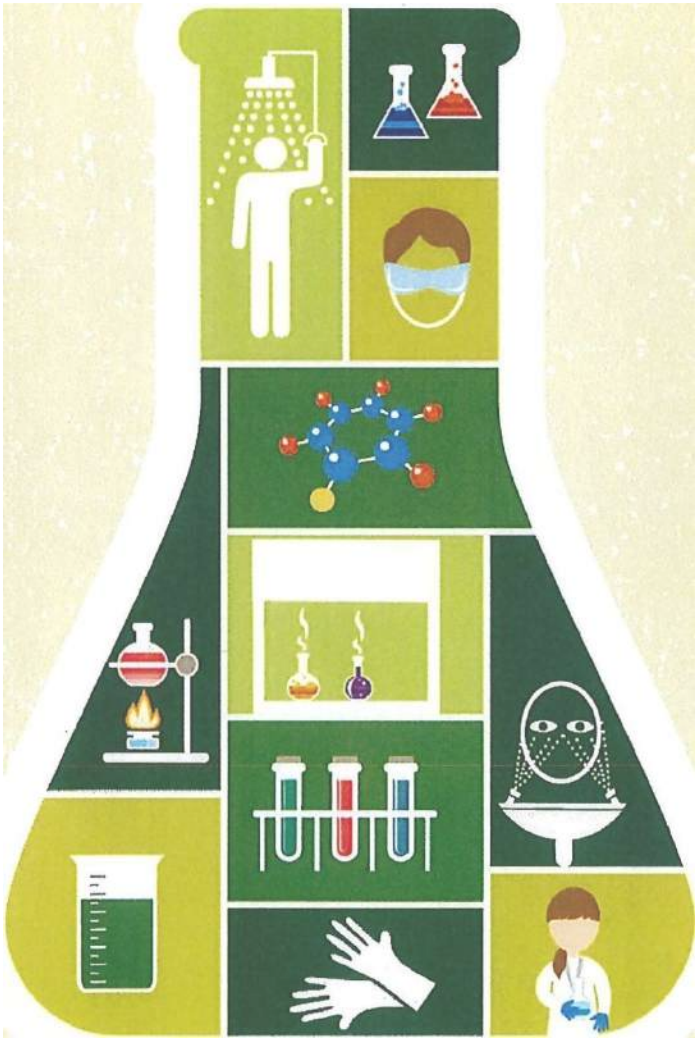
Chemical Hygiene Plan

2024 - 2025



Core Plan

David Douglas School District

September 2024

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1. Introduction

1.1. Goal of the Chemical Hygiene Plan

It is the policy of David Douglas School District to provide a place of employment that is free from chemical exposures likely to harm employees' health, and that complies with all federal, state, and local laws and regulations affecting the safety and health of its employees.

This Chemical Hygiene Plan addresses this goal for the laboratory workplace by including the requirements of the Occupational Safety and Health Administration (OSHA) Standard on Occupational Exposure of Hazardous Chemicals in Laboratories (Laboratory Standard) as well as the Oregon Administrative Rules (OAR) General Occupational Safety and Health Rules.

1.2. Who is covered by the Chemical Hygiene Plan

The laboratory standard covers "laboratory use of hazardous chemicals" where chemical manipulations occur that are not part of an industrial production process. This standard has been selected as appropriate for use in educational environments for the purposes of this plan.

"Laboratory scale" means work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. This definition applies to work which takes place inside a school within dedicated laboratory facilities as well as in typical school classrooms. This definition excludes workplaces whose function is to produce commercial quantities of materials. As such, this plan does not include commercial scale practices, though these standards are used to advise development of school-site best practices where appropriate.

Employees who are to be addressed in the Chemical Hygiene Plan are individuals employed in the laboratory workplace that may be exposed to hazardous chemicals in the course of their assignments. This includes employees who actually work in the laboratory (instructors and aides) or employees who may be required to enter a laboratory where potential exposures may occur (such as maintenance or custodial personnel).

It is important to note that students are not employees of DDSD, and are not typically addressed within this plan. Although students are not covered under the Chemical Hygiene Plan, good personal chemical hygiene habits must be taught to all students who use laboratory facilities and classroom chemicals while enrolled in science courses.

1.3. Requirements used to develop the Chemical Hygiene Plan

The laboratory standard requires that covered laboratories prepare, implement, and make available to employees a Chemical Hygiene Plan (CHP) which is capable of:

- Protecting employees from health hazards associated with hazardous chemicals in the laboratory.
- Keeping laboratory employees' exposures below Oregon State's permissible exposure limits (PELs).

The following topics are included in the CHP

- Individual chemical hygiene responsibilities;
- Standard operating procedures;
- Personal protective equipment, engineering controls and apparel;
- Laboratory equipment;
- Safety equipment;
- Chemical management;
- Housekeeping;
- Emergency procedures for accidents and spills;
- Chemical waste;
- Training;
- Safety rules and regulations;
- Laboratory design and ventilation;
- Exposure monitoring;
- Compressed gas safety;
- Hazard identification and assessment;
- Medical consultation and examination.

2. Personnel responsible for Chemical Hygiene Plan

Successful development and implementation of a Chemical Hygiene Plan requires the full commitment of the School Site Supervisor and Laboratory Science Instructors, as well as the David Douglas District Safety Director and Chemical Hygiene Officer. Implementation of this plan must be by the District Safety Director and the Chemical Hygiene Officer.

The Chemical Hygiene Officer's goal is to ensure that responsibility for chemical hygiene and safety in the laboratories is shared by all who work in those laboratories, including students.

2.1. District Safety Director

(a) Establishes, maintains, and revises the chemical hygiene plan (CHP) with the Chemical Hygiene Officer (CHO).

(b) Creates and revises safety rules and regulations with the CHO.

(c) Assumes responsibility for personnel engaged in the laboratory use of hazardous chemicals, in partnership with School Site Supervisors.

(d) Provides the CHO with the support necessary to implement and maintain the CHP.

(e) After receipt of laboratory inspection report from the CHO, meets with School Site Supervisors to discuss cited violations and to ensure timely actions to protect trained laboratory personnel and facilities and to ensure that the school site remains in compliance with all applicable federal, state, local, and district codes and regulations.

(f) Provides budgetary arrangements to ensure the health and safety of the departmental personnel, visitors, and students.

(g) Coordinates with David Douglas Human Resources in order to maintain an accurate record for each laboratory employee undergoing medical consultations or medical examinations as required by the laboratory standard.

(h) Maintains accurate record of each accident and safety report from each school site.

2.2. Chemical Hygiene Officer

Best practices suggest that a Science Specialist, such as a District Science TOSA or a School Site Specialist, be responsible for the tasks of a Chemical Hygiene Officer.

(a) Establishes, maintains, and revises the chemical hygiene plan (CHP) with the District Safety Director.

(b) Creates and revises safety rules and regulations with the District Safety Director.

(c) Monitors procurement, use, storage, and disposal of chemicals.

(d) Reviews chemical purchase orders from the School Sites Supervisor to ensure compliance with the chemical hygiene plan and recommends safety precautions appropriate for the approved chemicals at the school site.

(e) Conducts regular inspections of the laboratories, preparations rooms, and chemical storage rooms, and submits detailed laboratory inspection reports to District Safety Directors and School Site Supervisors.

(f) Maintains inspection, personnel training, and inventory records (Including SDS sheets).

(g) Review laboratory procedures for potential safety problems before assigning to other laboratory personnel, when requested by Laboratory Science Instructors.

(h) Assists School Site Supervisors in ensuring safe and appropriate laboratory and chemical storage facilities.

(i) Seeks ways to improve the chemical hygiene program with input from other CHP Personnel.

2.3. School Site Supervisor

<Best practices suggest that a School Administrator, such as the Head Principal or a Vice Principal with science experience, be responsible for the tasks of a School Site Supervisor. >

(a) Assumes responsibility for personnel engaged in the laboratory use of hazardous chemicals, in partnership with School Site Supervisors.

(b) Provides the Laboratory Science Instructors with the support necessary to implement and maintain the CHP.

(c) Ensures that PPE is available and properly used by each laboratory employee and visitor.

(d) After submission of laboratory inspection report from the CHO, meets with District Safety Director to discuss cited violations and to ensure timely actions to protect trained laboratory personnel and facilities and to ensure that the school site remains in compliance with all applicable federal, state, local, and district codes and regulations.

