Checklist of E/OHS Activities for Laboratory Standard/Chemical Hygiene Plan

Program Contact Person: Arlyn DeBruyckere , CHO

Is the Laboratory Standard/Chemical Hygiene Plan in place? *Yes No N/A*

Is the Plan current?  *Yes No N/A*

Has the Plan been reviewed this school year? *Yes No N/A*

Fume hood was tested on \_1-9-2015\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*(date)*

The results indicate air velocity to be: *satisfactory, unsatisfactory.*

Chemical inventory:

Date of most recent survey : Being conducted on 1-9-2015

Location of inventory listing: Instructors chemistry office, HS Lab 310

Are Safety Data Sheets (SDSs) located with inventory? *Yes No N/A*

Are the SDS readily accessible? *Yes No N/A*

Has the DCFL Science Lab Checklist been completed? *Yes No N/A*

Is training for affected personnel complete? *Yes No N/A*

Date(s) of instruction: New employee for 2014-15

Status of Emergency Eye Wash/Deluge Shower:

Is flushing conducted weekly? *Yes No N/A*

Is descriptive signage properly posted? *Yes No N/A*

Is flushing activity documented? *Yes No N/A*

**Fume Hood Evaluation**

**Inspector : Brian Parrie** **Date 1/09/2015**

**Chemical Hygiene Officer: Arlyn DeBruyckere**

**Hood #1** Science Fume Hood, Rm 112  **Location: High School Chemistry**

|  |  |  |
| --- | --- | --- |
| **FIELD TEST (lft/min)** | | |
|  |  |  |
|  |  |  |

Pass Fail (face velocity of 100 lf/min cannot be achieved)

Sash Height:18” high or 12” wide without classroom exhaust fan on can be achieved. With the classroom exhaust fan on the sash high can only be 6” high or 10” wide.

Used as Storage? *Yes No*

Clean? *Yes No*

Comments**:** The fume hood was determined to be in good condition. The hood has consistently preformed as required by current statute. Chemicals being stored in the hood are left there to reduce down via evaporation before disposal.

**Completed by: Brian Parrie**  **Date 1/09/15**

**General Science Safety Considerations**

**For All Rooms Where Science Laboratories Are Conducted**

**And/or Demonstrations Are Given**

**Client:** Hutchinson Public Schools

**Room Number: WA 112**

**Description:** A school science laboratory is defined as a classroom where demonstrations and/or laboratory instructions are provided for individual or group experiments. They are places where science is taught. In addition, any condition listed under either the storage section or the chemical laboratory section that may apply to any area, for instance, must keep inventories of all biology reagents and chemicals.

