

# University of Louisville

## Department of Environmental Health & Safety

### Confined Space Program

**2021**

<b>Date</b>	<b>Item</b>	<b>Purpose</b>
2008	UofL Confined Space Procedure-initial program document	Initial document
4/3/2020	UofL Confined Space Program	Updated/revised for procedural facility, personnel, and OSHA requirements
8/14/2020	Program Revision	Revision of Appendix Appendix A through Appendix F
11/12/2020	Program Procedure	Updated confined space entry permit & requirements
2/3/2021	Contractor & Rescue and Emergency	Updated program to reflect University Wide Program
3/10/2021	Formatting, Hazard Assessment, Permit Update, Addition of Reclassification form, Definitions, Removal of Alternate Procedures	3 <sup>rd</sup> Party (ISTS) Review
3/25/2021	Review Written program DEHS Safety Team	Edit/Review Content
9/17/2021	Review and Finalize Program	Post to Physical Plant Website

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## 1.0 PURPOSE

The purpose of this program is to establish procedures to identify and safely enter permit-required confined spaces. It is designed to meet all the requirements of *OSHA 29 CFR 1910.146* Permit Required Confined Spaces Standard.

## 2.0 SCOPE

This program applies to all University of Louisville employees, contractors, sub-contractors, their employees and all visitors while on University property, any owned property and/or worksites. This program establishes the procedure to identify, evaluate, and enter permit required confined spaces.

## 3.0 DEFINITIONS

**Acceptable entry conditions** - conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

**Attendant** - individual stationed outside permit space(s) who monitors authorized entrants and who performs all assigned duties.

**Authorized entrant** - employee who is authorized by the employer to enter a permit space.

**Blanking or blinding** - the absolute closure of a pipe, line, or duct by the 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.

**Confined space** - a space that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work;
- Has limited or restricted means for entry or exit; and
- Is not designed for continuous employee occupancy.

**DEHS** – Department of Environmental Health and Safety

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

**Emergency** - any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

**Engulfment** - the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance 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.

**Entry** - the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

**Entry permit** - document that is used to allow and control entry into a permit space.

**Entry supervisor** - person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

**NOTE:** An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

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

- Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
- Airborne combustible dust at a concentration that meets or exceeds its LFL;
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this Part and which could result in employee exposure in excess of its dose or permissible exposure limit;
- Any other atmospheric condition that is immediately dangerous to life or health.

**Hot work permit** - means the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

**NOTE:** Confined Spaces must be considered Permit Required in ALL cases where Hot Work is performed inside the space. Continuous Air Monitoring is also required while Hot Work is conducted.

**Immediately Dangerous to Life or Health (IDLH)** - 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 permit space.

**Inerting** - means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

**NOTE:** This procedure produces an IDLH oxygen-deficient atmosphere.

**Isolation** - 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/tag out of all sources of energy; or blocking or disconnecting all mechanical linkages.

**NOTE:** See University of Louisville Control of Hazardous Energy Program for more information on Isolation.

**Line breaking** - intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

**Non-permit confined space** - a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

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

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

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

- Contains or has a **potential** to contain a hazardous atmosphere;
- Contains a material that has the **potential** for engulfing an entrant;

- Has an internal configuration such that an entrant **could** be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains **any** other recognized serious safety or health hazard.

**Permit-required Confined Space Reclassification** – the process by which all hazards are removed from a Permit Required Confined Space, therefore allowing to be reclassified as a Non-Permit Space. This must be completed by using the University of Louisville Confined Space Reclassification form.

**Permit system** - written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

**Prohibited condition** - any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

**Rescue service** - means the personnel designated to rescue employees from permit spaces.

**Retrieval system** - 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.

**Testing** - process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

**University of Louisville** – otherwise referred to as The University, Employer, or U of L

## 4.0 RESPONSIBILITIES

### 4.1 The Department of Environmental Health and Safety will:

- Develop, implement and maintain the written Confined Space Entry Program.
- Evaluate the workplace to determine the presence confined spaces.
- Develop a list of all confined spaces and permit-required confined spaces.
- Evaluate confined spaces to determine if they are permit-required confined spaces.
- Develop safe confined space entry procedures.
- Develop alternative entry procedures.
- Assist departments as needed.
- Develop and review program training.
- Conduct and document annual program evaluation
- Perform audits or inspections of Confined Space Program
- Provide guidance on incident investigations.

### 4.2 Departments will:

- Assign responsibility to a Supervisor.
- Provide resources to assist DEHS in conducting evaluations and developing procedures.
- Assist DEHS in conducting annual program reviews as needed.
- Maintain all department compliance documentation.
- Determine the applicability of the Confined Space (CS) program to activities conducted within their work unit.
- Coordinate implementation of the confined program within their work unit.
- Ensure all necessary hazard assessments are performed and documented for confined space work areas and/or job tasks.
- Ensure program records, permits, other documentation, and training are maintained by the work unit.
- Assist in the investigation of confined space injuries and incidents within their work unit.

