

Chemical Hazards

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Chemical Hazards

Overview

Employees in every school or workplace use, handle, store, dispose of, and/or transport hazardous chemicals.

Refer to Administrative Procedures:

[AP 251 – Science Classroom Safety](#)

[AP 252 - Biological and Science Experiments](#)

Some areas of work involving the use of hazardous chemicals are:

- C.T.S. Programs
- Custodial Services
- Fine Arts Programs
- Food Services
- Horticultural Areas and Greenhouses
- Maintenance and Repair Services
- Refrigeration and Sanitation
- Renovations and Construction
- Science Programs

Examples of hazardous chemicals that employees may be exposed to include:

- acids
- cleaners
- fumes from welding
- lubricants
- synthetic vitreous fibers (i.e., fiberglass)
- oils
- paints
- photocopy toners
- wood dust

Exposure to hazardous chemicals either in their pure form or combined in products can cause or contribute to a variety of adverse health concerns. Some effects are minor and occur immediately following the exposure. Other effects result from repeated exposure over a long period of time.

There are four routes of entry of hazardous chemicals into the body:

- **Ingestion:** Problems may occur when employees eat or drink in areas where toxic chemicals exist.
- **Absorption:** Some chemicals are able to pass through the skin and enter the body. Others enter through unprotected cuts and scratches.
- **Inhalation:** Contaminants in the air can be inhaled and rapidly absorbed into the bloodstream and then carried to all parts of the body. Some may remain in the lungs and cause irritation, which eventually could lead to lung disease.
- **Injection:** This is not common, but can occur with needles, nails, and glass, and through the force of compressed air or pressurized liquids.

Legislative Requirements

Under federal and provincial legislation, employees have the right to know whether a chemical they are working with is hazardous, the nature of the hazard, and what safety measures should be taken. Employees also need to know the role they play in the life-cycle or cradle-to-grave management of hazardous chemicals.

The life-cycle management of hazardous chemical products is regulated under the following legislation:

- Hazardous Products Act
- Consumer Packaging and Labelling Act and Regulations
- Occupational Health and Safety Act, Regulation and Code (ALBERTA)
- Transportation of Dangerous Goods Act (TDG) (CANADA)
- Canadian Environmental Protection Act (CEPA)
- Alberta Environmental Protection and Enhancement Act (AEPEA)
- Public Health Act (ALBERTA)
- Fertilizers Act (CANADA)
- Alberta Fire Code

For each and every chemical it is necessary to look at the following four major systems established in the legislation:

- Workplace Hazardous Materials Information System (WHMIS)
- Consumer restricted products
- Transportation of Dangerous Goods (TDG)
- Alberta Environmental Protection and Enhancement Act (AEPEA)

Workplace Hazardous Materials Information System (WHMIS)

The Workplace Hazardous Materials Information System (WHMIS) - usually pronounced *wimmis* - is a Canada-wide system developed to make it easier for employees to find out about hazardous chemical products in their workplace that could injure them or be dangerous to their health.

WHMIS has three components:

- Labels
- Safety Data Sheets (SDS)
- Worker Education

Hazardous chemical products regulated under WHMIS are called *controlled products*.

As a condition of sale, the supplier of a controlled product is required to provide:

- WHMIS labeling
- Material Safety Data Sheets (SDS)

The employer in whose workplace controlled products are present is required to ensure that:

- A current SDS is readily available for every controlled product present in the workplace. **An SDS must be less than three years old to be valid and be supplier specific.**
- All SDS shall be kept in SDS binders at or near the site where the chemicals are used.
- All workers who use or are in close proximity to a controlled product know how to use, store, handle and dispose of the product safely.
- Controlled products are correctly labelled and stored at all times.

WHMIS Compliance

WHMIS is judged for compliance from a *performance* standard. The questions a government inspector could ask are:

Does the employee know and understand the risks involved, and how to safely handle the hazardous chemicals that he or she deals with in the school or workplace?

If the answers are YES, then there is compliance.

The Superintendent delegates to principals and non-school based department heads the responsibility to ensure that:

- Products are properly labelled.
- Employees obtain and keep on file current material safety data sheets (SDS).
- Employees have been trained in handling hazardous chemicals.

Consumer Restricted Products

Consumer restricted products are hazardous chemicals that are packaged for consumer use, i.e., for use in the home or for care or for recreation purposes. Examples include:

- bleach (sodium hypochlorite)
- hydrogen peroxide
- adhesives

- mineral spirits
- cleaning solvents (toluene)
- many corrosives, such as drain cleaners (sulphuric acid), tile cleaners (hydrochloric acid), oven cleaners (caustic soda)
- turpentine
- small propane cylinders
- most aerosols

When consumer restricted products are used in the workplace, they are subject to WHMIS regulations. The employer must ensure that:

- All employees who use or are in close proximity to a consumer restricted product know how to use, store, handle and dispose of it safely.
- Consumer restricted products are correctly labeled at all times.

These chemicals are every bit as hazardous as chemicals purchased commercially, however, to qualify as consumer restricted, the chemical must be packaged in a relatively small container, intended for “consumer” use and sold through retail outlets.

Consumer restricted products are not regulated as closely as controlled products - for example, the supplier does not need to provide a material safety data sheet. However, containers of these products must be labeled.

Consumer Restricted Product Compliance

The Superintendent delegates to principals and non-school based department heads the responsibility to ensure that:

- Products are properly labeled.
- Employees using or in close proximity to consumer restricted products have been trained (WHMIS).
- Current SDS must be available for consumer restricted products.

Upon completion of their training, employees should know:

- How to recognize a consumer restricted product.
- The nature of the hazard.
- The protective measures to adopt when handling, storing, using and disposing of the consumer restricted product.
- The emergency measures to follow if a leak or spill incident occurs.
- How to access further hazard information.

Transportation of Dangerous Goods Act (TDG)

Most of the hazardous chemicals found at your school or workplace were transported there. During transportation, these chemicals are called *dangerous goods* and fall under the TDG Regulations.

The purpose of TDG is to protect the general public during the transportation of dangerous goods. In the event of an accident, leak or spill, it is critical that the dangerous goods involved be identified as quickly as possible so that public safety can be assured and so that the emergency response can be swift and appropriate.

TDG is an information system. Under TDG Regulations, dangerous goods are identified by means of:

- labels on containers
- placards on trucks
- shipping documents

This information can be quickly applied by employees in an emergency. The identifications used are universal and international in scope and, because of this, they are rigidly specified.

The TDG Regulations require that the following employees be trained and carry their training certificates with them at all times:

- Those who “offer dangerous goods for transport”, i.e., a shipper or receiver.
- Those who “handle dangerous goods”, i.e., loads, unloads.
- Those who drive a vehicle carrying dangerous goods.

A training certificate is valid only for three years. After that time, the employee must be re-trained and issued a new certificate.

TDG and WHMIS are complementary, but mutually exclusive systems. A hazardous chemical cannot be under both systems at the same time. Once the dangerous goods have been unloaded from the transport vehicle and received, they are no longer regulated under TDG. They are controlled products and come under WHMIS.

TDG Compliance

TDG is judged from a prescriptive standard, i.e., are all the rules being correctly followed? The questions a government inspector would ask are:

- Is the employee (shipper, trucker, receiver) trained for TDG and does he/she carry a current certificate of training?
- Is the shipment of dangerous goods correctly packaged, marked, labeled and placarded and is it accompanied by a correctly made out shipping document?

If the answers are YES, then there is compliance.

The Superintendent delegates to principals and non-school based department heads the responsibility of demonstrating compliance by providing dangerous goods lists and ensuring that employees, who receive or ship dangerous goods, are TDG trained and certified.

Certified employees will know:

- The classes of dangerous goods.

- The information that is required on shipping documents.
- What labels and markings are required on packages and containers.
- What placards shall be shown on vehicles and when they shall be shown.
- The protective measures to adopt during transport.
- The responsibilities if they are the consignor, carrier or consignee of the dangerous goods.
- How and when to report accidents or incidents involving dangerous goods, especially those releases deemed dangerous occurrences.

Alberta Environmental Protection and Enhancement Act (AEPEA)

The Alberta Environmental Protection and Enhancement Act (AEPEA) and its regulations outline a system established for the protection, improvement, and wise use of the environment. The Act sets out proactive and preventive measures to be implemented through integrating management of the water, air, and land.

Although there are measures in AEPEA to severely punish polluters, the act and regulations are essentially preventive in nature. A wide range of measures ensure that projects that might damage the environment are not allowed to proceed before their impact is closely examined and adequate provisions made to prevent and mitigate potential adverse effects. Licences (approvals) typically stipulate on-going monitoring of and reporting on groundwater quality and water and air emissions.

AEPEA affects the Division in two ways:

1. If there is a release of a substance that causes or may cause an adverse effect to the environment:
 - The release (leak or spill) must be reported immediately by calling 911 and then advising the applicable Area Superintendent and a Division Health and Safety Officer.
 - Immediate steps must be taken to confine and remedy the effects of the release and to clean up and dispose of the leaked or spilled substance.
 - The environment must be returned to a condition that is satisfactory to Alberta Environmental Protection (AEP).
2. Hazardous waste generated by the Division must be stored, transported and disposed of (or recycled) in accordance with the regulations.

AEPEA Compliance

AEPEA is judged for compliance from a *shared responsibility* standard. The questions a government inspector would ask are:

Does the employee know the responsibilities regarding:

- The reporting of environmental accidents.
- The clean-up of releases.
- The disposal or recycling of waste and hazardous wastes.

- The approvals that need to be held, as well as certificates of qualification.

If the answers are YES, then there is compliance.

The Superintendent delegates to principals and non-school based department heads the responsibility to ensure compliance by providing employee education and training in AEPEA regulations.

A trained employee will know:

- What emergency and release reporting procedures to follow if there is an accidental leak or spill.
- How to confine the release and ensure prompt clean-up takes place to restore the environment to a satisfactory condition.
- What preventive and protective measures should be adopted.
- How to ensure that chemical hazards are used, handled, and disposed of in an environmentally safe manner.
- How to implement waste and hazardous chemical product waste minimization and recycling measures.

Guidelines for Meeting Legislative Requirements

Life-Cycle Management

To demonstrate due diligence, life-cycle management of hazardous chemical products is to be practiced in the school or workplace.

For every hazardous chemical product, it is important to know how:

- It is getting to the workplace.
- It is going to be safely stored and used.
- Leaks and spills are to be handled.
- It will be disposed of.

In its life-cycle, each chemical is governed by one of the three regulatory systems WHMIS, TDG and AEPEA. Depending on the point in the life-cycle the hazardous chemical product is at, it may pass back and forth from one system to another.