(e) Provides budgetary arrangements to ensure the health and safety of the departmental personnel, visitors, and students.

(f) Enforce good housekeeping practices in the laboratory or work area.

2.4. Laboratory Science Instructors

(a) Reads, understands, and follows all safety rules and regulations that apply to the work area.

(b) Covers, monitors, and enforces safety rules and regulations with students as they engage in laboratory instruction and interact with laboratory materials in the work area.
(c) Ensures that visitors follow the laboratory rules and assumes responsibility for laboratory visitors.
(d) Reviews laboratory procedures (as outlined in section 3 Standard Operating Procedures) for potential safety problems before assigning to other laboratory personnel, seeking advice of CHO when needed.
(e) Plans and conducts each lesson, demonstration, and investigation in accordance with the institutional chemical hygiene procedures.
(f) Promotes and follows good housekeeping practices with students and personally in the laboratory or work area.
(g) Notifies the School Site Supervisor supervisor of any hazardous conditions or unsafe work practices in the work area.
(h) Uses PPE as appropriate for each procedure that involves hazardous chemicals, and coordinates with School Site Supervisors for adequate.

2.5. District Facilities Manager

(a) Encourage good housekeeping practices in the laboratory or work area.
(b) Provides regular, formal chemical hygiene and housekeeping inspections, including routine inspections of emergency equipment.
(c) Monitors the facilities and any chemical fume hoods or exhaust arms to ensure that they are maintained and function properly. Responds to problems with the facilities or the ventilation, where they are present.
(d) Assists in hazardous waste disposal with the appropriate municipal agencies.

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3. Standard Operating Procedures for Classrooms and Laboratories

The Goal of Standard Operating Procedures are to protect employees and students working in the laboratory. These Standard Operating Procedures also protect others who may be exposed, and protects the environment from harm or contamination due to hazardous chemicals.

3.1. Procedures Requiring Prior Approval

These laboratory operations require review and prior approval by the Chemical Hygiene Officer:

- Non-routine procedures for which the employee or student has not been trained.
- Disposal of hazardous chemical wastes, including evaporation or disposal in drains.
- Operations or activities for which there are no written procedures.
- Analytical work with an unknown substance (for instructor, not ‘unknown’ for student).
- Work with a Chemical Ban Candidate.

3.2. Employee Exposure Protection

Laboratory Science Instructors must determine the need for protective equipment for the chemicals they use in order to protect themselves with adequate exposure controls.

Personal protective equipment (PPE) and instructions on the proper use of this equipment must be provided to employees, as appropriate, to minimize exposure to hazardous chemicals. If employees are unfamiliar with necessary safety precautions, they should reach out to their School Site Supervisor or Chemical Hygiene Officer.

For exposures to potentially hazardous gasses, a fume hood or exhaust arm is required. Respirators are not an acceptable substitute for a properly functioning chemical exhaust system.

In school sites where there is no fume hood or exhaust arm, the best prevention strategy for exposure is to not use chemicals which require additional ventilation. Instruction or chemical manipulations with hazardous chemicals must not be performed in facilities that are not equipped to safely handle the potential hazards of those manipulations.

The need for PPE and for adequate ventilation will be determined by using available SDS information.

More information about how to limit employee exposure risks is found under **4 Facilities Design Criteria**.

3.3. Employee Exposure Determination and Monitoring

Routine laboratory use of approved chemicals in dedicated laboratory facilities as well as in typical school classrooms has a risk of acute exposure. Spills and accidents are the most common examples of acute exposure risks.

Routine laboratory use of approved chemicals is unlikely to lead to chronic exposure risks to employees.

If there is reason to believe that exposure levels for an Oregon OSHA-regulated substance routinely exceed the Permissible Exposure Limits (PELs), the District or Chemical Hygiene Officer will ensure that employee or student exposure to that substance is measured.

More information about Exposure Monitoring is found under **11 Exposure Monitoring and Medical Attention**.

3.4. Medical Consultations and Medical Exams

Employees who work with hazardous chemicals will be allowed to receive medical attention when overexposure to a hazardous chemical is suspected.

The District Human Resources department is responsible for maintaining an accurate record for each laboratory employee undergoing medical consultation or medical examination as required by the laboratory standard. Direct all questions regarding medical consultations and examinations to the District Human Resources.

More information about Medical Attention is detailed under **11 Exposure Monitoring and Medical Attention**.

3.5. Chemical Procurement

All staff must observe the appropriate purchasing processes as outlined by Board policy. All purchases require preapproval per Board policy.

Many classroom investigations can take place using food grade chemicals or household chemicals. Food grade substances are not covered by this OSHA laboratory standard, but are covered under FDA and EPA standards. Seek advice about how to document a Safety Data Sheet for these substances if they are used frequently. Household cleaning chemicals are

covered by the OSHA laboratory standard, and require an SDS just the same as laboratory grade chemicals.

Food grade chemicals can typically be purchased by school sites and instructors and reimbursed, without prior approval. For any food grade chemical purchases, consider they might be stored and used safely. Common science safety procedures still apply to use and storage of these food grade or household cleaning chemicals, such as accurately labeled containers, adequate eye protection, and avoiding the mixture of incompatible chemicals.

Do not accept donations of chemical compounds.

Staff are **prohibited from purchasing or storing restricted chemicals**. A full list of restricted chemicals can be found at Chemical Ban Candidate Spreadsheet (Appendix 1.)

Carcinogens, reproductive toxins, or highly acute toxins are not allowed in middle school or high school laboratories in this school district without written approval of the Safety Program Manager or Chemical Hygiene Officer.

Many of these compounds are on the Chemical Ban Candidate List.

To purchase laboratory-grade chemicals in accordance with this Chemical Hygiene Plan, Laboratory Science Instructors must

(a) Consider amount and concentration.

Request no more than a five-year supply of laboratory-grade chemicals at a time. It is only acceptable to exceed this amount if the chemical is not available in a smaller container. Always try to purchase the smallest container that will serve your instructional needs.

Purchase the lowest concentration or purity of substance that is required for instructional purposes.

Understand proper handling, storage and disposal before ordering chemicals.

(b) Submit Purchase Approval to School Site Supervisor.

Requests for chemical purchases should be made through the standard requisition process. The purchasing department will confer with the Chemical Hygiene Officer for hazard assessment and review.

The Chemical Hygiene Officers will double check the Restricted Chemicals List and will follow up with Laboratory Science Instructors for best safety practices and appropriate replacements of prohibited chemicals.

(c) Receiving shipments at school sites.

Inspect chemical containers when they arrive. Open shipping boxes and styrofoam outer containers when chemical products arrive. This allows you to see if containers or contents have been damaged in shipping. Work with purchasing to return even slightly damaged new containers for refund and replacement.

If familiar chemicals are restocked, add them to the physical storage system in place. Locate safety data sheets for all chemicals that have been purchased. Update inventory in MSDSonline, per school site practice.

If new chemicals are purchased, then the SDS should be shared with the Operations Administrative assistant, who will coordinate with the Chemical Hygiene Officer to update MSDSonline with appropriate safety and container information.

3.6. Hazard Communication

Properly label laboratory chemicals at all stages of instructional delivery in order to identify any hazards associated with them.

(a) Container labels

Labels on incoming containers of hazardous chemicals must not be removed or defaced.

Do not open unlabeled bottles of chemicals. Ask laboratory staff if they know what is stored in unlabeled containers. Dispose of unknown chemical compounds promptly as outlined in **3.9 Waste Disposa**l.

When dispensing chemicals from one container to another, label the new container with the chemical's full name, concentration, and hazards (e.g., Sodium hydroxide 1M, Caution). Label all secondary containers in this manner unless they are intended for immediate use by the person who dispensed the chemicals (into a test tube for an immediate reaction). A solution to be used for multiple periods must be labeled in its container, but a student's beaker for their reaction may be considered immediate use.

Label reusable pipettes with the chemical formula of the solution they contain. Return pipettes to a storage container that is labeled with the chemical's name, formula and hazards. Disposable pipettes that are intended to be cleaned and reused must be labeled to avoid mixing incompatible substances. Disposable pipettes that are used only one time may remain unlabeled, provided they are disposed of.

These labeling directions are intended to be inline with David Douglas's Hazard Communication Program. See Hazard Communication Plan on the employee dashboard for expanded description.

