

FIRE SAFETY PLAN FOR:

Power House
Lakehead University
955 Oliver Road
Thunder Bay, Ontario
P7B 5E1

Reviewed without change - June 2025

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Chapter 1: Introduction

As required by the Ontario Fire Code, Section 2.8, (Ontario Regulation 213/07 of the Ontario Fire Protection and Prevention Act, as amended), this Fire Safety Plan has been prepared by Lakehead University for the Power House, 955 Oliver Road, Thunder Bay, Ontario.

The purpose of the plan is to provide safety information for all occupants in the event of a fire, to ensure the effective use of life saving features in the building, and to prevent fires from being initiated. This fire safety plan has been designed to suit the resources of the Power House. This plan must be approved by Thunder Bay Fire Rescue; however, Lakehead University is responsible for ensuring that the information provided in this fire plan is accurate and complete.

Information found within this Fire Plan includes: contact information, an audit of building resources, maintenance of building resources (as required by the Ontario Fire Code), building schematics, and an outline of responsibilities, emergency procedures, control and extinguishment of a fire, fire protection measure and fire hazards and prevention.

The Fire Protection and Prevention Act, Part VII, Section 28 states that any person who contravenes any provision of the fire code is guilty of an offence. If convicted a company or corporation is liable to a fine of not more than \$100,000. Any individual, director or officer of a corporation is liable for a fine of not more than \$50,000 or imprisonment for a term of not more than one year, or both.

The Fire Safety Plan shall be reviewed as often as necessary, but at intervals not greater than twelve (12) months, to ensure that it takes account of changes in use and other characteristics of the building. The Chief Fire Official is to be notified regarding any subsequent changes in the contents of the approved Fire Safety Plan.

This official document is to be kept readily available at all times for use by staff and fire officials in the event of an emergency

The approved location of the Fire Safety Plan for the Power House is the Security Office, UC 1016. In addition, copies will be kept in the Health & Safety Office and in the Fire Safety Plan Box located at the main entrance.

Chapter 2: Audit of Human Resources

Building Owner	Lakehead University 955 Oliver Road Thunder Bay, ON P7B 5E1 Phone: 807-343-8110
President	Dr. Gillian Siddall 955 Oliver Road Thunder Bay, ON P7B 5E1 Phone: 807-343-8010 ext.8200
Vice President, Finance& Administration	Kathy Pozihun Phone: 807-343-8010 ext.8383
Director, Physical Plant	Hugh Briggs Phone: 807-343-8010 ext.8790
Health & Safety, Office of Human Resources	Brenda Huska Phone: 807-343-8010 ext.8806 Tiffany Moore Phone: 807-343-8010 ext.8671
Security Staff	On site 24/7, minimum 3 people Phone: 807-343-8911 (Emergencies) Phone: 807-343-8010 ext.8569 (Non-emergency)
Maintenance Staff	Physical Plant, available from 8am to 4pm (After hours contact Security) Phone: 807-343-8010 ext.8273
Cleaners	Physical Plant, Arno Kalbus, Facilities Manager Phone: 807-343-8010 ext.8962 Physical Plant, Services Supervisor, Phone: 807-343-8010 ext.8968
Fire Alarm Monitoring Company	Tbay Tel Phone number and passwords are held by Security Services (807-343-8010 ext.8569).

Chapter 3: Audit of Building Resources

3.1 General Description

The Power House located at 955 Oliver Road is a non-combustible two (2)-storey building with one (1) basement level constructed in 1967.

The operating hours of the building are 8am to 4pm, Monday to Friday.

i. Occupancy and Use

Basement-Thermodynamic room, Liquid Nitrogen storage, Air compressor room, Pumps, Pipes, Storage.

Main Floor- Boiler room, Chemical Treatment rooms, Tool storage, Electrical room, Washroom, Lunchroom.

Second Floor-Electrical room, Offices, Washroom, Computer room, Lunchroom.

ii. Fire Department Access

Firefighters will access the property via the Oliver Road, Lot 5 entrance. Security Services will call in detailed instructions to the city's Emergency Service Dispatch and provide specific information regarding the alarm, including the building entrance to use and any details concerning the fire (i.e. which zone is affected, chemical storage, etc.).

3.2 Fire Alarm System

This building is provided with an Edwards IRC/FCC single stage system.

Main Control Panel location: Electrical room 1005.

Annunciator Panel location: An annunciator is located in the security office, UC 1016.

i. Sequence of Operation

Upon activation of a fire alarm initiating device in any portion of the building, a general fire alarm will sound throughout the building.

ii. Ancillary Functions

The fire alarm system is activated by:

- Manual pull stations
- Smoke detectors
- Heat detectors

Upon activation of the fire alarm system:

- A fire alarm signal will be transmitted to the Security Office and confirmed at their annunciator panel. A fire alarm signal will also be transmitted to an independent off-site monitoring station.
- The fire alarm annunciator and control panel will display information regarding which zone is affected.

Fire dampers are present in the office area of the building, located in the duct work. Dampers operate via thermal melts and are not tied to the fire alarm system.

3.3 Fire Hydrants

Private hydrants are located as shown on the site plan. The private hydrants are connected to the municipal water supply. Municipal hydrants are found only bordering Oliver Road.

3.4 Fire Extinguishers

Fire extinguishers are located throughout the building. See floor plans for locations.

3.5 Emergency Power

Emergency power is provided by the emergency generator in the powerhouse building (1 megawatt Kohler generator). This emergency generator runs off diesel fuel and will power the main campus for a maximum of 4 days. The generator is equipped with a 3000L belly tank for diesel fuel storage. A 10,000L back-up supply is stored in the outdoor tank, as indicated on the site plan

Emergency power provided to the Power House will run the Emergency Lighting, Exit Lights and the Fire Alarm System.

The fire alarm system is equipped with battery backup contained within the fire alarm panel. In the event of a power failure, the batteries provide sufficient power to allow the fire alarm to operate in “supervision” mode for 24 hours and the alarm to sound for at least 60 minutes.

3.6 Main Hydro Shut-Off

The main hydro disconnect switch is located outdoors near the west side of the building, as shown on the site plan. Disconnecting hydro to the Power House will disconnect the power supply to all buildings on the main campus.

3.7 Gas Shut-Off Valve

The main gas shut off valve for the Power House is located outdoors on the Northwest side of the building. Using this gas shut-off valve will discontinue the natural gas supply to the main campus as well.

Propane is used by the boiler igniters. The shut-off valve is located outdoors on the west side of the building.

The back-up 10,000L diesel fuel tank (for the emergency generator and boilers) has a shut-off valve located directly on the tank.

In addition, there are shut-off valves inside the Power House that will discontinue natural gas supply to specific buildings on campus. For example, one such shut-off valve for CB, UC, SC, BB, and FB is located on the main floor of the Power House. Maintenance professionals can provide additional details upon request.

See site and floor plans for locations.

3.8 Hazards

The following classes of hazardous materials are located in the Power House chemical treatment room:

- Flammable and Combustible Liquids
- Poisonous or Toxic Materials
- Oxidizing Materials
- Corrosive Materials

Upon arrival at the scene, Lakehead University Security Staff can provide the Fire Department personnel with the exact locations of hazardous materials in the building. Hardcopies of the Safety Data Sheets are accessible in PH 1002 and the second floor office.