Steps in the Life-Cycle of a Hazardous Chemical Product

Step	Regulated Under
1. Ordering of hazardous chemical product	WHMIS
2. Receipt of hazardous chemical product from manufacturer, a supplier, or the Division distribution center	TDG <ul style="list-style-type: none"> - shipping document - labels - markings - placards
3. Storage and handling in the workplace <ul style="list-style-type: none"> - Material Safety Data Sheets 	WHMIS <ul style="list-style-type: none"> - labels - SDS

- WHMIS Supplier Labels	- training employees to safely work with the chemicals
- Consumer Restricted Product Labels	Control Products Regulations and Hazardous Products Act
- WHMIS Workplace Labels	- labelling - SDS
- Personal Protective Equipment Symbols	- training employees to work safely with the chemicals
- General Handling of Hazardous Chemicals	
- Storage and Location of Hazardous Chemicals	
4. Leaks and spills in the workplace	AEPEA and EPA
- Spill Clean-up Equipment	
- Reporting	WHMIS - training for clean up
- During Transportation	
5. Disposal of waste	WHMIS
a) Hazardous chemical product becomes a waste	AEPEA and EPA
b) Select disposal/recycle option for hazardous chemical product waste	Workplace shall exercise due diligence in selection of waste option WHMIS - AEPEA and EPA - licensing of facilities
c) Ship hazardous chemical product waste from workplace to waste disposal/facility recycler	TDG - waste manifest - recycle docket - labels - markings - placards Environmental regulations AEPEA and EPA WHMIS - for hazardous wastes that are controlled products
6. Shipping hazardous chemicals (other than waste)	TDG - shipping document - labelling - markings - placards AEPEA and EPA WHMIS

1. Ordering / Purchasing

Before ordering hazardous or consumer restricted products, employees should consider:

- Non-hazardous product alternatives.
- Quantity required considering shelf life of product.
- Storage requirements.

From Distribution Centre

- Controlled products sent shall have the appropriate WHMIS and TDG information on the shipping document.

- Current Safety Data Sheets (SDS) for all controlled products ordered shall be sent to the workplace for placement in the Material Safety Data Sheet (SDS) binder.
- Additional supplier labels and Safety Data Sheets (SDS) shall be available for all controlled products listed.

From Other Suppliers

- Controlled products or consumer restricted products ordered from other suppliers shall have the appropriate WHMIS and TDG information on the shipping document.
- For all orders the employee shall:
 - Determine if product is controlled or consumer restricted and if the product will be transported to the workplace as a dangerous good.
 - Ensure the Safety Data Sheet (SDS) accompanies a control or consumer restricted product.
- Almost all controlled products will be dangerous goods during transport.
 - If the supplier says that the product is not a controlled product or consumer restricted product, the supplier shall verify this in writing.
 - If the supplier is not sure, the employee shall not order the product until the supplier can specify.
- If the product will be transported as a dangerous good, the employee ordering shall advise the supplier that the shipment *will be refused* unless the container is properly marked and the dangerous goods are correctly described on the shipping document that accompanies the shipment.
 - If the supplier says the product is not a dangerous good, the supplier shall verify this in writing.
 - If the supplier is not sure, the employee is not to order the product until the supplier can specify.

2. Receiving

Only employees with current TDG training shall accept a dangerous good from the supplier. If the product is transported as a dangerous good either from a supplier, the shipment shall be accompanied by a shipping document which the receiver (consignee) shall check to see it has been correctly completed and includes:

- The name of the carrier.
- The name and address of the receiver.
- The name and address of the shipper (consignor).
- A description of the dangerous goods including the:
 - shipping name
 - product identification number (PIN)
 - classification
 - packing group
 - SDS
- The correct quantity of dangerous goods received.
- Any special safe handling, transporting or storage instructions.
- A 24-hour emergency telephone number where the consignor can be reached.
- An indication of the type and number of placards, if required.

- The number and the letters that identify the protective direction, e.g., this side up, if any.
- The permit number, if applicable.
- The Emergency Response Plan number, if required.
- Signatures of the consignor and the carrier.
- The Safety Data sheet.

If the shipment consists of both dangerous and non-dangerous goods, the information about the dangerous goods shall be:

- Listed first under the heading Dangerous Goods.
- Written or highlighted in a contrasting column.
- Indicated by an X in a column headed DG.

The outer packaging shall be labeled and marked with correct:

- TDG label.
- Shipping name which matches shipping name on document.
- PIN which matches PIN on document.
- If the outer packaging is correctly marked and labeled, inner containers do not need to be marked and labeled for dangerous goods.

Correctly Labeled and Marked Dangerous Goods Package

- If shipping document and/or package labels and markings are incorrect, the receiver shall refuse the shipment at this point.
- If everything is in order to this point, then the receiver shall always open outer packaging to see if inner container(s) display proper WHMIS supplier labels or consumer restricted product labels.
- The receiver shall then check the Safety Data Sheet (SDS) to ensure it matches the hazardous chemical product name and supplier shown on SDS.
- The receiver shall check that SDS has been enclosed.
- If SDS is not enclosed, the receiver shall refuse the shipment or arrange for immediate transmission of SDS.
- If the supplier has chosen to put a WHMIS supplier label on outer packaging without labelling the inner packaging, the receiver shall immediately label the product with workplace labels using the information found on the supplier label.
- If the hazardous chemical product inside the outer packaging does not display supplier labels, the receiver shall refuse the shipment unless the labels have been enclosed for the receiver to immediately affix before handling, use and storage.
- If the receiver has concerns about a chemical product and there are no visible indicators to inform the employee that the product is a controlled hazardous chemical, it should not be accepted.
- A controlled product transported as a dangerous good is subject only to WHMIS requirements once received.

- The receiver (consignee) shall compare the hazardous chemical product shipment with the shipping document, and if everything matches, the receiver shall sign the shipping document and give one copy to the driver and keep the other copy on file for two years.
The receiver may be required to produce the copy of the shipping document to a dangerous goods inspector on demand or within fifteen days of a written request.
If the receiver's shipping document is subsequently lost, the receiver is liable and can be charged with a dangerous goods infraction.
- Only TDG certified staff shall sign for or receive dangerous goods.
- Standard work procedures for employees should reflect a high standard of care for the loading and unloading of hazardous chemicals and movement from place to place within the workplace.

3. Storage and Handling in the Workplace

Safety Data Sheets (SDS)

- For every controlled product, the supplier shall transmit a *current* Safety Data Sheet (SDS) to the purchaser on or before the sale, unless the purchaser has already received the SDS from this supplier with a previous order.
- The SDS shall be dated not more than three years before the date of sale or importation of the controlled product. If the SDS is more than three years, it is no longer valid unless the SDS has a *change of date* letter attached. The product cannot be used until a current SDS has been obtained.
- If there is no current SDS for a controlled product, it shall be stored until a current SDS or change of date letter has been obtained.
 - suppliers shall revise the SDS within 90 days of receipt of any new information
- The SDS shall be in English and French or, if necessary, in the other main language of the workplace.
- Copies of all workplace SDS shall be placed in binders near locations where the hazardous chemical products are used and stored and shall be readily available to all employees.
- **Copies of all hazardous chemical inventory lists shall be placed in DocuShare.**

If the workplace has computerized SDS:

- All employees shall know how to use the computer in order to access and read the SDS.
- Reasonable steps shall be taken to keep the terminal active.
- Hard copies need to be available immediately upon request by employees.

All employees handling and using controlled products shall be WHMIS trained.

WHMIS Supplier Labels

The WHMIS supplier label may be attached, printed, stenciled or embossed on the product or container, and shall:

- Have a hatch border.
- Be easily identifiable.
- Be on the container when the shipment arrives or be enclosed with shipment to be attached on receipt.

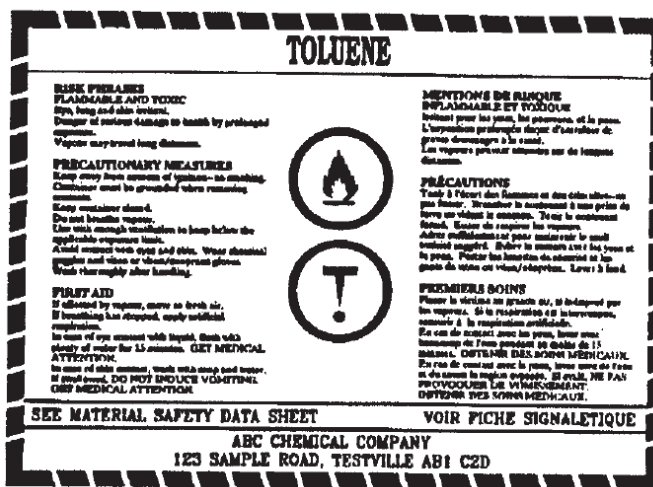
- Be printed in English and French either on a single bilingual label or on two separate labels.
- Contrast with the background colour of the container.
- Be made of durable material to remain attached and readable under normal conditions of transport, use, and storage.
- Be positioned so that it will be easily seen under normal conditions of handling and storage.

WHMIS labels must contain the following information:

- product identifier
- supplier identifier
- SDS statement
- hazard symbols
- risk phrases
- precautionary measures
- first aid measures









If the product is 100 ml or less the labeling only requires the following:

- Product Identifier.
- Supplier Identifier.
- SDS Statement.
- Hazard Symbols.
- Standard WHMIS Symbols.
- Only the eight standard WHMIS symbols for identifying the six classes of hazardous chemical products are to be used on supplier labels.
- Clear and identifiable symbols.
- Products that are hazardous in more than one way shall have a symbol to identify each hazard.
- Symbols in a colour that will not conflict with, or create confusion with, TDG symbols. The use of black and white is acceptable for all symbols.



Example:

WHMIS Hazard Classes

A	Compressed Gas	
B	Flammable and Combustible Material	
C	Oxidizing Material	
D	Poisonous and Infectious Material 1. Materials causing immediate and serious toxic effects 2. Materials causing other toxic effects 3. Biohazardous infectious material	  
E	Corrosive Material	
F	Dangerously Reactive Material	

Consumer Restricted Product Labels

Consumer restricted products can be identified through hazard symbols on their labels.

Shape

Signal Words

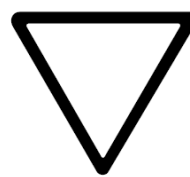
Degree of Hazard



Danger



Warning



Caution

Pictogram

Nature of Hazard



Poison



Corrosive



Flammable



Explosive

The hazard posed by a specific chemical is indicated by combining the appropriate shape and pictogram. Below is the hazard symbol for a product with a very severe risk of flammability:



WHMIS Workplace Labels

A workplace label must have the following information:

- Product identifier.
- Safe handling instructions.
- Reference to Material Safety Data Sheet (SDS).

A workplace label shall be prepared and affixed when:

- A receiver finds the controlled product inside a labeled outer package that is not labeled for WHMIS.
- A supplier label becomes illegible, damaged, or lost.
- A controlled or restricted product is decanted to a new permanent container.
- The chemical information is revised and updated (revised or updated label shall not contradict the current SDS in the workplace for that hazardous chemical product).
- Old stock is present and a current SDS is available (if old stock is present and not accompanied by an SDS this stock shall be prepared for disposal).
- A controlled product is in storage tanks or being transferred through piping systems (if label is inappropriate, tags should be used).
- A bulk controlled product is received as powder or granules.

When a controlled product is to be decanted from original container then:

- In these instances only the *product name* shall be printed on the container. Only controlled products that have a readable supplier label shall be decanted. Please note that only employees trained in handling the transfer of these types of products should be allowed to perform any decanting processes.
- The employee is going to be the *only person* using the controlled product for *one work shift*.
- The employee is going to put it *back* into the labeled container before the shift ends.
- The employee is *decanting* a laboratory reagent or preparing laboratory samples.



Preparing a Workplace Label

To prepare workplace labels the following Division developed labels can be used. These workplace labels are available from your supervisor.

With reference to the controlled product SDS, the employee shall use the following steps to prepare the Division workplace label.

Refer to the controlled or restricted product SDS to prepare the workplace label.