(b) Safety data sheets

Since 2016, safety data sheets are required to follow the Globally Harmonized System for Classification and Labeling of Chemicals (GHS). GHS safety data sheets have 16 sections, hazard pictograms, hazard statements, and precautionary statements.

Digital safety data sheet must be stored on MSDSonline at https://chemmanagement.ehs.com/9/ebinder, which is actively maintained by David Douglas. Safety data can be found readily, along with expiration date, total amount, and availability at other district locations.

(c) Laboratory signs

Laboratory areas that have special or unusual hazards must be clearly marked with posted warning signs.

Signs must be posted to show the location of safety showers, drench stations, eyewash stations, exits, first aid kits, fire extinguishers, emergency numbers, etc.

Extinguishers must be labeled to show the type of fire for which they are intended. Label waste containers to show the type of waste that can be safely deposited in them.

Consumption of food and beverages is not permitted in areas where laboratory operations are actively being carried out. Mark areas where food is permitted with a warning sign (e.g., **EATING AREA - NO CHEMICALS**).

Refrigerators used for chemical storage must not contain food. Chemical Storage refrigerators must have this warning sign posted: **"CHEMICAL STORAGE ONLY - NO FOOD OR BEVERAGES ALLOWED!"**

Other refrigerators in laboratory or instructional spaces must never contain laboratory chemicals. Other refrigerators must have this warning sign posted: **"FOOD STORAGE ONLY - NO CHEMICALS OR LAB SPECIMENS ALLOWED!"**

3.7. Material Handling

Store, distribute, and handle hazardous chemicals in a manner that minimizes the potential for accidents and employee exposure.

(a) Stockrooms/Storerooms

Segregate hazardous chemicals by hazard class in a well-identified area with local exhaust ventilation. (See Appendix 2. Storage pattern for chemicals where space is limited.)

Stockrooms must be monitored for safety and inventory control. The Chemical Hygiene Officer will work with school staff to help them control and monitor their inventory. Examine stored chemicals for replacement, deterioration, and container integrity annually. Ensure safety data sheets (SDSs) are available on MSDSonline for each chemical compound in stock.

(b) Distribution

Transport chemical containers using a laboratory cart, if possible. Carts should provide sufficient secondary containment capacity to control potential spills. Place containers in a laboratory bottle carrier to reduce risks of breakage.

To avoid exposure to elevator passengers, transport chemicals on freight-only elevators, if possible.

Purchase plastic-coated chemical containers to reduce the risk of spills.

(c) Compressed gas

Never roll or drag compressed gas cylinders. Transport large cylinders with a suitable handcart with the cylinder strapped in place.

(d) Laboratory storage

Keep quantities of chemicals stored in the laboratory or in the classroom to a minimum. Store chemicals away from heat sources and direct sunlight.

Keep chemical inventories current when containers are disposed of, added to, or replaced. When inventorying, track the size of the container, not how much it contains.

(e) Segregate incompatible materials in storage:

- Acids away from bases in dedicated cabinets.
- Oxidizers away from organic compounds and flammable materials.
- Bleach away from ammonia.
- Water-reactive compounds away from alcohols, aqueous solutions, and sinks.
- Flammable glacial acetic acid in the flammables cabinet, not the acid cabinet.
- Store concentrated sulfuric acid on a separate shelf in the acid cabinet away from concentrated hydrochloric acid.
- Store nitric acid in a secondary container in the acid cabinet.

(f) Use of a Additional Ventilation

Use additional ventilation for processes that may release hazardous chemical vapors, fumes or dusts. Additional ventilation may take the form of chemical fume hoods, extractor or exhaust arms, or safely conducting work outside. Use additional ventilation when working with any volatile liquid or fine powders.

In school sites where there is no fume hood or exhaust arm, the best prevention strategy for exposure is to not use chemicals which require additional ventilation. Instruction or chemical manipulations with hazardous chemicals must not be performed in facilities that are not equipped to safely handle the potential hazards of those manipulations.

The need for additional ventilation will be determined by using available SDS information.

For facilities with a fume hood, limit chemical storage in the hood to 24 hours. Chemicals stored in the hood must not block the flow of air. Provide secondary containment for all stored chemicals. Secondary containment must hold 100 percent of the largest container's capacity.

Keep the hood ventilation system running while chemicals are stored in it.

(g) Working Alone

Students must never work alone in a laboratory. There are no exceptions to this policy.

Unfamiliar experiments or chemical manipulations must not be conducted by an instructor working alone in a laboratory.

When piloting a familiar demonstration or reaction before school or after school, inform another science team member. Best practices apply to instructors as well as students.

(h) Dispensing Chemicals

When transferring chemicals from one container to a secondary container, be sure the new container is compatible with the chemical and is labeled with the name of the chemical as well as its concentration (e.g., Sodium hydroxide 1M, Caution). The label must have the date and name of the employee filling the container if it will be used to store chemicals. Containers that will be used in a classroom investigation only need to be marked with the name of the chemical, not the employee name. Hazard warning

statements on all chemical labels, tags, and markings are required. (e.g., Poison, caution, corrosive, flammable, oxidizer, etc.)

3.8. Emergency Prevention and Response

Laboratory instructors and other employees must be familiar with emergency procedures in order to prevent and reduce the impact of laboratory accidents.

(a) Emergency procedures:

Emergency procedures in place in all DDSD buildings must be followed. Laboratory accidents should follow the "ACCIDENTS/INJURIES" procedure. An uncontrolled fire or a classroom filling smoke should follow the "FIRE ALARM" procedure. A failure of the ventilation system, exposure to hazardous gas, or other emergency sufficient to cause evacuation of the classroom should follow the "HAZARDOUS MATERIAL EXPOSURE" procedure. A spill that is beyond the cleanup capability of the person who created the spill or custodial staff should also follow the "HAZARDOUS MATERIAL EXPOSURE" procedure.

(b) Chemical Spills:

Chemical spills can occur in science classrooms. Minor spills can typically be cleaned up by trained school personnel. Most spills will be minor spills. Major spills are any spills that cannot be cleaned up by school personnel, or which require equipment that school personnel are not equipped with.

Each school must have a spill response kit, which includes PPE, dykes, absorbents, neutralizers, and hazardous waste containers.

To clean up a spill:

(1) Quickly assess the spill, its hazards, and the danger to yourself and your students. Take appropriate action after considering your assessment. If the spilled chemicals are unknown, assume the worst and evacuate.
(2) Notify other school personnel of the accident, and if necessary, evacuate the area. The safety of you and your students is always the top priority.

(3) If the spilled chemical is volatile, ventilate the area or evacuate. If the spilled chemical is flammable, remove all ignition sources.
(4) Tend to any injured or contaminated person and if necessary request help.
(5) Take steps to contain and limit the spill. Protect yourself with chemical goggles, chemical resistant gloves, and if necessary, an apron. To contain a spill, gently pour sand or an absorbent material around the spill and onto the spill.
(6) Neutralize the spill if necessary. Use a solid base such as sodium carbonate, sodium bicarbonate, or soda ash to neutralize an acid. Use citric acid powder to neutralize a base spill. The neutralizer needs to be mixed well with the sand and absorbent to come in contact with all the spilled material.
(7) Clean up the spill. Use a plastic dustpan and plastic broom to sweep up the now solid mass and place it into large, heavy-duty garbage bags for disposal.
(8) Consult chemical information for safe disposal. Every chemical has information for proper disposal listed in section 13 of its Safety Data Sheet. Dispose of contaminated materials properly.

Reviewing this plan is important for remembering spill response procedures. This plan is not a substitute for spill response training, however.

Spill response training will be provided to all Laboratory Science Instructors <by the Chemical Hygiene Officier> and all maintenance personnel managed by the District Facilities Manager on an annual basis, as part of the annual plan refresher.

(c) First aid:

Departments must have personnel trained in first aid available during working hours to render assistance until medical help can be obtained. All laboratory science personnel in the district are required to possess a valid first aid/CPR card. First aid kits must be made available in all dedicated laboratory facilities and typical science classrooms.

(d) Emergency and Safety equipment:

The District Safety Director and Chemical Hygiene Officer must ensure that adequate emergency and safety equipment is available in the laboratory and is inspected regularly. This includes safety glasses, chemical goggles, chemical cabinets, safety showers, drench stations, eyewash stations, fire blankets, chemical safe fire extinguishers, fume hoods, and other safety equipment (Refer to Appendix 3. Science classroom and lab safety reference and checklist).