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| --- | --- | --- | --- | --- |
| **ITEM** | **CITATION** | **CONDITION** | | |
| **EXISTS** | **LACKING** | **N/A** |
| **1)** Laboratories must be equipped with adequate ventilation. For new labs (build after July 1990) an manual shutoff control for the laboratory exhaust ventilation system must be provided outside of the room, in a position adjacent to the access door to the room or in such other location as approved by the fire chief. | UBC (97) 305.2.4, 307.5.2, & 1202.2.3  UFC (97) 8004.1.11 & 8003.1.4.2 |  |  | X |
| **2)** At least one 2A-20BC, or larger, rated and approved portable fire extinguisher must be provided for each 3,000’ of laboratory. Travel distance must not exceed 50’ from anywhere in the lab. At least one fire extinguisher suitable for class D fires must be provided in laboratories where combustible metals are used and stored. | UFC (97) 1002.1  UFC Std. 10-1-3-2 | X |  |  |
| **3)** At least one approved fire blanket must be provided in each laboratory. | UFC (97) 1001.9 | X |  |  |
| **4)** Students must be under the direct supervision of a faculty member or an assistant at all times. In most cases it is recommended that direct supervision means direct eye contact. It is recommended that no more than two students be assigned to a lab station, a place in the room equipped with water, gas, and electricity, or a place where students do labs. | NFPA 45 (91) 1-4 | X |  |  |
| **5)** Aisles serving work areas on two sides must be at least 42” wide; those serving work areas on one side only must be 36”. | UFC (97) 1204.2.2 (2) | X |  |  |
| **6)** Minimum of two means of exit access must be provided when:  Existing: lab exceeds 1,000 sq. feet  New: lab exceeds 200 sq. feet (built after 7/90) | NPFA 45 (91) 3-4.1  UBC (97) 1007.3.8 | X |  |  |
| **7)** Labs must be separated from each other and other portions of the building by not less than a 1-hour occupancy separation.\*  Existing: labs located in buildings protected by automatic extinguishing systems—only smoke separation required  New: (built after 7/72)  \*Recommend this be determined by a licensed design professional | UFC (97) Appendix 1-A 7.2 as amended  UBC (97), 305.2.4 | X |  |  |
| **8)** Labs must be equipped with automatic detection electrically interconnected with the building fire alarm system. Exception: labs protected by a complete automatic sprinkler system that is interconnected to the building fire alarm require no additional detection. | UFC (97) 1007.2.4.2 & 1007.2.4.1.1 as amended | X |  |  |
| **9)** All electrical outlets must be properly grounded and all fixed electrical equipment and appliances must be plugged in to grounded outlets as required by the electrical code. | UFC (97) 8504  99NEC 250-112 | X |  |  |
| **ITEM** | **CITATION** | **CONDITION** | | |
| **EXISTS** | **LACKING** | **N/A** |
| **10)** Electrical receptacles, switches, and controls must be located so as not to be subject to liquid spills. | NFPA 45 (91) 3-6.1 | X |  |  |
| **11)** Extension cords must not be used as a substitute for permanent wiring. | UFC (97) 8506.1 | X |  |  |
| **12)** The use of multi-plug adapters, octopus arrangements, cube adapters, strip plugs, or any other device that does not comply with the electrical code is prohibited. | UFC (97) 8507 | X |  |  |
| **13)** A minimum of 30” of clearance must be maintained in front of electrical control panels for access. | UFC (97) 8509.2 | X |  |  |
| **14)** Written procedures for laboratory emergencies, including emergency evacuation, must be developed for each lab. | NFPA 45 (91) 4-6.3.1 | X |  |  |
| **15)** Piping systems must comply with nationally recognized standards. | NFPA 45 (91) 8-1.1 | X |  |  |
| **16)** Enough eye protection devices (goggles) must be provided for every student in the room, visitors, and the teacher whenever potentially hazardous activities are taking place. | MN Public Law, section 126.20 | X |  |  |
| **17)** Refrigerators, freezers, and other cooling equipment used to store or cool flammable liquids must be of explosion-proof construction | NFPA 45 (91) 9-2.2.2 |  |  | X |
| **18)** Each refrigerator, freezer, or cooler must be prominently labeled to indicate whether it is or is not suitable for storing flammable liquids. | NFPA 45 (97) 9-2.2.1 |  |  | X |
| **19)** Flammable liquids stored in refrigerated equipment must be in closed containers. | NFPA 45 (91) 9-1.6.6 |  |  | X |

**General Science Safety Considerations**

**For All Laboratories and/or Rooms Where Chemical Demonstrations Are Conducted**

**Client:** Hutchinson Public Schools

**Room Number: High School112**

**Description:** In addition to the provisions that are outlined for any science laboratory area, the following provisions are specific for chemistry classes (but may apply to any lab where similar activities are carried on).