- The product name is to be printed in the top box in English, and if necessary, in the other languages of the workplace.
- The WHMIS hazard symbols and personal protective equipment (PPE) symbols or precautions that do not apply are to be blacked out using a marker.
- Safe handling instructions are to be added.
- The completed label is to be placed on the side of the container or attached as a tag where it is clearly visible during use and storage and be covered with plastic overlay for durability.
- **Do not** put the label on the bottom of the container or cover over other vital information.

Product Identifier / Identificateur Du Produit
 WHMIS Hazard Symbols / Symboles De Danger SIMDUT
 Personal Protective Equipment / Équipement De Protection Personnel
Other / Autre
Refer to the Material Safety Data Sheet for additional information / Pour Information Supplémentaire Referer A La Fiche Signalitique

Personal Protective Equipment (PPE) Symbols

- Appropriate personal protective equipment (PPE) shall be available and worn at all times.
- Only the nine internationally recognized PPE symbols shall be found on supplier and workplace labels.



1. Chemical
Protective
Monogoggles



2. Face Shield



3. Apron



4. Disposable
Dust Mask



5. Cartridge
Respirator



6. Supplied Air
Respirator



7. Hand
Protection



8. Protective
Chemical
Footwear



9. Full Body
Protective
Clothing

These symbols indicate the type of protection needed to keep hazardous chemicals from affecting the user.

As the label does not indicate everything that is necessary to know about the hazardous chemical product, the Safety Data Sheet (SDS) shall also be read before product is used to:

- Determine what type of equipment and clothing material is necessary in relation to the way the controlled product will be used in the workplace.
- Know the general precautionary rules, and first aid response.

Standard work procedures for employees should reflect a high standard of care when handling and using controlled products to prevent any incidents that could impair or damage the environment, human health or safety, or property.

General Handling of Hazardous Chemicals

- Controlled products should only be used for the purpose outlined by the manufacturer.
- The SDS and label shall always be read before using the chemical.
- Opened product should be used before opening new stock.
- Good inventory management and regular stock rotation should be practiced.
- A current inventory of hazardous chemicals must be maintained and readily available.
- Only those controlled products that have readable supplier labels are to be decanted.
- Appropriate PPE is to be available and worn at all times when an employee is decanting hazardous chemical products.

Storage and Location of Hazardous Chemicals

- A storage room or area shall allow for easy access to all areas of the workplace.
- A teacher work station (e.g., desk) shall not be located where chemicals are stored.
- Flammables and acids (greater than two molar) must be stored in the applicable cabinets certified for their storage.
- Hazardous chemicals shall not be stored in a service area such as:
 - a boiler room
 - a mechanical room
 - an electrical area
- There shall be adequate provision for security.
- The storage room or area shall be kept locked when not in use.
- Adequate shelving shall be provided so that chemicals with different properties can be properly segregated horizontally and vertically when stored.
- Chemical products should be kept off the floor.
- Chemicals shall be stored so that in the event of a leak or spill, the product does not run into drains and sewers or contaminate the ground.
- Chemical liquids in glass bottles should be stored below eye level.
- Adequate space shall be provided for the quantity of chemicals normally used.
 - limit quantities ordered
- Date all containers so older stock is used first.
- Shelf life of chemicals shall be monitored closely.
- Deteriorated and contaminated products shall be removed to a waste storage area and disposal arranged.

- for information regarding this process, refer to *The Disposal of Wastes* in this section
- Highly flammable products and excess quantities of flammable products shall be stored in cabinets that conform to standards established by the Alberta Fire Code.
- Acids should be stored in vented acid cabinets
 - separate organic and inorganic acids
- Special care shall be exercised with boiler water treatment chemicals and test chemicals. If stored in a boiler room, they shall be locked and access restricted to authorized personnel.

Inventory Guidelines

- A hazardous chemical inventory list shall be established.
The list shall include:
 - name of chemical
 - quantity
 - supplier
 - verification and date of SDS
 - date of purchase
 - storage group
 - hazard classification
 - review date
 - storage location
- Updates of the inventory list shall take place on a continuous basis as products are:
 - received
 - used
 - deleted from inventory
- **A hazardous chemical inventory list should be available at the main office of each school and stored in DocuShare.**
- A *Chemical Hazard Inventory List* form can be found at the end of this section.
- An additional up-to-date copy of the inventory list shall be kept on file in the general office, along with the Safety Data Sheets (SDS), as part of the facilities emergency preparedness plan. This would provide vital information in situations where an accident or spill results in the evacuation of the facility.
- Update the inventory on a continual basis as chemicals are received and used or deleted from list, reflect curriculum changes, custodial chemical hazardous product changes, or changes in regulations governing the use of hazardous products.
- Use opened containers before opening new stock.
- Track chemical shelf life. Liquid chemicals should be used within one or two years. Dry powdered chemicals should be used within three years.
- A binder of current SDS shall be readily available in the area where chemicals are stored.

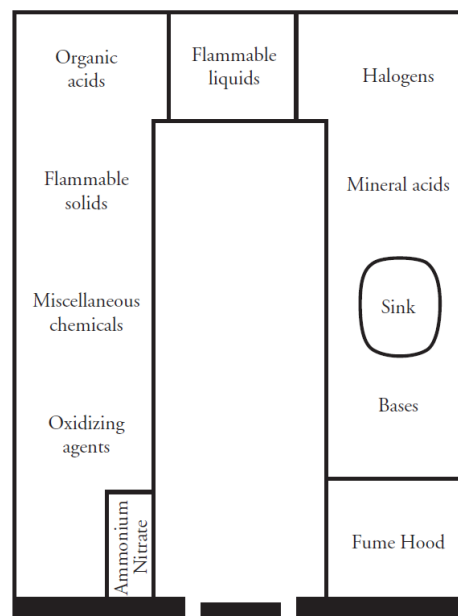
Location

- Secondary schools should have a separate storage area for chemicals. A forced-air exhaust system must be provided for this area to prevent the build-up of fumes. The installation of a smoke detector is recommended.
- It is advantageous for elementary schools and others that keep small quantities of low hazard chemicals to have a store-room with clearly marked cupboards.
- Only very low hazard chemicals should be stored in a classroom or laboratory and then only in enclosed cupboards.
- Chemical storage cupboards should be enclosed by doors. Open shelves will restrict the types of chemicals that can be stored safely. All cupboards should have some ventilation (usually loose-fitting doors, or the spaces around doors, are sufficient).
- Cupboards for the various chemical categories are best separated from each other by a wooden partition. Lack of proper separation creates the possibility of mixing incompatible chemicals through spills, breakage, leakage, dust or fumes.
- Alberta Fire Code regulations relating to the storage of flammable materials must be met.
- Indoor ventilation should be provided at both floor and ceiling levels in chemical storage rooms to conform to fire regulations.
- Gas burners should not be used in chemical storage rooms. Gas supplies to these rooms should be shut off permanently.
- Form a seal around the lids of bottles containing materials that release vapours, using plastic electrical tape or parafilm.

Store Room Plans

- A store room plan for chemicals should result in the separation of incompatible groups and the isolation of those that present special hazards. Storing all chemicals together in alphabetical order is not adequate. Separating just one or two groups, such as acids and flammables, is not much better.
- The plans that follow can be used to provide guidance for safe storage, and are adaptable to facilities of various designs.
- Layout 1 illustrates adequate separation of a fairly extensive collection of chemical materials in a chemical storeroom that could be found in a secondary school or maintenance zone. A storeroom such as this should be provided with an exhaust fan, as well as other safety equipment that is necessary.
- Bunsen or other gas burners should not be used in this room.

Layout 1



Layout 2

Glassware	Glassware				
Acids	Bases	Oxidizing agents	General	Flammable Solids	Flammable Liquids

- Layout 2 illustrates adequate separation for smaller quantities of low hazard chemicals in storage cupboards suitable for a small elementary or junior high school. It is not suitable for the needs of most high schools. These cupboards shall not be airtight.

Layout 3

Non-reactive general	Non-reactive general	Oxidizing agents	Flammable solids
Acids	Bases	General	Flammable liquids

- Layout 3 illustrates storage of small quantities of very low hazard chemical materials suitable for a small elementary school. Only very weak acids, bases, oxidizing agents and very low hazard flammable liquids are to be stored. These cupboards shall not be airtight.

Organization of Chemicals

Chemicals should be organized to avoid physical contact between different chemical groups.

Chemical Storage Groups:

Inorganic Acids

Mineral acids should be stored in a well-ventilated area in well-painted wood cupboards without metal pipes, valves or other metal objects in them, and separated from other cupboards by at least a partition. Some commercial cabinets with acid-resistant paint are satisfactory.

Nitric acid is a strong oxidizing agent and suitable precautions should be taken with its storage. Its container will build in pressure over time and should be replaced when this occurs.

Parafilm or plastic electrical tape can be placed around lids for storage to help prevent the escape of fumes. Plastic lids will deteriorate with time and should be replaced when this occurs.

Organic Acids

Approved organic waste containers, complete with flame screens, must be used for all organic waste. Containers should be in a well-ventilated area. Store acid anhydrides with this group.

Strong Bases

Some of these will react with glass containers to form a filmy precipitate and are best stored in base-resistant plastic bottles. Those that emit fumes should be sealed with parafilm or electrical tape.

Flammable Liquids

Most organic liquids are included here. Flammable liquids should:

- Be stored in a cool, well-ventilated cupboard.
- Separate from other cupboards by at least a partition.
- Clearly labelled; and away from exit routes.

Refer to the Alberta Fire Code for regulations governing the type, location, allowed quantities and other requirements for these storage facilities.

Flammable liquids must not be stored in a refrigerator unless it is specially designed for this purpose and explosion proof.

Hydrogenated hydrocarbons are less flammable, but should be stored in a well ventilated area.

Note that this category includes alkali metals, powdered metals, powdered carbon and others. Oxidizing agents must be kept away from this cupboard and the materials in it.

Flammable Solids

There should be no paper, cardboard, cloth or other combustible materials in the cupboard. Precautions must be taken to avoid contamination with dust or other chemicals.

Oxidizing Agents

Oxidizing Agents are highly reactive. They should be stored away from other materials. Ammonium nitrate is an example of a strong oxidizing agent.

Halogens

These should be stored in a cupboard that is separated from other cupboards by at least a partition. Lids on bottles should be sealed with parafilm or electrical tape.

Miscellaneous


This includes most materials not included in any of the previous categories. Some further separation may be desirable if available storage facilities allow.

4. Leaks and Spills

All workplaces shall have sorbent material, emergency equipment and appropriate PPE available to employees for the clean-up of controlled products being used at the workplace.

Spill Clean-up Equipment

The following list indicates spill clean-up equipment that may be required in areas of the workplace where leaks and spills would most likely occur. The types of materials stored in these areas will determine the type of equipment required.

<ul style="list-style-type: none">• flashlights• nitrile gloves• non-sparking scrapers and shovels• brooms, squeegees and plastic scoops• selective and universal sorbents• salvage drums, labels and liners• bung (drum) wrench• soda ash (good neutralizer)• grounding wires and cables		<p>Items supplied in Spill Kits</p> <p>Additional items that school may wish to purchase</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------

The correct PPE and clean-up materials to be used will depend on the chemical leaked or spilled and will be indicated on the SDS for that chemical.

No employee shall attempt to clean up any leak or spill without using the recommended PPE and appropriate spill response as indicated on the SDS for the hazardous chemical product.

