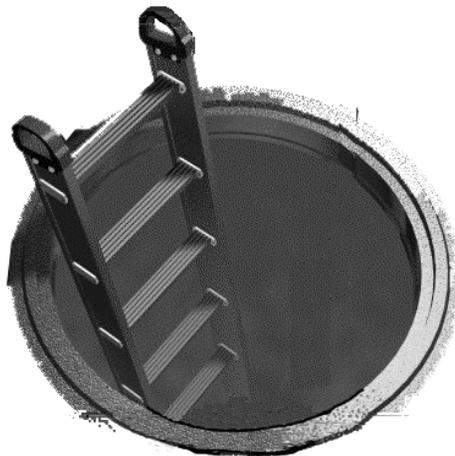


University of Wisconsin - Superior

# Confined Space Program



**Revised June, 2014**



# **CONFINED SPACE ENTRY PROGRAM**

**University of Wisconsin-Superior**

**Revised June 2014**

## **Section 1 INTRODUCTION**

A confined space is, by definition, a space that is large enough and so configured that an employee can enter and perform work, has a limited or restricted means for entry or exit and is not intended for continuous human occupancy. Examples of confined spaces include boilers, hoppers, underground vaults, tanks, sewers, storage bins, crawl spaces, pits, ducts, tunnels, diked areas, vessels, and silos.

The entry procedures to be used to enter a confined space are determined based on the space classification as either a non-permit or permit-required confined space. A non-permit confined space is a confined space has a safe atmosphere to work in and no other hazards capable of causing death or serious physical harm.

A permit-required confined space is a confined space with existing or potential hazards that significantly increase the risk to the employee. These hazards include hazardous atmospheres, electrical hazards, unguarded moving parts, a severely restricted exit from the space, engulfment hazards, converging walls, sloping floors, falls from heights exceeding 6 feet, or any other recognized serious safety or health hazard. Often, work like welding or painting within a non-permit confined space, might introduce significant hazards, and the normal classification of the space would be upgraded to a permit-confined space.

The general entry procedure involves a team of individuals, including the employee's supervisor, the entrant, an attendant and entry supervisor. The classification of the space as a permit or non-permit space determines what steps and personnel are needed to make the entry.

Long before work is assigned in a confined space, the employee's supervisor must make an evaluation of the space considering the combined hazards of the work, materials used and the physical characteristics of the space to determine if the space is a permit-required confined space. Even if the space has been shown to be a non-permit space in the past, physical conditions and/or air quality may have changed since the last entry or the work to be done may introduce new hazards in the confined space.

## **Section 2 SCOPE**

This written Confined Space Entry Program contains the practices and procedures necessary to protect individuals from the hazards that may result from the entry into permit and non-permit confined spaces. It applies to all University of Wisconsin-Superior (UW Superior) employees and contractors who enter confined spaces at UW Superior.

This program complies with the requirements of Chapter SPS 332.28 and 332.29/29 CFR 1910.146 of the Wisconsin Administrative Code, which incorporates both the federal OSHA Permit-Required Confined Space regulation and supplemental requirements by the Wisconsin Department of Safety and Professional Services, the agency responsible for developing, implementing and enforcing occupational health and safety for Wisconsin state and municipal workers.

## **Section 3 RESPONSIBILITIES**

### **A. Supervisor Responsibilities**

Supervisors are responsible for the implementation of and compliance with this written Program. Supervisors will:

- Evaluate work areas to identify confined spaces and their hazards;
- Affix appropriate signage required for confined spaces;
- With the assistance of the employees, classify the confined space according to the hazards that may be present and that may result from the work to be conducted;
- Ensure that employees receive proper training prior to entering confined spaces;
- Provide the appropriate equipment and personal protection for employee use;
- Monitor the entry process to make sure that the entry into the confined space is safe and conducted according to procedures outlined in this Confined Space Entry Program
- Notify contractors of confined space locations and their hazards, and require compliance with the confined space regulations.

### **B. Environmental Health and Safety Office Responsibilities**

The Environmental Health and Safety (EH & S) manager provides support for the Confined Space Entry program by:

- Coordinating training;
- Assisting in the maintenance of equipment;
- Reviews and revises the written confined space entry program as needed; and
- Monitoring compliance with state and federal guidelines.

### **C. Responsibilities of Authorized Entrants**

Authorized entrants are employees who are authorized by the employer to enter a confined space. The authorized entrant may also serve as the entry supervisor. During an entry into a non-permit or permit confined space, the duties of the authorized entrant are:

- Know the hazards associated with the confined space, including physical hazards, potential routes of exposure, signs or symptoms and consequences of the exposure.
- Use appropriate personal protective equipment properly (e.g., face and eye protection, and other forms of barrier protection such as gloves, aprons, and coveralls)

- Maintain communication with the attendant at all times.
- Alert the attendant when recognizing any warning signs or symptoms of exposure to a dangerous situation or if a prohibited condition is detected.
- Exit from the confined space as soon as possible when ordered by the attendant or entry supervisor, when a symptom of exposure to a dangerous situation is detected, when a prohibited condition is detected or audible alarm from the gas meter is activated.

#### D. Responsibilities of Attendants

An attendant is an individual stationed outside of a confined space who monitors the authorized entrant. Attendants are not required for an entry into a non-permit confined space, but their presence will add an extra measure of safety to the entry and are highly recommended. During an entry into a non-permit or permit confined space, the duties of an attendant are:

- Know the hazards associated with the confined space, including physical hazards, potential routes of exposure, signs or symptoms and consequences of the exposure;
- Remain outside the space during the entry unless relieved by another qualified attendant;
- Keep an accurate account of the workers within the space;
- Maintain constant communication with the entrants to monitor their status for personal safety, symptoms of exposure or behavioral changes;
- Order the evacuation of the confined space if the entrant's safety or health is at risk from exposure to a hazardous condition or substance from inside or outside of the space, if a prohibited condition is detected, or alarm conditions from the gas monitors;
- Call for rescue and emergency services as soon as the entrant requires assistance to escape from the space, and perform only non-entry rescues according to the rescue procedure.
- Keep all unauthorized persons a safe distance away from the confined space and report to the entry supervisor if these persons have entered the confined space.
- Perform no duties that might interfere with monitoring the activities of the entrants.

#### E. Entry Supervisor Responsibilities

An entry supervisor is responsible for determining if conditions are acceptable for entry into a permit-required confined space, for authorizing and overseeing the entry into permit spaces, and for terminating the entry. The entry supervisor may also serve as an attendant or entrant, and the duties of entry supervisor may be passed from one individual to another during the course of an entry operation. *Note: the entry supervisor does not need have the rank as a supervisor. Serving as an entry supervisor does not change the employee's status, rank or pay scale.*

During an entry into a Non-Permit or Permit-Required confined space, the duties of an entry supervisor are:

- Know the hazards associated with the confined space, including physical hazards, potential routes of exposure, signs or symptoms and consequences of the exposure.
- Verify emergency plans and entry conditions such as permits, tests, procedures, and equipment before allowing entry;

- Endorse the entry permit before entry begins if the entry is into a permit confined space.
- Terminate entry and cancel entry permits (where required) when the entry is completed or if a new condition exists;
- Take appropriate measures to remove unauthorized entrants; and
- Ensure that entry operations remain consistent with the entry permit and that acceptable entry conditions are maintained.