**4.3 Supervisors will:**

- Ensure employees follow program requirements.
- Ensure each employee receives initial and retraining as needed.
- Ensure that confined space hazards are properly controlled through the required confined space permit, and all other necessary engineering and workplace controls, and required personal protective equipment.
- Evaluate, approve, and document necessary procedures for safe confined space entry or rescue.
- Ensure employees comply with this program and take prompt corrective action when unsafe conditions or practices are observed.
- Investigate injuries and incidents within their work unit related to confined space entries.
- Participate in annual review and revision of this program, including needed confined space classification or re-classifications, as part of this CSP program.

**4.4 University of Louisville Employees and will:**

- Attend training appropriate for their level of involvement.
- Follow program requirements.
- Notify supervisor of any confined space entries or deviations from this program.

**5.0 CONFINED SPACE ENTRY PROCEDURES****5.1 Identification of Confined Spaces**

The University will evaluate buildings and properties in order to determine if permit-required confined spaces are present. This will be managed by DEHS with the input and assistance from Departments and Supervisors. DEHS will maintain a list of all Confined Spaces and ensure each space is assessed.

- Signs or Labels- Permit Required Confined Spaces shall be labeled and have similar language that states: "Danger – Confined Space: Authorized Personnel Entry Only."
- Non-Standard Signs or Labels- Where standard signs or labels cannot be used due to the configuration or conditions of the space, other suitable materials or means shall be used to convey the above information.
- Secure Spaces – Spaces may remain unlabeled if they are secure and require a special tool to open Ex. Manhole Covers

**5.2 Preliminary Evaluation of Confined Spaces**

- UofL Confined Space Inventory Form (Appendix A) – a written inventory intended to document the location of confined spaces by campus and building.
- UofL Confined Space Hazard Assessment Form (Appendix B) – Used for classification (non-permit vs. permit-required), planning, preparation, and completion of work in new or changing confined spaces, forms shall be submitted to the DEHS for approval.
- UofL Confined Space Permit (Appendix C) – Used to complete all necessary documentation required by UofL, and by KY OSHA for entry into Permit Required Confined Spaces.
- Qualifications of Personnel Evaluating Confined Spaces - UofL confined space evaluations may only be performed by qualified DEHS personnel or a competent third party representative. All confined space evaluations are subject to review by DEHS.

**5.3 Confined Space Entry**

Confined Space Entry Process:

- Prepare for entry
- Isolate Sources of Energy
- Verify safe entry conditions
- Enter the space following planned procedures

- Complete work assignment
- Properly Exit space following the planned procedures

#### 5.4 Changes in Confined Spaces

When there are **changes** in the **use or configuration** of a **non-permit** confined space that might increase the hazards to entrants, the employer *shall reevaluate* that space and, if necessary, reclassify it as a permit-required confined space.

### 6.0 PERMIT-REQUIRED CONFINED SPACE PROCEDURE

The University of Louisville uses a permit system to manage entrance into permit required confined spaces, to prevent unauthorized entry and evaluate the hazards of permit spaces prior to entry.

#### 6.1 Pre-Entry Requirements

Prior to any entry into a *permit-required confined space*, the Authorized Supervisor(s), Entrant(s) and Attendant(s) must ensure the following parameters are met to allow for permit required confined space entry, and completion of work:

- Prepare for entry
- Isolate sources of energy
- Follow Control of Hazardous Energy (LOTO) procedures
- Monitor entry from entrance point
- Establish barriers to prevent unauthorized entry
- Post Permit at work site
- Establish rescue procedures
- Monitor for hazardous atmospheres, initially and continuously, depending on atmospheric conditions of entry
- Conditions such as dusty environments may not always allow for continuous monitoring
- When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space

#### 6.2 Confined Space Entry Permit & Requirements

Following determination that a confined space will be a *permit-required confined space*, the Authorized Supervisor shall complete the [Permit Required Confined Space Entry Permit \(PRCS\) \(Appendix C\)](#).

The UofL PRCS is prepared for the following purposes:

- Prompts the Authorized Supervisor to take the necessary planning steps to prepare the confined space for entry.
- Facilitate and document tracking of the conditions prior to, during, and following the entry.
- Facilitate proper and timely closure of the confined space permit, as required by OSHA.
- Serve as an instructional guide to the entry for the Supervisor, Attendants, and Entrants.
- Serve as a “warning or cautionary notice” to nearby workers.
- Provides critical information to emergency responders, in event of a confined space emergency prior to entry.
- Completed Permits must be sent to the applicable member of DEHS for proper filing and review

### 6.3 Eliminate Atmospheric Hazards

Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for oxygen content, flammable gases and vapors and for potential toxic air contaminants, in that order.