Spills of custodial chemicals, e.g., strippers, neutralizers/conditioners, cleaners or floor finishers are mostly water soluble, and should be diluted with large quantities of water and cleaned up with mop and pail - then disposed of into the drain.

Spills of boiler water treatment chemicals pose an added risk as they are generally stored near drains that lead to city sewers. These chemicals shall first be contained and then neutralized.

- *Alkalis* should be neutralized with sodium dihydrogen phosphate.
- *Acids* should be neutralized with sodium bicarbonate.

Once neutralized the spill may be collected with sorbents or flushed to drain.

Hydrocarbons, e.g., oil, fuel or solvents, should be cleaned up with appropriate sorbents.

Contaminated sorbents should be collected in waste disposal drums that are clearly marked *WASTE* and indicate the identity of the chemical that was cleaned up.

Laboratory chemicals should be cleaned up by lab technicians following the same procedures

in which they have been instructed for waste chemical cleanup and reduction, e.g., evaporation, distillation, neutralization, precipitation, reduction/oxidation reactions.

- Sorbents used for clean-up have the same hazardous properties as original spilled chemical and shall be properly stored and disposed of as a hazardous chemical.
- Following clean-up, employees shall replenish and prepare a Spill Kit in readiness for a future incident.
- An analysis and discussion of incident and spill response shall be made so that all workplace employees learn from the experience.

Reporting

When any leak or spill of a controlled product occurs, the employee who was in control of the product at the time or who discovers the leak or spill should activate the workplace planned emergency response:

- **Identify**, if possible, the chemical from label, smell, colour, or from personal knowledge of how and where hazardous chemical is stored without putting oneself at risk.
- **Alert others** - and take appropriate action (refer to School Disaster Plan).
- **Report** - leaks or spills of a hazardous substance that result in a release into the environment that causes or may cause an adverse effect.
 - A *release* into the environment may be into the ground, air or water through discharge, seepage, throwing, dumping, or exhaust.
 - An *adverse* effect may range from a spill of oil on the ground to the release of an unpleasant odor that could cause impairment or damage.
 - Leaks or spills of this type should be reported to 911 immediately and then inform the applicable Area Superintendent and a Division Health and Safety Officer. In reporting provide the following details:
 - name of chemical, if known.
 - approximate quantity.
 - location of leak or spill and effect it may have on the environment, e.g., flowing into city sewer system.
 - Following the incident, the principal or non-school based department head shall ensure that a written report is made through SchoolWorks.

Immediate Considerations for Response

Employees shall:

- Deal with any injuries.
- Secure the area, e.g., barrier tape, signage.
- Get assistance.
- Put on correct PPE - if unsure of chemical, use highest rate of protection.
- Contain spill or stop leak.
- Clean up.

Employees shall read SDS to check for correct:

- Sorbents and clean-up materials to use.
- PPE.
- Safety supplies.
- First aid.

All employees who may be required to use, handle, store or dispose of hazardous chemical waste should be trained to handle leaks and spills. Employees involved in clean-up shall discuss and agree to the steps to the clean-up plan:

- Clean up or neutralize the spill.
- Store and label waste.
- Decontaminate re-usables.
- Report adverse effect incidents.

During Transportation

A leak or spill of a dangerous good that represents a danger to health, life, and property or the environment or exceeds the limits set out under the legislation, is called a *dangerous occurrence*.

- The employee who was in charge, management or control of the dangerous goods at the time of a dangerous occurrence shall immediately report the incident to 911 and then the Superintendent of Support Services. In reporting provide the following details:
 - name of chemical, if known
 - approximate quantity
 - location of leak or spill
- Once 911 has been called and the Superintendent shall be notified of the dangerous occurrence, local police and the Director of Business and Operations shall be promptly informed.
- The employee involved shall also take reasonable emergency measures to reduce any danger to health, life, property, or the environment. They should:
 - deal with any injuries
 - secure the area, e.g., barrier tape, signage
 - keep other people away
 - contain spill or stop leak only if possible to do so without danger to themselves or others
- Following the incident, the principal or non-school based department head shall ensure that a written report is made through SchoolWorks.

An analysis and discussion of the incident and spill response shall be made with employees involved in transporting dangerous goods so they can learn from the experience.

- Employees who may be required to handle, store or transport dangerous goods shall be trained in handling of leaks and spills and in how to report incidents.

5. Disposal of Waste

- Hazardous waste is a substance that is dangerous to humans, wildlife or the environment and is intended for disposal or recycling.

- When hazardous waste is to be removed from the workplace and transported, it is subject to TDG classification as it is governed by the TDG Act and regulations at this stage in its life cycle.
- WHMIS requires that waste that is a controlled product shall be identified and that all employees who handle waste shall be trained how to store and handle the waste safely.
- Waste Disposal Forms must be submitted at four times of the year (See *Appendix I* for detailed information).
- AEPEA regulates hazardous waste storage at the workplace. There is no limit on how long hazardous waste may be stored at the workplace where it is generated. However, the waste storage area is required to come up to certain standards. Trained personnel and equipment must be available to deal with spills.
- AEPEA also regulates which wastes may go to landfill.

Old Stock

- Any old or contaminated stock shall be labelled to WHMIS standards.

Empty Hazardous Containers (plastic)

- Jugs or pails that originated with a specific supplier.
 - these may be returned to the supplier
 - collect and store empty containers until you have a sufficient quantity for pick-up
- Containers that have previously held pesticides, insecticides or herbicides or that were contaminated with toxic materials.
 - these will NOT be accepted for recycling
 - hold until a proper disposal method is arranged
 - these containers shall be identified and labelled as “Not for Re-use”

Aerosol Containers

- Do NOT include aerosol containers with regular garbage.
- Identify and hold with other waste chemicals until a proper disposal method is arranged.

Spent Stripping Solutions

- Minimize environmental impact by disposing of the solutions into sanitary sewers so they can be properly treated at public-owned treatment works (POTW).

Clean-Up Sorbent Containers

- Sorbents are used to clean up leaks and spills they shall be placed in a closed container and WHMIS labels applied according to the hazardous chemical product that they contain.

6. Shipping Dangerous Goods Other Than Waste

- In most instances, the Distribution Center or an independent supplier will be the shipper. However, from time to time the school or workplace may be involved in shipping hazardous chemical products that are dangerous goods, usually to return the product to the Distribution Center or supplier.
- Employees who will act as shippers (consignor) or transporters (carrier) of dangerous goods shall be TDG certified.
- All packages containing a dangerous good for transport shall have labels, markings, placards when necessary, and shipping documents to identify the contents.

Labeling

- Standard TDG labels indicate the following:
 - classification /risk shall be affixed or printed on the packages so that they are easily visible and not placed on the bottom of packaging, or on top, if other packages are to be stacked on top.
- Labels on compressed gas shall be on or near the shoulder of the cylinder.
- A small package needs to have only one set of easily visible labels.
- If a package is larger than two meters in volume there shall be two labels or sets of labels on opposite sides of the package.
- A label indicating the *primary risk* is usually the only label required, but if a dangerous good has more than one type of risk, it may be necessary to provide a label for the subsidiary risk.
- Only the twelve standard TDG labels identifying the nine classes shall be used.
- The outer packaging of liquid dangerous goods that are contained in an inner packaging shall also have a THIS WAY UP label.

Marking

- In addition to labeling, further basic information shall be written on the outside of the package. This marking shall be:
 - the shipping name
 - the product identification number (PIN)

Placarding

- Placards of at least two hundred and fifty mm², which are diamond shaped, shall be placed on the outside of the vehicle to be used to transport most dangerous goods shipments if the quantity of the dangerous goods exceeds five hundred kilograms.
- The correct placards are to be supplied by the shipper (consignor) to the driver (carrier).
- If the placards become defaced, lost, or stolen, the person who is in control of the load at the time shall immediately replace them (usually this is the driver).
- Employees handling dangerous goods during transport shall:
 - Check the shipment against the completed shipping document, and if it matches, sign shipping document along with shipper (consignor).
 - Check that the dangerous good packages are correctly labeled and marked.

- Load and unload the dangerous goods properly considering safety requirements.
- Attach placards indicating type of hazards, when necessary.
- Be familiar with the Division's operating permit.
- Carry and deliver all shipping documents:
 - bill of lading
 - waybill
 - manifest
 with the dangerous goods.
- Carry all shipping documents in the cab of vehicle near driver's reach.
- When leaving vehicle leave documents on driver's seat or in a pocket on driver's door.
- Know first aid response for dangerous goods being transported.
- Give one copy of signed shipping document to receiver (consignee) and keep one copy for two years.
- The carrier may be required to produce a copy of shipping document upon demand or within fifteen days of a written request. If lost, the shipper is liable and could be charged with a dangerous goods infraction.

Shipping Document

- A shipping document is required for all shipments of dangerous goods other than shipments of hazardous waste.
- The shipping document shall be correctly completed and include:
 - The name of the carrier.
 - The name and address of the receiver.
 - The name and address of the shipper (consignor).
 - A description of the dangerous goods including the:
 - shipping name
 - product identification number (PIN)
 - classification
 - packing group
 - The correct quantity of dangerous goods received.
 - Any special safe handling, transportation or storage instructions.
 - A 24-hour emergency telephone number where the consignor can be reached.
 - An indication of the type and number of placards, if required.
 - The number and the letters that identify the protective direction, e.g., this side up, if any.
 - The permit number, if the shipper or carrier has been granted a permit.
 - The Emergency Response Plan number, if required / signatures of the consignor and the carrier.

Always use the applicable shipping document form for Dangerous Goods (available from the Distribution Center).

- The shipper (consignor) keeps one copy and gives two copies to the driver (carrier) who shall keep one and provide the other to the receiver (consignee) upon delivery.
- A copy of the shipping document shall be kept for two years.

The shipper may be required to produce a copy of shipping document upon demand or within fifteen days of a written request. If lost, the shipper is liable and could be charged with a dangerous goods infraction.

Special Considerations

Asbestos and Synthetic Vitreous Fibers

Asbestos can present a potential health hazard if fibers are inhaled. Three major diseases associated with inhalation of asbestos fibers are: asbestosis, lung cancer and mesothelioma. Removal of, or repair to, asbestos or products containing asbestos, should only be conducted by employees who have been specially trained to do this work and who have the correct equipment to do the work safely. To ensure protection against exposure to asbestos, employees need to be aware of special precautions required when there could be exposure to asbestos at the school.

In the past, asbestos-containing materials were applied to structural steel and concrete because of their fire resistance, strength, chemical resistance and insulating properties. Asbestos-containing products were also used to insulate pipe and boilers. Fireproof asbestos textiles were also made into gloves, aprons and protective suits, fire blankets and curtains. Many brake pads, clutch plates and automotive and industrial gaskets may still contain asbestos.

Prior to 1985, asbestos was incorporated into many building materials found in Division Schools, including decorative wall board, green chalk boards, caulking compounds, floor tiles, acoustical tile, dry wall and texturing products.

Substitute materials are now available for a number of the uses of asbestos described above and are currently used. Asbestos is still legally used for some applications, such as cement board and corrosion-resistant water pipe. **However, no modifications or renovations should occur to Division facilities without prior approval from the Facilities and Maintenance Department.**

Where feasible, Division maintenance staff identify and substitute with a material less hazardous than asbestos.

Recent research shows that some of the materials now used as asbestos substitutes synthetic vitreous fibers, e.g., fiberglass and refractory ceramic fibers can be a health hazard. Caution should be exercised and personal protection should be used with these materials as well.