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| **ITEM** | **CITATION** | **CONDITION** | | |
| **EXISTS** | **LACKING** | **N/A** |
| **1)** Proper eyewash facilities must be installed that produce 25 psi of water for 15 minutes. Squeeze bottles do not meet this specification. It is recommended that eyewash fountains should be located within 25’ of students in any area of the room. The device must be plumbed into a drinkable water supply. This rule applies to any rooms where labs are conducted that are potentially harmful to the eyes. | ANSI Z-358.1-1981 | X |  |  |
| **2)** Emissions generated at workstations must be confined to the area in which they are generated (laboratory hoods). | UBC (97) 1202.2.3 | X |  |  |
| **3)** In new labs (build after 7/90) a manual shutoff control for the laboratory exhaust ventilation system must be provided outside of the room in a position adjacent to the access door to the room or in such other location as approved by the fire chief. | UBC (97) 1202.2.3  UFC (97) 8003.1.4.2 |  |  |  |
| **4)** Chemicals stored in the open in the laboratory work area must be kept to the minimum necessary for the work being done. | NFPA 45 (91) 7-2.3.1 | X |  |  |
| **5)** A complete inventory of chemicals on hand must be maintained and must be available to the fire chief. All materials must be dated upon receipt. | UFC (97) 8001.6 | X |  |  |
| **6)** Persons responsible for each lab must be familiar with the chemical nature of the materials present in the lab and the appropriate mitigating actions to be taken in case of fire, leak, or spill. | UFC (97) 8001.11.1.1 | X |  |  |
| **7)** Incoming shipments of chemicals must be transported and opened by school personnel familiar with the potential hazards. | NFPA 45 (91) 7-2.2.1 | X |  |  |
| **8)** Neutralizing chemicals spill kits, dry sand, vermiculite, EM Absorbent, and other spill control methods must be readily available while the lab is in use. | UFC (97) 8001.11.1 | X |  |  |
| **9)** Written maintenance procedures must be established, including regular inspection, testing, and maintenance of lab utilities, hood and exhaust systems, pressure equipment (autoclaves, steam sterilizers, etc.), and emergency equipment. | NFPA 45 (91) 4-6.2 | X |  |  |
| **10)** Lab hoods and special local exhaust systems must be labeled to indicate intended use. Hoods in which radioactive materials are handled must be identified with the radiation hazard symbol. | NFPA 45 (91) 6-13 |  |  | X |
| **11)** Provide a properly marked, easily accessible main gas shutoff valve in the room. | UFC (97) 8004.1.12 | X |  |  |
| **12)** Fume/exhaust hoods must be listed (e.g., UL or FM) and maintained in proper operating condition. | UFC (97) 8001.4.4 & 8001.4.7.1 | X |  |  |
| **13)** Heat sources (e.g., gas burners, hot plates, heating mantles, etc.) should never be left unattended. | Recommendation | X |  |  |
| **ITEM** | **CITATION** | **CONDITION** | | |
| **EXISTS** | **LACKING** | **N/A** |
| **14)** It is recommended that due to the serious explosion hazard present, the following chemicals not be used in an instructional setting:  Benzoyl Peroxide Percholoric Acid  Carbon Disulfide Picric Acid  Ethyl Ether Potassium Metal  Magnesium Powdered Metal | Recommendation |  |  | **X** |
| **15)** Loose clothing (e.g., full cut blouses, neckties, etc.) and long hair should be properly restrained. Also, some laboratory activities could be dangerous to persons wearing contact lenses. | Recommendation | **X** |  |  |

**General Science Safety Considerations**

**For Chemical Storage Facilities**

**Client:** Hutchinson Public Schools

**Room Number: High School112**

**Description:** Chemical Storage Facilities means any area or room where chemicals are stored. Usually this refers to the chemistry storage area, but occasionally there may be other facilities in the school, most likely located within a classroom, that store chemicals. These rules apply to all areas where chemicals are stored.