## **Section 4     CONTRACTORS WORKING ON SITE**

Any supervisor who requests a contractor to be hired to perform work in a confined space has an obligation to inform the contractor of the requirements of this section. (See Appendix C). The state and federal permit required confined space regulation, 29 CFR 1910.146 (c)(8) requires the host employer to warn outside contractors of known confined space hazards. There is also an obligation to require contractors to comply with 29 CFR 1910.146, the Permit Required Confined Space standard, for any entry into a confined space that could be classified as a permit space on the host employer's work site. Failure to comply with the requirements of this section could result in a serious liability for the supervisor and UW-Superior.

Contractors should provide their own equipment for entry procedures and have a rescue plan in place. Private sector employers are governed by a different set of regulations than Wisconsin state agencies. If the contractor requests advice on preparing a confined space program or use of UW Superior's equipment, refer them to the Environmental Health and Safety Office.

When UW-Superior (as a host employer) arranges to have contractors perform work that involves permit confined space entry, **Contractors and the supervisor at UW Superior will:**

- Inform the contractor that the work to be conducted involves entry into a permit confined space and that the contractor must be in full compliance with the requirements the OSHA Confined Space regulation, 29 CFR 1910.146 or entry will be denied.
- Require documentation of the contractor's confined space entry and rescue procedures, and equipment to be used to complete the work.
- Appraise the contractor of the identified hazards and any experience with the space that makes the space in question a permit confined space.
- Inform the contractor of any precautions or procedures that UW Superior has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;
- Coordinate entry procedures to be used with the contractor when employees of both UW Superior and the contractor will be working in or near confined spaces.
- Conduct a debriefing with the contractor at the conclusion of the entry regarding any hazards confronted or created in permit spaces during entry operations.
- Request a copy of the canceled confined space entry permit used by the contractor's employees.

## Section 5 TRAINING

Employee training will include the hazards typically encountered within confined spaces and those unique to UW Superior, procedures for conducting a safe entry, the use of air monitoring equipment and personal protective equipment required for safe entry, basic first and CPR, and safe work practices required in the confined space. Trained employees will be able to serve as authorized entrants, attendants or entry supervisors as needed.

Training will be provided before the employee is first assigned duties as an entrant, attendant or supervisor, whenever significant new hazards have been recognized that have not been included in previous training, when new or significantly or revised procedures are implemented, and periodically to maintain proficiency. Each employee will receive a certificate that indicating the training has been completed.

Untrained personnel and student employees (even if trained) are not allowed to enter a permit-required confined space. Trained student employees may provide attendant services from the exterior of the space.

## Section 6 CONFINED SPACE CLASSIFICATIONS and IDENTIFICATION

When an employee must enter a confined space to service equipment or perform other work, the employee is making an “entry” which could place him or her at risk for an injury. Supervisors are required to evaluate their work areas to identify spaces that could be considered confined spaces using the definitions below. When discovered, the confined space must be entered into the campus inventory of confined spaces (see Appendix B). Supervisors must also post signage (except on manhole covers in sewers or in public areas) at the entry points. Examples of signage that can be used at entry points include (but are not limited to):

**Danger - Confined Space. Do Not Enter**  
**Danger - Permit - Required Confined Space**

By definition, a confined space is a space that is large enough and has a configuration that allows an employee to bodily enter and perform assigned work. A confined space always has a limited or restricted means for entry or exit and is not designed for continuous employee occupancy. A room with a full size door, such as an electrical vault or service area, would not be considered a confined space. For determining the entry procedures that must be followed, a confined space can be further classified as:

- (A) A **Non-Permit Confined Space** (also called a non-permit required confined space) is a confined space that does not contain or have the potential to contain atmospheric or other hazards capable of causing death or serious physical harm. The air quality (oxygen, combustible gases, toxic gases and vapors) of a non-permit confined space is within the limits specified in Section 7. The entrant’s activities will not introduce hazardous conditions or air contaminants in the confined space.

A non-permit confined space **must be reclassified** as a permit-required confined space when the air quality falls outside any of the acceptable air quality criteria while the employee is in a confined space, or when unusual hazards are introduced into the space that will affect the air quality or personal safety. Examples include using a chemical, welding or using a cutting torch in a space that under normal conditions is defined as a non-permit confined space.

- (B) A **Permit Confined Space** (also called a permit-required confined space, PRCS or permit space) is a confined space that has one or more of the following characteristics:
1. Contains or has the potential to contain a hazardous atmosphere;
  2. Contains a material that has the potential for engulfment of an authorized entrant;
  3. Has an internal configuration that could cause an authorized entrant to be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
  4. Contains any other recognized serious safety or health hazard.

A permit confined space **can be reclassified** as a non-permit space when the space has no atmospheric hazards, and all other hazards within the space are eliminated prior to entry or after using permit confined space procedures to enter. The permit space can also be reclassified when ventilation is used to eliminate the atmospheric hazards and no other hazards exist.

**Note: UW Superior employees are not trained as confined space rescue team and will not provide these services. If a permit-required space cannot be safely reclassified as a non-permit space and must be entered, the services of a trained confined space rescue team must be contracted in advance of the entry.**

## Section 7 AIR QUALITY

A hazardous atmosphere (air) may expose employees to the risk of death, incapacitation, or the impairment of ability to self-rescue (escape unaided), injury or acute illness. The air quality must remain within acceptable limits at all times and the concentration of all airborne substances capable of causing death, incapacitation, impairment, injury, or acute illness due to its health effects are kept at acceptable levels.

Acceptable air quality within a confined space is one in which the employee may safely breathe without the need for respiratory protection and which does not contain any hazardous levels of air contaminants. The acceptable criteria are:

- a. Oxygen levels between 19.5 - 23.5%, and
- b. Combustible gases less than 10% of the lower explosive limit, and
- c. Hydrogen sulfide levels less than 10 ppm (parts per million), and
- d. Carbon monoxide levels less than 35 ppm (parts per million), and
- e. No other known air contaminants above the PEL (permissible exposure limit), ceiling limit or 15 min. STEL (short term exposure level).
- f. No air contaminants that would create an IDLH atmosphere.

Respirators can be worn to provide protection from specific air contaminants, however, the use of a respirator will add to the physical and psychological stress associated with confined areas and can interfere with communication of the entrant to the attendant. Whenever feasible, ventilating the space with fresh air to reduce the air contaminants to safe levels is a preferred method of protection.