(e) Accident reports:

Carefully investigate all accidents and near accidents. Consider what may have led to the accident, and how this can be used to improve laboratory safety.

Report all injuries or illnesses that arise out of your work in the lab and which occurs during the course and scope of your work with the District to your manager/supervisor immediately. Complete an Incident Report Form located on the Employee Dashboard within 24 hours of the incident. Be sure to hit "Submit" to officially send your report to the District Office.

3.9. Waste Disposal

The Laboratory Instructional Personnel must ensure that laboratory chemicals are properly disposed of in a way that limits risk to human health and the environment. The District Facilities Manager and Chemical Hygiene Officer are available to consult on proper disposal procedures.

(a) Waste handling

Label chemical wastes with the words Hazardous Waste and the type of hazard it presents (e.g., Flammable, Corrosive, Toxic) on each container. Segregate waste chemicals based on their hazards in the same way that chemical products are stored in the stockroom. Once the hazardous waste collection container is mostly full, contact the District Facilities Manager and Chemical Hygiene Officer to arrange for proper disposal.

Unlabeled containers of chemical wastes are unacceptable. Ask other instructors if they know what these containers may hold. Waste disposal companies cannot dispose of unknown materials, so their field chemist will have to test the contents. This is an expensive process that is avoidable in a well-run laboratory.

(b) Waste disposal

All laboratory wastes must be properly disposed of. Before disposing of any laboratory waste materials, consult the appropriate Safety Data Sheet for the proper disposal method or procedure.

Hazardous laboratory wastes must only be disposed of by trained personnel. Don't dispose of volatile organic compounds by evaporating them in a fume hood.

The District Facilities Manager and Chemical Hygiene Officer must ensure that laboratory chemicals are properly disposed of in a way that limits risk to human health and the environment.

(c) Treatment by generator

Some laboratory waste can be treated prior to disposal. All treatment activities must be tracked on a log sheet that shows the date, type, and amount of materials added to the treatment collection container. Treating laboratory waste is not typically expected in secondary science laboratories.

3.10. Training

The District Safety Director and Chemical Hygiene Officer must provide laboratory staff and other appropriate employees (e.g., receiving and shipping personnel, custodial, maintenance, stockroom personnel, emergency teams) with training and other information on the hazards of chemicals present in their work area and what to do if an accident occurs.

On-line training can be used as a substitute for some of this training. Visit the David Douglas SafeSchools account at https://ddouglas-or.safeschools.com/training/list?category_id=CAT-GUID-ENVIRO to see their collection of on-line videos.

(a) Training Program

Training must consist of at least these subjects:

- Procedures to follow to prevent the release of hazardous chemicals.
- Techniques for identifying a chemical release.
- The physical and health hazards of chemicals at the school site.
- Steps instructors can take to protect themselves and their students from chemical hazards, including general laboratory safety rules, emergency procedures and protective equipment to be used.
- Specific details of this Chemical Hygiene Plan

(b) When to provide training and information

Information and training must be provided at the time of the employee's initial assignment to the work area where hazardous chemicals are present and prior to assignments involving new exposure situations. Refresher information and training will be provided at least annually.

(c) Student training

Students must receive general laboratory safety training at the beginning of each semester and whenever practice demonstrates a need. Specific safety procedures must be taught whenever the need dictates.

More information about Training is detailed under **10 Employee Training.**

3.11. Information Posting

Employees must be provided with the following information:

- OSHA Standard for Hazardous Chemicals in Laboratories, OAR 437-002-0391 and 29 CFR 1910.1450.
- Location and availability of the Chemical Hygiene Plan.
- Permissible exposure limits (PEL's) for DOSH-regulated substances found in OAR 437-002-0382 or recommended exposure limits for other hazardous chemicals where there is no applicable standard.
- Signs and symptoms associated with exposure to hazardous chemicals used in the laboratory.

More information about Training is detailed under **10 Employee Training.**

3.12. Facility Inspections

Safety inspections of laboratory and classroom environments contribute to overall laboratory and employee safety. The District Safety Manager and School Site Supervisor must ensure that these procedures are followed in each department and by the Chemical Hygiene Officer.

Laboratory safety inspections must include all areas covered in Appendix 3. Science classroom and lab safety reference.

Inspect laboratory safety equipment at least semi-annually to ensure fitness for use, including:

- Fume hoods & other protective equipment (environmental controls).

- PPE (e.g., gloves, goggles, respirators).
- Emergency equipment (e.g., fire extinguishers, spill kits).
- First aid equipment (e.g., showers, eyewash stations). (See Appendix 3. Science classroom and lab safety reference.)

More information about Inspections are detailed under **7 Facility Inspections**.

3.13. Review of Chemical Hygiene Plan

Annual review of the Chemical Hygiene Plan contributes to overall laboratory and employee safety. The Chemical Hygiene Plan must be reviewed by the District Safety Director, Chemical Hygiene Officer, School Site Supervisors, Laboratory Science Instructors and others designated by the District Safety Director, at least annually for:

- Compliance with current regulations.
- Adequacy in protecting employees from the health and physical hazards associated with chemicals in use in the laboratory.

The results of this review must be recorded, including notes on needed changes, and when those changes were made.

David Douglas will begin the annual review process in April of a given school year, redraft and re-authorize the plan by July 1st, and make updated plans available to staff at the start of the following school year.

The plan must be updated as necessary (e.g., when there are changes in laboratory operations, laboratory personnel, regulations, etc.) and in a timely manner.

More information about Plan Review is detailed under **8 Plan Review**

3.14. Chemical Hazard Assessment

Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals must be followed. In addition to these general guidelines, specific guidelines for chemicals that are used frequently or are particularly hazardous must be adopted.

Laboratory personnel must conduct their work under conditions that minimize the risks from both known and unknown hazardous substances. Before beginning any laboratory work, the hazards and risks associated with an experiment or activity should be determined and the necessary safety precautions implemented. Every facility should develop site-specific policies and procedures for the highest-risk materials and procedures used in their facility. To identify these, consideration should be given to past accidents, process conditions, chemicals used in large volumes, and particularly hazardous chemicals.

Perform Risk Assessments for Hazardous Chemicals and Procedures Prior to Laboratory Work:

(a) Identify chemicals

Identify the chemicals to be used, amounts required, and circumstances of use in the experiment. Consider any special employee or laboratory conditions that could create or increase a hazard. Consult sources of safety and health information (such as SDS and container labeling) and experienced scientists to ensure that those conducting the risk assessment have sufficient expertise.

(b) Evaluate the hazards

Evaluate the specific hazards posed by the chemical reactants, chemical products, and the experimental conditions. The evaluation must cover toxic, physical, reactive, flammable, explosive, radiation, and biological hazards, as well as any other potential hazards posed by the chemicals.

(c) Consider scale

For a variety of physical and chemical reasons, scaling up the size of reactions poses special risks. These risks merit additional prior review and precautions.

(d) Appropriate risk mitigation

Select appropriate controls to minimize risk, including use of engineering controls, administrative controls, and personal protective equipment (PPE) to protect workers from hazards. The controls must ensure that OSHA's Permissible Exposure Limits (PELs) are not exceeded. Prepare for contingencies and be aware of the institutional procedures in the event of emergencies and accidents.

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4. Facilities Design Criteria

The work conducted in a school must stay below the OSHA mandated Permissible Exposure Limits, appropriate to the physical facilities available, and appropriate for the quality of the ventilation system.

4.1. Designing for Permissible Exposure Limits

Laboratory operations must be conducted in a manner and in facilities that prevent employee exposure to chemical substances in excess of the Permissible Exposure Limits PELS listed in OAR 437-002-0382.

The state has adopted its own PELs that are stricter than federal PELs for exposure to thiram, mineral dusts, and carcinogens in laboratories. The PELs for all regulated air contaminants are found in the state's Z tables. Contact OR-OSHA for a copy of the state Z tables.

The state air contaminants standards for general industry and construction contain PELs for 70 chemicals for which OSHA does not have a PEL, lower PELs for 13, an additional ceiling limit for acetic anhydride, and a shorter duration level for carbon disulfide.

Oregon's air contaminants standard for agriculture contains a shorter list of chemicals, though with the same PELs.