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| --- | --- | --- | --- | --- |
| **ITEM** | **CITATION** | **CONDITION** | | |
| **EXISTS** | **LACKING** | **N/A** |
| **1)** Quantities of flammable and combustible liquids shall not exceed the amounts necessary for demonstration, treatment, laboratory work, maintenance purposes, or operation of equipment. Not in any case will it exceed the limits set forth in table 7902.5-A. | UFC (97) 7902.5.7.2 #3 | **X** |  |  |
| **2)** Quantities of flammable and combustible liquid in excess of 10 gallons must be stored in a flammable liquids cabinet. Quantities not exceeding ten gallons must be stored in an approved location. | UFC (97) 7902.5.8 | **X** |  |  |
| **3)** The maximum quantity of flammable and combustible liquids in storage and use in a lab must not exceed 120 gallons.  Exception: These quantities may be doubled in areas protected by an automatic extinguishing system.  Exception: These quantities may be doubled if stored in approved storage cabinets.  (Both exceptions may apply.) | UFC (97) table 7902.5-A | **X** |  |  |
| **4)** Class I flammable liquids may be stored in glass containers of not more than one-gallon capacity only if the required liquid purity would be affected by storage in a metal container, or if the liquid would cause excessive corrosion of a metal container. Otherwise, Class I-A liquids are restricted to glass containers not exceeding one-pint capacity and Class 1-B liquids are restricted to glass containers not exceeding one-quart capacity. Class 1-C liquids are permitted to be stored in containers up to one-gallon capacity. | UFC (97) 7902.1-A | **X** |  |  |
| **5)** No container for Class I or II liquids in any lab may exceed a capacity of one gallon. See table 7902.1-A for other limitations. | UFC (97) 7902.1-A | **X** |  |  |
| **6)** Materials that will react with water or other liquids to produce a hazard must not be stored in the same room with flammable or combustible liquids. | UFC (97) 7902.5.4 | **X** |  |  |
| **7)** Stored gas cylinders shall have all protective devices on (caps, collars, and similar devices). | UFC (97) 7401.7.1 | **X** |  |  |
| **8)** All gas cylinders must be secured in a place to prevent falling. | UFC (97) 7401.6.4 | **X** |  |  |
| **9)** Material Safety Data Sheets (MSDS) must be readily available on the premises for all hazardous chemicals. | UFC (97) 8001.6 | **X** |  |  |
| **10)** All chemicals must be stored in approved containers (if possible, chemicals should be stored in the original shipping package). | UFC (97) 8001.4.2 | **X** |  |  |
| **11)** Incompatible materials shall be segregated to prevent accidental contact with one another. (Storage of materials which are incompatible shall no be allowed in the same cabinet or exhausted enclosure.) | UFC (97) 8001.11.8 | **X** |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ITEM** | **CITATION** | **CONDITION** | | |
| **EXISTS** | **LACKING** | **N/A** |
| **12)** All shelving must be of substantial construction and properly secured to prevent falling over. (Shelving above work areas should be kept free of chemicals; storage above eye level should be avoided.) | UFC (97) 8001.11.9 | **X** |  |  |
| **13)** Shelving must be equipped with a lip or guard to avoid products rolling off. | UFC (97) 8001.11.9 | **X** |  |  |
| **14)** Defective containers must be removed and disposed of in a proper manner. | UFC (97) 8001.4.7.3 | **X** |  |  |
| **15)** Disposal of chemical wastes must be in accordance with applicable federal and state regulations and good safety practices. | UFC (97) 8001.5.1 | **X** |  |  |
| **16)** All storage cabinets and storage rooms must be locked or otherwise secured against unauthorized entry. | UFC (97) 8001.11.2 | **X** |  |  |
| **17)** All containers must be properly labeled to identify the contents. | UFC (97) 8001.7 | **X** |  |  |
| **18)** Toxic and highly toxic compressed gas, Class IV liquid, solid oxidizers, unclassified detonable, Class I organic peroxides, Class III and IV unstable and reactive material shall not be allowed in the classroom. | UFC (97) 8001.15.2.4 | **X** |  |  |
| **19)** When transferring flammable liquids between metal containers, the containers must be properly bonded together. The practice of purchasing large containers and dispensing into smaller ones is discouraged. | UFC (97) 8001.11.5 | **X** |  |  |