## **Air Quality Tests**

An employee may not enter a confined space until the air quality of the confined space is determined. A portable gas meter that can simultaneously test for oxygen, hydrogen sulfide, carbon monoxide and combustible gas will be used to monitor the air within the space before and during the entry. The meter is equipped with audible alarms and visual warnings to indicate unacceptable air quality. The alarms and warnings will signal that the air within the confined space has one or more of the following hazards:

- a. An oxygen content of less than 19.5% or greater than 23.5%
- b. A hydrogen sulfide content of 10 parts per million (ppm) or more,
- c. A carbon monoxide content of 35 ppm or more; or
- d. A combustible gas content 10% or more of the lower explosive limit.

The portable gas meters kits include battery powered air pumps that will draw air from the space to the meter sensors. Manual sample draw kits may also be used, which include a squeeze bulb and length of tubing to draw air from the space to the meter; the bulb must be squeezed continuously to properly sample the air.

A hand-held Drager air sampler and sampling media are available to sample the space for a specific hazardous air contaminant that is suspected to be present at or above the short term exposure limit (STEL). Contact the EH & S office for assistance in selecting the media and training in the use of the equipment.

The Permit Required Confined Space standard is intended to protect entrants against short-term, acute hazards which would present an immediate danger of death or disability that would render the employee unable to escape from the confined space. It does not address exposures at or below the permissible exposure limits, e.g., air contaminants such as arsenic or asbestos, nor other safety hazards that do not present an acute risk of personal safety.

## **Ventilation**

Mechanical ventilation may be used to reduce the atmospheric contaminants within a space to acceptable levels and to provide cooling for employees working in hot zones. Air can be blown into or exhausted from the space depending upon the reason for the ventilation. Where feasible, open other manholes or access points to increase air circulation.

*Caution: Controlling atmospheric hazards using mechanical ventilation does not eliminate the hazard--it merely reduces the concentrations to acceptable levels! Ventilation cannot be used as a substitute for atmospheric monitoring.*

When forced air ventilation of the confined space is used, fresh air should be blown into the immediate area the entrant is expected to occupy. At least 200 cfm/entrant should be used as the target ventilation rate. In spaces up to 20 feet in diameter, the end of the supply duct should be within 10 feet of the bottom blowing downward. In spaces larger than 20 feet in diameter, the end of the supply duct should be 3-5 feet of the bottom blowing horizontally. In spaces larger than 50 feet in diameter, use more than one ventilation system.

Locate emergency generators, pumps or blowers with internal combustion engines at least 10 feet from the opening and downwind of the confined space and any source of fresh air used for ventilation. Smoking and open flames are not permitted within 10 feet of a confined space.

## **Section 8 SAFETY DATA SHEETS**

Safety data sheets must be kept at the confined space entry site for any material that may pose a hazard during the entry process. The material safety data sheets are necessary for substance identification and treatment should a medical emergency occur.

## **Section 9 ISOLATION OF HAZARDS**

Confined space hazards frequently occur in parallel with other hazardous conditions. **Isolation** of hazards is the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tag-out of all sources of energy; or blocking or disconnecting all mechanical linkages.

Isolation of hazards must be done prior to entry into the space, if possible, or immediately upon entry. Employees will isolate hazards by using Lock Out or Tag Out procedures in the UW Superior Lock-Out Tag-Out Program.

## **Section 10 EQUIPMENT AND PERSONAL PROTECTION**

Supervisors will ensure that equipment and personal protective equipment is provided as needed to conduct safe entry into confined spaces. Employees will inspect equipment prior to each use and report any defects to their supervisor for repairs. The following equipment is available for use:

- Gas and electric powered blowers and hose for ventilation
- Gas meters with manual or battery-powered sampling pumps to monitor atmospheric hazards for oxygen levels, carbon monoxide, hydrogen sulfide and combustible gases.
- Grab samplers and assorted media to monitor for specific atmospheric contaminants that cannot be detected by the gas meters.
- Lock-out, Tag out locks, tags and equipment

- Communication equipment including two way radios, cellular phones, and tug lines for communicating with entrants or rescue providers.
- Ladders for safe ingress and egress of entrants
- Body harnesses for use in emergency retrieval
- Retrieval tripod
- Personal protective equipment, including hard hats, safety glasses and gloves
- Lighting
- Traffic cones and vests for working in streets

## **Section 11 ENTRY PROCEDURES – PRE-ENTRY ASSESSMENT**

Prior to entering any confined space the entrants, attendants and entry supervisors must make an assessment of the space and entry conditions to classify the space as either a non-permit or permit-required confined space. The following checklist (also found in the pre-entry checklist of the permit) should be reviewed prior to each entry into any confined space:

- a. Are atmospheric hazards present that cannot be controlled by ventilation (determined through testing)?
  - i. Oxygen levels are below 19.5 or above 23%
  - ii. Carbon monoxide (CO) levels exceed 35 ppm
  - iii. Hydrogen Sulfide (H<sub>2</sub>S) levels exceed 10 ppm.
  - iv. Combustible gases (LEL) exceed 10%
- b. Are one or more air contaminants present in concentrations that exceed the STEL?
- c. Will the work to be conducted introduce a chemical or atmospheric hazard? (Have a safety data sheet at the site)?
- d. Is there is a potential engulfment hazard?
- e. Does a potential serious safety hazard exist or be introduced by the work to be conducted?
- f. Does the space have inward converging walls or a downward sloping floor that could trap an entrant?
- g. Will the work create an unusual hazard for entering or exiting the space?
- h. Will hot-work be conducted? A separate hot work permit is required

**If none of the conditions listed above are present, the space is classified as a non-permit confined space. Follow the procedures in Section 12 for Non-Permit Confined Spaces.**

**If one or more of the conditions listed above are present, the space must be classified as a permit-required confined space. Follow the entry procedures in Section 13 for Permit-Required Confined Spaces.**

A permit confined space **can be reclassified** as a non-permit space after the space has been tested and contains no atmospheric hazards, and all other hazards within the space have been eliminated prior to entry or after using permit confined space procedures to enter. The permit space can also be reclassified when ventilation is used to eliminate the atmospheric hazards and no other hazards exist.