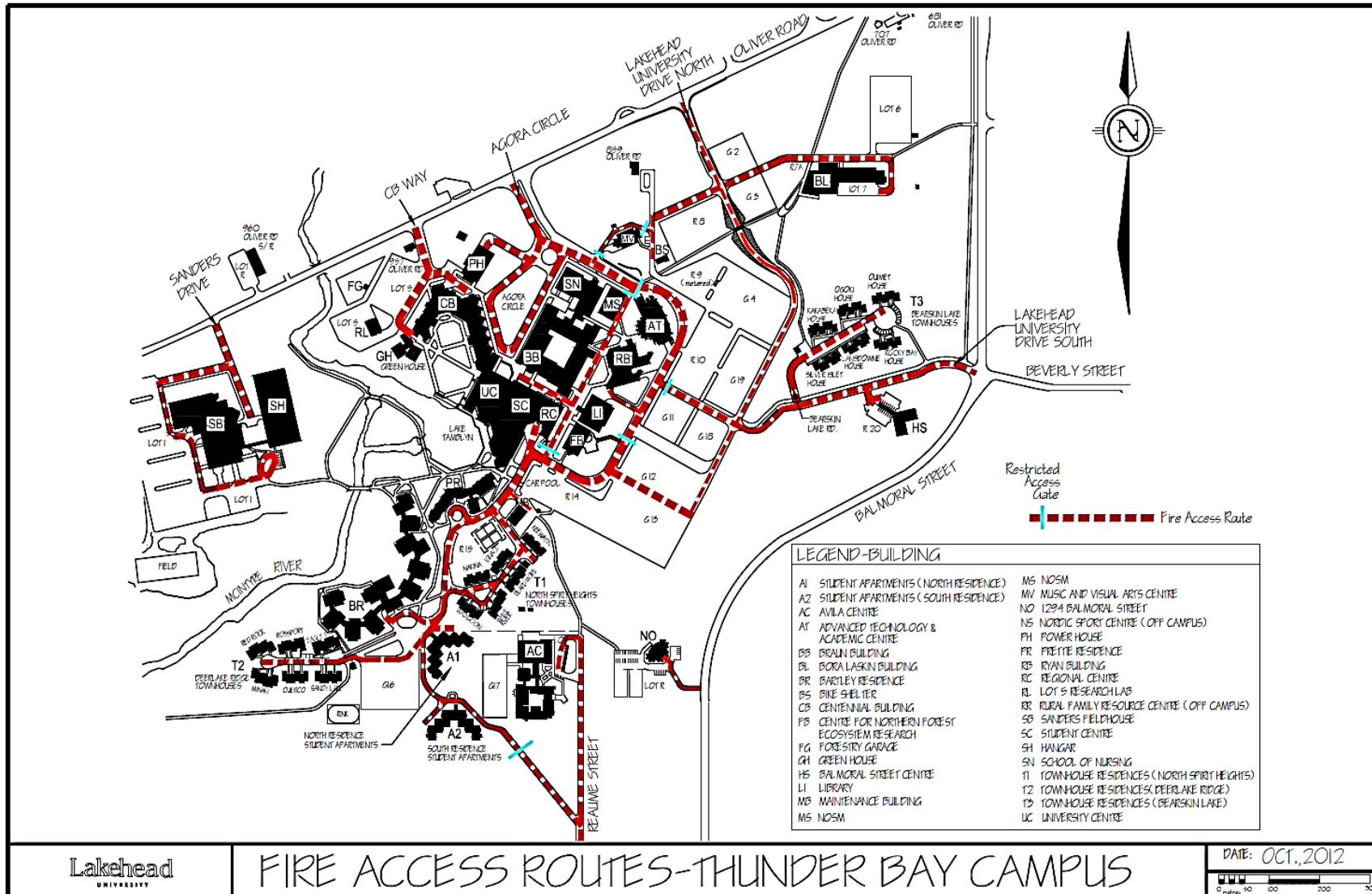
In addition, the Power House building contains:

- Indoor Compressed Refrigerant Gas (PH 1000)
- Indoor Diesel Fuel (PH 1000)
- Indoor Liquid Nitrogen Storage (PH 0002)
- Indoor PCB Ballast Storage (PH 1004)
- Indoor/Outdoor Oil Filled Transformers (PH 1005A&B)
- Outdoor Compressed Gas Cylinder Storage
- Outdoor Diesel Fuel Storage

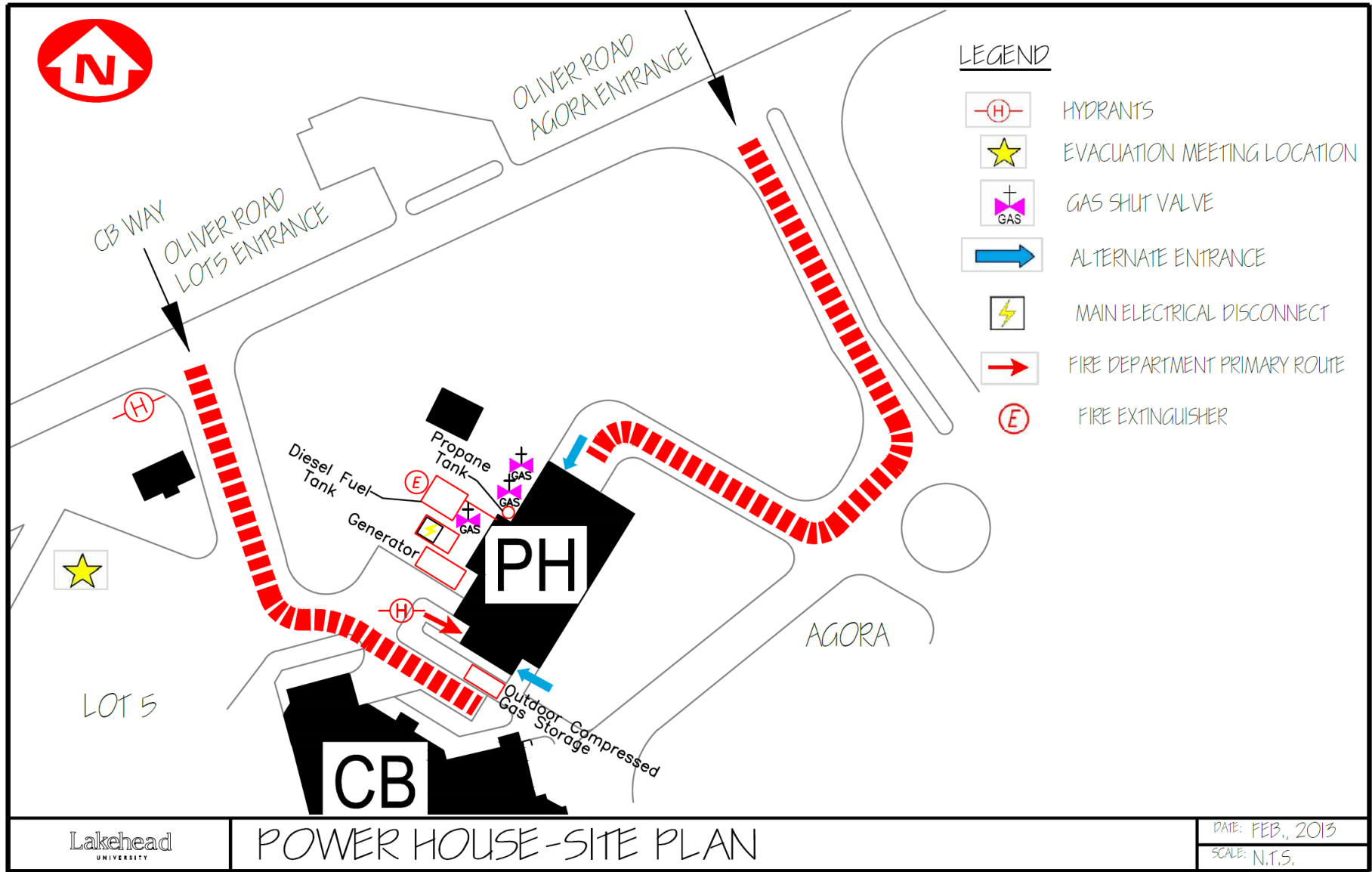
Refer to Section 5.11 and 5.12 for important emergency procedures.