**TABLE 7902.1-A: MAXIMUM SIZE OF CONTAINERS AND PORTABLE TANKS**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CONTAINER TYPE** | **CLASS I-A** | **CLASS I-B** | **CLASS I-C** | **CLASS II** | **CLASS III** |
| **1.** Glass1 | 1 pt. | 1 qt. | 1 gal. | 1 gal. | 5 gal. |
| **2.** Metal or listed approved plastic2 | 1 gal. | 5 gal. | 5 gal. | 5 gal. | 5 gal. |
| **3.** Approved plastic | 0 gal. | 0 gal. | 0 gal. | 0 gal. | 5 gal. |
| **4.** Safety cans | 2 gal. | 5 gal. | 5 gal. | 5 gal. | 5 gal. |
| **5.** Metal drum | 60 gal. | 60 gal. | 60 gal. | 60 gal. | 60 gal. |
| **6.** Approved portable tanks | 660 gal. | 660 gal. | 660 gal. | 660 gal. | 660 gal. |
| **7.** Polyethylene3 | Note 4 | Note 4 | Note 4 | 60 gal. | 60 gal. |

1Class I-A and I-B liquids are allowed to be stored in glass containers of not more than 1-gallon capacity if the required liquid purity, such as American Chemical Society analytical reagent grade or higher, would be affected by storage in metal containers or if the liquid would cause excessive corrosion of a metal container.

2See Sections 7902.1.8.1.3 and 7902.5.10.2.2 for special limitations.

3Polyethylene containers in accordance with nationally recognized standards. See Article 90, Standard u.3.3.

4See Rows 2, 3, and 4.

**TABLE 7902.5-A: EXEMPT AMOUNTS OF FLAMMABLE AND COMBUSTIBLE LIQUIDS—**

**MAXIMUM QUANTITIES STORED PER CONTROL AREA1,2,3**

|  |  |
| --- | --- |
| **TYPE OF LIQUID** | **EXEMPT AMOUNT (gallons)** |
| Flammable  Class I-A  Class I-B  Class I-C  Combination I-A, I-B, I-C | 30  60  90  1204 |
| Combustible  Class II  Class III-A  Class III-B | 120  330  13,2005 |

1Control areas shall be separated from each other by not less than a one-hour fire-resistive occupancy separation. The number of control areas within a building used for retail or wholesale sales shall not exceed two. The number of control areas in buildings with other uses shall not exceed four. See Sections 204 and 8001.10.2.

2Quantities are allowed to be increased 100 percent when stored in approved storage cabinets. When Note 3 applies, the increase for each Note is allowed.

3Quantities are allowed to be increased 100 percent in buildings equipped with an approved automatic sprinkler system. When Note 2 applies, the increase for each Note is allowed.

4Combinations shall not contain more than the exempt amounts of any individual class.

5Quantities permitted in a building equipped with an approved automatic sprinkler system are not limited.

**Carcinogen/Substances of Known High Chronic Toxicity**

**Standard Operating Procedures**

**Client:** Inver Grove Heights Community Schools

abstrbu1 Which carcinogens are present in district science laboratories?

|  |  |  |
| --- | --- | --- |
| **KNOWN CARCINOGENS** | **SUSPECT CARCINOGENS** | **OTHERS** |
| ٱ Asbestos | ٱ Cadmium/Cadmium Compounds | ٱ |
| ٱ Arsenic | ٱ Carbon Tetrachloride | ٱ |
| ٱ Benzene | ٱ Chloroform | ٱ |
| ٱ Benzidine | ٱ DDT | ٱ |
| ٱ Bis (Chloromethyl) Ether | ٱ 2,4D | ٱ |
| ٱ Chloromethyl Methyl Ether | ٱ Methylene Chloride | ٱ |
| ٱ Chromium/Chromium Compounds | ٱ Formaldehyde (Gas) | ٱ |
| ٱ Mustard Gas | ٱ Lead Acetate |  |
| ٱ Vinyl Chloride | ٱ Lead Phosphate |  |
|  | ٱ Nickel/Nickel Compounds (Powder) |  |
|  | ٱ Saccharin |  |
|  | ٱ Urethane |  |

abstrbu1 List total time (in hours) employee is exposed to carcinogens (checked chemicals above) per academic year.

hours per academic year

abstrbu1 Are checked chemicals required, or could acceptable substitutes be implemented?