## **Section 12 ENTRY PROCEDURE - NON-PERMIT CONFINED SPACES**

### **A. General Safety Requirements for entry**

1. Any condition that would make it unsafe to remove an entrance cover must be eliminated before the cover is removed.
2. No smoking, flames or spark sources are permitted within 10 feet of the opening to a confined space or any source of fresh air used for ventilation.
3. Locate generators, pumps or blowers with internal combustion engines downwind and at least 10 feet from the opening of the confined space and any source of fresh air used for ventilation.
4. Park vehicles in such a manner to prevent the accumulation of exhaust fumes in the confined space. If this is not possible, extend the vehicle's exhaust pipe away from the space or turn the engine off.
5. Keep openings to confined spaces clear of hand tools and debris.
6. Guard openings to confined spaces at all times with railings, temporary covers or barriers. Safety cones and barrier tape may be used to make the openings more visible.
7. Keep copies of the Safety Data Sheets (SDS) or similar written information of the substances that the entrant may be exposed to for use by the rescue service or medical facility.
8. When forced air ventilation of the confined space is used, fresh air should be blown into the immediate area the entrant is expected to occupy. At least 200 cfm/entrant should be used as the target ventilation rate. In spaces up to 20 feet in diameter, the end of the supply duct should be within 10 feet of the bottom blowing downward. In spaces larger than 20 feet in diameter, the end of the supply duct should be 3-5 feet of the bottom blowing horizontally. In spaces larger than 50 feet in diameter, use more than one ventilation system.
9. When the entrance to a confined space is in the street or pedestrian traffic area, park vehicles in such a way that traffic flow is unobstructed and, where possible, the vehicle can provide protection for the pedestrian, entrant and attendant. Activate the 4-way flashers on the vehicle.

### **B. Non-Permit Confined Space Entry Procedure**

1. A single individual, serving both as an entrant and entry supervisor may enter a non-permit confined space without an attendant. When practical, an attendant should be present.
2. When an entry will be made without an attendant, the entrant should notify his/her supervisor when the entry begins and the expected duration of the entry. The entrant will remain in radio contact with the radio base station during the entry.
3. All entrants must wear a fall protection harness that will aid rescuers in extracting a person from a confined space should an injury occur. (Requested by Superior Fire Department).
4. Calibrate the gas meter and check the air quality at the opening by inserting the probe through the pick hole or other small opening prior to opening the cover.

5. If no alarm conditions or high readings are found, open the cover and sample at the entry, the midpoint and bottom (or far point) of the confined space using the gas meter and remote sampler.
6. If the air quality within the confined space **does not meet all** the acceptable air quality listed in Section 7, ventilate the space and retest.
7. If after ventilation, the air quality of the confined space continues to fail the criteria of step 6, the space reclassified as a Permit Confined Space. As soon as the reclassification is effective, procedures in Section 13 must be followed.
8. The entry can be made if and when the air quality of the confined space meets **all** of the air quality criteria in step 6.
9. Continuously monitor the air in the immediate area of the entrant. If an attendant is present, the attendant can monitor the air quality from the surface using the meter and either the manual or battery-powered pump. The entrant should wear a gas meter even if an attendant is also monitoring the air.
10. Entrants must leave the space immediately if a hazardous atmosphere is detected or a physical hazard develops at any time during the entry. Evaluate the cause of the hazard and prepare corrective actions before re-entering. Until the cause has been corrected, the space should be considered a permit space. See the Permit Required Space Procedure.

## **Section 13 Entry Procedure for Permit-required Confined Spaces**

### **A. General Safety Requirements for Entry.**

1. Any condition that would make it unsafe to remove an entrance cover must be eliminated before the cover is removed.
2. No smoking, flames or spark sources are permitted within 10 feet of the opening to a confined space or any source of fresh air used for ventilation.
3. Locate generators, pumps or blowers with internal combustion engines downwind and at least 10 feet from the opening of the confined space and any source of fresh air used for ventilation.
4. Park vehicles in such a manner to prevent the accumulation of exhaust fumes in the confined space. If this is not possible, extend the vehicle's exhaust pipe away from the space or turn the engine off.
5. Keep openings to confined spaces clear of hand tools and debris.
6. Guard openings to confined spaces at all times with railings, temporary covers or barriers. Safety cones and barrier tape may be used to make the openings more visible.
7. Keep copies of the Safety Data Sheets (SDS) or similar written information of the substances that the entrant may be exposed to for use by the rescue service or medical facility.
8. When forced air ventilation of the confined space is used, fresh air should be blown into the immediate area the entrant is expected to occupy. At least 200 cfm/entrant should be used as the target ventilation rate. In spaces up 20 feet in diameter, the

end of the supply duct should be within 10 feet of the bottom blowing downward. In spaces larger than 20 feet in diameter, the end of the supply duct should be 3-5 feet of the bottom blowing horizontally. In spaces larger than 50 feet in diameter, use more than one ventilation system.

9. When the entrance to a confined space is in the street or pedestrian traffic area, park vehicles in such a way that traffic flow is unobstructed and, where possible, the vehicle can provide protection for the pedestrian, entrant and attendant. Activate the 4-way flashers on the vehicle.

## **B. Pre-Entry Checklist and Entry Permit**

An Entry Permit is required to be completed prior to entering all permit-required spaces. The permit and the conditions must be reviewed by the entrants, attendant and entry supervisor before the entry begins. Entry permits must be signed by the entry supervisor and will be kept at the sight until the entry is completed. See Appendix A for a copy of the Checklist/Entry Permit.

All problems encountered with the entry procedure must be included on the permit. At the end of the entry, the entry supervisor must review the permit and the work, and cancel the permit.

The canceled permits will be archived by the work area supervisor for a minimum of one calendar year. Any problems encountered during an entry operation will be used in the Confined Space Entry program review and revision, and to ensure that employees are adequately protected.

## **C. Permit-Required Confined Space Entry Procedure**

- A permit-required confined space can be reclassified as a non-permit space if all hazards have been eliminated without entry into the space and if there are no actual or potential atmospheric hazards.
- If the permit space must be entered to eliminate the hazards, the space is considered a permit space until the hazards are eliminated.
- Once the hazard is eliminated, the space can be reclassified as a non-permit space.

The following steps must be followed for all entries into a permit required confined space.

1. Entry into a permit required confined space requires advanced planning and coordination with the Superior Fire Department for rescue services.
  - A. Contact the Superior Fire Department (715-394-0227) to notify them of the planning for entering a permit required confined space and need for rescue planning.
  - B. Be prepared to provide the following information to the Fire Department:
    - a. Date and time that entry is anticipated
    - b. Location (street address) and type of entry (manhole, boiler, etc)
    - c. Potential hazards within the space (atmospheric hazards, sloped surfaces etc)