- Any employee who enters the space, or that employee's authorized representative, shall be provided an opportunity to observe the pre-entry testing required by this paragraph.
- There may be no hazardous atmosphere within the space whenever any employee is inside the space.
- Continuous forced air ventilation shall be used, as follows:
  - o An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere
  - o The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space
  - o The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space
  - o Forced air ventilation may not create additional hazards such as creation of dust and may not be possible during certain operations such as welding
    - Negative pressure ventilation must be used in this case if a hazardous atmosphere is present
- The atmosphere within the space shall be continuously tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee who enters the space, or that employee's authorized representative, shall be provided with an opportunity to observe the periodic testing required by this paragraph.
- If a hazardous atmosphere is detected during entry:
  - o Each employee shall leave the space immediately;
  - o The space shall be evaluated to determine how the hazardous atmosphere developed; and
  - o Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.
- Reevaluate the permit space in the presence of any authorized entrant or that employee's authorized representative who requests that the employer conduct such reevaluation because the entrant or representative has reason to believe that the evaluation of that space may not have been adequate.
- Immediately provide each authorized entrant or that employee's authorized representative with the results of any testing conducted in accordance with this section.

*NOTE: Atmospheric testing conducted in accordance with 29 CFR 1910.146 Appendix B would be considered as satisfying the requirements of this paragraph. For permit space operations in sewers, atmospheric testing conducted in accordance with Appendix B to section 1910.146, would be considered as satisfying the requirements of this paragraph.*

### 6.4 Confined Space Permit Duties

#### Entry Supervisor

The Entry Supervisor will assess and record all information onto the PRCS and sign the PRCS. The steps further described in this section will assist in completing the hazard information required.

- Entry Supervisor will review the completed Permit with all Authorized Entrants and Attendants.

- The Permit will be posted at the work site or otherwise be readily accessible to Authorized Entrants and emergency personnel.
- Entry Supervisor will close out the permit at the completion of the work and sign the permit. The Permit will be forwarded to DEHS. The DEHS Office will also request canceled permits for subsequent program review.
- All canceled permits must be kept on record for a period of one year. Any problems encountered during an entry operation shall be noted on the Permit so that DEHS can investigate and make any appropriate revisions to the UofL Confined Space Program.
- The entry supervisor shall terminate entry and cancel the entry permit when:
  - o The entry operations covered by the entry permit have been completed; or
  - o A condition that is not allowed under the entry permit arises in or near the permit space.

#### Attendant Duties

Each permit-required confined space (PRCS) entry must be assigned an attendant to remain outside the confined space, be in constant communication with the entrants, and be capable of summoning emergency rescue personnel in the event of an accident or hazardous exposure within the confined space. The responsibilities of the Attendant are as follows:

- Knows the hazards that may be faced during entry,
- Is aware of possible behavioral effects of hazard exposure in authorized Entrants.
- Continuously maintains communication and an accurate count of authorized Entrants in the confined space and ensures that the means used to identify authorized Entrants, and accurately identifies who is in the confined space.
- Remains outside the confined space during entry operations until relieved by another Attendant.
- Monitors activities inside and outside the confined space to determine if it is safe for Entrants to remain in the space and orders the authorized Entrants to evacuate the confined space immediately under any of the following conditions:
  - o If the Attendant detects a prohibited condition.
  - o If the Attendant detects the behavioral effects of hazard exposure in an authorized Entrant.
  - o If the Attendant detects a situation outside the space that could endanger the authorized Entrants.
  - o If the Attendant cannot effectively and safely perform all the duties required.
- Summon rescue and other emergency services as soon as the Attendant determines that authorized Entrants may need assistance to escape from confined space hazards.
- Takes the following actions when unauthorized persons approach or enter a confined space while entry is underway:
  - o Warn the unauthorized persons that they must stay away from the confined space.
  - o Advise the unauthorized persons to exit the confined space immediately, if they have entered the space.
  - o Inform the authorized Entrants and the Entry Supervisor if unauthorized persons have entered the confined space.
- Performs no duties that might interfere with the Attendant's primary duty to monitor and protect the authorized Entrants.
- Authorized Attendants shall not monitor more than one confined space at a time.

#### Entrant Duties:

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Trained and uses appropriate personal protective equipment

- Is aware of possible behavioral effects of hazard exposure in authorized Entrants.
- Shall witness and verify calibrated air monitoring data and if approved, sign off, before entry is made.
- Is entitled to request additional monitoring at any time.
- Maintain communication with the Attendants to enable the Attendant to monitor the Entrants status as well as to alert the Entrant to evacuate if needed; and
- Exit from confined spaces as soon as possible when ordered by an Attendant or Entry Supervisor, when the Entrant recognizes the warning signs or symptoms of an exposure exists, or when a prohibited condition exists, or when an alarm is activated.

### **6.5 Equipment & Material Requirements**

Equipment must be provided and available for use during confined space entry.

Equipment / Materials may minimally include:

- UofL Confined Space Permit forms,
- Other UofL work permit forms (where required),
- Air monitoring devices,
- Personal Protective Equipment (PPE) including full body harness, hard hat, hand/eye protection and any other required protective gear,
- Rescue equipment (tripods, etc.),
- Communication devices (radios, cell phones, etc.),
- Ventilation devices,
- Lighting equipment,
- Barriers to prevent unauthorized access and,
- Tools or equipment necessary to complete the required task(s).