Chapter 4: Building Schematics

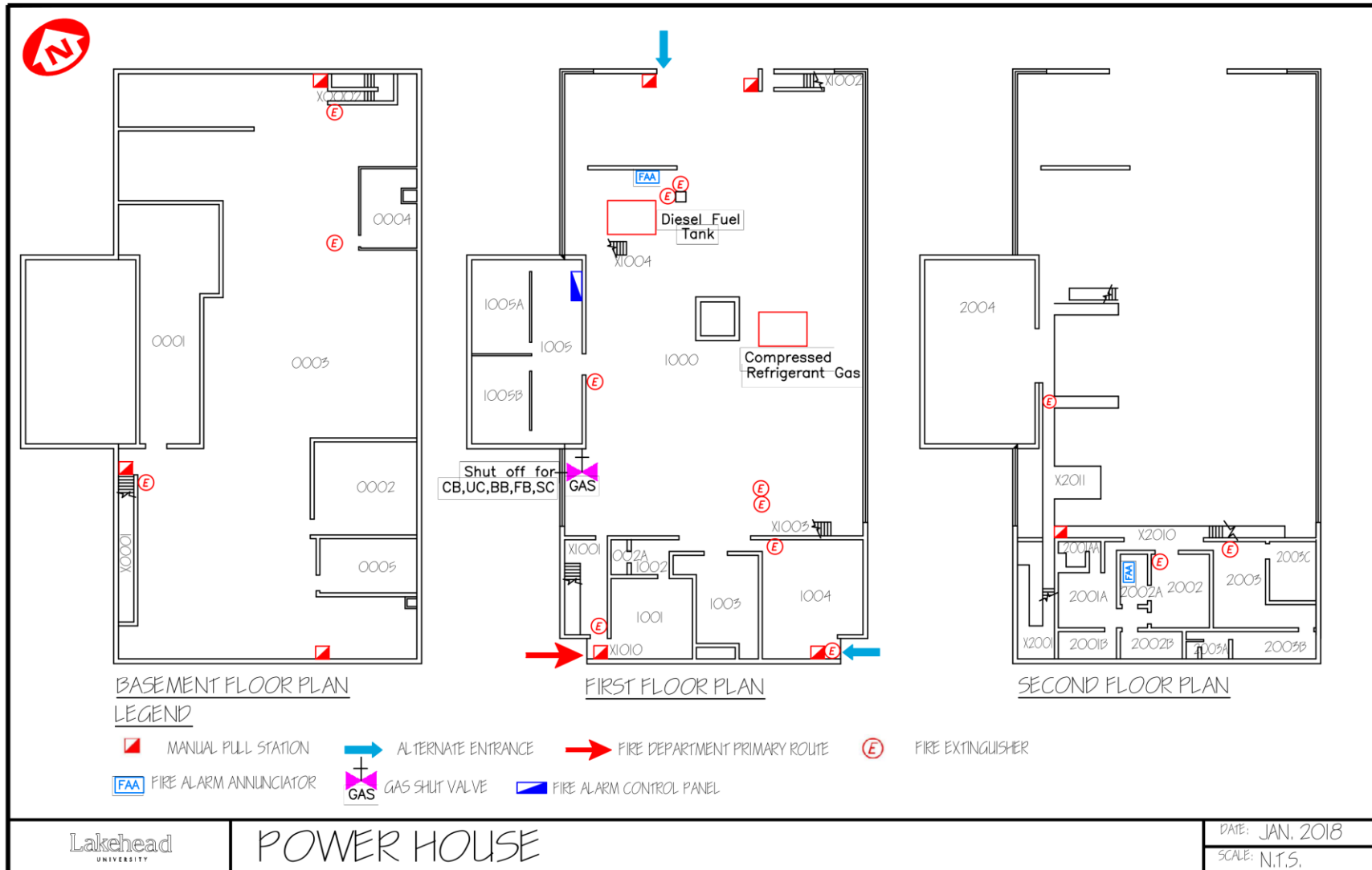
4.1 Fire Access Routes



4.2 Site Plan



4.3 Floor Plans



Chapter 5: Responsibilities & Emergency Procedures

The preparation and implementation of a Fire Safety Plan, helps to assure effective use of people and resources to control and eliminate fire hazards in the workplace and to respond effectively to a fire emergency. This will reduce the incidence of fire, protect life safety and reduce the impact of fire should one occur.

The procedures outlined in this Plan will be conducted with all due regard for personal safety

It is not the intent of this Plan to place a person in a hazardous situation that they are not trained or properly equipped for.

Many parties will have a role to play in promoting fire safety in the workplace. Each party will be responsible for certain administrative functions to be performed throughout the year. Some may be responsible for ensuring that tasks are carried out, while others may be responsible for carrying out those tasks.

5.1 Building Owner and Management (President, VP Finance & Administration)

The Ontario Fire Code defines “owner” as “any person, firm, or corporation having control over the property under consideration”. Article 1.2.1.1 of the Ontario Fire Code states, “Unless otherwise specified, the Building owner is responsible for carrying out the provisions of this Code”. Therefore, owners must take responsibility for ensuring compliance with the Ontario Fire Code.

The building owner / occupant have numerous responsibilities related to fire safety and must ensure that the following measures are enacted:

- Comply with the Ontario Fire Code.
- Ensure the Fire Safety Plan is developed, approved and fully implemented.
- Keep a copy of the approved Fire Safety Plan on the premises in an approved location.
- Review the Fire Safety Plan annually and revise when changes occur that will affect the information therein, such as contact information or changes to the fire protection system.
- Notification of the Chief Fire Official regarding changes in the Fire Safety Plan.
- Establishment of emergency procedures to be followed at the time of an emergency.
- Post and maintain at least one (1) copy of the fire emergency procedures.
- Appointment and organization of designated supervisory staff (Managers, Maintenance staff, Security or Fire Wardens) to carry out fire safety duties.
- Instruction of supervisory staff and other occupants so that they are aware of their responsibilities for fire safety.

- Designate and train sufficient alternates to replace supervisory staff during any absence
 - “Supervisory staff shall be instructed in the fire emergency procedures as described in the fire safety plan before they are given any responsibility for fire safety”, as outlined in Section 2.8.1.2. (1) of the Ontario Fire Code.
 - It is not necessary that the supervisory staff be in the building on a continuous basis, but they shall be available on the notification of a fire emergency, to fulfill their obligations as described in the Power House Fire Safety Plan.
- Hold drills in accordance with the Ontario Fire Code and in consultation with the Chief Fire Official, incorporating Emergency Procedures appropriate to the Power House.
- Keep adequate records of training and fire drills for a period of at least one-year.
- Ensure that hazards are identified and eliminated or controlled.
- Maintenance of building facilities and ensure that building life safety and fire protection systems provided for occupant safety are maintained.
- Provisions of alternate measures for safety of occupants during shut down of fire protection equipment.
- Assuring that checks, test and inspections as required by the Ontario Fire Code are completed on schedule and that records are retained for a minimum period of two (2) years.

5.2 Employers, Managers and Supervisors

Employers are responsible for fire safety within their area of operation. Employers, Managers and Supervisors must:

- Comply with the Ontario Fire Code within the space you control or lease.
- Ensure that Fire Wardens have been designated and trained to carry out the duties assigned to them under this Plan. Contact Human Resources for a current list of building Fire Wardens.
- Identify key personnel in your department requiring fire extinguisher training. To arrange training contact the Office of Human Resources – Health & Safety (807-343-8010 Ext 8806).
- Review the fire emergency procedures outlined in this Plan with your employees.
- Ensure any person who requires assistance to evacuate the building is identified and that a specific plan is established in the event of an emergency. This plan will be formulated in consultation with the areas fire warden.
- Practice and encourage employees to participate in fire drills conducted in the building.
- Encourage employees to cooperate with Security staff as they provide direction during fire alarms and building evacuations.
- Respond to any requests to eliminate fire hazards.
 - Eliminate those departmental fire hazards which you can control.
 - Report any fire hazards that you cannot control to Security Services or Physical Plant.
- Assist in evacuation procedures

i. Emergency Procedures - Supervisors

On notification of a Fire Emergency, Supervisors will:

1. Evacuate the area nearest the fire first, if known. Direct people to the nearest exit. If the exit is impassable, direct people to an alternate route.
2. If safe to do so, make a sweep of the area, checking all open rooms, including washrooms and storage rooms to ensure everyone has left.
3. Close but do not lock doors,
4. Note the name and/or location of any individuals who remain in the building to report to the Fire Department or Security Services staff.
5. Ensure persons who require assistance to evacuate or those who cannot evacuate are assisted down the exit stairs or to the nearest exit stair landing. See section 5.6 for more detail.
6. Once the building has been evacuated, leave the building using the closest exit stair.
7. Once outside the building, direct evacuees to the designated meeting location (Lot 5 parking lot) or in cases of inclement weather, to an adjacent building and ensure Security Services is notified of your alternate location.
8. Immediately notify the Fire Department personnel or Security Services staff of the location and/or name of any individuals who remained in the building and disclose any other information regarding the location or nature of the fire.
9. If Fire Department personnel are not on the scene, confirm with Security Services that the Fire Department has been notified.
10. Assist the Fire Department personnel and Security Services staff, as requested.
11. Obtain information from evacuees in your area. If anyone has information for the Fire Department or Security Services staff, ensure that it is reported.
12. The end of the Fire Alarm signal DOES NOT indicate that it is safe to re-enter the building. Ensure that no one re-enters the building until the all clear signal has been given by Security Services staff or Fire Department personnel.
13. After the fire emergency or fire drill is over, report any problems encountered during the evacuation to the Office of Human Resources- Health & Safety at 807-343-8010 Ext 8806.

Supervisors will execute their duties with all due regard for their own personal safety

5.3 Evacuation Meeting Locations

The designated evacuation meeting location for the Power House is the Lot 5 parking lot.

All persons evacuating the Power House must immediately report to the designated location and to their Supervisor.

5.4 Physical Plant (Mechanical & Electrical Staff)

- Be familiar with the floor area, exits, the locations of any fire safety equipment and the sound of the building's fire alarm.
- Be familiar with the operation of all fire protection and life safety systems and equipment.
- Provide specific checks, tests, and inspection requirements of the Ontario Fire Code assigned to you, as summarized in Chapter 11 of this Plan.
- Notify the appropriate persons of any planned or unplanned shutdown of fire protection or life safety equipment.
- Assist in implementing alternate measures for fire safety to compensate for the inactive system, as outlined in the Chapter 9 of this Plan.
- Restore the fire protection and fire alarm systems to normal operation after repairs or maintenance are completed or as soon as you are authorized to do so after an emergency.
- Assist in fire prevention by controlling fire hazards and conditions of possible safety threats.
- Promptly address and correct any fire hazards reported to you.
- Physical Plant will be notified by Security of any fire drills taking place.

i. Emergency Procedures -Physical Plant Staff

Upon notification by Security Services that a fire alarm has been activated, Physical Plant staff will stand by for further instructions.

Electrical Staff will:

- Be notified of all fire alarms and attend the site of any actual fire emergencies, or if the fire alarm system cannot be reset by Security Services.
- Prepare to disconnect the electrical service to the affected area. Disconnection will be at the direction of the Fire Department.
- Request assistance of other Physical Plant Departments as needed.