Federal OSHA had revised its Z tables of hazardous substances and PELs in the 1980s to include the substances adopted by Oregon's standards, but in 1992 a federal circuit court struck down the OSHA revisions. Several states, including Oregon, retained some of the PELs from the pre 1989 OSHA Z tables, which are stricter than existing federal standards.

4.2. Design for Laboratory Facilities

See Appendix 3. Science classroom and lab safety reference and checklist for a detailed list of requirements.

Laboratory facilities should include, where appropriate:

- An adequate general ventilation system with air intakes and exhausts located to avoid intake of contaminated air.
- Well-ventilated stockrooms and storerooms.
- Proper chemical storage for specific hazardous materials; e.g., flammables, corrosives, oxidizers. Proper storage includes safety cabinets (fire cabinet, corrosives cabinet).
- Adequate laboratory sinks.

- Emergency equipment including fire extinguishers, spill kits, and alarms.
- First aid equipment including first aid kits, eyewash fountains, and drench showers.
- Drain-free floors in chemical storage rooms.
- Some chemicals may require secondary ventilation to safely use. If your work area does not have secondary ventilation, then find replacement chemicals which are more appropriate.

4.3. Design for Laboratory Ventilation

The general laboratory ventilation system should provide a source of air for breathing and for input to local ventilation devices, ensuring that laboratory air is continually circulated, and direct air flow into the laboratory from non-laboratory areas and out to the exterior of the building.

Maintenance staff regularly monitor general ventilation at school sites in David Douglas.

Toxic chemicals with low boiling points or dust hazards must only be used in a facility with an adequate fume hood or exhaust arm. Adequate ventilation requires significant airflow. With the sash raised to 12 inches, air should enter a fume hood at 60-to-125 linear feet per minute - checked quarterly with a velocity meter or anemometer. Maintain written documentation of all tests.

Cabinets that store corrosive acids should have open ventilation holes to prevent accumulation of corrosive vapors.

Flammable liquids cabinets must be kept closed unless they are equipped with an explosion-proof auxiliary exhaust ventilation system. Stockrooms should have their own dedicated ventilation system that provides additional air exchanges.

The quality and quantity of ventilation should be evaluated when installed, monitored quarterly, and reevaluated whenever a change in ventilation devices is made.

4.4. Considerations for Laboratory Instruction

Not all science instruction takes place in a dedicated laboratory facility. Many laboratory investigations can safely take place in typical school classrooms. Safety considerations for typical school classrooms include:

- An adequate general ventilation system with air intakes and exhausts located to avoid intake of contaminated air.
- Proper chemical storage for immediate use of specific hazardous materials; e.g., flammables, corrosives, poisons and oxidizers. Proper storage includes safety

carts with non-reactive materials, secondary spill containers, and properly sealed chemicals.

- Adequate instructional tables and sinks. Work surfaces should be chemically resistant, smooth, and easy to clean. Handwashing sinks for hazardous materials may require elbow, foot, or electronic operation for safe operation.
- Wet classroom areas, such as near the sink, should have chemically resistant, impermeable, and slip resistant flooring.
- Emergency equipment including fire extinguishers, spill kits, and alarms.
- First aid equipment including first aid kits, and where needed, eyewash fountains, and drench showers.
- Adequate PPE for instructors and students (safety glasses, chemical goggles, non-reactive gloves).

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5. General Laboratory Safety Rules

To protect the health and safety of laboratory instructors and students who work with hazardous chemicals through training and careful attention to safe operation practices. These rules may serve as the basis of a “Student Science Safety Code of Conduct”, and should be taught and referenced in science classrooms where hazardous chemicals are used.

5.1. General Rules

The following pages contain the general laboratory safety rules for all school district laboratories. Other specific laboratory safety rules for individual laboratories can be added to these rules by the Chemical Hygiene Officer or School Site Supervisor of that particular school laboratory.

(a) Know the safety rules and procedures that apply to the work at hand. Before beginning any new operation, determine the potential hazards and appropriate safety precautions to take.

(b) Know the types of protective equipment that are available and use the proper equipment for each job.

(c) Know the location and use of emergency equipment in the area, as well as ways to obtain additional help in an emergency. Be familiar with emergency procedures.

(d) Watch out for unsafe conditions and report to other personnel so corrections can be made as soon as possible. One person's accident can be a danger to everyone in the lab area.

(e) Consuming food or beverages in laboratories or areas where chemicals are being used or stored is prohibited.

(f) Practical jokes or other behavior that might distract, startle, or confuse another worker can be dangerous and must be avoided.

(g) Use equipment for its designed purpose only.

(h) If you leave an operation unattended for any period of time, leave the laboratory lights on, post a sign, and take the necessary precautions for the event of a failure of a utility service (such as electricity or cooling water).

(i) Never leave laboratory chemicals unattended in an unsecured room.

(j) Notify the School Site Supervisor and Chemical Hygiene Officer immediately if someone has been exposed to a hazardous chemical.

5.2. Chemical Handling

(a) Do not smell or taste chemicals.

(b) Always add acid to water. Never add water to acid.

(c) Know the hazards posed by the different classes of chemicals, including oxidizers, flammables, corrosives, reactives, compressed gasses, acutely hazardous, and chronically hazardous chemicals.

(d) Read and understand the Safety Data Sheet (SDS) before using any new chemical.

(e) Chemical wastes must be disposed of properly. Consult with the Chemical Hygiene Officer about waste management prior to instituting a new laboratory experiment.

(f) Be sure equipment is carefully secured before use. Combine reagents in the proper order, and avoid adding solids to hot liquids.

(g) Never work alone in the laboratory. Make arrangements to have someone monitor your activities.

(h) When transporting, storing, using, or disposing of any substance, be sure that it can't accidentally come into contact with an incompatible substance. This contact could result in an explosion, fire, or the production of hazardous gasses, fumes or vapors. See Appendix 2. Storage pattern for chemicals where space is limited.

5.3. Health and Hygiene

(a) Wear appropriate eye protection at all times in areas where hazardous chemicals are being used or are being stored.

(b) Use safety glasses when there is a risk of physical damage to the eye (rebounding springs, sparks). Use chemical goggles when there is a risk of chemical damage to the eye (splashing liquid, fine chemical dust). Use specially fitted chemical goggles which are non-vented to protect from chemical damage caused by vapors (off-gassing solutions, organic compounds with low boiling points).

(c) Strongly encourage students not to wear contact lenses in the laboratory. Plastic contact lenses can absorb chemical vapors which may then cause serious eye damage. Advise students to prepare for days when hazardous gasses or vapors may be present by wearing glasses. If a student is wearing contact lenses, they need additional PPE in order to protect their eyes from hazardous chemicals.

(d) Use personal protective equipment, including face shields, gloves, and other special clothing, as needed. Inspect gloves before each use, and replace them if they appear degraded or contaminated. Avoid contact between gloves and exposed skin, clothing, and eyes or mucous membranes during use.

(e) Secure long hair and loose clothing to avoid accidents. Lab smocks or aprons are highly recommended. Wear clothing that covers the arms, legs and feet. Closed-toe shoes must be worn. Advise students to prepare for days when glassware, chemical, or other hazards may be present with a back up pair of comfortable, closed toe shoes.

(f) A pipettor, pipette bulb, aspirator, or other mechanical device must be used to provide vacuum. Using the mouth to pipette chemicals or to start a siphon is not permitted for any laboratory procedure;

(g) Avoid exposure to gasses, vapors, and aerosols. Use a chemical fume hood when this type of exposure could occur.

(h) Wash hands well with soap and water before leaving the laboratory. Chemicals on hands can be transferred to food.

5.4. Food Handling

(a) Do not store, handle or consume food or beverages in the laboratory or other areas where chemicals are used or stored. In typical classroom environments, mark areas and surfaces where chemicals are used. Clearly mark areas where food is allowed.

(b) Do not bring chemicals or chemical equipment into areas that are designated for food consumption or smoking.

(c) Never use laboratory glassware or utensils to prepare or consume food. Laboratory refrigerators, ice chests, microwave ovens and cold rooms must not be used for food storage or preparation. Laboratory refrigerators must have spark-proof motors to avoid setting off explosions of leaking vapors.