### **6.6 Isolation Requirements**

Isolation is the process by which a confined space is removed from service and completely protected against the release of energy and material into the space. Isolation is achieved by such means as:

- misaligning or removing sections of lines, pipes, or ducts
- lockout or tag-out of all sources of energy
- blocking, blanking, bleeding, or disconnecting all mechanical linkages.

These requirements will ensure the accidental release of energy or hazardous materials will not occur while Entrants are in the confined space.

It may not be feasible to isolate certain confined spaces (i.e. sewer system). In this situation, air monitoring shall be continuous, and PPE/ other control requirements must be strictly adhered to.

### **6.7 Block or barricade pedestrian and vehicular access**

Ensure pedestrian and vehicle access to confined space entry points is blocked during all confined space entry activities, and that the entry is secured against entry by unauthorized persons. In addition to personnel/attendant monitoring, this may be accomplished by barricades, signage, tape, etc.

### **6.8 Air Monitoring and Permit Documentation**

Ensure the completion of air monitoring and written permit for entry are complete as outlined in this section, and that the permit is posted immediately outside the permit-required confined space. The general sequence for completing air monitoring shall accommodate the following:

1. Employees that conduct monitoring shall have received training in confined space monitoring.
2. Equipment shall have been calibrated and bump tested per manufacturer instructions, or monthly, and tagged/labeled with updated calibration requirements. A calibration log shall be maintained for each instrument. This may also be an electronic log, which can be printed for written documentation.
3. Monitor for oxygen level, combustible gas (LEL), pertinent toxic gases & vapors, depending on confined space setting (such as CO, CO<sub>2</sub>, NO<sub>2</sub>, NH<sub>3</sub>, and/or H<sub>2</sub>S) with documentation written on or attached to permit (if electronic print out).
4. Frequency – Test permit-required confined space air initially, and continuously while work is conducted in the space. Where work is conducted away from the Attendant, personnel in confined space shall monitor continuously with data logging capability. Perform continuous monitoring where oxygen-consuming equipment is used in the space. Any initial measurements resulting in out-of-range readings, shall require ventilation and continuous monitoring once space is cleared for entry.
5. Attendant (or Entrant(s)) shall record monitoring data during testing or monitoring data shall be recorded by real-time data logging instrument, where required, and later assure that data is identified and affixed to the permit.
6. Communication – Attendants and entrants must maintain visible or communication contact (radio) during confined space work.

#### **6.9 Confined Space Permit Closure**

Once work is complete within the confined space, all authorized entrants must safely exit the space and the permit cancelled and signed by the entry supervisor. The completed permit must then be sent to DEHS.

#### **7.0 ALTERNATE PROCEDURES**

The University may use alternate procedures when possible. Alternative procedures can be used whenever:

- The department can demonstrate and document that the only hazard posed by the permit space is an actual or potential hazardous atmosphere;
- The department can demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry;
- The department has developed monitoring and inspection data that supports the demonstrations regulatory requirements;
- If an initial entry of the permit space is necessary to obtain the data required to declassify the space, the entry is performed using a confined space entry permit;
- The determinations and supporting data are documented by the department and are made available to each employee who enters the permit space.

#### **8.0 ENTRY PERMIT**

An entry permit will be used to document compliance and to authorize entry to a permit-required confined space. [Appendix C](#) contains all of the following requirements at a minimum:

1. The permit space to be entered;
2. The purpose of the entry;
3. The date and the authorized duration of the entry permit;
4. Name of authorized entrants
5. Name of attendants;

6. Name of current entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry;
7. Hazards of the space to be entered;
8. Measures used to isolate the space and eliminate or control hazards prior to entry;
9. Acceptable entry conditions;
10. Results of initial and periodic tests, names or initials of testers, tests were performed;
11. The rescue and emergency services that can be summoned and how to summon;
12. Communication procedures;
13. Equipment needed for entry (PPE, testing equipment, communications equipment, alarm systems, and rescue equipment);
14. Any other information to ensure safety;
15. Additional permits.

## 9.0 RECLASSIFICATION OF A PERMIT CONFINED SPACE

A permit-required confined space may be reclassified to a non-permit confined space under the following procedures:

- The permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified to a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.
- If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed using the entry permit. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

***NOTE:** Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards. 1910.146 (c) (5) covers permit space entry where the employer can demonstrate that forced air ventilation alone will control all hazards in the space.*

- The University has certified in writing that the Confined Space is eligible to be reclassified through the use of [Appendix B- Confined Space Hazard Assessment](#)
- The entry supervisor shall complete [Appendix E – Confined Space Reclassification Form](#) and have DEHS Approve prior to entry
- If hazards arise within a permit space that has been reclassified to a non-permit space under each employee in the space shall exit the space. DEHS shall then reevaluate the space and determine whether it must be reclassified as a permit space.