5.5 Security

- Be familiar with the floor area, exits, the locations of any fire safety equipment and the sound of the building's fire alarm.
- Participate in fire drills as described in this Plan.
- Assist in fire prevention by controlling fire hazards and conditions of possible safety threats.
- Promptly report or correct any fire hazards you have been informed of.
- Provide specific checks, tests, and inspection requirements of the Ontario Fire Code assigned to you, as summarized in the Chapter 11 of this Plan.
- Notify the appropriate persons of any planned or unplanned shutdown of fire protection or life safety equipment.
- Assist in implementing alternate measures for fire safety to compensate for the inactive system, as outlined in Chapter 9 of this Plan.
- Be familiar with the procedures and operation of the Fire Alarm and Security Systems.
- Be familiar with your role upon notification of a fire alarm.
- Know where the Fire Plan is kept and how to access the buildings safety data sheets.
- Security must have quick access to fire safety equipment (Fire Alarm Panel, generator room, pull station keys, elevator keys, and service/fire access roads).
- Be available to assist the Fire Department.

As with any emergency Fire Alarms will take priority over any other university business

i. Emergency Procedures- Security Services

Upon receiving notification of a fire alarm at the security office, you will:

1. Check the fire panel and print out for the exact location of the alarm.
2. Over the radio, notify the security personnel and dispatch all patrol officers to the appropriate building.
3. Call the monitoring company and verify they have received the alarm signal and have contacted the fire department.
4. Open electronic access gates if present on the buildings Fire Access Route.
5. Await further instructions from the Security Officers on the scene. Upon receipt of a report from the Security Officer on scene, the Security will:
 - a. Contact Fire Dispatch (807-684-1525) to provide specific information regarding the alarm.
 - b. Contact Physical Plant and Electrical staff (807-343-8010 Ext 8273) if there is a known fire.
6. Alert Human Resources at 807-343-8010 Ext 8806 or 807-343-8010 Ext 8671 or after hours using the Emergency Contact phone numbers filed with Security.
7. DO NOT touch the fire panel.
8. Any information received on the cause of the alarm will be relayed immediately to the Security Officers on scene.

9. Ensure the Fire alarm system is not silenced or reset until authorization is given by the Fire Department.

Upon notification of a fire alarm, Security Officers assigned to patrol will:

1. ONE officer will meet the Fire Department at the designated entrance.
2. Advise the Fire Department of any information regarding the cause of the alarm or details of the fire and relay any concerns regarding the zone affected.
3. ALL OTHER officers will immediately report to the area in distress and report to the other security personnel the condition of the site.
 - a. One officer will check the zone indicated by the annunciation panel as being in distress, if it is safe to do so. Report findings to the security office and indicate if there is a need for other services to be called (i.e. Ambulance, Electrical, or Mechanical). The officer will also report if there is an actual fire, smoke present or if the cause of the fire is known.
 - b. Ensure fire access routes are unobstructed (Remove any bollards and open gates).
 - c. One officer will control crowds and ensure that all persons are kept away from the building and the roadway is clear for the Fire Department. Ensure no one re-enters the building until the Fire Department has given the all clear.
4. Security officers will follow the instructions of the Fire Department personnel.
5. Once authorized by the Fire Department, Security Officers will silence the alarms, reset the activated device, return elevators to normal service, reset maglocks(if applicable) and provide the "All Clear" announcement to those who have evacuated the building.
6. Security will facilitate the Fire Department's investigation (if a fire occurred).
7. An incident report must be generated for ALL fire alarms, without exception.
8. Forward a copy of the report to the Office of Human Resources – Health & Safety.

Security Officers shall refer to a more detailed description of these procedures in the "Security Services Department Policy & Procedure Manual".

5.6 Persons Requiring Assistance to Evacuate

Persons requiring assistance to evacuate are encouraged to identify themselves to their Supervisor or to their Instructors upon commencing employment or classes at Lakehead University. It is the responsibility of Lakehead University to ensure that persons requiring assistance to evacuate are provided with means to leave the premises safely. Supervisors should be aware if there are individuals in their classes or department who require assistance in the event of a fire emergency.

For those persons who are unable to evacuate, Supervisors must know:

- Where a person can be safely left in the eventuality that evacuation from the building is not possible.
- The procedure for reporting the location of persons left in the building to the Fire Department or Security Services.

Immediately inside the exit stair is the best location to await rescue, in the event that evacuation is not possible. Exit stairs are enclosed fire protected stairwells with fire resistant walls and doors designed to protect from smoke and fire. **Be familiar with the evacuation plan.**

i. Emergency Procedures- Persons Requiring Assistance to Evacuate

On notification of a Fire, a Supervisor who is aware that a person with requiring assistance to evacuate is present in their workplace or classroom will:

1. Ensure that the individual has been notified.
2. Carry out your regular duties: instruct all occupants to evacuate via the nearest exit, conduct a systematic check of the immediate area and turn off all equipment if safe to do so.
3. If the individual requiring assistance to evacuate has not made alternate plans for evacuation , the following procedure will be followed:
 - a. The Supervisor will help any person requiring assistance in reaching a safe location outside the building using an exit stairwell, insofar as they are able to do so.
 - i. Persons requiring assistance should be moved into the exit stair when there is a break in the flow of persons evacuating, or when the stair is clear.
 - ii. If the person is unable to continue while descending, stop at the next door encountered on the way down. Do not obstruct others who are evacuating.
 - iii. Station the person immediately inside the stairwell, if safe to do so, call Security (807-343-8911, extension 8911 or a blue emergency telephone) or exit the building and immediately inform Security Services or the Fire Department of the person's location.
 - b. To assist individuals who are unable to evacuate using the stairs, the Supervisor, will ensure the person requiring assistance is moved to the nearest exit stairwell landing.
 - i. Persons who cannot use the stairs are to remain inside the exit stairs, ensuring that the exit stair door remains closed.
 - ii. Any person who wishes to stay with the individual may do so.
 - iii. Contact Security (807-343-8911, extension 8911 or a blue emergency telephone). If a phone is not available exit the building and immediately inform Security Services or the Fire Department of the person's location.

Those who have begun providing support must ensure the person requiring assistance has been safely evacuated before resuming their regular duties

5.7 All Occupants

All occupants must be familiar with Lakehead University Emergency Procedures to be followed upon discovery of smoke or fire and upon hearing the fire alarm. Occupants will also participate in all fire drills and other fire safety training prescribed by Lakehead University.

Refer to the Emergency Procedures Flipbook posted throughout the building for a quick reference.

Notify your Supervisor if you have a condition that you feel may inhibit your ability to evacuate the building safely without assistance. If you are assigned to assist someone to evacuate, ensure that you know the procedures to be carried out. Make note and report any fire hazards or unsafe conditions observed in the building. Refer to Chapter 7 for more details.

i. Emergency Procedures- All Occupants

Upon Discovery of Fire or Smoke

1. Leave the fire area immediately. Remove any person in immediate danger. Ensure that all doors to the affected area are closed to confine the fire. Do not lock.
2. Warn people in the area to evacuate.
3. Activate the fire alarm using the nearest pull station.
4. Leave the building using the closest exit stair, closing doors and open windows behind you.
5. Once at a safe location call 807-343-8911, extension 8911 from a campus phone or use the blue emergency telephone.
6. Follow instructions provided by your Supervisor, Security staff and the Fire Department.
7. Report to Security staff or the Fire Department if you know of anyone still in the building.
8. Move away from the building and congregate in the designated meeting location (Parking lot 5).
9. Do not return to the building until authorized to do so by the Fire Department, Security, or a Fire Warden.

On Notification of a Fire

1. Evacuate the building immediately using the nearest exit stair.
2. Leave the building using the closest exit stair, closing doors and open windows behind you.
3. Follow instructions provided by your Supervisor, Security staff and the Fire Department.
4. Report to Security staff or the Fire Department if you know of anyone still in the building, or if you saw smoke or fire.
5. Move away from the building and congregate in the designated meeting location (Parking lot 5).
6. Do not return to the building until authorized to do so by the Fire Department or Security.

5.8 Extra Precautions While Exiting

1. Check all doors before opening them using the back of your hand.
 - a. If the door is hot, do not open it. Use an alternate path to exit.
 - b. If the door is not hot, brace yourself against it and open it slightly, standing to one side. If you detect fire or smoke, feel air pressure or a hot draft, close the door quickly, leaving it unlocked. Use an alternate path to exit.
2. If an exit route is not available or you are trapped:
 - a. Return to a "safe room" (i.e. an office) and close the door, leaving it unlocked.
 - b. Seal off all openings which may admit smoke.
 - c. Crouch low to the floor if smoke enters the room.
 - d. Call Security at 807-343-8911 or extension 8911 and alert them to your location. Wait to be rescued.

- e. If a phone is not available get the attention of emergency personnel by any means available to you (shout, wave from a window, etc.).
 - f. Listen for instructions given by authorized personnel.
3. If you encounter smoke while exiting and an alternate exit or a “safe room” is not available, drop to your knees and crawl towards the closest exit stair.

5.9 Special Evacuation Procedures

i. Contractors & Cleaning Staff

1. As long as it is safe to do so, turn off any equipment you are using and ensure that it is not left in such a way as to block exits.
2. Evacuate the building using the nearest exit stair. Do not use the elevator.
3. Follow the directions of Fire Wardens, Security staff and the Fire Department.
4. Ensure that the building staff are aware that you have evacuated
5. Move away from the building and congregate in the designated meeting location (Parking lot 5).
6. Do not return to the building until authorized to do so by the Fire Department or Security services.