Asbestos removal and repair projects are classified by types, based on the risk hazard. When an employee or contractor comes into the school or workplace to remove or otherwise deal with asbestos, the principal or non-school based department head shall be advised of the project type and be alerted to the level of risk:

Low Risk Asbestos Project

Examples of Projects:

- Installation, repairs to or removal of asbestos-containing manufactured products, where sanding or cutting are not required:
 - hardboard
 - green chalkboard
 - floor or lay-in ceiling tile, under five tiles
 - lab worktops
 - heat protectors
 - kilns
 - electrical panels
- Stripping asbestos vinyl tiles.
- Painting exterior cement or asbestos board.
- Transportation or handling of materials in bulk or sealed container for disposal.

Safety Guidelines to Follow:

- The work area is roped off and marked with Asbestos Hazard caution signs ensuring restricted entry into area while work is in progress.
- Air monitoring and site inspection is taking place on a regular basis throughout the duration of the project by a qualified person.
- The air conditioning or forced ventilation system has been blocked off in immediate work area and remains off until the completion of the work.
- All moveable objects and furniture have been removed from work area and non-transportable objects and the floor are completely enclosed with heavy duty plastic sheeting.
- Correct clean-up is done with HEPA vacuum of floor, walls, furniture, and fittings, as well as work equipment.
- All equipment and asbestos-contaminated waste is removed at the conclusion of the job.
- A copy of the site inspection and air monitoring report is given to the principal or non-school based department head.

Medium Risk Asbestos Project

Examples of Projects:

- Maintenance or minor repairs where removal of insulation is not required:
 - pipes
 - conduits
 - rainwater leaders
 - pipe, boiler, tank insulation
- Removal of insulation using glove bags.
- Removal of mechanical gaskets or flexible connections.

- Using hand or power tools fitted with dust collectors to cut, shape, drill, or assist in the removal of asbestos-containing manufactured products.

Safety Guidelines to follow in addition to those listed for Low Risk Projects:

- A plastic floor-to-ceiling enclosure around work area.
- Negative air pressure system vented to exterior of building is being used.
- Two-step clean-up system is being used (dust and waste is cleaned up using HEPA vacuum, wet-sweeping, and damp mopping daily, and at the conclusion of last day of work following this regular cleaning, a sealant or glue is applied to substrate and remaining plastic to lock down remaining fibers). After a twelve to twenty-four hour wait and a satisfactory air test result, final clean-up takes place.

High Risk Asbestos Project

Examples of Projects:

- Removal of lay-in floor or ceiling tile containing asbestos over five tiles.
- Removal of insulation from pipes, boilers, and tanks.
- Removal of an asbestos fire curtain.
- Encapsulation or removal of asbestos-containing fireproofing, insulation, or acoustic plaster.
- Enclosures of asbestos containing materials.

Safety Guidelines to follow in addition to those listed for Low and Medium Risk Projects:

- One worker has been designated as project supervisor.
- Decontamination unit is available.
- Removal of waste for disposal is taking place weekly.

If at any time the principal or non-school based department head feels the work is being carried out in an unsafe manner and is putting employees at risk, they should stop the work immediately and notify the Director of Business and Operations.

Considerations for all Projects

- Have all employees been alerted that a project involving asbestos is taking place at a specific location(s) in the workplace?
- Have the maintenance staff or contractors developed codes of practice for a confined space, for respirator use, and for the asbestos project, and are copies immediately available where work is taking place?
- Are copies of asbestos and standard first aid training certificates for all project staff or contractors posted in the project area?
- Does the project supervisor know whom to contact in case of an emergency?

Cylinders (Acetylene, Propane, Oxygen, etc.)

Storage Guidelines:

- Cylinders should be stored in a secure, dry, well-ventilated area, clear of exit routes and fire exits, heat and ignition sources and with valve protection caps securely in place.
- Storage areas for large cylinders should be fitted with cylinder racks securely anchored to the wall at a height appropriate for the cylinder to be stored. Cylinders should be individually secured to the storage rack, not more than two rows deep, using chains, straps or bars.
- There shall be no free standing storage of cylinders.
- Cylinders containing gases such as acetylene, liquefied propane and liquefied carbon dioxide should be stored upright.
- Cylinders should be segregated according to cylinder content - flammable, oxidizing and inert.
- Indoor storage areas for oxidizing gases should be separated from flammable gases and highly combustible materials by at least 6 meters and by an approved fire-resistant partition.
- Full and empty cylinders should be stored separately, with the latter clearly identified as such.
- Cylinders should be protected from cuts or abrasions and not allowed to drop or strike each other violently.

Movement Guidelines

- Cylinders weighing in excess of eighteen kilograms total should be transported by cart, properly retained in a vertical position.
- Students are not permitted to move cylinders unless they are under the direct supervision of a teacher or teaching aide.

Use and Maintenance

- Indoor ventilation should be provided in the work area.
- Gas welding equipment must be equipped with flashback arrestors at the tank.
- Oil and grease should never be permitted to come in contact with oxygen cylinder valves, regulators, hoses or associated equipment, nor should combustible substances be used as lubricants. Employees should ensure there is no oil or grease on their hands, gloves or clothing.
- Cylinders should be regularly inspected for leaks.
- Some stem valves used on cylinders for low molecular weight gases such as hydrogen will leak when fully opened. Under no circumstances should any adjustment to the stem packing nut or pressure relief safety nut be considered. Such actions are extremely hazardous and are the responsibility of the supplier alone.
- Leaks resulting from improper plumbing or worn fittings should be identified, using approved liquids or detection instrumentation. If wear is the reason for the problem the components should be replaced.

- Fittings should not be tightened beyond the manufacturer's specifications.
- Cylinders of compressed gas should only be connected to regulators specified for use with the contents of the cylinder.
- The seat of the cylinder stem valve should be cleaned before coupling with the regulator. The stem valve should not be used to blow out the regulator fitting seat.
- The regulator should not be closed before coupling. The coupling nut should never be over-tightened from the regulator stem.
- Once the regulator is installed and before use or further connection to the apparatus the regulator-to-cylinder connections should be checked for leaks.
- In addition to the use of liquids and detection instruments, the regulator can be used to detect leaks. Open the cylinder stem valve and note the pressure.
- Close the stem valve and wait 15 minutes. There will be no pressure drop if the regulator/cylinder connection is leak-free.

Hazardous Gases, Metals and Dusts

Some of the chemicals found at school may be potentially hazardous if not properly used. Teachers should be aware that young people have a higher metabolic rate and tend to absorb toxins from hazardous chemical products more rapidly than adults. Appropriate cautions should be used and the Division expects and encourages employees to seek immediate medical attention should an individual be exposed to the hazards on the following pages and develop the symptoms described. Such incidents should be reported through the Electronic Accident/Incident Reporting System.

Potential Hazards include the following:

- Dusts: wood dust (particularly cedar and mahogany dust), fine metal dusts (including heavy metals) and clay and paint residue dusts in the art rooms may cause health problems.
- Fumes and vapours: soldering (lead), welding (heavy metals), kilns (heavy metals), chemicals used in photography labs are among the most hazardous chemicals found in schools.
- Solvents used in cleaning and in shops are potentially among the most harmful of all substances since they are volatile and may spread quickly through the worksite. Solvents enter the lungs and are easily absorbed. Many solvents can also cause skin irritations (dermatitis).
- Acids used in photography, auto mechanics, etching and most other shops give off mists in addition to being corrosive.
- Methyl alcohol causes blurred vision, dizziness, sore throats, chest tightness, and depression and should not be used.
- Modern photocopiers give off ozone and should be in a ventilated area.

As much as possible or practical, employees need to reduce their use of hazardous chemical products by choosing to use nontoxic substitutes or limiting quantities (i.e., micro-scale chemistry).

However, when there is no substitute available or the use of the hazardous chemical product has been reduced as much as possible, the following information should be considered. The

following summaries are not all-inclusive in content. All employees shall refer to the appropriate SDS.

Metallic Mercury

Mercury is not recommended for use in Division schools.

Mercury is commonly found in thermometers, barometers and thermostats. It is a heavy, silvery metal that is a liquid at room temperature. It is considered a stable element. However, when it is combined with ammonia, acetylene, oxalic acid or amines and agitated, it may form explosive compounds. Mercury can enter the body through the lungs, skin and digestive system. Mercury may accumulate in the body and affect the nervous system.

Mercury breaks into tiny beads when it is spilled. These beads vaporize very easily and tend to be very difficult to remove from small spaces. Immediate and thorough cleanup of mercury spills is very important. A SDS must be included in the SDS binder if any equipment containing mercury exists in a building.

Nitrogen Oxides

This is a grouping of a number of related chemical compounds containing nitrogen and oxygen that are often produced in operations in the workplace like welding or metal cleaning. Nitrogen oxides have a distinct and pungent odour noticeable at a concentration of 5 ppm and distinct at 10 to 20 ppm.

Employees can be accidentally exposed to high concentrations, e.g., *acute exposure*, if engineering controls or standard work procedures are compromised. Engineering controls that isolate processes using nitrogen oxide offer the best protection against exposure. For welding and metal cleaning operations, the combination of local exhaust and general ventilation has to keep the levels of fumes below the recommended occupational exposure limits. Whenever there's a possibility of eye contact with liquid nitrogen oxides chemical safety goggles and face shields shall be worn.

Cylinders of nitrogen oxides shall be stored separately from combustibles, organic peroxides and hydrogen. **The appearance of a reddish-brown gas or a pungent odour may be indications of a leak, and employees should evacuate the area and seek appropriate assistance.**

Sulphur Dioxide

Sulphur dioxide is a colourless, highly irritating gas with a strong acidic taste and pungent odour which will dissolve in water to form sulphurous acid, which in turn can oxidize to form sulfuric acid.

Employees who could potentially be exposed are those working in food service and those who work with fumigants, disinfectants, boilers, furnaces or industrial refrigeration units.

The primary objective when sulphur dioxide is present in the workplace is to keep concentrations below the recommended occupational exposure limits through process controls, ventilation, improvements in equipment design and by substituting other materials for sulfur dioxide or elements that produce sulfur dioxide as a by-product.

Safety practices such as regular inspection of all equipment, prompt repair of leaks, immediate clean-up of spills and proper storage, handling and labelling of cylinders and other containers will help keep the level of sulfur dioxide in the workplace down.

Cylinders should be stored in a rack and always fastened securely to another supporting structure in an upright position and kept away from sources of heat, dampness and highly flammable substances. Storage containers should be checked periodically for leaks. If a leak is found the area should be evacuated immediately and appropriate assistance sought.

Welding

Fumes, dusts and toxic gases are the hazards produced by welding operations. These can come from the base and filler metals being used, any coatings on the base metal, electrode coatings or shielding gas, or from a reaction caused by the welding process.

Metal fume fever is caused by inhaling metal oxide particles produced by welding galvanized metal. The particles react with the lining of the lungs, making the victim feel sick a few hours after exposure.

All traces of solvents shall be removed before welding starts because heating them produces poisonous fumes. Take care that vapours from chlorinated solvents are not exposed to UV radiation, because this also causes a reaction releasing poisonous gas. Solvents should be stored and used in a separate room and never used on materials that are going to be welded.

Toxic hazards can be controlled through ventilation and safe work practices. The employee shall always ensure that the ventilating equipment designated for each job is used.

