplied by the Operator, and also any temporary changes in the facility's HVAC system operation schedule that will be made in
13.17.5 Appendix E: Pest Management at County Facilities

conjunction with the chemical treatment. In multi-story or multi-unit facilities the above information shall be provided to all occupant departments.

III. Notification to Facility Occupants of Scheduled Chemical Application

1. Chemical applications should be scheduled immediately prior to weekends or periods when the facility will be unoccupied whenever possible.

2. The Department Supervisor advises employees of the scheduled chemical application and has available chemical labels, MSDSs and precautionary information supplied by the Operator.

3. The Facility Manager posts notices at the areas to be treated and at all entrances to the facility advising visitors and occupants of the scheduled chemical application(s). The notices shall indicate the date and time of scheduled application and when it is safe to re-enter the facility. The notices should also identify the pest for which the treatment is being applied, the chemical(s) to be used, and how the chemical(s) will be applied. The chemical label(s), and/or the MSDSs, should be posted next to the notices.

   The information shall be posted with as much advance notice as possible, but no later than 48 hours prior to scheduled the chemical application and must remain posted for at least 72 hours after the chemical application.

4. The use of baits or other pesticides granted an exemption by the IPM Coordinator shall not be required to post signs as stated in paragraph 3 above. However, each facility that uses pesticidal baits or other pesticides granted an exemption by the IPM Coordinator shall post a permanent sign in each building where such pesticides are used. The sign shall indicate the name of the chemical and the active ingredient of the pesticide used in or around the facility. The sign will also list the target pests, the area or areas where the pesticides are commonly placed, the contact number for the facility manager and the pesticide applicator responsible for the application.

5. When a facility will be treated for pests on a regular basis, notices must be posted prior to each treatment. Those facilities scheduled for quarterly treatments should be posted with new notices prior to each treatment. Those facilities scheduled for monthly treatments can either be posted with new notices prior to each treatment, or posted one time with notices that indicate the day of the month treatment is scheduled for (e.g. the first Friday of every month). The latter method allows for the notices to remain posted from month to month.

   Changes in any posted information such as chemical(s) to be used, precautionary information, etc. requires the posting of updated notices.

Resources

The following resources can be contacted for further information or consultation.

- IPM Coordinator- 299-4181  
  Management Program Oversight

- Agriculture Department - 299-2172  
  Chemicals registered for specific application

- Vector Control - 299-2050  
  Pest identification and methods of eradication
13.17.5 Appendix E: Pest Management at County Facilities

- Purchasing - 299-2892
  Pest Control Operator contract information

- GSA Building Operations Air Conditioning Shop - 299-2510
  Facility heating, ventilation and air conditioning (HVAC) systems

- GSA Property Management - 299-3355
  Leased facility issues

- Labor Relations - 299-3223
  Employee concerns regarding scheduled chemical applications

rev. 11/93
### Pesticide Use Record - or - Housekeeping Schedule

*(Agriculture Commissioner) (Cal/OSHA)*

Post this schedule every place disinfecting is done. If only cleaning is done, this schedule is not needed. Different schedules may be required for different types of rooms, and sometimes for individual pieces of equipment.

| Room(s): | ______________________ |
| Square footage to be disinfected: | ________ |
| Number of fixtures (sinks, etc.) to be disinfected: | _____________________________ |
| Days/Times procedure is to be done: | _____________________________ |
| Purpose of procedure: | _____________________________ |
| Amount of undiluted product used per application: | __________ (estimate the amount if spray cans are used) |

| Chemical to be used: | ______________________ | Brand name: | __________________ |
| Dilution (if applicable): | ______________________ |
| Is this chemical a Cal/EPA registered pesticide? | Yes (make sure pesticide regulations are followed) |

| EPA Registration number: | __________________ |
| No (do not use it for disinfecting) |

Describe the disinfection procedure: ____________________________________________________________

Surfaces to be disinfected: ________________________________________________________________

Equipment to be disinfected: ________________________________________________________________

Tools that will be used: ________________________________________________________________

How will tools be protected or disinfected? ____________________________________________________

Names of person(s) responsible for doing the work: ________________________________

Dates the procedure was followed: ________________________________________________________

<table>
<thead>
<tr>
<th>Date</th>
<th>Month</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Destroy date for this record (two years after final entry): __________

**SUPERVISOR** completes the following:

I certify that:

___ The Material Safety Data Sheet (if needed) for this chemical is available to employees doing the work.

___ Employees doing the work have been trained in housekeeping procedures and safe use of the chemical.

___ Employees have been provided with personal protective equipment as needed.

Name of supervisor: ________________________________

---

13-45
Signature of supervisor: ________________________________________________