5.10 Hazardous Materials Emergencies

It is the responsibility of the Supervisor in each area to have appropriate spill kits available wherever hazardous materials are used or stored. In all cases of spills, attempts will be made (if safe to do so) to prevent spilt material from contacting equipment, infrastructure and being releasing into the environment (sinks, drains, open ground).

i. Minor Chemical Spills

Response to minor chemical spills which pose no immediate threat to health, environment or damage to property, as follows:

1. Notify occupants in the immediate area of the spill.
2. Use spill kits to absorb/contain spill.
3. If unpleasant odours are generated call 8911 (807-343-8911)
4. Place waste in a sealed container in a secure, well ventilated area.
5. Call Human Resources 8806 (807-343-8010 Ext 8806) or 8671 (807-343-8010 Ext 8671) to arrange for chemical waste disposal.

ii. Major Chemical Spills

Response to major chemical spills, or spills which pose a threat to health, environment or damage to property, as follows:

1. Evacuate the immediate area, turning off spark-producing equipment and extinguish flames if flammable chemicals were spilled.
2. Assist contaminated persons with use of emergency eyewash or shower.
3. From a safe location, call 8911 (807-343-8911). Identify the chemicals involved, quantity spilled and hazards.
4. Wait in a safe location and keep unauthorized staff out of the contaminated area.

A copy of the chemical spill procedures are found in Lakehead University's "Emergency Procedures & Information" flipbook, posted throughout the campus and in every room that contains hazardous materials. The flipbook contains information regarding many hazardous or emergency situations and will be updated as required. All users of hazardous materials MUST be familiar with then Safety Data Sheet (SDS) prior to use.

5.11 Fuel Oil Spill Procedure

This procedure is to be utilized in the event of accidental fuel oil spill occurring within the Power House building. In the Power House, there is a 1,000 litre fuel oil tank that supplies back-up fuel to number 3 boiler in the event that there is a natural gas curtailment. This tank is filled as required via an automated system from the 10,000 litre fuel oil tank located outdoors.

i. Emergency response priorities:

- Rescue & First Aid
- Contain and / or isolate the area
- Contact as noted below
- Cleanup and decontamination
- Disposal as per Hazardous Waste Disposal Procedure
- Post-incident review, analysis and documentation.

ii. In the event of a spill

The person shall forthwith notify the workplace supervisor and:

- Physical Plant Work Order 807 343-8010 Ext 8273
- Human Resources Health & Safety, 807 343-8010 Ext 8671
- Security, 807 343-8911
 - Security to be advised to standby to contact Thunder Bay Fire & Rescue if required.
- If the spill impacts the natural environment then contact:
 - 24 hour Ministry of Environment Spills Action Centre, 1-800-268-6060
 - The City of Thunder Bay, Environment Division at 807 684-2195

Upon discovering a spill, spread of the spill must be immediately mitigated. This may require the shut off of main valves located on top of each tank. Note that the automatic fill system in the Power House can be shut down by powering off the fuel pump controller located in the emergency generator transfer switch room.

The spill kit(s) are located next to each tank that is to be utilized to absorb the fuel oil spill.

Upon mitigation of spread of the spill, all of the fuel must be absorbed and placed in a steel drum that must have appropriate flammable material signage for disposal. Disposal shall be according to Lakehead University's Hazardous Waste Disposal Procedure.

These procedures are posted conspicuously in each room that stores diesel fuel.

5.12 Compressed Refrigerant Gas

The refrigerant gas, R134A, is used in the chillers located in the Power House. See floor plan for location of cylinder. A gas leak detection system is installed, accompanied by procedures in place to address any refrigerant gas leak that may occur.

The refrigerant gas, R143A, is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources. See the Safety Data Sheet (SDS) in Appendix A for additional details.

Chapter 6: Fire Extinguishment, Control or Confinement

In the event of a small fire, first ensure that the Fire Alarm System has been activated and dial extension 8911(807-343-8911) to ensure that the Security Office have been notified prior to any attempt to extinguish a fire. Security officers will report to Emergency dispatch (911) any specifics details concerning the location and nature of the fire.

Fighting a fire is always a voluntary act

Only those persons who are trained and familiar with extinguisher operation may attempt to fight a fire. In the event a small fire cannot be extinguished with the use of a portable fire extinguisher or the smoke presents a hazard for the operator, the door to the area should be closed to confine and contain the fire. Leave the area.

6.1 Suggested Operation of Portable Fire Extinguishers

Remember the acronym **P.A.S.S.**

Pull the safety pin

Aim the nozzle

Squeeze the trigger handle

Sweep from side to side (watch for fire restarting)

Never re-hang extinguishers after use. Contact Security Services (807-343-8010 Ext 8569) to ensure that they are properly recharged by qualified personnel. Security services will also ensure that a replacement extinguisher is provided.

Keep extinguishers in a visible area without obstructions around them.

6.2 Classification of Fires

Fires are classified according to the fuel type involved.

Class “A” fires are those fuelled by combustible solids, such as wood, paper, excelsior, rags and rubbish.

Class “B” fires occur in the vapour-air mixture over the surface of flammable liquids, such as gasoline, oil, grease, paints and thinners.

Class “C” fires occur in or near live electrical equipment.

Class “D” fires occur with pyrophoric (combustible) metals such as magnesium, titanium, lithium, sodium, potassium, etc.

Class “K” fires involve cooking oils or fats, such as those found in a deep fryer.

6.3 Classification of Fire Extinguishers

Portable fire extinguishers are classified according to their ability to handle specific classes of fires.

Labels on the extinguisher indicate the class or classes of fire that they can be expected to extinguish.



Extinguishers suitable for class “A” fires are identified by a triangle containing the letter “A”



Extinguishers suitable for class “B” fires are identified by a square containing the letter “B”



Extinguishers suitable for class “C” fires are identified by a circle containing the letter “C”



Extinguishers suitable for class “D” fires are identified by a star containing the letter “D”



Extinguishers suitable for class “K” fires are identified by a hexagon containing the letter “K”. Class K extinguishers must ONLY be used on cooking fires (i.e. The deep fryer)

In the Power House class “ABC” extinguishers are provided.

Chapter 7: Fire Hazards and Fire Prevention

Fire Prevention is everyone's responsibility

If you notice a potential fire hazard report it to your supervisor or Health & Safety (807-343-8010 Ext 8806) immediately. Every precaution shall be taken to minimize accidents and prevent injuries.

7.1 Housekeeping

- Maintain safe escape routes by keeping exits, stairwells, hallways, windows, aisles and corridors free from obstructions and combustible materials.
- Ensure both sides of a door are kept free and clear of debris.
- Tables, equipment and other materials and installations may be placed in corridors only with the approval of the Fire Department. For further information contact Health & Safety at 807-343-8010 Ext 8806 or Physical Plant at 807-343-8010 Ext 8273.
- Regularly clear out combustible materials, such as waste paper and cardboard boxes. Review dead files and dispose of waste material.
- Emergency exits are marked by the lighted "EXIT" signs. Report any burnt out exit lights to Physical Plant at 807-343-8010 Ext 8273 or to Security 807-343-8010 Ext 8569 after hours.

7.2 Fire Doors

- Keep fire doors closed. If you find a fire door propped open, discard the wedge so it cannot be reused.
- Some fire doors are held open using electromagnetic devices. All hold open devices in the building will be released on activation of the fire alarm system. If you notice any problems with the electromagnetic hold open devices contact Physical Plant at 807-343-8010 Ext 8273 immediately.

7.3 General Hazards

- Do not use open candles or open flames.
- Smoking is prohibited on university property, except in designated smoking area.
- Place posters or decorations on bulletin boards. Never leave anything flammable in the corridors, stairwell or any means of egress.
- Do not hang decorating material from ceilings and keep streamers and banners to a minimum.
- Avoid placing combustible materials directly in contact with an electrical outlet.
- Ensure proper disposal of oily rags.

7.4 Electrical Hazards

- All electrical equipment, electrical lights used for decorations and extension cords must be CSA or ULC approved. Accepted certification marks can be review on Lakehead University's Health & Safety website. <http://hr.lakeheadu.ca/wp/?pg=140>

- Electrical wiring that is defective, frayed or cracked must be replaced. Discontinue use and contact physical plant (807-343-8010 Ext 8273) immediately upon discovery of damaged electrical wiring.
- Outlets and electrical devices that show evidence of electrical arcing will mean discontinuation of use until a qualified electrician from Physical Plant can assess the problem.
- If a circuit breaker consistently “trips”, discontinue using the device that is causing the circuit to trip. Contact a licensed electrician from Physical Plant to assess the electrical system.
- **All electrical work must be done by a licensed electrician with Physical Plant (807-343-8010 Ext 8273).**
- Circuit breaker panels shall not be covered or obstructed by stored material. 1 meter clearance is required.
- Electrical equipment located where flammable or combustible liquids are present shall conform to the Electrical Safety Code made under the Electricity Act, 1998.