- d. Safety equipment and procedures to be used (tripod & harnesses, ventilation, etc)
  - e. Contact information (cell phone preferred)
  - C. The Fire Department may need to visit the site, and/or call in additional staff to provide rescue services which will determine when your entry may take place.
  - D. Do not continue the entry into the permit confined space until the approval of the Superior Fire Department has been provided.
2. A minimum of two individuals, entrant and attendant, are required when entering a permit confined space. Either the attendant or entrant can serve as the entry supervisor.
  3. Before entering, complete the pre-entry checklist and space evaluation.
  4. Fall protection harnesses and retrieval systems will be used when entering a permit-required confined space unless the retrieval system would increase the overall risk of the entry or would not contribute to the rescue of the entrant. A tripod and winch will be set up prior to an entry to a confined space that is through a manhole or other top opening. The entrant will wear a full body harness secured to a life line providing it does not interfere with a safe escape. Attach the life line to the winch or secure by other method.
  5. Calibrate the gas meter and check the air quality using the meter and sample probe. Sample the air at the opening by inserting the probe through the pick hole or other small opening prior to opening the cover. Note the results on the pre-entry checklist.
  6. If no alarm conditions or high readings are found, open the cover and sample at the entry, midpoint and bottom (or far point) of the confined space using the remote sampler. If other air contaminants are suspected to be present, sample the air at each location using the Drager hand pump and media (contact EH & S for assistance). Note the results on the pre-entry check list.
  7. If the air quality in the confined space does not meet **all** of the criteria in Section 7, ventilate the space and retest. If the air quality of the confined space continues to fail the criteria, the entry will not be made. If the air quality meets the criteria, proceed to step 8.
  8. The entry supervisor must review and verify the emergency plans, the pre-entry checklist and entry conditions such as tests, procedures, and equipment before allowing entry. The entry supervisor must complete and sign the entry permit before the entry may begin.
  9. Continuous air monitoring in the immediate area of the entrant is required. If the manual (squeeze bulb) sampler is used for sampling the air in the space, the bulb must be at least once every five seconds to keep air moving past the sensors of the meter. Ventilation may not be used in place of monitoring.
  10. The attendant must continuously monitor the confined space and be in constant communication with the entrant. The attendant should be equipped with a two-way radio that will remain "**ON**" throughout the entry procedure.
  11. While in the confined space, if the air quality should fall outside of the limits of the criteria in Section 7, the attendant or entry supervisor must order the entrant to exit the space immediately.
  12. In the event of an emergency, the attendant will first call for rescue services on the two - way radio followed by attempting a rescue of the entrant by use of the retrieval device or any other means **WITHOUT** entering the confined space. Conduct CPR or emergency first aid if needed.

## Section 14 RESCUE

The UW-Superior Confined Space Entry Program will not provide emergency rescue service for permit-required confined space entries. This service will be provided by the Superior Fire Department if advanced coordination is conducted, or through contracting with a certified rescue provider. When the entrant needs assistance to exit the confined space or an emergency occurs, the attendant will do the following:

1. If a cell phone is available at the site, contact 911 and provide the location of the emergency. If using a 2-way radio, call the radio base (or Campus Safety if the base does not respond) and declare that a medical emergency exists. The attendant must inform the base of the nature of the emergency and the exact location of the confined space so the proper services can be called.
2. The attendant can attempt a rescue of the entrant by use of the retrieval device or any other means **WITHOUT** entering the confined space.
3. The attendant will remain at the site and maintain constant communication with the entrant. At no time should the attendant enter the confined space.
4. Upon their arrival, inform the rescue service of the hazards they may confront during the rescue attempt, including access to any material safety data sheets that are unique to the site.

## Section 15 PROGRAM REVIEW

The UW-Superior Confined Space Entry Program will be reviewed annually to determine its effectiveness. Utilizing canceled permits and other available information the Environmental Health and Safety office will determine if:

- Additional hazards have been identified within a given space;
- Additional measures should be taken to protect the entrants;
- Additional spaces should be included in the confined space inventory; and
- Some locations can be removed from the program.

## Section 16 DEFINITIONS

**Blanking or blinding:** the absolute closure of a pipe, line or duct by fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

**Double block and bleed:** means the closure of a line, duct, or pipe by closing and locking two in-line valves and by opening and locking a drain or vent valve in the line between the closed valves.

**Engulfment:** means the surrounding and effective capture of a person by a liquid or finely divided flowable solid that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction or crushing.

**Full Body Harness:** means a harness having a waist belt, shoulder straps, leg straps, and "D" ring or shoulder rings attached no lower than the shoulder blades.

**Hazardous atmosphere:** means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (escape unaided), injury or acute illness from one or more of the following causes:

1. Flammable gas, vapor or mist in excess of 10% of its lower explosive limit (LEL).
2. Airborne combustible dust at a concentration that meets or exceeds its lower explosive limit (LEL). *NOTE:* This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.
3. Atmospheric oxygen concentrations below 19.5% or above 23.5%
4. Air concentration of any substance in excess of the TLV or PEL. *NOTE:* This definition does not include an atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness.
5. Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

**Hot work:** welding, burning, cutting grinding or heating that could provide a source of ignition.

**IDLH (Immediately dangerous to life or health):** means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a confined space.

**Inerting** means the displacing of the atmosphere in a confined space with a noncombustible gas (such as nitrogen) resulting in an atmosphere that is noncombustible. *Note:* Inerting produces an IDLH oxygen-deficient atmosphere.

**Isolation** means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

**LEL (Lower Exposure Limit):** the lower limit of flammability of a gas or vapor at ordinary ambient temperatures expressed as a percentage of the gas or vapor in air by volume.

**Line breaking:** the intentional opening of a pipe, line or duct that is or has been carrying a hazardous material, inert gas or any fluid at a volume, pressure or temperature capable of causing injury.

**mg/M<sub>3</sub>:** milligrams per cubic meter of air. The concentration, by weight, of a particulate, mist or fiber in air expressed as milligrams of substance found in one cubic meter of air.

**Non-Permit Confined Space:** a confined space that does not contain or have the potential to contain atmospheric or other hazards capable of causing death or serious physical harm.

**Oxygen deficient** atmosphere means an atmosphere containing less than 19.5% oxygen by volume.

**Oxygen enriched** atmosphere means an atmosphere containing more than 23.5% oxygen by volume.

**Permissible exposure limit (PEL)** is an occupational exposure limit established by OSHA and adopted by Wisconsin Dept. of Safety and Professional Services in SPS 332/1910 Subpart Z as a maximum concentration exposure limit that may not be exceeded without personal protective equipment (PPE). The PEL is expressed either as:

- (a) a time weighed average concentration (TWA) that is representative of the employees average exposure in an 8 hour work shift;
- (b) a ceiling (C) concentration that must not be exceeded at any time;
- (c) or a short term exposure limit (STEL) which is a 15 minute TWA exposure that will not be exceeded at any time during the shift. Exposures will be suitably reduced during a portion of the day to keep the overall exposure below the 8-hour TWA allowable level.

**Permit Confined Space** (also called a permit-required confined space, PRCS or permit space) is a confined space that has one or more of the following characteristics:

1. Contains or has the potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfment of an authorized entrant;
3. Has an internal configuration that could cause an authorized entrant to be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
4. Contains any other recognized serious safety or health hazard.