(d) Refrigerators used for chemical storage must have this warning sign posted: "**CHEMICAL STORAGE ONLY - NO FOOD OR BEVERAGES ALLOWED!**"

(e) All other refrigerators in laboratory or classrooms spaces must have this warning sign posted:

"**FOOD STORAGE ONLY - NO CHEMICALS OR LAB SPECIMENS ALLOWED!**"

5.5. Housekeeping

(a) Keep work areas clean and free from obstructions. Cleanup must follow the completion of each operation and at the end of each day.

(b) Respond to laboratory accidents and spills immediately. Follow the appropriate spill procedures. If the spill is too large or hazardous for two school personnel trained in spill response to clean by themselves, follow the Emergency Procedure for Hazardous Material Exposure.

(c) Keep chemical and waste containers labeled at all times. Inform the Chemical Hygiene Officer immediately of the presence of any unlabeled containers. Do not open unlabeled containers.

(d) Label chemical product containers with the full name of the product that matches its SDS and its concentration (e.g., Sodium hydroxide, 1M) and its primary hazards (toxic, corrosive, reactive, flammable).

(e) Never block access to exits, emergency equipment, controls, etc.

(f) Notify the School Site Supervisor and Chemical Hygiene Officer immediately if equipment malfunctions. Discontinue use of the equipment if a safety hazard exists.

(g) Keep chemical storage under any hoods to a minimum. Leave the hood ventilation system turned on if chemicals are stored in or under the hood. Limit chemical storage in fume hoods to under 24 hours.

5.6. Glassware

(a) Accidents involving glassware are the leading cause of laboratory injuries. Where possible, use plastic beakers or vessels to mitigate the risk of glass breaking.

(b) Use careful storage and handling procedures to prevent glassware breakage.

(c) Use adequate hand protection when inserting glass tubing into rubber stoppers or corks or when placing rubber tubing on glass hose connections. Tubing should be fire polished or rounded and lubricated. Hold hands close together to limit movement of glass should a fracture occur.

(d) Handle vacuum-jacketed glass apparatus with extreme care to prevent implosions. Only glassware designed for vacuum work should be used for that purpose.

(e) Wear protective gloves when picking up broken glass.

(f) Wear disposable chemical-resistant gloves (eg: nitrile or latex gloves) under durable gloves (dishwashing gloves) when handling contaminated glass shards. Sweep up small pieces with a brush and dustpan.

5.7. Flammability Hazards

(a) Never use an open flame to heat flammable liquids. Extinguish open flames as soon as its purpose is served.

(b) Before lighting a flame, remove all flammable substances from the immediate area and check all containers of flammable substances to ensure they are tightly closed.

(c) Store flammable materials in a flammable storage cabinet or other appropriate location.

(d) Make sure that all flammable cabinets and containers are properly grounded to prevent accidental ignition of flammable vapors and liquids from static electricity or other sources of ignition.

(e) Flammable cabinets must be kept closed or provided with ventilation piping that leads directly outside and is equipped with an explosion-proof exhaust fan.

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6. Specific Exposure Control Measures

To reduce instructor or student exposure to hazardous chemicals through unique exposure control measures.

General exposure potential should be considered for all instructional use of hazardous materials. Three situations may require unique specific exposure control measures:

- Use of Ban Candidate or other high-hazard chemicals.
- Experimental procedures that increase the risk of harmful exposures.
- Procedures that could exceed the capacity of protective equipment or practices.

Each of these special situations requires review and prior approval by the Chemical Hygiene Officer.

6.1. General Exposure Potential

The primary routes of exposure to chemicals are by inhalation, ingestion, and contact with skin or eyes.

(a) Inhalation of chemical vapors, mists, gasses, fumes or dusts can produce poisoning through the mucous membrane of the nose, mouth, throat, and lungs and can seriously damage these tissues. The degree of injury resulting from exposure depends on the toxicity of the material, its solubility in tissue fluids, its concentration and the duration of exposure.

(b) Ingestion of many chemicals can be extremely dangerous. Some are poisonous in small doses while others can cause health problems from long-term low-level exposures. Many chemicals will also directly damage the tissue of the mouth, throat, nose, lungs, and gastrointestinal tract.

(c) Contact with skin and eyes can lead to significant chemical injury. Skin contact frequently will cause local irritation, but many chemicals can be absorbed through the skin and cause systemic poisoning. Most chemicals are damaging to the eyes, which are very sensitive organs. Alkaline materials like hydroxides, phenols, and strong acids can cause permanent loss of vision. Special care must be taken with chemical vapors, which can be absorbed by plastic contact lenses. Vapors trapped behind a contact lens may then cause serious eye damage.

(d) Chemicals that are highly volatile or prone to corrode their container's caps increase the risk of harmful exposures. Find out whether staff or students have particular sensitivities to any chemical. Risk factors include asthma, chemical

sensitivities, pregnancy and compromised immune systems. These factors must be considered when determining the amount of time a person should be working with a specific chemical compound.

6.2. Use of Ban Candidate Chemicals

Purchase of chemicals listed in Appendix 1. Ban Candidate Chemicals is prohibited without prior written <authorization> from the Chemical Hygiene Officer.

The Oregon OSHA publishes a list of PELs for air contaminants. Several of the listed airborne contaminants may be found in secondary school science stockrooms. Follow these guidelines when working with the chemicals listed below to avoid exceeding the PELs:

(e) Cadmium

Cadmium compounds are carcinogenic. Purchase and use of cadmium compounds is prohibited.

(f) Chromium - hexavalent

Hexavalent chromium compounds (chromate compounds, dichromate compounds, and chromium trioxide) are carcinogenic. Minimize the use of these compounds and the amount kept in storage.

Use of hexavalent chromium compounds is discouraged. If they must be used, buy the smallest amount necessary and only use them in the fume hood while wearing chemical resistant gloves.

Only hexavalent chromium compounds pre-diluted to reduce the risk of dust formation will be approved for purchase.

(c) Lead

Lead compounds are neurotoxic by ingestion and inhalation.

Purchase lead compounds pre-diluted to reduce the risk of dust formation.

Only open powdered lead compounds in chemical fume hoods.

<Lump lead compounds (sinkers, pellets, toys) are not considered hazardous to school-aged students. Care should be taken when disposing of lump lead, however. These items can contaminate waterways and impact local food chains.>

(d) Methylene chloride

Methylene chloride is a probable carcinogen that is highly volatile, easily inhaled and absorbs into the bloodstream through unprotected skin.

Use of methylene chloride is discouraged. If it must be used, buy the smallest amount necessary and only use it in the chemical fume hood while wearing chemical-resistant gloves.

(e) Mercury compounds and apparatus

<Mercury in it's elemental form has been largely removed from science classrooms over the last few decades, but some equipment may still contain traces of this element. Equipment with mercury should be replaced. Compounds containing mercury are very toxic. Use of mercury compounds is discouraged.>

(f) <Formaldehyde

Formaldehyde is being explored as a carcinogen, and has shown harmful effects at concentrations as low as 2 ppm in the air.

Biology specimens stored in formaldehyde or formalin should be decanted and held in a formaldehyde-free alternative.

e.g., Flinnsafe, Carosafe, propylene glycol, or alcohol solution. Formaldehyde disposal shall adhere to the local guidelines for hazardous waste disposal.>

The Chemical Hygiene Officer will audit all school sites for these high-risk materials in 2022, in preparation for the 2022-2023 Chemical Hygiene Plan Review.

6.3. Experimental Procedures that Increase Risk

The OSHA Laboratory Standard requires that laboratories evaluate the need for specific exposure control measures when employees use experimental procedures that call for use of select carcinogens, reproductive toxins, or substances with a high degree of acute toxicity. If the Chemical Hygiene Officer authorizes use of these compounds, they must ensure an exposure control measure evaluation is completed first and the recommended measures implemented.

These measures include the establishment of designated areas, use of containment devices, decontamination procedures and safe removal of contaminated waste.

Procedures that increase risk also include

(a) Decontamination procedures

The Chemical Hygiene Officer and Laboratory Facility Manager must develop procedures for decontaminating chemical usage areas in the laboratory. Decontaminate contaminated equipment and glassware in a chemical hood

before moving them. Decontaminate fume hoods after use and always before resuming normal work.

(b) Procedures for handling reproductive toxins

(e.g., Lead, cobalt and nickel compounds, formaldehyde, ethidium bromide.)

Only handle dry forms of these substances in a fume hood.

Use gloves and other protective clothing to prevent skin contact.