## 10.0 TRAINING AND DUTIES

Training shall be provided so all employees whose work is regulated by this section acquire the understanding, knowledge and skills necessary for the safe performance of the duties and responsibilities assigned to them. Training shall be provided before entry into a confined space, before a change in assigned duties and whenever there is a change in permit space operations that presents a hazard for which an employee has not previously been trained.

1. Supervisors will be trained in the same procedures as Attendants and Entrants.
2. Supervisors, Entrants and Attendants will receive training on how to recognize hazards in Confined Spaces.

3. All Supervisors will use [UNIVERSITY OF LOUISVILLE CONFINED SPACE ENTRY PERMIT Appendix C](#) and determine that all pertinent information is noted on the form. Supervisors will determine that the necessary procedures, practices, and equipment for safe entry are noted on the form.
4. Supervisors will identify contributing factors of job duties added to Confined Spaces and inform Entrants when hazards change and document this change on the entry permit.
5. Entrant Supervisors can determine at appropriate intervals that the entry operations remain consistent with the terms of the form and that acceptable entry conditions are present.
6. Supervisors or Attendant/Rescuers will cancel the Entry authorization and terminate entry whenever acceptable entry conditions are not present. Entrant Supervisor or Attendant/Rescuer will take the necessary measures for concluding an Entry operation, such as closing off a Confined Space and closing the entry, once the work authorized has been completed.
7. In the event of an ordered evacuation, the Entrant Supervisor will be required to respond to the Space immediately.

## 11.0 RESCUE AND EMERGENCY SERVICES

Departments will have a designated certified emergency rescue provider for **ALL** permit required confined space entries at on-campus locations. DEHS has provided Industrial Safety and Training Services (ISTS) as an approved personal service contract (PSC) as a primary rescue team for departments across campus. Departments are **required to have certified rescue service on site** during a permit required confined space permit entry.

ISTS is staffed and equipped to provide emergency rescue services from confined spaces to permit required confined spaces. In the event of any emergency situation requiring rescue from a permit required confined space, university employees **shall not attempt** to enter the space to perform rescue. The attendant on duty shall immediately contact certified rescue provider on site and also call the University of Louisville dispatch at 502-852-6111, dispatch will contact the Louisville Fire Department by calling 911. Two-way radio communication may be used if coordinated to ensure rescue services can be reached.

### 11.1 RESCUE AND EMERGENCY SERVICE RESPONSIBILITIES:

- Be aware of the hazards of a permit space
- Capable to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified.
- Ensure that at least one member of the rescue team or service holding a current certification in first aid and CPR is available.
- Knowledgeable on how to use rescue equipment such as monitors, retrieval devices, etc.
- Has completed HAZCOM training.

## 12.0 DOCUMENTATION

The following documents, including department where they will be maintained and duration of retention, are required for compliance with this program:

1. Written Permit-required Confined Space Entry program (DEHS; most recent)
2. List of Confined Spaces (DEHS; Most recent)
3. List of Permit Required Confined Spaces (DEHS; most recent)
4. Confined Space hazard evaluations (DEHS; Most recent)
5. Confined Space Entry Permit (DEHS; Most recent)

6. Canceled Confined Space Entry Permits (Departments; previous 12 months)
7. Calibration records (Equipment owner; most recent)
8. Equipment Inspection records (Equipment owner; most recent)
9. Training records (DEHS; Five years)
10. Medical & Respirator Fitness Exam Records shall be retained by the University work unit according to current medical exam records retention policy or procedures
11. Certification of training (DEHS; five years)
12. Annual program review (DEHS; most recent)

### 13.0 CONTRACTORS

When employees of another employer (contractor) are used to perform work that involves permit space entry, the University will:

Inform the contractor that the University and department responsible contains permit spaces,

- Permit space entry is allowed only by using permit space program meeting the requirements 29 CFR 1910.146,
- Inform the contractor why it is a permit space including the hazard assessment
- Inform the contractor precautions or procedures the University has implemented for the protection of employees in or near permit spaces where contractor will be working;
- Coordinate entry operations with the contractor, when both University personnel and contractor personnel will be working in or near permit spaces; and
- Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

- Obtain any available information regarding permit space hazards and entry operations from the University;
- Coordinate entry operations with the University, when both host employer personnel and contractor personnel will be working in or near permit spaces.
- Inform the University of the permit space program that the contractor will follow and of any hazards.