**ppm:** Parts per million. The concentration of a gas or vapor (by volume) in one million parts of air.

**Rescue Service:** means the trained personnel designated to rescue employees from confined spaces.

**Retrieval system** means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces. Retrieval systems are required for entering permit confined spaces, unless their use will increase the risk of injury or interfere with the escape of an individual within the space.

**STEL:** See Permissible Exposure Limit, item (c).

# **Appendix A**

## **PRE-ENTRY ASSESSMENT And ENTRY PERMIT**

For Space Evaluation Only

<b>Pre-Entry Assessment</b>	<b>No</b>	<b>Yes</b>
Atmospheric hazards are present that cannot be controlled by ventilation (determined through testing):		
Oxygen levels are below 19.5 or above 23%		
Carbon monoxide (CO) levels exceed 35 ppm		
Hydrogen Sulfide (H <sub>2</sub> S) levels exceed 10 ppm.		
Combustible gases (LEL) exceed 10%		
One or more air contaminants are present in concentrations that exceed the STEL		
There is a potential engulfment hazard		
There is a potential serious safety hazard		
The space has inward converging walls or a downward sloping floor that could trap an entrant		
The work to be conducted will introduce a serious safety hazard		
The work to be conducted will introduce a chemical or atmospheric hazard. (Have a safety data sheet at the site).		
The work will create an unusual hazard for entering or exiting the space		
Hot work will be conducted. A separate hot work permit is required		
<p><b>If any of the assessments above are answered with a “yes”, the space is considered a permit-required confined space, and the pre-entry checklist included on the Entry permit should be completed.</b></p>		

## Entry Permit for Permit-Required Spaces and Pre-Entry Checklist University of Wisconsin-Superior Confined Space Entry Program

<p><i>This Check list and Permit is valid from.</i></p> <p>_____</p> <p><i>and Expires:</i></p> <p>_____</p> <p><i>(may not exceed 8 hours)</i></p>	<p><b>Location:</b> (Bldg or Site, direction, room #, Street Address)</p>						
<p><b>Rescue Procedure:</b> Rescue Team Contracted (Permit Spaces): _____</p> <p>Call:    <input type="checkbox"/> Base# _____    <input type="checkbox"/> Campus Safety radio # _____    <input type="checkbox"/> Dial 911</p> <p>Other Instructions:</p>							
<p><b>Purpose for Entry:</b></p>							
<p><b>Personnel:</b> Entry Supervisor: _____</p> <p>Attendants: _____</p> <p>Entrants: _____</p>							
<p><b>Personal Protection and Equipment In Use:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Full Body Harness (required)  <input type="checkbox"/> Safety Glasses or Goggles (required)  <input type="checkbox"/> Hard Hat (required)  <input type="checkbox"/> Gloves  <input type="checkbox"/> Coveralls or other Protective Clothing  <input type="checkbox"/> Respirator  <input type="checkbox"/> First aid kit         </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Calibrated gas meter, and/or Drager grab sampler  <input type="checkbox"/> Tripod/Hoisting equipment (permit spaces)  <input type="checkbox"/> Lanyards and lifelines for entrants (permit spaces)  <input type="checkbox"/> Non-sparking tools/equipment  <input type="checkbox"/> Flashlight or other lighting  <input type="checkbox"/> Radio, cell phone or other communication  <input type="checkbox"/> Lock-out Tag-Out equipment         </td> </tr> </table>						<input type="checkbox"/> Full Body Harness (required) <input type="checkbox"/> Safety Glasses or Goggles (required) <input type="checkbox"/> Hard Hat (required) <input type="checkbox"/> Gloves <input type="checkbox"/> Coveralls or other Protective Clothing <input type="checkbox"/> Respirator <input type="checkbox"/> First aid kit	<input type="checkbox"/> Calibrated gas meter, and/or Drager grab sampler <input type="checkbox"/> Tripod/Hoisting equipment (permit spaces) <input type="checkbox"/> Lanyards and lifelines for entrants (permit spaces) <input type="checkbox"/> Non-sparking tools/equipment <input type="checkbox"/> Flashlight or other lighting <input type="checkbox"/> Radio, cell phone or other communication <input type="checkbox"/> Lock-out Tag-Out equipment
<input type="checkbox"/> Full Body Harness (required) <input type="checkbox"/> Safety Glasses or Goggles (required) <input type="checkbox"/> Hard Hat (required) <input type="checkbox"/> Gloves <input type="checkbox"/> Coveralls or other Protective Clothing <input type="checkbox"/> Respirator <input type="checkbox"/> First aid kit	<input type="checkbox"/> Calibrated gas meter, and/or Drager grab sampler <input type="checkbox"/> Tripod/Hoisting equipment (permit spaces) <input type="checkbox"/> Lanyards and lifelines for entrants (permit spaces) <input type="checkbox"/> Non-sparking tools/equipment <input type="checkbox"/> Flashlight or other lighting <input type="checkbox"/> Radio, cell phone or other communication <input type="checkbox"/> Lock-out Tag-Out equipment						
<p><b>Site Controls:</b></p> <p>Ventilation method:    <input type="checkbox"/> Mechanical: blower or exhaust fan    <input type="checkbox"/> Natural Ventilation Only</p> <p>Source Isolation:    <input type="checkbox"/> Lockout/Tagout completed    <input type="checkbox"/> Pumps or lines blinded,                                         <input type="checkbox"/> Hazard Source disconnected or blocked    <input type="checkbox"/> Space inerted with:                                         <input type="checkbox"/> Lines purged or flushed and vented</p> <p>Guarding:    <input type="checkbox"/> Opening Guarded    <input type="checkbox"/> Opening free of objects or tools</p> <p>Other (list):</p>							
<p><b>Communication Method with Entrant:</b>    <input type="checkbox"/> Voice    <input type="checkbox"/> Radio    <input type="checkbox"/> Visual    <input type="checkbox"/> Tug Line    <input type="checkbox"/> Other:</p> <p>Signals to be used:</p>							
<b>Pre-Entry Air Monitoring</b>	%	%	CO, ppm	H2S, ppm	Other Air Contaminant		
	Oxygen	Combustible gas	Carbon Monoxide	Hydrogen Sulfide	list: _____		
Prior to opening lid							
Top							
Mid Point							
Bottom							
Was ventilation required to bring atmospheric hazards within acceptable limits?					Yes      No		
Was ventilation used continuously during the entry?					Yes      No		
Was the gas meter calibrated before use?					Yes      No		
<p>Air Monitoring Equipment Used:    <input type="checkbox"/> Four-Gas Meter    <input type="checkbox"/> Drager Grab Sampler    <input type="checkbox"/> Other:</p> <p>                                 Sampling Pump Used:    <input type="checkbox"/> Manual draw (bulb)    <input type="checkbox"/> Battery powered pump    <input type="checkbox"/> Other:</p>							



## **Appendix B**

### **UW Superior Confined Space Inventory**

This list is not complete and does not identify confined spaces that are infrequently entered or yet to be evaluated.