In Ontario it is ILLEGAL to connect unapproved equipment to an electrical supply

7.5 Extension Cords

- Extension cords are designed for temporary use only. Never should they be used as permanent wiring.
- Assure that extension cords used are of the proper rating to accept the required electrical load.
- Protect extension cords from damage and do not run them under mats or carpets. For long term use, extension cords must be replaced with a power bar or installed permanent wiring.
- Power bars are acceptable for long term use, provided they are used safely. Review safe use of power bars on Lakehead University’s Health & Safety website.
<http://hr.lakeheadu.ca/wp/?pg=140>

7.6 Space Heaters and Appliances

- Space heaters are to be used with care, at least 1 meter away from combustible materials and must NEVER be left unattended.
- Seasonal trees must be flame retardant and ULC certified.
- Turn off or unplug any appliances or decorative lights before you leave.
- **All electrical appliances with heating elements (kettles, coffee makers, space heaters) must have an automatic shut-off function.**

7.7 Storage Areas

- Storage areas must be kept clean, organized and free of debris.
- Stacked material must be arranged so that the piles are stable and not at risk of tipping over.
- Light fixtures should be protected by wire guard or cage to prevent damage of light bulbs.
- Material should not be stored directly touching an electrical outlet.
- Electrical equipment and devices should not be operated, or connected to an electrical source in storage rooms.

- Doors to storage rooms shall be kept closed at all times.
- Service rooms should not be used for storage.
- Combustible material will be stored only in approved areas (see Section 7.8)
- Flammable and combustible liquids, hazardous, reactive, or unstable chemicals shall not be stored in rooms used for ordinary combustible materials (i.e. Paper or cardboard boxes).

7.8 Flammable and Combustible Liquids

- All personnel working in laboratories must be trained in the safe handling of flammable and combustible liquids.
- Those working with hazardous chemicals are required to be familiar with the use and handling of chemicals as outlined in the applicable Safety Data Sheets (SDS).
- Ensure that flammable materials are stored in approved containers or cabinets and their lids tightly closed.
- As outlined in the Ontario Fire Code, approved containers are those built in conformance with the Transportation of Dangerous Goods Regulations or ULC/ORD-C30, Safety containers.
- If an open flame is necessary ensure there are no flammable substances or vapours present in the immediate area. Extinguish the open flame when it is no longer needed and NEVER leave an open flame unattended.
- When volatile flammable materials are present, use only non-sparking equipment.
- Discard flammable or combustible waste into approved waste containers only.
- Do not store flammable and combustible liquids with corrosives, oxidizers, reactive chemicals or compressed gases.
- Restrict the quantity of flammable liquids stored in approved glass or metal containers to 5 litres, as per the Ontario Fire Code.
- All cabinets and refrigerators containing flammable or combustible liquids shall be clearly identified and must conform to ULC-C1275, ULI 1275, be FM approved, or meet NFPA 30 standard.
- All flammable and combustible materials will be declared on the hazardous materials sign, posted on all exterior lab doors.

In the case of fire or explosion, immediately turn off burners and other heating devices, if it is safe to do so. Activate the fire alarm, call 807-343-8911, or extension 8911 from a safe distance and follow the emergency procedures outlined in this Plan or on the emergency procedures flip book.

There are specific regulations pertaining to handling, using or storing flammable or combustible liquids. Contact the Office of Human Resources-Health & Safety at 807-343-8010 Ext 8806 for additional information.

7.9 Compressed Gas

- Storage of compressed gas cylinders will be in designated areas only and must conform to the Ontario Fire Code O.Reg. 213/07.

- Cylinders will not under any circumstances be stored in aisles, hallways, doorways, stairwells or exits.
- Cylinders must be secured with a chain at all times whether they are full or empty.
- Any area where compressed gas is stored MUST have signage on the doors depicting the hazard, type of gases and contact information of the person in authority.
- All compressed gases will be declared on the laboratories hazardous materials sign, posted on all exterior lab doors.

7.10 Hot Works

Hot works, such as welding, will be conducted by approved staff only following approved procedures. Contact Physical Plant at 807-343-8010 Ext 8273 for more information or to request a permit for hot work.

Chapter 8: Fire Protection Measures

8.1 Fire Alarms & Pull Stations

The Power House is equipped with fire alarm pull stations. Look for pull stations as you approach an exterior exit or a stairwell leading outside. The pull station will generally be located in the corridor adjacent to the exterior door leading to the vestibule or the stairwell, or located inside the vestibule itself. Refer to building drawings in Chapter 4.

8.2 Fire Extinguishers

The Power House is equipped with fire extinguishers. The extinguishers are either wall mounted, or located in the fire hose cabinets in the hallways. Extinguishers are checked monthly. If you discharge an extinguisher, or find one that has been discharged, contact Security at 807-343-8010 Ext 8569 and request a replacement.

8.3 Emergency Exits

Emergency Exits are marked by lighted signs with the word “EXIT”. Exit signs are located high on the wall above ground level doors, or at stairwells leading to ground level exit doors. Lighted directional signage is also provided, where required. An outlined arrow appearing below the word “EXIT” indicates the direction to the closest emergency exit. Following these signs will provide an exit route during an emergency.

8.4 Emergency Lighting

The Power House is equipped with emergency lighting. Emergency lighting provides illumination to exits, corridors and principle exit routes in the event of the loss of primary power.

8.5 Fire Routes

Fire routes are areas of access for responding Fire Professionals. Obey the signs posted and park only in designated parking spots.

Chapter 9: Alternative Measures for Fire Safety

In the event of any shut down of fire protection equipment systems (either entirely or partially), alternate measures for fire safety must be taken. For any shut down of fire protection equipment in excess of 24 hours, the Fire Department shall be notified in writing.

Occupants will be notified of the areas affected by the shutdown and instructions for alternate fire safety measures or actions will be posted as to alternative provisions or actions to be taken in case of emergency. These provisions and actions must be acceptable to the Chief Fire Official.

9.1 Fire Alarm Systems

- It is the responsibility of Physical Plant to notify Security Services when any or all of a fire alarm system is out of service.
- Security will notify the Fire Department with a description of the problem and the anticipated length of time needed to correct it.
- Security will notify the monitoring company that a portion of the fire alarm system is offline.
- The Office of Human Resources – Health & Safety will notify the building supervisory staff that the fire alarm system is temporarily shut down.
- While the fire alarm is out of service, Security Services will either lock out the building or initiate a fire watch. During a Fire Watch a walkthrough of the affected area will be completed regularly by Security Services until such a time that the fire alarm service is restored.
- Notices will be posted on all exits and the main entrance by Security, stating the problem and when it is expected to be corrected.
- Security will notify the Fire Department, the monitoring company and the building occupants when the fire alarm system is back in operation.

9.2 Water System Shutdown

- It is the responsibility of Physical Plant to notify Security Services when all or part of the water system is out-of-service.
- Security Services will notify the Fire Department that all or part of the water system on campus is out-of-service, as well as the location of any fire hydrants taken out-of-service.
- Physical Plant will bag and lock out any fire hydrants that have been taken out of service.

9.3 Emergency Power Shutdown

- It is the responsibility of Physical Plant to notify Security Services when all or part of the emergency power system is out-of-service.
- Security Services will notify the Office of Media Relations to send out a general notice to the University Community and will notify the Fire Department that all or part of the emergency power system is out-of-service.

9.4 Fire Watch

A fire watch is implemented to ensure the fire safety of a building or area of a building and to minimize the impact of malfunctioning equipment. Security officers dedicated to a fire watch are responsible for patrolling the affected area(s) at least once every hour.

A fire watch is required when:

1. Failure of the fire alarm system occurs.
2. Failure of fire safety equipment occurs.
3. Any act which causes an increased risk to persons or property, such as hot works.
4. The Fire Department requests a fire watch be initiated.

9.5 Exits

Exits shall not be obstructed. In the event that planned construction or maintenance will cause an exit to become unusable, the following emergency procedures will be employed:

- Ensure the planned construction or maintenance is in compliance with municipal building permits.
- Ensure alternative measures are developed to compensate for the blocked exits.
- Post temporary exit signs to clearly identify the alternate exits.
- If necessary, create emergency evacuation procedures.

Physical Plant will alert the building occupants to obstructed exits via a communication bulletin.

9.6 Fire Extinguishers

It is the responsibility of Security Services to provide a temporary fire extinguisher (of equal type and rating) when a fire extinguisher has been removed for servicing.

Chapter 10: Fire Drills

Fire drills are regularly conducted to ensure that all building occupants are familiar with fire evacuation procedures. Fire drills assist Security Services and Human Resources staff in revising and refining fire

emergency procedures. The Power House will have scheduled fire drills once a year and fire drill records are required to be retained for a period of one year.

All occupants of a building must evacuate immediately during a fire drill

Building occupants should report any observations made during the evacuation to their Supervisor. Supervisors will report any problems encountered during the evacuation drill to Health & Safety by calling 807-343-8010 Ext 8806.

Chapter 11: Maintenance Schedule as Required by the Ontario Fire Code

The following is a list of the portions of the Fire Code that require checks, inspections, and/or tests to be conducted of the facilities. Permanent records of all tests and corrective measures taken are required to be retained for a period of two years after they are made. If the time interval between tests exceeds two years, then the records shall be retained for the period of the test interval plus one year.

Records are to be made available upon the request of the Chief Fire Official or Fire Prevention Officers.