### 14.0 REFERENCES

The following references may be consulted as pertinent to the University of Louisville Confined Space Program:

Reference Documents	Link
OSHA Permit-Required Confined Space Standard 29 CFR 1910.146	<a href="https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&amp;p_id=9797">https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&amp;p_id=9797</a>
OSHA Permit-Required Confined Space Compliance Guide	<a href="https://www.osha.gov/confined-spaces">https://www.osha.gov/confined-spaces</a>

### 15.0 APPENDICIES



**APPENDIX B - CONFINED SPACE HAZARD ASSESSMENT**

See DEHS for Microsoft Word copy of this form

<h2 style="margin: 0;">Confined Space Hazard Assessment</h2>				
<b>Location:</b>		<b>Department:</b>		
<b>Initial Assessment Date:</b>		<b>Assessment Modification Date:</b>		
<b>Space:</b>		<b>Conducted By:</b>		
<i>*Insert picture of the space here</i>				
<i>* ✓ indicates an affirmative answer and X indicates a negative answer</i>				
Confined Space - must meet all the below criteria		Permit Required Confined Space must be a confined space and meet any one of the below criteria		
	Is large enough or so configured that an employee can bodily enter and perform work... AND		Contains or has a potential to contain a hazardous atmosphere... OR	
	Has limited or restricted means for entry or exit AND		Contains a material that has the potential for engulfing an entrant... OR	
	Is not designed for continuous employee occupancy.		Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly covering walls or by a floor that slopes downward and tapers to a smaller cross-section... OR	
			Contains any other recognized serious safety or health hazard	
Authorized Entry Points				
	Top		Side	
				Bottom
Authorized Entry Methods (Dependent on Task)				
	Permit Required		Alternative Entry	
				Reclassification
Hazards	Source/Type	Quantity	Severity (Rate 1 to 5)	Hazard Abatement Method
Explosive Atmosphere				
Combustible Material				
Electrical Circuits				
Toxic Gases				
Toxic Material				

Thermal Hazards									
Machinery									
Slip / Fall Hazards									
Engulfment Hazards									
Entrapment Hazards									
<b>Personal Protective Equipment Required</b>									
Check	Type	Check	Type	Check	Type				
	Gloves (WORK)		Hearing Protection (Determine based on work Performed)		Hard Hat				
	Coveralls		Safety Glasses with Side Shields		Goggles may be used in place of glasses				
	Air Supplied Respirator		Air Purifying Respirator (3)	Acid	Org	DMF	N	R	P100
<b>Ventilation Requirements</b>									
	<b>Space Volume in cubic feet (Exact volume not determined due to configuration)</b>								
	<b>Natural circulation</b> - no atmospheric hazards in the space - additional ventilation may be required for worker comfort, hot work, grinding or other operations that would produce airborne fumes, mist or dust. Entry Supervisor must assess additional ventilation requirements based on tasks to be performed in the space prior to time of entry								
	<b>Mechanical ventilation</b> required for venting hazardous atmospheric contaminants								
When a forced ventilation of a confined space is required, at least three air exchanges should be provided before re-sampling.									
Cubic Feet of the Space			Cubic Feet of Space divided by Capacity Rate of Blower			Result multiplied by three to determine length of time for three air exchanges of the space to occur			
<b>Required Rescue &amp; Safety Equipment (check if required)</b>									
	Life Line					Man Winch			
	Body Harness					Fall Arrest Unit			
	Floor level opening barrier					Emergency Retrieval Line			

	Tripod or Anchor Point		Blower
	Class I, Division I, Group D Electrical Equipment (6)		Vent Saddle
	Powered Communication		Vent Trunks
	Portable Lighting		Ladder
	Atmospheric Monitor Make & Model	To be Determined	Emergency Escape Respirators

**Acceptable Entry Conditions**

	Confined Space Entry permit posted		Lockout electrical components in space
	Oxygen 19.5 – 23.5%		Lockout mechanical components in space
	Lower Explosive Level <10%		Lockout all pipes to and from space
	Toxic fumes/vapors less than PEL		Forced Mechanical Ventilation Established & Maintained (Based on Air Monitoring)
	No engulfing material in space		No hazardous chemicals or material
	Continuous Air Monitoring		Rescue Team Available (If Permit Required)
	Space Drained - Flushed		Pre-entry brief completed
	Max Internal temperature <u>105</u> °F		Minimum Internal Temperature _____ °F
	Training verified for supervisor, entrants and attendants		Training verified current for all Rescue Team Members