Gas Welding and Cutting

Welding requires a lot of energy to melt or fuse the metals and this release of heat and energy can cause chemical and physical reactions that don't normally occur at room temperature.

Cylinders should not be handled unless it is done under the direct supervision of a trained teacher or teacher's aide. Any cylinder hook-ups must be reviewed by a teacher or teacher's aide.

Most welding operations use fuel gases, which can be a serious hazard in case of fire or explosion. Both careful handling of fuels and good housekeeping practices are important to minimize the risk.

The safety rules for the handling and storage of fuel cylinders include:

Receiving

Only those oxygen or fuel gas cylinders that are clearly labelled and for which the employee has a SDS.

Handling

- When work is complete, cylinder valves shall be closed and valve protection caps put on. The pressure shall be released from regulators and hose lines before the cylinders are moved and placed in storage.
- To prevent cylinders from slipping, handle them only with clean hands or clean clothing.
- Move cylinders in a upright position only and secured on a vehicle or cart designed for that purpose.
- Regulators should be detached and cylinders should be fitted with a valve protection cap while being moved. Tighten valve protection caps by hand.

Storing

- Storage areas shall be clearly identified. Place cylinders so labels are easily seen.
- Cylinders shall be securely stored where there is no chance that they will be knocked over or damaged. Valve protection caps shall be put on.
- Never store cylinders near heat sources including exposure to heat from the sun.
- Never allow cylinders to touch electric wires as this can cause electrical arcing and fire.
- Store cylinders away from elevators, stairs, doorways, aisles and never in stairwells.
- Cylinders shall be protected against valve damage. Cover them with a non-combustible and weather-proof canopy if they are to be stored outside.
- Store full cylinders separately from empty ones for each type of gas. Empty cylinders should be marked EMPTY and their valves closed. Fit them with protection caps.
- Store oxygen and fuel gas cylinders separately.
- Keep all welding cylinders at least 6 meters from flammable materials such as paint and solvents.

Disposal

- Return empty cylinder promptly to suppliers.
- Transport cylinders in an upright position, properly secured to a firm support and make sure the valve protection cap is on.

Electric Welding

Electric welding fuses metal by an electric arc at a very high temperature. Most arc welding is done by hand using an electrode in a holder, and electrical shock can be an additional hazard. Equipment shall be installed or repaired only by a qualified electrician and should only be used under the supervision of a trained teacher or teacher's aide.

For further information refer to the Workplace Health and Safety Chemical Hazards publication, *A Welder's Guide to the Hazards of Welding - Gases and Fumes*

Abrasive Blasting

Airborne dusts are the most serious health hazard in abrasive blasting operations. The dusts can come from a number of different sources, including broken down abrasives, pulverized surface coatings and abraded material from the object being blasted.

Under normal conditions, larger dust particles settle fairly quickly. However, small particles remain airborne longer and can be easily inhaled. Smaller particles can settle in the lungs, and sometimes soluble particles will dissolve into the bloodstream.

For further information refer to the Workplace Health and Safety Chemical Hazards publication, *Crystalline Silica in the Workplace* (www3.gov.ab.ca/hre/whs/publications), available from Alberta Human Resources and Employment.

Dust particles can also get into the eyes, ears, nose and throat. Depending on the type of dust, effects can range from temporary discomfort to long term health problems. Dust can even get into the body, settling on a small open wound or abrasion or on food that is eaten.

Heavy concentrations of dust can also affect employees who are fairly far away, depending on the ventilation system for indoor blasting and on wind conditions and humidity when blasting outside. Even when there is no blasting occurring, dust can still be a hazard, e.g., when cleaning dust collector bags or handling the abrasive material.

When there isn't enough air flow around the work area, a dense dust cloud may develop. This makes it hard for the operator to see and may contribute to a serious accident. Dust that settles on floors creates a slipping hazard, especially because dust doesn't look slippery.

Dust can create a fire hazard. For example, dust from blasting rusty material, mixed with aluminum dust from another process, can be ignited by a short in an electrical appliance or by a globule of hot iron. In some cases, especially when organic abrasives are used in a closed area, the dust cloud can be an explosion hazard. The source of ignition might be nothing more than a spark made by a shoe-nail scraping across a metal surface. Combustible organic abrasives shall be used only in automatic blasting systems.

With air-propelled blasting, an improperly grounded hose can lead to the buildup of static electricity on the employee's body. A small spark is all that's needed to ignite highly flammable materials or to cause the kind of explosion previously mentioned. A static shock can also startle any employee enough to cause a serious accident.

Communication Technology, Art and Drama

One of the major hazards in these areas is the use and storage of toxic chemicals and flammable materials.

Safety precautions established through work procedures for high risk tasks shall minimize employee exposure to these chemicals.

Employees should:

- Never work with a material of unknown composition.
- Reduce the level of dusts and vapours in the air, by keeping all containers closed while working except for when they are in use. This also helps to prevent spills in the work area.
- Clean up dusts by wet mopping. Sweeping only stirs up the dust and puts it back into the air.
- Clean up spills with spill control materials which absorb the liquid and dispose of accordingly as hazardous waste.
- Wear gloves and barrier creams to protect the skin. Creams should never be used as a substitute for gloves but are helpful against substances that dry or cause minor irritation to the skin.
- Wash thoroughly after working with hazardous chemicals, paying special attention to hands and fingernails.
- Never use solvents to clean any part of the body.
- Launder work clothes frequently and wash them separately from other clothes.
- Never eat or drink while working.

Working with Metals

Among the most serious of metal shop hazards are airborne pollutants, including vapours, fumes and dusts. The type of pollutants varies with the kind of process being used and the metal being worked on. For example, solvent vapours may be found where metal degreasing is going on and airborne droplets of electrolyte may be present near electroplating operations.

Fumes from the welding or burning of metal in employee's breathing zones can lead to both short and long-term medical problems, such as throat irritation, inflammation of the lungs, bronchitis, lead poisoning and metal fume fever.

A number of metals are toxic and require special precautions to be taken if there is a danger of fumes or dusts getting into the air. These metals include beryllium, cadmium, lead, manganese, vanadium and hard metal. Skin can become sensitive to nickel, leading to the development of dermatitis.

Occupational dermatitis is a common problem among metal workers. It is caused mainly by contact with oils and other metal adhesives. Dermatitis is a skin condition that is recognizable by red, swollen, painful or itchy hands with scaly or broken skin.

Airborne hazards shall be controlled by eliminating or reducing the production of pollutants through process controls, by removing them from the breathing zone of employees through proper ventilation or by using respiratory protective equipment.

There are also a number of precautions that have to be taken in handling metal wastes. The soot deposited in boilers and flues may be toxic, so maintenance staff shall wear PPE and respiratory protection.

Lead remnants should be collected and stored in metal bins or containers with lids. Some metal remnants may contain arsenic as a metallic arsenide. This will react with water or even very humid air to form a very toxic gas. Therefore, metal remnants should be kept in containers with tight fitting lids to keep out moisture.

Metal remnants should be disposed of through an appropriate recycler.

Working with Wood

Exposure to wood and wood dust can cause a number of effects, including allergic conditions of the skin and irritation of the eyes, throat and lungs. Early symptoms include itchy skin, watery eyes, a sore throat and coughing. In more serious cases the symptoms can also include nose bleeds, nausea, vomiting, loss of appetite, headaches, general weakness or dizziness.

Serious lung disorders are fairly rare but when they do occur they are either short-term attacks or long-term conditions. A high fever with aching in the chest area or any other abnormalities in lung function should be checked by a doctor.

Wood preservation involves a variety of different treatments. Chemical treatments are widely used and can involve soaking or injecting the wood with pesticidal oils, metal salts or organic compounds. Some of the preservatives used can cause intoxication or irritation of the hands, eyes, nose or throat.

A wide range of adhesives is used in bonding manufactured panels. Apart from the casein glue, natural adhesives are less widely used than synthetics. Synthetic formaldehyde adhesives are used the most. Many of these can cause skin irritation or be an intoxication hazard if formaldehyde or organic solvents are released into air.

Wood assembly work, especially furniture making, also involves using a wide range of adhesives. The fine wood dust produced by using belt, disk and orbital sanders can also be a hazard.

Surface finishing can involve the use of a large number of paints, varnishes, lacquers or impregnations. The solvents used for thinning can form both toxic and explosive mixtures with the air especially when applied by spray.

Most of these hazards can be controlled by proper ventilation and with precautionary standard safe work procedures

Appropriate masks should be worn when encountering wood dust from any source (e.g., cutting, sanding, cleaning, etc.)

Lead

Lead presents a potential hazard to employees. It is a major component of many alloys such as solder and bronzes. Inorganic compounds made from metallic lead have a variety of uses, especially as pigments in paints and ceramics.

Inorganic lead can enter the body through the lungs and digestive system. Very fine dust or fume particles can enter the lungs where the lead is absorbed into the blood stream. Lead can also enter the blood stream through ingestion of contaminated food or drink. Organic lead compounds are absorbed directly through the skin. Once in the blood stream, lead is carried to a number of organs. Even when lead in the body has reached hazardous levels, its presence may not be suspected. For workers regularly exposed to inorganic lead, medical monitoring is required.

In the workplace, lead exposure can occur when:

- Soldering or welding metal materials in CTS areas, e.g., automobiles or art.
- Painting operations use lead-based paints.
- Using lead electrodes and/or electrolytes.

For further information about lead, refer to the Workplace Health and Safety Chemical Hazards publication, *Lead in the Workplace* (www3.gov.ab.ca/hre/whs/publications), available from Alberta Human Resources and Employment.

When maintenance staff or contractors come into the workplace to remove or repaint areas where lead paint has been used, the principal or non-school based department head should be advised of and monitor for the following conditions:

- Employees or contractors are substituting other materials which are less hazardous and the work area is enclosed and signed to restrict entry to only those employees working on the project.
- The air conditioning or forced ventilation system has been blocked off in immediate work area.
- All moveable objects and furniture have been removed from work area and non-transportable objects and floor are completely enclosed with heavy duty plastic sheeting.
- Local exhaust ventilation is being used to collect dust and fumes at their source.
- Correct clean-up is done of the work area, furniture, and fittings, as well as work equipment.
- Air monitoring is taking place on a regular basis during and upon completion of the project.
- All equipment and project waste is removed at the conclusion of the job.
- The maintenance staff or contractors have written work procedures for the routine handling of lead-based products and for dealing with accidental spills or releases.

Lung Hazards in Auto Repair

Auto service technicians are exposed to a variety of toxic substances. Students and employees working in autobody shops can also be at high risk from exposure to chemicals which over a period of time can cause damage to health.

If the employee or student also smokes, the hazard is greatly increased. Some of the elements contained in cigarette smoke and the various chemicals found in auto repair work may attack different parts of the respiratory system at the same time. Their effects may combine to give an effect even greater than their sum (a synergistic effect) making them especially damaging.

How can employees protect themselves?