This list has been prepared for convenience only. For accurate reference, the fire code and referenced standards should be consulted.

Definitions of key terms include:

Check: means visual observation to ensure the device or system is in place and is not obviously damaged or obstructed.

Test: means the operation of a device or system to ensure that it will perform in accordance with its intended operation or function.

Inspect: means physical examination to determine that the device or system will apparently perform in accordance with its intended function.

11.1 Daily Tasks

Responsibility	Task	Description	Fire Code Reference
Security	Inspect	Fire alarm system for status of primary and remote trouble indicators and primary power "on" indicator.	6.3.2.2. CAN/ULC-S536

11.2 Monthly Tasks

Responsibility	Task	Description	Fire Code Reference
Maintenance	Inspect	Doors in fire separations.	2.2.3.4.
Contractor	Check	Pilot lights on emergency lighting unit equipment for operation.	2.7.3.3.(1)
Contractor	Inspect	Emergency lighting unit equipment.	2.7.3.3.(2)
Contractor	Test	Emergency lighting unit equipment for function upon failure of the primary power supply.	2.7.3.3.(3)(a)
Contractor	Inspect and Test	Batteries that provide emergency power for lights referred to in 2.7.3.3. (5)	2.7.3.3. (6)
Security	Inspect	Portable fire extinguishers and record electronically or on the attached tag.	6.2.7.2.
Contractor	Inspect and Test	Fire alarm system for operability: initiating device, alert/alarm/trouble signals, annunciator, battery, voice paging and emergency telephones.	6.3.2.2. CAN/ULC-S536
Maintenance	Inspect, Test and Maintain	Emergency generator system (under partial load) and specified components.	6.7.1.1.(1) CSA C282

11.3 Semi-annual Tasks

Responsibility	Task	Description	Fire Code Reference
Contractor	Inspect, Test and Maintain	Emergency generator system and specified components.	6.7.1.1.(1) CSA C282

11.4 Annual Tasks

Responsibility	Task	Description	Fire Code Reference
Maintenance	Operate	Disconnect switch for mechanical air-condition and ventilation systems.	2.6.1.8.
Contractor	Test	Emergency lighting unit equipment for design duration.	2.7.3.3.(3)(b)
Contractor	Test and Inspect	Emergency lighting equipment charging conditions for voltage, current and recovery period to ensure manufacturer's specifications are met.	2.7.3.3.(4)
Health & Safety	Review	Fire safety plan as often as necessary but at intervals not greater than 12 months.	2.8.2.1.(4)

Contractor	Maintain	Fire extinguishers (mechanical parts, extinguishing agent, and expelling means will be thoroughly examined)	6.2.7.1. NFPA 10
Contractor	Inspect and Test	Fire alarm system operability and all components and devices	6.3.2.2. CAN/ULC-S536
Maintenance	Inspect	Private hydrants annually and after each use.	6.6.5.1. to 6.6.5.5.
Maintenance	Inspect and check	Private hydrants water flow.	6.6.5.6.
Contractor	Inspect, Test and Maintain	Emergency generator system (under full load) and specified components.	6.7.1.1.(1) CSA C282
Contractor	Drain	Liquid fuel tanks and refill with a fresh supply (unless achieved by normal replenishment from test program).	6.7.1.5.(1)-6.7.1.5.(2)

11.5 Tasks Every Five (5) Years

Responsibility	Task	Description	Fire Code Reference
Contractor	Test	H2O, CO2 and dry chemical (stainless steel shell) extinguishers, hydrostatically tested.	6.2.7.1. NFPA 10

11.6 Tasks Every Six (6) Years

Responsibility	Task	Description	Fire Code Reference
Contractor	Maintain	Stored-pressure fire extinguishers that require a 12-year hydrostatic test by emptying and subjecting to the applicable maintenance procedures.	6.2.7.1. NFPA 10

11.7 Tasks Every Twelve (12) Years

Responsibility	Task	Description	Fire Code Reference
Contractor	Test	Extinguishers with milled steel shells hydrostatically tested.	6.2.7.1. NFPA 10

11.8 Tasks, As Required

Responsibility	Task	Description	Fire Code Reference
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Security	Check	Doors in fire separations in occupied buildings as frequently as necessary to ensure that they remain closed.	2.2.3.5.(1)
Maintenance	Inspect	Fire dampers, as required.	2.2.3.7.
Security	Maintain	Access for firefighting free of obstructions.	2.5.1.2.(1)
Security	Maintain	Fire access routes to be immediately ready for fire department vehicles.	2.5.1.3.
Health & Safety	Review	Fire safety plan as often as necessary but at intervals not greater than 12 months.	2.8.2.1.(4)
Security	Maintain	When an emergency power system or any part thereof is shut down, the supervisory stall shall be notified.	6.7.1.1.(3)
Security	Maintain	Required exit signs in a clean and legible condition and clearly visible.	2.7.3.1.
Security	Illuminate	Exit signs while the building is occupied.	2.7.3.2.

Appendix A: MSDS for 134A Refrigerant Gas

SAFETY DATA SHEET according to Regulation (EC) No 1907/2006
and 453/2010



DuPont™ SUVA® 134a refrigerant

Version 7.0

Revision Date 09.10.2012

Ref. 130000000349

This SDS adheres to the standards and regulatory requirements of Great Britain and may not meet the regulatory requirements in other countries.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : DuPont™ SUVA® 134a refrigerant
Registration number : 01-2119459374-33-0002
Synonyms : 1,1,1,2-Tetrafluoroethane
HFC-134a

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Refrigerant

1.3. Details of the supplier of the safety data sheet

Company : Du Pont de Nemours (Nederland) B.V.
Baanhoekweg 22
NL-3313 LA Dordrecht
Netherlands

Telephone : +31-78-630.1011

E-mail address : sds-support@che.dupont.com

1.4. Emergency telephone number

Emergency telephone number : +44-(0)8456-006.640

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Gases under pressure, H280: Contains gas under pressure; may explode if heated.
Liquefied gas

Not a hazardous substance or mixture according to EC-directives 67/548/EEC or 1999/45/EC.

2.2. Label elements



Gas cylinder

Warning

H280 : Contains gas under pressure; may explode if heated.

SAFETY DATA SHEET according to Regulation (EC) No 1907/2006
and 453/2010



DuPont™ SUVA® 134a refrigerant

Version 7.0

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Ref. 130000000349

Special labelling of certain
substances and mixtures

Contains: 1,1,1,2-Tetrafluoroethane / Contains fluorinated greenhouse gas
covered by the Kyoto Protocol.

P410 + P403

Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Rapid evaporation of the liquid may cause frostbite.

Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.

May cause cardiac arrhythmia.

SECTION 3: Composition/information on ingredients

3.1. Substances

Registration number	Classification according Directive 67/548/EEC	Classification according Regulation 1272/2008 (CLP)	Concentration
1,1,1,2-Tetrafluoroethane (CAS-No.811-97-2) (EC-No.212-377-0)			
01-2119459374-33-0002		Press. Gas H280	100 %

3.2. Mixtures

not applicable

The above products are REACH compliant; Registration number(s) may not be provided because substance(s) are exempted, not yet registered under REACH or are registered under another regulatory process (biocide uses, plant protection products), etc.

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice : If unconscious place in recovery position and seek medical advice. Never give anything by mouth to an unconscious person. If breathing is irregular or stopped, administer artificial respiration. If symptoms persist, call a physician.

II : First aider needs to protect himself.

Inhalation : Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Consult a physician.

SAFETY DATA SHEET according to Regulation (EC) No 1907/2006
and 453/2010



DuPont™ SUVA® 134a refrigerant

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Ref. 130000000349

- | | | |
|--------------|---|--|
| Skin contact | : | Take off all contaminated clothing immediately. Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician. |
| Eye contact | : | Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention. |
| Ingestion | : | Is not considered a potential route of exposure. |

4.2. Most important symptoms and effects, both acute and delayed

- | | | |
|----------|---|--|
| Symptoms | : | Inhalation of high concentration may cause central nervous system depression resulting in dizziness, weakness, nausea, headache and possibly unconsciousness., Anaesthetic effects, Light-headedness, Confusion, Incoordination, Drowsiness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness |
| | : | Skin contact may provoke the following symptoms:, Frostbite |

4.3. Indication of any immediate medical attention and special treatment needed

- | | | |
|-----------|---|--|
| Treatment | : | Do not give adrenaline or similar drugs. |
|-----------|---|--|

SECTION 5: Firefighting measures

5.1. Extinguishing media

- | | | |
|------------------------------|---|---|
| Suitable extinguishing media | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment., Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. |
|------------------------------|---|---|

5.2. Special hazards arising from the substance or mixture

- | | | |
|--------------------------------------|---|--|
| Specific hazards during firefighting | : | Pressure build-up. Fire or intense heat may cause violent rupture of packages. |
| | : | Hazardous combustion products: |
| | : | Hydrogen fluoride |
| | : | Fluorinated compounds |
| | : | Carbon oxides |
| | : | Exposure to decomposition products may be a hazard to health. |

5.3. Advice for firefighters

- | | | |
|---|---|--|
| Special protective equipment for firefighters | : | In the event of fire, wear self-contained breathing apparatus. |
| | : | Use personal protective equipment. |
| | : | Wear neoprene gloves during cleaning up work after a fire. |
| Further information | : | Cool containers / tanks with water spray. |

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

3/11

SAFETY DATA SHEET according to Regulation (EC) No 1907/2006
and 453/2010



DuPont™ SUVA® 134a refrigerant

Version 7.0

Revision Date 09.10.2012

Ref. 130000000349

Personal precautions : Evacuate personnel to safe areas. Ventilate area, especially low or enclosed places where heavy vapours might collect. Refer to protective measures listed in sections 7 and 8.