Always wash hands and arms immediately after working with these materials.

Keep records of the amounts of these materials on hand, amounts used, and the names of the workers using them.

Train employees in emergency procedures for accidents or spills involving these substances. Notify the Chemical Hygiene Officer of all chemical exposures or spills.

Store containers of these substances in a well-ventilated area and label them properly.

(c) Procedures for handling chemicals with high acute toxicity

(e.g., Fluoride compounds, nitric acid, bromine, phenol.)

Seek safer alternative compounds for use in experiments.

Use and store these substances in restricted access areas with warning signs.

Always use a hood when working with concentrated forms of these substances.

Always wash your hands and arms immediately after working with these materials.

Keep records of the amount on hand, the amount used, and the names of the workers using them.

(d) Procedures for handling select carcinogens

(e.g., Formaldehyde, perchloroethylene and chromate, nickel, cobalt and cadmium compounds.)

Seek safer alternative compounds for use in experiments.

The use and disposal of these substances should be approved by the Chemical Hygiene Officer prior to this activity.

Use and store these substances in areas of restricted access with special warning signs.

Always use a hood when working with concentrated forms of these substances.

Always wash your hands and arms immediately after working with these materials.

Keep records of the amounts on hand, the amounts used, and the names of the workers using them.

6.4. Procedures that Exceed Protective Capacity

Check the need for exposure controls when staff handle chemicals or use lab procedures. Include a review of existing engineering controls, administrative practices, and PPE.

Make sure ventilation systems provide protection for employees from chemical exposures. For example, use a chemical fume hood when procedures generate smoke, dust, fumes, or vapors.

Provide training to ensure employees are adequately protected from overexposure to hazardous chemicals. Keep track of the chemicals being used in experiments and demonstrations. Higher hazard chemicals require a higher degree of protection from harmful exposures. Use this information to decide if medical monitoring is needed.

Choose the right PPE for the compounds you are using. Before working with hazardous chemicals, ask the Chemical Hygiene Officer what type of PPE is necessary. Receive training in proper use and maintenance of PPE prior to using it - especially respirators.

Our procedures must always be within our capacity to adequately protect employees from hazardous risks in the laboratory or classroom. If these factors cannot be mitigated with existing engineering controls, administrative practices, or PPE, then contact the Chemical Hygiene Officer for support in development of a special procedure.

7. Inspections

To develop a well-organized laboratory inspection program which allows the Chemical Hygiene Officer to identify and correct the cause of chemical exposures before they occur. The objectives of our inspection program are to:

- Generate and maintain a high level of prevention awareness.
- Educate staff and students in the merits and methods of detecting and eliminating hazardous situations.
- Demonstrate the school district's interest in protecting the health and safety of staff and students.
- Foster a better understanding of the responsibilities that each must assume in the prevention of accidents.
- Help determine where additional training or instruction may be required.

7.1. Inspection Procedures

Two main mechanisms exist for routine inspection of dedicated laboratory facilities and typical school classrooms. One process is the Quarterly Safety Survey of all classrooms at a school site, including science classrooms. The other process is the Annual Science Classroom and Lab Safety Inspection.

The Quarterly Safety Survey is performed every quarter of the school year (October, January, April, and July). The Quarterly Safety Survey is conducted by the school site head custodians, under the supervision of the District Facilities Manager, and includes other classrooms not covered under this Chemical Hygiene Plan.

Refer to Appendix 5. Quarterly Safety Survey, Section V. for science specific information.

The Annual Science Classroom and Lab Safety Inspection is performed annually at each school, typically in the Winter Semester. <Consider a Month/range of months. How about Jan-Feb. Or is Feb-March better, to stay away from the end of grading periods.?> This is conducted by the Chemical Hygiene Officer, in support of the Laboratory Science Instructors and maintenance personnel managed by the District Facilities Managers at each school site. This inspection focuses on classroom spaces, storage spaces, and facilities requirements (such as ventilation for PELs monitoring, or SDS documentation for GHS compliance).

Refer to Appendix 6. Science classroom and Lab Safety Inspection. This checklist provides information on the recommended and required environmental health and safety components of a well functioning laboratory.

7.2. Emergency Equipment

Inspect safety equipment as appropriate to ensure it is functioning properly. Different safety equipment requires different checks and tests.

(a) Less Frequent Checks and Tests

Most fire extinguishers (Carbon Dioxide, water, wet chemical) need to be tested every 5 years.

Dry chemical fire extinguishers need to be tested every 12 years.

(b) Annual Checks and Tests

Safety Showers and Drench Stations need to be tested annually.

Fume hoods need to be tested annually.

All Fire extinguishers need to be fully maintenance checked annually.

All Spill kits need to be checked annually.

(c) Quarterly Checks and Tests

Electrical equipment being adequately grounded needs to be checked quarterly.

Chemical Storage Safety equipment, such as fire cabinets or corrosive cabinets, need to be checked quarterly.

Warning Signs and Hazard Labels for storage areas need to be checked quarterly.

Gas shut-off accessibility needs to be checked quarterly.

(d) More Frequent Checks and Tests

All Fire extinguishers need to be visually checked once a month, per school site maintenance.

All eyewash stations should be checked and flushed once a week, per school site maintenance.

7.3. First Aid Equipment

First aid kits are required in dedicated laboratory facilities and in typical science classrooms where hazardous chemicals are used.

First aid kits should contain PPE which is specifically set aside and appropriate for First Aid protection. Administering first aid should not deplete instructional safety supplies, nor vice-versa.

First aid kits should be inspected annually, and replenished as needed.

7.4. Personal Protective Equipment

PPE is required in dedicated laboratory facilities and in typical science classrooms where hazardous chemicals are used.

Appropriate eye protection is required at all times in areas where hazardous chemicals are being used or are being stored.

Use safety glasses when there is a risk of physical damage to the eye (rebounding springs, sparks).

Use chemical goggles when there is a risk of chemical damage to the eye (splashing liquid, fine chemical dust).

Use specially fitted chemical goggles which are non-vented to protect from chemical damage caused by vapors (off-gassing solutions, organic compounds with low boiling points).

Strongly encourage students not to wear contact lenses in the laboratory. Plastic contact lenses can absorb chemical vapors which may then cause serious eye damage. Advise students to prepare for days when hazardous gasses or vapors may be present by wearing glasses. If a student is wearing contact lenses, they need additional PPE in order to protect their eyes from hazardous chemicals.

Use personal protective equipment, including face shields, gloves, and other special clothing, as needed. Gloves should be selected for their intended use, and should generally be chemically resistant. Inspect gloves before each use, and replace them if they appear degraded or contaminated. Avoid contact between gloves and exposed skin, clothing, and eyes or mucous membranes during use.

Consider the use of protective smocks, aprons, or lab coats as appropriate.

PPE should be checked quarterly, and replenished as needed.

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8. Plan Review

The effectiveness of the Chemical Hygiene Plan must be reviewed and evaluated at least annually. The plan must be updated as necessary on an annual basis, though suggested revisions and comments for consideration are welcome to be submitted to the Chemical Hygiene Officer at any time.

8.1. Review Process

The Annual Review of all DDSD Chemical Hygiene Plans is due July 1. This due date requires a process that begins several months prior, in April.

The Chemical Hygiene Officer and District Safety Director begin the review process by setting an annual focus for the review in April.

The Chemical Hygiene Officer seeks input and comments from interested parties during May and June.

The Chemical Hygiene Officer drafts a proposed update in June. This updated draft can be collaborated on during Summer Work Days with extra duty pay available for interested parties, if necessary.

8.2. Review Considerations

Review should be done so as to preserve comments and updates to the previous plan.

Factors to consider for updating in the review include:

- Changes in laboratory procedures, operations or equipment that may affect the potential for personal exposure to hazardous chemicals.
- The addition or deletion of the use of specific hazardous chemicals that warrant a review of laboratory safety procedures.
- Changes in laboratory personnel or their responsibilities.
- The review and evaluation of inspection records, accident investigations, and professional research on chemical hygiene techniques.
- Changes or updates to Standards and Statutes used to develop the plan.

8.3. Review Final Authorization

The Annual Review of all DDSD Chemical Hygiene Plans is due July 1.

On this date, School Site Administrators, District Safety Directors, and Chemical Hygiene

Officer will officially authorize the chemical hygiene plan for the next school year.