**Communication Procedures - between attendant & entrants**

Wireless Radio    Line Radios    Verbal from Access

**Rescue Procedures**

Self-Rescue    Non-entry Rescue    Rescue Team Entry

**Notes**

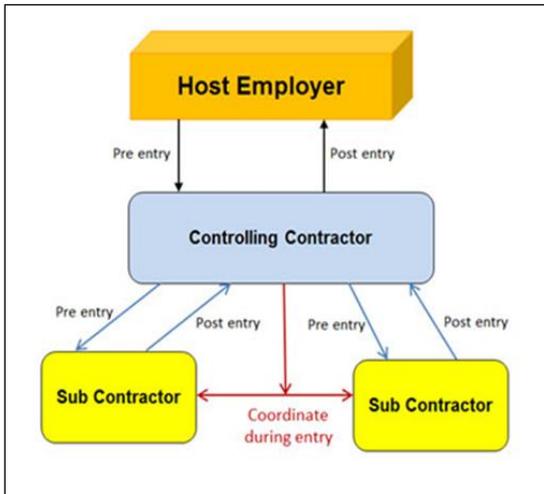
**APPENDIX C – UNIVERSITY OF LOUISVILLE CONFINED SPACE ENTRY PERMIT**

University of Louisville- CONFINED SPACE ENTRY PERMIT												
<b>ANY CHANGE IN THE CONFINED SPACES ENVIRONMENT, OR A LACK OF OCCUPANCY, SHALL REQUIRED NEW MONITORING PRIOR TO THE RE-COMMENCEMENT OF WORK.</b>												
SPACE TO BE ENTERED				LOCATION				SPACE #				
PURPOSE OF THE ENTRY												
DATE PERMIT ISSUED												
DURATION OF PERMIT / PERMIT CANCELLED TIME				BEGINNING TIME				ENDING TIME				
PRINT NAME OF ENTRY SUPERVISOR												
SPACE HAZARDS			YES	NO	NA	SPACE HAZARDS			YES	NO	NA	
ATMOSPHERIC						FALLS FROM HEIGHT						
MECHANICAL						HEAT						
ELECTRICAL						ADJACENT WORK						
CHEMICAL						WORK BEING PERFORMED						
ENGULFMENT						CONFIGURATION						
NOISE						OTHER						
HAZARD CONTROLS			YES	NO	NA	HAZARD CONTROLS			YES	NO	NA	
LOTO						CLEANING AND PURGING						
BLANK OR BLIND						ADDITIONAL WORK PERMITS						
NATURAL VENTILATION						CONTINUOUS AIR MONITORING						
MECHANICAL VENTILATION						OTHER						
EQUIPMENT NEEDED			YES	NO	NA	EQUIPMENT NEEDED			YES	NO	NA	
GLOVES						AIR MONITOR						
PROTECTIVE CLOTHING						AIR BLOWER						
SAFETY SHOES/BOOTS						FLOOD LIGHTS / FLASHLIGHTS						
HARD HAT						RADIOS / CELL PHONE						
SAFETY GLASSES/GOGGLES/ FACE SHIELD						GFCI						
LADDER						EYE WASH/SHOWER ACCESS						
FIRE EXTINGUISHER						HARNES USE						
FIRE BLANKETS/SHIELD						RESCUE PLAN						
ATMOSPHERIC TESTING												
MONITORING EQUIPMENT USED				MODEL				SERIAL #				
MONITOR CALIBRATION DATE				DATE								
PERSON PERFORMING TESTS (PRINT NAME)												
PERSON PERFORMING TEST (SIGNATURE)												
PERIODIC or CONTINUOUS TESTING (CHOOSE ONE)												
MONITORING												
Alarm set points		Air monitoring results must be recorded at least every 30 minutes										
Time:	INTL											8HR
O2	19.5/23.5%											
LEL	<10%											
CO	35 PPM											
H2S	10PPM											
SIGNATURES												
ENTRY SUPERVISOR												
ENTRANT(S)												
ATTENDANT												
RESCUER(S)												
OTHER(S)												

Rescue plans are to be provided by Industrial Safety and Training Services at the time of entry

### APPENDIX D – CONFINED SPACE CONTRACTOR REQUIREMENTS

OSHA has established the following specific requirements with respect to contractor work, as further summarized.



The rule makes the controlling contractor, rather than the host employer, the primary point of contact for information about permit spaces at the work site.

**Host employer** must provide information about work site permit spaces to controlling contractor, who passes info to other entry employers (whose employees will enter the spaces).

Controlling Contractor (General) provides information to Entry Employers (Sub-Contractors), and others affected:

- Information from Host Employer
- Any additional hazard information
- Permit space precautions

Controlling Contractor also debriefs host and entry employers/ exchanges information

Entry Employer (Contractors) must:

- Obtain information from Controlling Contractor
- Inform Controlling Contractor of permit program being followed, including information on created hazards