6.2. Environmental precautions

Environmental precautions : Should not be released into the environment.
In accordance with local and national regulations.

6.3. Methods and materials for containment and cleaning up

Methods for cleaning up : Evaporates.

6.4. Reference to other sections

For disposal instructions see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling : Vapours are heavier than air and may spread along floors. Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8.

Advice on protection against fire and explosion : The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Do not drag, slide or roll cylinders. Never attempt to lift cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Keep at temperature not exceeding 52 °C. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from contamination. Protect cylinders from damage. Keep away from direct sunlight. Store only in approved containers.

Advice on common storage : No materials to be especially mentioned. For further information see Section 10 of the safety data sheet.

Storage temperature : < 52 °C

7.3. Specific end use(s)

no data available

SECTION 8: Exposure controls/personal protection

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8.1. Control parameters

If sub-section is empty then no values are applicable.

Components with workplace control parameters

Type Form of exposure	Control parameters	Update	Basis	Remarks
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1,1,1,2-Tetrafluoroethane (CAS-No. 811-97-2)

TWA	4,240 mg/m ³ 1,000 ppm	2007	EH40 WEL	
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Derived No Effect Level (DNEL)

- 1,1,1,2-Tetrafluoroethane : Type of Application (Use): Workers
Exposure routes: Inhalation
Health Effect: Chronic effects, Systemic toxicity
Value: 13936 mg/m³
- : Type of Application (Use): Consumers
Exposure routes: Inhalation
Health Effect: Chronic effects, Systemic toxicity
Value: 2476 mg/m³

Predicted No Effect Concentration (PNEC)

- 1,1,1,2-Tetrafluoroethane : Value: 0.1 mg/l
Compartment: Fresh water
- : Value: 0.01 mg/l
Compartment: Marine water
- : Value: 1 mg/l
Compartment: Water
Remarks: Intermittent use/release
- : Value: 0.75 mg/kg dry weight (d.w.)
Compartment: Fresh water sediment
- : Value: 73 mg/l
Compartment: Water
Remarks: Sewage treatment plants

8.2. Exposure controls

Engineering measures : Ensure adequate ventilation, especially in confined areas.

Eye protection : Wear safety glasses or coverall chemical splash goggles.
Eye protection complying with EN 166.
or
ANSI Z87.1
Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.

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Hand protection	: Material: Leather gloves The suitability for a specific workplace should be discussed with the producers of the protective gloves.
	: Material: Low temperature resistant gloves
	: Protective gloves complying with EN 374. or US OSHA guidelines
	: The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
Skin and body protection	: Wear suitable protective equipment. Wear as appropriate: impervious clothing
Protective measures	: Self-contained breathing apparatus (SCBA) is required if a large release occurs. The type of protective equipment must be selected according to the concentration and amount of the substance at the specific workplace.
Hygiene measures	: Handle in accordance with good industrial hygiene and safety practice.
Respiratory protection	: For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Respiratory protection complying with EN 137.

SECTION 9: Physical and chemical properties
9.1. Information on basic physical and chemical properties

Form	: Liquefied gas
Colour	: colourless
Odour	: slight, ether-like
Freezing point	: -108 °C at 1,013 hPa
Boiling point	: -26 °C at 1,013 hPa
Flammability (solid, gas)	: The product is not flammable.
Auto-ignition temperature	: 743 °C at 1,013 hPa
Oxidizing properties	: The product is not oxidizing.
Vapour pressure	: 5,700 hPa at 20 °C
Relative density	: 4.24 at 20 °C

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Water solubility : 1 g/l at 25 °C

Partition coefficient: n-octanol/water : POW: 1.06 at: 25 °C

9.2. Other information

no data available

SECTION 10: Stability and reactivity

10.1. Reactivity : Decomposes on heating.

10.2. Chemical stability : The product is chemically stable.

10.3. Possibility of hazardous reactions : Stable under recommended storage conditions.

10.4. Conditions to avoid : The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions. Pressurized container: Do not pierce or burn, even after use. Temperature : > 52 °C

10.5. Incompatible materials : Alkali metals
Alkaline earth metals
Powdered metals
Powdered metal salts

10.6. Hazardous decomposition products : Hazardous thermal decomposition products may include:
Hydrogen fluoride
Carbon oxides
Fluorocarbons
Carbonyl fluoride

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute inhalation toxicity

- 1,1,1,2-Tetrafluoroethane
LC50 / 4 h rat :567000 ppm

Low Observed Adverse Effect Concentration (LOAEC) / dog :75000 ppm
Cardiac sensitization

Skin irritation

- 1,1,1,2-Tetrafluoroethane
rabbit
Classification: Not classified as irritant
Result: slight irritation

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Not expected to cause skin irritation based on expert review of the properties of the substance.

human

Classification: Not classified as irritant

Result: No skin irritation

Eye irritation

- 1,1,1,2-Tetrafluoroethane

rabbit

Classification: Not classified as irritant

Result: slight irritation

Not expected to cause eye irritation based on expert review of the properties of the substance.

human

Classification: Not classified as irritant

Result: No eye irritation

Sensitisation

- 1,1,1,2-Tetrafluoroethane

guinea pig

Classification: Not a skin sensitizer.

Result: Did not cause sensitization on laboratory animals.

Not expected to cause sensitization based on expert review of the properties of the substance.

Did not cause sensitization on laboratory animals. There are no reports of human respiratory sensitization.

Repeated dose toxicity

- 1,1,1,2-Tetrafluoroethane

Inhalation rat

No toxicologically significant effects were found.

Mutagenicity assessment

- 1,1,1,2-Tetrafluoroethane

Animal testing did not show any mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity assessment

- 1,1,1,2-Tetrafluoroethane

Not classifiable as a human carcinogen.

Toxicity to reproduction assessment

- 1,1,1,2-Tetrafluoroethane

No toxicity to reproduction

Further information



Cardiac sensitisation threshold limit : 312975 mg/m3

Avoid skin contact with leaking liquid (danger of frostbite). Inhalation of decomposition products in high

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II concentration may cause shortness of breath (lung oedema).

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish

- 1,1,1,2-Tetrafluoroethane
LC50 / 96 h / Oncorhynchus mykiss (rainbow trout): 450 mg/l

Toxicity to aquatic plants

- 1,1,1,2-Tetrafluoroethane
EC50 / 72 h / Algae: > 118 mg/l
Information given is based on data obtained from similar substances.

Toxicity to aquatic invertebrates

- 1,1,1,2-Tetrafluoroethane
EC50 / 48 h / Daphnia magna (Water flea): 980 mg/l

12.2. Persistence and degradability

Biodegradability

- 1,1,1,2-Tetrafluoroethane
/ 28 d
Biodegradation: 3 %
Not readily biodegradable.

12.3. Bioaccumulative potential

Bioaccumulation

- 1,1,1,2-Tetrafluoroethane
Bioaccumulation is unlikely.

12.4. Mobility in soil

Mobility in soil

II Koc: 37.26

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). / This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6. Other adverse effects

Ozone depletion potential

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0

Global warming potential (GWP)

1300

Additional ecological information

IPCC - TAR (Third Assessment Report of the Intergovernmental Panel on Climate Change) - 2001

SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Product : Can be used after re-conditioning.
If re-conditioning is not practicable, dispose of in compliance with local regulations.
- Contaminated packaging : Empty pressure vessels should be returned to the supplier.
If recycling is not practicable, dispose of in compliance with local regulations.

SECTION 14: Transport information

ADR

- 14.1. UN number: 3159
14.2. UN proper shipping name: 1,1,1,2-Tetrafluoroethane
14.3. Transport hazard class(es): 2
14.5. Environmental hazards:
14.6. Special precautions for user:
Tunnel restriction code: (C/E)

IATA_C

- 14.1. UN number: 3159
14.2. UN proper shipping name: 1,1,1,2-Tetrafluoroethane
14.3. Transport hazard class(es): 2.2
14.5. Environmental hazards :
14.6. Special precautions for user:
no data available

IMDG

- 14.1. UN number: 3159
14.2. UN proper shipping name: 1,1,1,2-Tetrafluoroethane
14.3. Transport hazard class(es): 2.2
14.5. Environmental hazards :
14.6. Special precautions for user:
no data available

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Other regulations : Take note of Directive 98/24/EC on the protection of the health and safety of

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workers from the risks related to chemical agents at work.

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of H-Statements referred to under section 3.

H280

Contains gas under pressure; may explode if heated.

Further information

An Exposure Scenario (ES) is not required.

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Significant change from previous version is denoted with a double bar.

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