ٱ Will retain carcinogen in curriculum ٱ Will discontinue use of chemicals

If retained in curriculum, use table to log/document usage:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CARCINOGENIC CHEMICAL** | **AMOUNTS USED** | **DATES USED** | **NAME(S) OF USER(S)** | **NUMBER OF HOURS USED** |
|  |  |  |  |  |
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**Carcinogen/Substances of Known High Chronic Toxicity**

**Storage Guidelines**

1. Store in a well-ventilated area.

2. Use secondary containers or trays with sufficient capacity > 100% primary container.

3. Label with the following information:

|  |
| --- |
| **WARNING!**  **HIGH CHRONIC TOXICITY**  **OR**  **CANCER-SUSPECT AGENT** |

4. Limited access should be provided for these chemicals.

5. Areas should be posted.

6. District Storage Location:

7. Guidelines (from above) that need to be implemented: 1 2 3 4 5

**Carcinogen/Substances of Known High Chronic Toxicity**

**Handling Guidelines**

1. Use a “controlled area” (an exhaust hood, glove box, designated area in a laboratory with localized ventilation).

District Controlled Area: Fume hood

2. Controlled areas should possess the following signage, conspicuously posted:

|  |
| --- |
| **WARNING!**  **TOXIC SUBSTANCE IN USE**  **OR**  **CANCER-SUSPECT AGENT:**  ***AUTHORIZED PERSONNEL ONLY*** |

3. Use of Personal Protective Equipment, like impermeable gloves, aprons, and face shields.

4. Protect surfaces where carcinogens are handled by using chemically resistant trays or pans that can be decontaminated.

5. On leaving a controlled area, laboratory workers should remove any protective apparel that has been used and thoroughly wash hands, forearms, face, and neck. If disposable apparel or absorbent paper liners have been used, these items should be placed in a closed and impervious container that should then be labeled in some manner such as the following: CAUTION—CONTENTS CONTAMINATED WITH SUBSTANCES OF HIGH CHRONIC TOXICITY. Non-disposable protective apparel should be thoroughly washed, and containers of disposable apparel and paper liners should be incinerated.

6. Wastes and other contaminated materials from an experiment involving substances of high chronic toxicity should be collected together with the washings from flasks and such and either decontaminated chemically or placed in closed, suitable labeled containers for incineration away from the controlled area. If chemical decontamination is to be used, a method should be chosen that can reasonable by expected to convert essentially all of the toxic materials into nontoxic materials. For example, residues and wastes from experiments in which B-propiolactone, bis (chloromethyl) ether, or methyl chloromethyl ether have been used should be treated for 10 minutes with concentrated aqueous ammonia.

In the event that chemical decontamination is not feasible, wastes and residues should be placed in an impervious container that should be closed and labeled in some manner such as the following: CAUTION—COMPOUNDS OF HIGH CHRONIC TOXICITY or CAUTION—CANCER-SUSPECT AGENT.

7. Transfer of contaminated wastes from the controlled area to the incinerator should be done under the supervision of authorized personnel and in such a manner as to prevent spill or loss. In general, liquid wastes containing such compounds should be placed in glass or polyethylene (usually preferable) bottles half-filled with vermiculite, and these should be transported in plastic or metal pails of sufficient capacity to contain the material in case of accidental breakage of the primary container.

8. Normal laboratory work should not be resumed in a space that has been used as a controlled area until it has been adequately decontaminated. Work surfaces should be thoroughly washed and rinsed. If experiments have involved the use of finely divided solid materials, dry sweeping should not be done. In such cases, surfaces should be cleaned by wet mopping or by use of a vacuum cleaner equipped with a high efficiency particulate air (HEPA) filter. All equipment (e.g., glassware, vacuum traps, and containers) that is known or suspected to have been in contact with substances of high chronic toxicity should be washed and rinsed before they are removed from the controlled area.

9. In the event of continued experimentation with a substance of high chronic toxicity (i.e., if a worker regularly uses toxicologically significant quantities of such a substance three times a week), a qualified physician should be consulted to determine whether it is advisable to establish a regular schedule of medical surveillance or biological monitoring