<u>Non-Permit Spaces</u>						
(Note: Any non-permit space can be reclassified as a permit space if the air quality falls outside of acceptable ranges during the entry or if unusual hazards are introduced into to the space that affect the air quality (such as using a chemical or welding or cutting torch).)						
Location	Access	Ventilation	Engulfment Hazard	Potential Air Contaminants	Lockout /Tagout	Other Safety Concerns
Barstow Hall, Room 1, Crawl Space,	Horizontal crawl space, 4 X 4 ft door		None Known	None Known		
Curran Hall basement stairwell, Un-excavated space	Horizontal Crawl space, 4 X 4 ft door	None	None Known	None Known		uneven surfaces, low head room
MWC Basement, Room B721 DE tank and sump pit	Open surface tank, <5 ft deep	Mechanical	None Known	Hydrogen Chloride,		slips, falls
MWC Basement Corridors & B721 East and West crawl spaces	Horizontal crawl space, 4 X 4 ft door	Natural (open end)	None Known	None Known	Heating feed lines, valves	Horizontal entry, sloped floors
MWC Deep End of <u>Empty</u> Swimming Pool	Open Surface Tank (when empty)	Natural	Sloping floor at deep end	Hydrogen Chloride (Muriatic Acid)	Pool Supply lines	Slips, falls on ladders, sloping floor
Old Main Attic Spaces	Top-down side	Natural		Refrigerant R-22		Low Head Room, Electrical Conduit, Cables
Wessman Arena Basement Tunnel	Horizontal	None	None Known	possible asbestos		Low Head Room
Steam Pit # 2 21 St. and WITC Parking Lot	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit # 3 Corner of 21 <sup>st</sup> St. and Catlin	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #4 Near Catlin Ave., and N 20 <sup>th</sup> St.	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #4A Near Lot 13, Marcovich Parking Lot	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #5 Near Catlin Ave. and N 19 <sup>th</sup> St.	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit

Non-Permit Spaces

(Note: Any non-permit space can be reclassified as a permit space if the air quality falls outside of acceptable ranges during the entry or if unusual hazards are introduced into to the space that affect the air quality (such as using a chemical or welding or cutting torch).

Steam Pit #6 Catlin Ave, by NE corner of Holden Fine Arts	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #7 East-West Fire Lane North of Holden	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #8 Fire Lane North West Corner of Lot 7	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #9 Southwest corner of Lot 7	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #10 Catlin Ave., by tennis courts	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #11 Catlin Ave., in front of Ostrander Hall	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #12 Catlin Ave., Where Sundquist Hall was	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #13 Fire Lane btw Catlin & Yellowjacket U	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #13A East of Yellowjacket Union	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #14 Fire lane by Yellowjacket Union	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #15 Old Heating Plant, NE corner of Barstow	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #15A Btw Swenson and Yellowjacket Union	Manhole			Not Evaluated		
Steam Pit #17 Catlin Ave, SW of Crownhart Hall	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #19 Catlin Ave, NW of Crownhart Hall	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit

Non-Permit Spaces

(Note: Any non-permit space can be reclassified as a permit space if the air quality falls outside of acceptable ranges during the entry or if unusual hazards are introduced into to the space that affect the air quality (such as using a chemical or welding or cutting torch).

Steam Pit #1A Cor89ner of Faxon and Poplar Ave.	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #2A Faxon between Catlin and Cypress Ave.	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #3A SW corner of Faxon and Catlin	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #4.A Catlin Ave., West between Ross and Hawkes	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #7A Catlin Ave., btw Ross and Wessman	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Steam Pit #8.A Catlin Avenue and Wessman Arena,	Manhole	None	None Known	Steam, Low Oxygen		High pressure steam line passes through pit
Halbert Heating Plant Coal Fire Boiler #1	Severely restricted access port Horizontal entry	Mechanical Boiler Draft, 100% Fresh Air	None Known	Dust, During Cleaning	yes	Falls into ash bin Retrieval lines will not assist in retrieval due to entry
Halbert Heating Plant Coal Fire Boiler #2	Severely restricted access port Horizontal entry	Mechanical Boiler Draft, 100% Fresh Air	None Known	Dust, During Cleaning	yes	Falls into ash bin Retrieval lines will not assist in retrieval due to entry

The following locations at UW Superior should be considered permit-required confined spaces until an evaluation is conducted based on existing conditions and proposed scope of work.

<b>Anticipated Permit-Required Confined Spaces at UW Superior</b> (May be Reclassified as Non-Permit Spaces Depending Upon Conditions of Work)			
<b>Location</b>	<b>Access</b>	<b>Existing Ventilation</b>	<b>Anticipated Potential Hazards</b> <small>(conduct a thorough review at time of work)</small>
Any non-permit space in which a new hazard is introduced during maintenance or repairs.			Welding, cutting, cleaning, abatement activities, etc
Sanitary Sewers	Manhole	None	Sewer gas
Elevator pits	Elevator shaft	None	Crushing
Sump pump pits	Manhole	None	Sewer gas ; Automatic startup of valves, pumps, motor starters
Sanitary ejector pits	Manhole	None	Sewer gas ; Automatic startup of valves, pumps, motor starters
Marcovich Wellness Center Surge Tank	Open surface tank	None	Low Oxygen (if sludge is present) Muriatic Acid, Sodium Hypochlorite. Ladders, slippery surfaces.
Halbert Heating Plant Coal Fire Boiler #1 & 2	Severely restricted access. Horizontal entry	Mechanical Boiler Draft, 100% Fresh Air	Dust and ash. Falls into ash bin
Halbert Heating Plant, 4 <sup>th</sup> level Ash Silo in Ash Eductor room	Manhole No access ladder		Ash dust. Energized equipment. Open hole by rotary vane
Halbert Heating Plant, Boilers 1 & 2 Steam drums on top of boilers	16 X 12" manhole on side platform	None	Low oxygen. Energized steam and water pumps
Halbert Heating Plant, Boilers 1 and 2, Wind boxes below operating deck level	Manhole opening, 7.5 ft above deck	Natural (chimney)	Energized equipment.
Halbert Heating Plant, Boilers 1 and 2, Sifting Hoppers,	Restricted entry	Natural (chimney)	Energized fans. Sloped Floors
Halbert Heating Plant, Third level Deairator Tank	12 X 16" Manhole, 5.5 ft above deck	None	Low oxygen. Energized equipment: Pumps, Steam
Halbert Heating Plant, Lower Level, Condensate Receiver tank	12 x 16" manhole	None	Low oxygen. Energized equipment.
Halbert Heating Plant, Fourth Level Surge Bin	Manhole,	None	Energized equipment: Coal elevator, coal conveyor. Sloped Floors, Converging walls
Halbert Heating Plant, Bsmt SE Corner Blow Down Tank			

## **UW Superior Confined Space Program Review Criteria for Defining a Confined Space**

A confined space is a space that is large enough and configured so an employee can enter and perform assigned work. A confined space always has a limited or restricted means for entry or exit and is not designed for continuous employee occupancy. A room with a full size door, such as an electrical vault or service area, would not be considered a confined space, even though it may contain hazards.