**Contact Department Manager Supervisor or OSH manager for DEHS (502) 852-2948 for assistance.**

**APPENDIX E – CONFINED SPACE RECLASSIFICATION FORM**

University of Louisville- Confined Space Reclassification Form										
<b>ANY CHANGE IN THE CONFINED SPACES ENVIRONMENT, OR A LACK OF OCCUPANCY, SHALL REQUIRED NEW MONITORING PRIOR TO THE RE-COMMENCEMENT OF WORK.</b>										
SPACE TO BE ENTERED			LOCATION			SPACE #				
PURPOSE OF THE ENTRY (May Not Create Hazard)										
DATE PERMIT ISSUED										
DURATION OF Entry (Max 12 hrs or 1 Shift)			BEGINNING TIME			ENDING TIME				
PRINT NAME OF ENTRY SUPERVISOR										
SPACE HAZARDS (AFTER ELIMINATION)			YES	NO	NA	SPACE HAZARDS (AFTER ELIMINATION)			YES	NO
ATMOSPHERIC						CAN THE SPACE BE RECLASSIFIED (SEE ASSESSME				
MECHANICAL						HEAT				
ELECTRICAL						ADJACENT WORK				
CHEMICAL						WORK BEING PERFORMED				
ENGULFMENT						CONFIGURATION				
NOISE						FALLS FROM HEIGHT				
ARE ALL ABOVE ANSEWERS "NO": <input type="checkbox"/> YES <input type="checkbox"/> NO ENTRY SUPERVOSOR SIGNATURE: _____										
HAZARD CONTROLS			YES	NO	NA	HAZARD CONTROLS			YES	NO
LOTO						CLEANING AND PURGING				
BLANK OR BLIND						ADDITIONAL WORK PERMITS				
NATURAL VENTILATION						CONTINUOUS AIR MONITORING				
MECHANICAL VENTILATION						OTHER				
ARE HAZARD CONTROLS EFFECTIVE?: <input type="checkbox"/> YES <input type="checkbox"/> NO ENTRY SUPERVOSOR SIGNATURE: _____										
EQUIPMENT NEEDED			YES	NO	NA	EQUIPMENT NEEDED			YES	NO
GLOVES						AIR MONITOR				
PROTECTIVE CLOTHING						AIR BLOWER				
SAFETY SHOES/BOOTS						FLOOD LIGHTS / FLASHLIGHTS				
HARD HAT						RADIOS / CELL PHONE				
SAFETY GLASSES/GOGGLES/ FACE SHI						GFCI				
LADDER						EYE WASH/SHOWER ACCESS				
FIRE EXTINGUISHER						HARNESS USE				
FIRE BLANKETS/SHIELD						RESCUE PLAN				
ATMOSPHERIC TESTING										
MONITORING EQUIPMENT USED			MODEL			SERIAL #				
MONITOR CALIBRATION DATE			DATE							
PERSON PERFORMING TESTS (PRINT NAME)										
PERSON PERFORMING TEST (SIGNATURE)										
PERIODIC or CONTINUOUS TESTING (CHOOSE ONE)										
MONITORING										
Alarm set points		Air monitoring results must be recorded at least every hour								
Time:	INTL									
O2 19.5/23.5%										
LEL <10%										
CO 35 PPM										
H2S 10PPM										
SIGNATURES										
ENTRY SUPERVISOR										
ENTRANT(S)										
ATTENDANT										
DEHS APPROVAL										

## APPENDIX F - BASIC CONFINED SPACE SCENARIO EXAMPLE STEPS

The following outlines a minimum basic Confined Space scenario but it *is not intended* to be *an all-inclusive outline* because other factors might come into play concerning a specific Confined Space.

### 1. PRE-ENTRY:

- a. The Supervisor in charge will review the most recent confined space hazard assessment and control of hazardous energy procedure to identify if the space qualifies for reclassification.
- b. If the space does qualify for reclassification, the supervisor must start the process of hazard elimination.
- c. If the space does not qualify for reclassification, ISTS Rescue Services must be contacted as soon as possible.
- d. After all hazards have been eliminated, the PRCS Reclassification Form must be completed and approved by DEHS
- e. The Supervisor or Attendant shall secure an Entry Permit before the start of the job and review it with the Authorizer.
- f. The Supervisor or the Attendant shall secure an atmosphere monitor and test the Confined Space before Entry at a minimum of the top, middle, and bottom. The person taking the readings shall document the readings on the Permit paperwork.
- g. All pre-work procedures shall be completed before work commences within the Confined Space. Pre-work procedures include, but are not limited to:
  1. Proper ventilation.
  2. Adequate lighting.
  3. Rescue procedures.
  4. Communications.
  5. Personal protective equipment & Lockout/Tagout of equipment.
  6. Atmosphere testing at top, middle, and bottom of space.
- h. All persons entering the Confined Space and the Attendant/Rescuer shall sign the Permit. Confined Space Safety Program **Appendix C**.
- i. The Permit shall be kept at the opening of the Confined Space while work is being performed.
- j. ISTS will be present and review each step with UofL for PRCS Entries

### 2. WORKING IN THE CONFINED SPACE:

**NOTE: This Permit is to be posted at the point of access to the Confined Space.**

- a. When initial atmosphere monitoring is completed, the monitor shall stay with the Entrants working in the Confined Space. The monitor shall be kept in close proximity of Entrant, so the alarm can be heard.
- b. Work may commence at this time.
- c. If the alarm is activated, monitor malfunctions, ventilation discontinues or lighting, all Entrants shall evacuate the Confined Space until the problem is solved.
- d. After the problem has been solved, the atmosphere in the Confined Space shall be retested at top, middle and bottom of the space before any entry is made.

### 3. COMPLETION OF WORK:

- a. After completion of work or end of the work shift, all persons working in the Confined Space and the Attendant/Rescuer shall sign out on the permit.
- b. The Confined Space will be closed and secured as it was before the Entry began.
- c. The Permit shall be returned to the DEHS office along with the atmosphere monitor.

**NOTE: Return completed and signed Permit to the DEHS Office when the work is done at the end of the day.**