- See that there is adequate ventilation installed and functioning properly in the shop. When operating a motor, be sure the exhaust pipe is connected to an approved exhaust system.
- Keep a clean shop environment. Use common sense when dust, fumes or mists are present.
- Don't clean brake assemblies and drums with compressed air. Use a vacuum, and wet wash the parts. Arcing and grinding of brake linings should be performed with an adequate local exhaust dust collection system. The dust collected should be disposed of in sealed bags or containers as hazardous waste. A protective respiratory mask should be used when exposure to asbestos dust cannot be avoided.
- **Spray painting should be carried out in a specially designed spray-paint booth. Protective respiratory protection should be used.**

Auto Repair

Carbon monoxide, an odourless, colourless gas, from car exhausts and cigarette smoking reduces the oxygen-carrying capacity of the blood. Early symptoms of carbon monoxide poisoning include headache, followed by weakness, dizziness, dim vision, nausea and vomiting. There are monitors in place and if levels exceed acceptable standards these alarms will be activated. Refer to the Workplace Health and Safety Chemical Hazards publication, *Carbon Monoxide at the Worksite* (www3.gov.ab.ca/hre/whs/publications), and Medical Guidelines, *Monitoring of Workers Exposed to Carbon Monoxide*, (www3.gov.ab.ca/hre/whs/publications), available from Alberta Human Resources and Employment.

Lead from auto exhaust is absorbed through the skin and lungs. Excessive lead exposure causes anemia and damages the nervous system.

Sulfuric acid gas and **particulate sulfates** are found in greater amounts in the exhaust of autos with catalytic converters than in the exhaust of older cars. The symptoms of excessive sulfur in the air include irritation of the eyes, nose, throat and lungs.

Brake linings may contain amounts of asbestos, so exposed persons could develop an asbestos related disease. For more information refer to Part 4 of the Occupational Health and Safety Act, Regulation and Code.

Brake fluids may contain chemicals that are irritating to the respiratory system, the skin, and the eyes.

Graphite can cause lung disease similar to coal miners' lung disease. There may be coughing and difficulty in breathing.

Oils, when inhaled in large quantities as mists or smoke can cause irritation. Oils contacting the skin may cause dermatitis (an inflammation of the skin).

Employees should always be familiar with the SDS for each hazard.

Autobody Work

Both **fibrous glass** and **talc** have been used as fillers in body work, in combination with either polyester or epoxy resins. If these agents are at a high level in the workplace masks may be necessary.

Styrene, a respiratory irritant, is often an ingredient in polyester resins. Epoxy resins cause allergic sensitivity reactions on the skin. Refer to Workplace Health and Safety Chemical Hazards publication, *Health Effects of Styrene Exposure* (www3.gov.ab.ca/hre/whs/publications), and Medical Guideline, *Monitoring for Workers Exposed to Styrene* (www3.gov.ab.ca/hre/whs/publications), available from Alberta Human Resources and Employment.

Spray painting, after fiber-glassing or other surface preparation, may cause a number of air contaminants to be released into the environment of the body shop.

Lead and zinc chlorinates are common primer pigments that can cause lung irritation if inhaled and skin irritation on contact.

Solvents may affect the blood, liver, kidneys and central nervous system. Polyurethane paints for automobile exteriors may contain isocyanates that can cause so-called industrial asthma. For more information refer to Workplace Health and Safety Chemical Hazards publication, *Isocyanates at the Worksite* (www3.gov.ab.ca/hre/whs/publications), available from Alberta Human Resources and Employment.

Pesticides

The Division minimizes the use of toxic pesticides. Toxic pesticides should only be used on a Division site in consultation with the Construction and Maintenance Department.

The most common health effects from exposure to pesticides are on the nervous and muscular systems. No matter what type of pesticide is being handled in the workplace, it is important to

read the label and Material Safety Data Sheet (SDS). Applicators shall know what precautions to take when handling pesticides.

For further information about pesticides, refer to Workplace Health and Safety Medical Guidelines, *Monitoring of Workers Exposed to Organophosphate Pesticides* (www3.gov.ab.ca/hre/whs/publications), available from Alberta Human Resources and Employment.

Pesticide Application Guidelines

Things to look for:

- Ensure that a warning has been given to employees, including when and where application is to take place and what chemical is being used, and the associated hazards.
- No pesticides or pesticide containers shall be stored at the site prior to, or following the application.

Working with Flammable and Combustible Liquids

The flash point of a liquid is the temperature at which it gives off vapour in a high enough concentration to form an ignitable mixture with air. Under WHMIS, a flammable liquid has a flash point of less than 37.8°C, and a combustible liquid has a flash point between 37.8°C and 93.3°C.

Acetone, benzene, undiluted alcohol and brake fluid are examples of flammable liquids. Varsol and kerosene are examples of combustible liquids.

Solvents are often highly flammable liquids that can vapourize in open or closed containers, when leaks or spills occur and when heated. The degree of danger depends on the flash point of the liquid, the concentration of the vapour in the air and the possibility of an ignition source coming into contact with the mixture.

Since the vapours from most flammable liquids are invisible, they can be difficult to detect unless a gas indicator is used. Most vapours are also heavier than air, so they will tend to collect at floor level or other low-lying areas. Investigations of fires involving these liquids often find that the fire was caused by the ignition of a vapour trail that has travelled a considerable distance from the source, creating a flashback.

Common sources of ignition include overheating bearings, pilot lights, hot particles and embers from welding or grinding and sparks from static electricity, electric tools and motors.

Many flammable liquids can also be health hazards if they come in contact with the eyes or skin, if they're accidentally swallowed or if vapours are present in the staff breathing zones, even in low concentrations.

To control these hazards the workplace has to determine the need for safeguarding electrical equipment, ventilation requirements, eliminating ignition sources and appropriate fire protection systems. The development and observance of safe materials handling procedures is

of the utmost importance. The danger of fire explosion can be minimized by following safe storage, dispensing and transport procedures.

Safe work procedures include making sure that all containers are clearly labelled to WHMIS standards. Dispensing should be done from only one drum at a time, and all decanting should be completed by the same employee before another material is dispensed.

Because there may be a difference in potential between the dispensing and receiving containers, grounding is needed when solvents are transferred. It is essential to properly wire flammable liquid dispensing and receiving containers together before pouring.

Any unused liquid should be returned to the designated storage area at the end of the work shift. Small spills should be cleaned up right away, but first make sure that the liquid does not contact the skin. Clean-up rags should be disposed of in the proper container. Never use sawdust to absorb a solvent spill. Pouring solvents into sinks or floor drains is strictly prohibited. Use only containers designated for liquid waste disposable.

For detailed information concerning a specific solvent review the appropriate SDS.

Training Requirements

Workplace Hazardous Materials Information System (WHMIS)

Any new or present employee who may use, handle, store and/or dispose of hazardous chemicals in the workplace or who works in *proximity* to a chemical hazard where there is any potential for any adverse health effect as a result of exposure shall have basic WHMIS training. As part of the annual WHMIS /TDG site evaluation, principal or non-school based department head must ensure that relevant employees have appropriate training.

In addition, information will be provided on Leaks and Spills Clean-Up and Release Reporting.

Employees to be WHMIS Trained:

Elementary Schools:

- Head Custodian

Elementary - Junior High Schools:

- Head Custodian
- Junior High teachers involved in CTS Applied Technology, Art and Science

Senior High Schools:

- Head Custodian
- Laboratory Technicians
- CTS staff involved in Construction, Mechanics, Fabrication and Cosmetology

- Fine Arts Teachers involved in Art and Drama
- All Science Teachers

Other Division employees to be trained:

- Maintenance Staff
- Warehouse Staff
- Relevant Supervisory Staff

Retraining of employees shall occur when:

1. They have changed work location and have a new job involving the handling of different chemicals.
2. New hazardous products are introduced into the workplace.
3. The review of the annual WHMIS/TDG site evaluation at the workplace identifies problem areas in the application of WHMIS information and work procedures.
4. New health hazard information is available regarding a chemical hazard used at the workplace.
5. Changes occur in the legislation.

Transportation of Dangerous Goods (TDG)

Any new or present employee who will be shipping, transporting or receiving dangerous goods at the school or workplace shall be trained by a qualified trainer in the product-specific requirements directly related to the dangerous goods the employee is expected to handle.

These employees should also be familiarized with Spills Clean-Up and Release Reporting outlined earlier in this section of the Manual.

Employees to be TDG Trained:

- Shipper
- Receiver
- Warehouse Employee
- Designated Office Staff (Junior and Senior High Schools)
- Relevant Supervisory Staff

The employee with TDG training shall have available a copy of their *Certificate of Training* near the shipping and receiving area of the workplace. If trained to transport hazardous chemical products, the employee shall carry it so it is available at all times if requested by a Dangerous Goods Inspector. The certificate shall indicate:

- The date the employee was trained and whether it is initial or refresher training.
- The employee designated and trained as one or more of these: a shipper (consignor), transporter (carrier) or receiver (consignee).
- The specific classes of dangerous goods for which the person has been trained.

Retraining Shall Occur every three years before training certificate is due to expire or when changes occur in the legislation.

Implementation Process

Getting Started

The principal or non-school based department head shall:

1. Conduct annual WHMIS/TDG site evaluations of the workplace. A sample form can be found at the end of this section (Forms).
2. Review the site evaluation and develop an action plan for follow-up in areas where improvement is needed.
3. Ensure that required employees are trained in WHMIS and TDG. A record of all trained staff must be maintained in the Document Binder.

Ongoing Activities

The principal or non-school based department head shall:

1. Ensure that individually trained employees working in areas where hazards exist (i.e., science labs, custodial staff, etc.) will schedule drills for emergency response to leaks and spills.
2. Ensure Division employees systematically look for and consider non-hazardous product alternates.
3. Conduct an annual WHMIS/TDG site evaluation to evaluate the program and training, particularly checking on-the-job application through site-specific work-procedures.
4. File a copy of each completed audit and action plan for follow-up, in Docushare.
5. Maintain current hazardous chemical inventory lists in the Occupational Health and Safety Binder.
6. Ensure SDS are present and readily available for all Controlled Products and Consumer Restricted Products being used at the site. SDS must also be current (no more than three years old).

Appendix I: Hazardous Waste Pick-up Procedures

The construction and Maintenance Department coordinates the disposal of accumulated waste materials and unwanted chemicals from all Division schools. A pick up from the schools will take place **four** times a year. Schools wanting to dispose of chemical waste must return their completed ***Worksite Chemical Disposal Forms*** to the attention of Manager, Facilities and Maintenance. Materials to be disposed of can only be picked up when these forms are completely filled out.

Ensure a copy of this memo is circulated to science coordinators, CTS staff, art/drama teachers, head custodians and any other individuals/instructors who may have chemical waste to dispose of. Below is a brief description of what needs to be filled out, how and what needs to be included with the chemicals upon pick up.

Fill out the appropriate Chemical or Waste Disposal Form with the following information.
(Three different forms exist, one for caretaking, mixed chemicals and pure chemicals)

- School name, contact person, phone number, and area or room where the waste can be located.
- The full chemical name - no abbreviations.
- The most appropriate chemical state (solid or liquid).
- The approximate weight or volume of each waste product.

The Workplace Hazardous Waste Shipping Document must accompany the waste. The Class and PIN categories will be filled in at a later date. Estimate the quantity in kilograms or liters and categorize the waste by referencing the shipping name and description area.

Chemical waste must be collected in a sealed, airtight, chemically compatible container. In most cases the original container is suitable for waste disposal. **Waste not securely contained or identified will not be picked up for disposal.** Please ensure that the materials for disposal are stored in a safe and accessible location in the school. **For ease of pick up please specify where in the school the waste is being stored and a contact name.**

If you have any questions or require clarification, please contact the Director of Business and Operations.

Forms

Worksite Hazardous Waste Disposal Document (Caretaking)

See Appendix I for information related to completing this form.