Review the criteria below and evaluate the spaces using the normal conditions to assign an initial classification for the inventory. Record any additional requirements in a comment to be included with the inventory.

### **A. Criteria for defining a Non-Permit Confined Space:**

**(All criteria have to be met in order to be classified as a non-permit space.)**

1. It is a confined space
2. The space does not contain or have the potential to contain atmospheric hazards. Air quality is within the following guidelines:
  - Oxygen is present in concentrations between 19.5 - 23%
  - No combustible gases in excess of 10% of the LEL
  - Carbon Monoxide is less than 35 ppm
  - Hydrogen Sulfide is less than 10 ppm
  - No other air contaminants are present in excess of the Short Term Exposure Limit
3. The space does not have any safety hazards capable of causing death or serious physical harm, such as:
  - electrical hazards that cannot be controlled by lockout tag out procedures,
  - unguarded moving parts that cannot be controlled by lock out tag out procedures before entry
  - engulfment hazards such as water, ash, or soil
  - high temperatures, steam, noise
  - Converging walls or sloped floors that would interfere with self-rescue
4. The opening would not prevent the employee from escaping easily unaided in an emergency
5. The entrant's activities will not introduce hazardous conditions or air contaminants in the confined space.

### **B. Criteria for defining A Permit Confined Space:**

**(If one or more of the following are or has the potential to be present, the space should be classified as a permit space)**

1. It is a confined space.
2. The space has or has the potential to contain atmospheric hazards:
  - Oxygen levels are less than 19.5% or more than 23%
  - Combustible gases may be present in concentrations of 10% or more of the LEL
  - Carbon Monoxide is present in concentrations equal to or greater than 35 ppm
  - Hydrogen Sulfide is present in concentrations equal to or greater than 10 pm
  - Other air contaminants are present in concentrations exceed the Short Term Exposure Limit
3. The opening is so restrictive that an employee could not easily escape unaided in an emergency.
4. The space contains a material that has the potential for engulfing an entrant, such as soil, water, ash;
5. The space has an internal configuration that could cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section;
6. The space has safety hazards capable of causing death or serious physical harm, such as:
  - electrical hazards that cannot be controlled by lockout tag out procedures before entry,
  - unguarded moving parts that cannot be controlled by lock out tag out procedures before entry
  - high temperatures,
  - uncontrolled or leaking steam
  - noise

## **Appendix C**

### **Information for Contractors Working in UW Superior Confined Spaces**

## **Information for Contractors Working in UW Superior Confined Spaces**

UW Superior has a written Confined Space Entry Program that is utilized for both permit-required and non-permit required confined spaces by UW Superior employees. This fact sheet contains an overview of the requirements when Contractors are hired to conduct work in permit-required confined spaces at UW Superior.

When UW-Superior (as a host employer) arranges to have contractors perform work that involves permit confined space entry, UW Superior will:

- Require documentation of the contractor's confined space entry and rescue procedures.
- Provide information to the contractor about the conditions that make the space in question a permit space. A list of known or suspected permit-required confined spaces at UW Superior can be found below.
- Inform the contractor of any precautions or procedures that the Campus has implemented for the protection of employees in or near permit spaces.
- Coordinate entry procedures to be used with the contractor when employees of both UW Superior and the contractor will be working in or near confined spaces.
- Conduct a debriefing with the contractor at the conclusion of the entry regarding any hazards confronted or created in permit spaces during entry operations.
- Request a copy of the canceled confined space entry permit used by the contractor's employees.

Contractors who will enter UW Superior permit-required confined spaces are required to:

- Have a written Program meeting the minimum requirements of OSHA's Permit Required Confined Space standard, 29 CFR 1910.146.
- Provide their own safety equipment for entry procedures.
- Have a rescue plan in place. UW Superior will not provide rescue services. If rescue services are needed, contract with a local provider or the Superior Fire Department in advance.
- Obtain any available information regarding permit space hazards and entry operations from the Campus, and evaluate those hazards for risk to their employees.
- Inform Campus of the permit space procedures the contractor will follow.
- Inform Campus of any hazards confronted or created in permit spaces.
- Coordinate entry operations with the University, when both University personnel and contractor personnel will be working in or near permit spaces.

The following locations at UW Superior should be considered permit-required confined spaces until the Contractor conducts an evaluation for existing conditions and proposed scope of work.

Location	Access	Existing Ventilation	Anticipated Potential Hazards <small>(conduct a thorough review at time of work)</small>
Any non-permit space in which a new hazard is introduced during maintenance or repairs.			Welding, cutting, cleaning, abatement activities, etc
Sanitary Sewers	Manhole	None	Sewer gas
Elevator pits	Elevator shaft	None	Crushing
Sump pump pits	Manhole	None	Sewer gas ; Automatic startup of valves, pumps, motor starters
Sanitary ejector pits	Manhole	None	Sewer gas ; Automatic startup of valves, pumps, motor starters
Marcovich Wellness Center Surge Tank	Open surface tank	None	Low Oxygen (if sludge is present) Muriatic Acid, Sodium Hypochlorite. Ladders, slippery surfaces.
Halbert Heating Plant Coal Fire Boiler #1 & 2	Severely restricted access. Horizontal entry	Mechanical Boiler Draft, 100% Fresh Air	Dust and ash. Falls into ash bin
Halbert Heating Plant, 4 <sup>th</sup> level Ash Silo in Ash Eductor room	Manhole No access ladder		Ash dust. Energized equipment. Open hole by rotary vane
Halbert Heating Plant, Boilers 1 & 2 Steam drums on top of boilers	16 X 12" manhole on side platform	None	Low oxygen. Energized steam and water pumps
Halbert Heating Plant, Boilers 1 and 2, Wind boxes below operating deck level	Manhole opening, 7.5 ft above deck	Natural (chimney)	Energized equipment.
Halbert Heating Plant, Boilers 1 and 2, Sifting Hoppers,	Restricted entry	Natural (chimney)	Energized fans. Sloped Floors
Halbert Heating Plant, Third level De-airator Tank	12 X 16" Manhole, 5.5 ft above deck	None	Low oxygen. Energized equipment: Pumps, Steam
Halbert Heating Plant, Lower Level, Condensate Receiver tank	12 x 16" manhole	None	Low oxygen. Energized equipment.
Halbert Heating Plant, Fourth Level Surge Bin	Manhole,	None	Energized equipment: Coal elevator, coal conveyor. Sloped Floors, Converging walls
Halbert Heating Plant, Bsmt, SE Corner Blow Down Tank			