The Chemical Hygiene Officer will make an electronic version of the Chemical Hygiene Plan available to all Laboratory Science Instructors officially at this time. The CHO will archive old electronic versions of the Plan, along with the notes and comments used in updating for the newly authorized plan.

Over the following month, the Chemical Hygiene Officer will post physical copies of the Plan in all dedicated laboratory facilities and typical science classrooms at the School Site. Physical copies will also be made available to post in employee common areas and to School Site Supervisors.

When teachers return to school to prepare for the next school year, they will have the updated draft for that academic year readily available.

9. Employee Information

To provide information about the hazards of chemicals present at the school site.

9.1. Information Requirements

Laboratory employees must be provided with specific information on the chemicals used in their work areas. OSHA's information requirements are summarized in this section under the heading "Information Program."

The Chemical Hygiene Officer will audit school site specific stockrooms and SDS in 2022 in order to offer more specific information about chemicals used in the school site.

9.2. Information Posting Frequency

The laboratory standard requires that employees receive information at the time of their initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. Updated information must be provided at least annually.

The Chemical Hygiene Officer will audit school site posting areas in 2022 for compliance with this posting standard.

9.3. Information Program

Laboratory employees must be informed of at least the following information:

- The contents of the OSHA Standard and its Appendices.
- The location and availability of the Chemical Hygiene Plan.
- The PEL's for OR - OSHA-regulated substances and/or recommended exposure limits for other hazardous chemicals. (Found in OAR 437-002-038.)
- Signs and symptoms of exposure to hazardous chemicals used in the laboratory.
- The location and availability of known reference materials on the hazards, safe handling, storage and disposal of hazardous chemicals found in the lab including Safety Data Sheets received from the chemical suppliers.

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10. Employee Training

Relevant training about the hazards of chemicals present at the school site must be provided every school year.

On-line training can be used as a substitute for some of this training. Visit the David Douglas SafeSchools account at https://ddouglas-or.safeschools.com/training/list?category_id=CAT-GUID-ENVIRO to see their collection of on-line videos. Additional, in-person training may be provided to familiarize staff with specific techniques in actual laboratory facilities.

The Chemical Hygiene Officer will audit school site specific training materials in 2022 in order to offer more specific training to each school site.

10.1. Training Requirements

Laboratory Science Instructors will be trained on

(a) Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

(b) The physical and health hazards of chemicals in the work area.

(c) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

(d) The employee must be trained on the applicable details of the employer's written Chemical Hygiene Plan.

The Chemical Hygiene Officer will audit school site specific stockrooms and SDS, and training materials in 2022 in order to offer more specific training about chemicals used in the school site.

10.2. Who Should be Trained

Provide this training to all employees who work in the laboratory as well as to other employees whose assignments may require that they enter a laboratory where exposures might occur, such as maintenance and custodial personnel. Inform employees who are responsible for receiving and handling shipments of new chemicals or chemical wastes about the potential hazards and appropriate protective measures for chemicals they may receive.

Students should also receive training appropriate to their level of chemical handling and potential exposure. Laboratory Science Instructors should be familiar enough with the details of this plan and of laboratory best practices to provide this training to students, as needed.

10.3. Record Keeping

Chemical Hygiene Officer will document training of laboratory personnel and maintain these records.

10.4. Training Frequency

The laboratory standard requires that employees receive training at the time of their initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. Refresher training and updated information must be provided at least annually.

10.5. Training Timeline

The Chemical Hygiene Officer will provide training as requested in Spring 2022, and develop a training and refresher program that can be used at each school site for August 2022.

11. Exposure Monitoring and Medical Attention

To provide laboratory instructors, other laboratory employees, and students with an appropriate level of exposure monitoring, and medical attention to protect them from adverse health effects resulting from potential exposure to hazardous chemicals.

11.1. Exposure Monitoring

The laboratory standards for exposure monitoring are summarized on the following pages. David Douglas Human Resources must maintain records of exposure monitoring, including the test method and results. Keep employee exposure monitoring records in the employee's file.

There is currently no reason to believe that exposure levels for an OSHA-regulated substance routinely exceed the action level (or in the absence of an action level, the PEL) at school sites in DDSD.

If there is reason to believe that exposure levels of these substances routinely exceed the action level (or in the absence of an action level, the PEL), employee exposure to that substance must be measured.

(a) Initial exposure determination

This is a list of common situations that increase the risk of employee exposures.

- Laboratory operations using hazardous chemicals in a way that increases releases.
- Past data that shows elevated exposures to the particular substance for similar operations.
- Procedures that use large volumes of hazardous chemicals.
- Procedures that use hazardous chemicals over a long period of time.
- Employees with exposure symptoms like skin irritation, difficulty breathing, nausea, or headache.

None of these conditions should exist in middle or high school laboratories.

(b) Exposure monitoring when the action level is exceeded

If an exposure determination exceeds a substance's PEL, the school district must follow the substance's Oregon OSHA exposure monitoring requirements. Monitor

airborne concentrations of individual hazardous chemicals in these circumstances:

- When testing or redesigning the hoods and other local ventilation devices.
- When a specific substance that is toxic or highly toxic is regularly and continuously used.
- When requested by a laboratory employee because of a documented health concern or suspicion that a PEL may be exceeded.

(c) Exposure record-keeping

Send exposure testing procedures and results to the District Human Resources for coordination and record maintenance.

The employee must be notified of any monitoring results within 15 working days of receiving the results, either individually or by posting the results in an appropriate location that is accessible to employees, such as the safety bulletin board.

Accurate records of measurements taken to monitor employee exposures must be kept, transferred and made available for each employee in accordance with OSHA's Access to Employee Exposure and Medical Records requirements (29 CFR 1910.1020).

The Chemical Hygiene Officer will consult with the District Safety Director and Environmental Control Technicians in 2022 to prepare a report detailing the current status of environmental monitoring programs, if any, within DDSD.

11.2. Medical Attention

Employees who work with hazardous chemicals must be provided with an opportunity to receive medical attention when overexposure to a hazardous chemical is suspected.

Medical attention must be provided to an employee under the following circumstances:

(a) Employees showing symptoms of chemical exposure must be permitted to receive a medical examination.

(b) Whenever a spill, leak or other event makes it likely a hazardous exposure has occurred, the affected employee must be provided with the opportunity for medical consultation to determine the need for a medical exam.

All medical examinations and consultations must be performed under the direct supervision of a licensed physician without cost to the employee, without loss of pay and at a reasonable time and place. Direct all questions regarding medical consultations and examinations to the District Human Resources.

11.3. Medical Consultation and Examination

Medical examinations are to be provided at no cost to the employee. All medical examinations and consultations must be performed under the direct supervision of a licensed physician, without loss of pay and at a reasonable time and place. Direct all questions regarding medical consultations and examinations to the Human Resources Department.

(a) Information for the physician

Provide the following information to a physician conducting medical consultations and exams:

- The identity of hazardous chemicals to which the employee may have been exposed.
- A description of the conditions under which the exposure occurred, including quantitative exposure data if available.
- A description of the signs and symptoms of exposure that the employee is experiencing, if any.

(b) Physician's report

A written opinion from the examining physician for any consultations or exams performed under this Operating Procedure must include:

- Any recommendations for further medical follow-up.
- The results of the medical examination and any associated tests.
- Any medical condition revealed during the course of the exam which might compromise employee safety during, or as a result of, exposure to hazardous chemicals found in the workplace.

- A statement that the employee has been informed by the physician of the results of the consultation or medical exam and any medical condition that may require further examination or treatment.

The written opinion should not reveal specific diagnoses unrelated to occupational exposure, except as noted above.

11.4. Medical Record Keeping

District Human Resources must maintain an accurate record for each laboratory employee undergoing medical consultations or medical examinations as required by the laboratory standard. Records for each employee must be transferred and made available as specified under OSHA's Access to Employee Exposure and Medical Records requirements (29 CFR 1910.1020).

Keep this information in an employee's file:

(a) Exposure monitoring test methods and results.

(b) Safety Data Sheet of the hazardous chemical(s) involved.

(c) Accident Report.

(d) Information submitted to, and received from, the physician.

Provisions equal to the above must be extended to affected students when an overexposure situation occurs. Application of the specific provisions related to student medical records, method of payment for physician services, etc., will vary according to student safety requirements and school district policies.

List of appendices, addenda, and articles