Consignee: School Division

School: _____

Area/Room: _____

Phone: _____

Consignor:

Date: _____

Contact Person: _____

Originator's Name: _____

Number of Containers	Shipping Name & Description	Class	PIN	Packing Group	Quantity Kg or Liters
	Miscellaneous Dangerous and Non-Dangerous Goods - Liquids	9			
	Miscellaneous Dangerous and Non-Dangerous Goods - Solids	9			
	Waste Toxic Liquids, N.O.S.	9	UN 3082	III	
	Waste Toxic Solids, N.O.S.	9	UN 3077	III	
	Waste Corrosive Liquids, N.O.S. (Alkaline)	8	UN 1760	II	
	Waste Corrosive Solids, N.O.S. (Alkaline)	8	UN 1759	II	
	Waste Corrosive Liquids, N.O.S. (Acidic)	8	UN 1760	II	
	Waste Corrosive Solids, N.O.S. (Acidic)	8	UN 1759	II	

	Waste Poisonous Liquids, N.O.S.	6.1 (9)	UN 2810	II	
	Waste Poisonous Solids, N.O.S.	6.1 (9)	UN 2811	II	
	Waste Poisonous Liquids, N.O.S. (Mixed Lab Waste)	6.1 (9)	UN 2810	II	
	Waste Poisonous Solids, N.O.S. (Mixed Lab Waste)	6.1 (9)	UN 2811	II	
	Waste Oxidizing Substances, N.O.S. (Liquids)	5.1 (9)	UN 3139	I	
	Waste Oxidizing Substances, N.O.S. (Solids)	5.1 (9)	UN 1479	I	
	Waste Flammable Solids, N.O.S.	4.1	UN 1325	II	
	Waste Flammable Liquids, N.O.S.	3	UN 1993	I	
	Waste Flammable Liquids, N.O.S. (Mixed Lab Waste)	3	UN 1993	I	
	Waste Paint Related Materials	3	UN 1263	II	
	Waste Paint Related Materials	3	UN 1263	II	

This shipment may contain “Unknown and Mixed Chemicals” as well as “Mixed Classifications of Dangerous Goods”. Treat as “Toxic Substances - Flammable, Corrosive, and Toxic”. Liquids and solids may release hazardous vapours.

Worksite Chemical Disposal Form (Mixed Chemical) for Science, CTS, Art and Drama

See Appendix I for information related to completing this form.

Consignee: School Division

Consignor:

School: _____ Date: _____
Area/Room: _____ Contact Person: _____
Phone: _____ Originator's Name: _____

DO NOT COMPLETE

Chemical Name	State (Liquid/Solid)	Volume/Weight (L/ml or g)	Type of Waste Mixture	T.D.G. Classification			
				Class	Sub-Class	Packing Gr.	P.I.N.

Total Volume/Weight							

Replacement Waste Containers Required: ☐ Yes ☐ No
Type: Organic (red) No.____ Inorganic (white) No.____

Worksite Chemical Disposal Form (Pure Chemical) for Science, CTS, Art and Drama

See Appendix I for information related to completing this form.

Consignee: School Division

Consignor:

School: _____ Date: _____
Area/Room: _____ Contact Person: _____
Phone: _____ Originator's Name: _____

DO NOT COMPLETE

Chemical Name	State (Liquid/Solid)	Volume/Weight (L/ml or g)	Type of Waste Mixture	T.D.G. Classification			
				Class	Sub-Class	Packing Gr.	P.I.N.

Total Volume/Weight							

Replacement Waste Containers Required: ☐ Yes ☐ No

Type: Organic (red) No.____ Inorganic (white) No.____

Receiving Dangerous Goods (TDG) Check List

To be used upon the receipt of any Dangerous Goods.

Carrier:

- ☐ name
- ☐ signature

Date of Receipt: _____

Received By: _____

Bill No.: _____

Receiver (consignee):

- ☐ name
- ☐ address

Shipper (consignor):

- ☐ name
- ☐ signature

Description of Goods:

- ☐ shipping name
- ☐ classification
- ☐ product identifier (PIN)
- ☐ packing group
- ☐ quantity received matches shipping label

If dangerous goods and non-dangerous goods are received:

- ☐ dangerous goods listed first, or
- ☐ dangerous goods highlighted in a contrasting column, or
- ☐ dangerous goods column indicated by an X

Safe handling information:

- ☐ special instructions for safe handling, transporting or storage

- ☐ 24 hour emergency telephone number where the consignor can be reached
- ☐ number and letters that identify the protective direction, e.g., this side up, if any
- ☐ permit number, if applicable
- ☐ Emergency Response Plan number, if required
- ☐ Material Safety Data Sheet is included

Outer packaging:

- ☐ TDG label
- ☐ shipping name - matches shipping name on document
- ☐ PIN - matches PIN on document

Note: if outer packaging is correctly marked and labeled, inner containers do not need to be marked and labeled for dangerous goods.

A copy of this document should be kept on file in the OH&S Document Binder.

Chemical Inventory List

School/Site: _____ Date: _____

Department: _____ Room Location: _____

Chemical	Quantity	Supplier Manufacturer	SDS Mo/Yr	Purchase Date(s)	Storage Group If Applicable	WHMIS Hazards Classification(s)

Annual WHMIS / TDG Site Evaluation Instrument

Worksite: _____ Date: _____

Evaluation Questions	Yes	No	N/A	Action Taken (Indicate Employee Responsibility)	Completion Date
1. WHMIS/TDG Employee Training					
a. Are all employees who may use, handle, store and dispose of hazardous chemical products or those who work in proximity to hazardous chemical products where there is any potential for any adverse health and safety effect as a result of exposure trained in WHMIS?					
b. Do all relevant employees know:					
i) how to tell whether a product is a controlled product or a consumer restricted product?					
ii) the procedures for receiving or bringing into the workplace a controlled product or consumer restricted product?					
iii) how to interpret the hazard symbols on the labels?					
iv) how to interpret and use the information on the supplier label and the workplace label?					

v) where the SDS are located?					
vi) how to reference the SDS?					
vii) how to interpret an SDS?					
viii) how to handle safely all controlled and consumer restricted products that they use, store, handle, or dispose of in the workplace.					
Evaluation Questions	Yes	No	N/A	Action Taken (Indicate Employee Responsibility)	Completion Date
c. Are all employees who will be shipping or receiving dangerous goods at the school or workplace or transporting dangerous goods between workplaces trained in TDG?					
d. Has at least one employee been delegated as the workplace shipper/receiver for dangerous goods?					
e. Do all employees involved in shipping know: i) how to classify the dangerous goods?					
ii) how to correctly mark and label the packaged dangerous goods?					
iii) how to prepare the shipping document?					
iv) when to provide placards to the carrier?					
v) what to do with documentation?					
f. Do all employees involved in receiving know: i) how to interpret and use the information on the TDG label and markings?					

ii) how to check packaging against shipping document upon receipt of shipment?					
iii) what to do with the documentation and how long to keep it?					
Evaluation Questions	Yes	No	N/A	Action Taken (Indicate Employee Responsibility)	Completion Date
g. Do all employees involved in transporting dangerous goods know: i) how to make sure the shipper has fulfilled all his responsibilities before accepting shipment?					
ii) when placards are needed on vehicle used in transport and when they can be removed?					
iii) how to securely load cargo?					
iv) what documentation must accompany the driver?					
v) how to mark shipping document after last shipment is unloaded?					
h. Do all employees involved in handling dangerous goods know the emergency response to a leak or spill, what constitutes a dangerous occurrence and the reporting requirements for dangerous occurrences?					
i. Do all employees have their TDG Certificate of Training available for inspection at all times?					
j. Is there a system in place that provides for the required retraining of employees, as well as the					

communication of updated information?					
k. Is there a current list of employees who have WHMIS and TDG training on file?					
Evaluation Questions	Yes	No	N/A	Action Taken (Indicate Employee Responsibility)	Completion Date
2. Safety Data Sheets a. Are Safety Data Sheets (SDS) in a clearly identified binder(s) for all controlled products or consumer restricted products that are used, handled or stored in the workplace?					
b. Are all SDS binders located in close proximity to area of product use?					
c. Are all SDS current (within 3 years)?					
d. Does the SDS binder contain an up-to-date inventory list of all hazardous chemicals?					
e. Is there a copy of all hazardous chemical inventory list on file in DocuShare?					
f. Is there a WHMIS chart posted containing hazard symbols and label requirements?					
g. If faced with an emergency situation do the employees know: i) where to look for first aid kits and emergency equipment, e.g., leaks and spills kit?					

ii) how to initiate response plan and who to notify?					
iii) what reporting procedures to follow?					
iv) how to clean up leaks and spills?					
Evaluation Questions	Yes	No	N/A	Action Taken (Indicate Employee Responsibility)	Completion Date
3. Labeling					
a. Do all original containers of controlled hazardous products whether empty or still containing the controlled product display a proper WHMIS supplier label?					
b. Do all original containers of consumer restricted products display a proper consumer restricted product label?					
c. Do all secondary containers of controlled products, or consumer restricted products that have been decanted from their original containers, display a proper workplace label?					
d. Whenever a label is damaged, missing or defaced has it been replaced with a proper WHMIS workplace label?					
4. Chemical Storage					
a. Are all chemicals stored in a safe and orderly manner in a secured area?					
b. Has a current inventory of hazardous chemicals been established?					

5. Disposal					
a. Are waste hazardous chemicals grouped according to TDG classes and stored in a safe and orderly manner in a secured area?					
b. Are employees familiar with the Division's Worksite Waste and Chemical Disposal Forms and Procedures?					

Plumbed-in Eye Wash Station Monthly Inspection Checklist

Location: _____

****To Flush Eyes: Hold eyelids open, position head to the side to allow the water to run over the affected eye and away from the unaffected eye. Roll the eyeballs so water will flow on all surfaces of the eye and under the eyelid. Flush for at least 15 minutes.**

As per the ANSI Z358.1-2009 Standard, plumbed-in eyewash stations should be activated long enough on a weekly basis to be sure flushing fluid is provided. Within the Division, plumbed-in eyewash stations can be located in some Boiler Rooms, all Science Laboratories and CTS Shops, where an eye hazard is present. Keep basin clean and free of trash or debris.

Monthly Operational Check - please date and initial below:

1. Is there a clear passage and easy access to the eyewash station (Eyewash should be no more than 55 feet away from hazard)?
2. Turn on the eyewash for 2 minutes.
3. Do valves easily activate and remain open until they are intentionally turned off?
4. Is the flushing fluid tepid (suitable range is 16-38°C)?
5. Is there enough water pressure so that the water reaches the facial area for an effective flush?
6. Is there too much water pressure (i.e. the water spills over the eyewash station onto surrounding surfaces)?
7. Are the nozzles equipped with protective covers that auto-remove when activated?

If the answer is NO, inform your school principal and enter a Service Request.

Please Note: Portable / Refillable eyewash stations should be inspected once per month, and should include re-filling the bottle with fresh water unless it is a sealed bottle with an identified expiry date.

These sealed bottles are acceptable until they reach the expiry date or the seal has been broken. Once seal is broken, the bottle should be disposed of and replaced.

Plumbed-in and Portable Eye Wash Station Monthly Inspection Checklist

Location: _____

Date	Initials	Date	Initials	Date	Initials	Date	Initials

Note any problems encountered with the eye wash station and what steps were taken to eliminate the problem:

Science Health and Safety Checklist

This checklist can be found in the Division Docushare by clicking on the following link: