Confined Space Entry Program
The issued confined space permits and this written program will be reviewed at a minimum annually per Colby College policy or as required under the Occupational Safety and Health Administration (OSHA) Permit-Required Confined Spaces (29 CFR 1910.146). The program and procedures are amended as necessary to address workplace changes which affect confined space entry procedures, including but not limited to the following:

- Confined space or process changes that present a new hazard/s;
- Identified program or procedure deviations or inadequacies.

When possible, revisions to this written program are made in the same month as the annual training.

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<th>REVISION</th>
<th>DESCRIPTION OF CHANGE</th>
<th>REVISION EFFECTIVE DATE</th>
<th>REVISION COMPLETED BY: NAME / COMPANY</th>
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<td>A</td>
<td>Initial program</td>
<td>12/2009</td>
<td>Bruce McDougal / Colby College</td>
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<td>B</td>
<td>Reformatted written program</td>
<td>04/2014</td>
<td>Wade Behnke / Colby College</td>
<td>Mark Crosby</td>
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<td>C</td>
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<td>Removed training quiz and log forms due to limited value</td>
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<td>Added Section 6.5.2 for new steam vault access procedures</td>
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APPENDICES:
Appendix A: Survey of Confined Spaces at Colby College
Appendix B: Colby College Confined Space Entry Permit
Appendix C: Colby College Confined Space Entry Equipment
1.0 PURPOSE
1.1 The purpose of this program is to establish safe work procedures and required practices to provide maximum protection to Colby College employees and contractors from the hazards associated with confined space entry. The Program complies with the requirements of Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1910.146, Permit Required Confined Spaces.

2.0 SCOPE
2.1 The Program applies to all Colby College employees or authorized contractors who are involved in the entry of confined spaces for repair, service, maintenance, installation, and inspection.

3.0 REFERENCE DOCUMENTS
3.1 OSHA, Permit Required Confined Spaces, 29 CFR 1910.146
3.2 Survey of Confined Spaces at Colby College (Appendix A)
3.3 Colby College Confined Space Entry Permit (Appendix B)
3.4 Colby College Confined Space Entry Equipment (Appendix C)

4.0 DEFINITIONS
4.1 Acceptable entry condition: Conditions that must exist in a permit space to allow entry at Colby College to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.
   4.1.1 Oxygen level within 20.3% to 20.8%
   4.1.2 No detectable toxic gases
   4.1.3 No detectable LEL
4.2 Attendant: An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant’s duties assigned in this program.
4.3 Authorized entrant: An employee who is authorized and trained by Colby to enter a permit space.
4.4 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.
4.5 Confined space: A space that:
   (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
   (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
   (3) Is not designed for continuous employee occupancy.
4.6 **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.

4.7 **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.

4.8 **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.

4.9 **Entry Permit (permit)**: The written or printed document that is provided by the employer to allow and control entry into a permit.

4.10 **Entry Supervisor**: The person (Engineer in Charge-CHP, & Supervisor of Mechanical and Electrical Service-Campus) 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.*

4.11 **Hazardous atmosphere**: An atmosphere that may expose employees to the risk of death, incapacitation, 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:

1. Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
2. Airborne combustible dust at a concentration that meets or exceeds its LFL;
   *NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.*
3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is provided by OSHA which could result in employee exposure in excess of its dose or permissible exposure limit. Potential toxic atmospheres at Colby College include the following:
   - Hydrogen sulfide from decaying organic matter (sewage)
   - Carbon monoxide from decaying organic matter or from the operation fuel burning equipment.
   - Various solvents from painting
   - Heavy metals from welding fumes
NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

(5) Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, section 1910.1200 of this Part, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

4.12 **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.

4.13 **Inerting:** 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.

4.14 **Isolation:** 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.

4.15 **Line breaking:** The 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.

4.16 **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.

4.17 **Oxygen deficient atmosphere:** Ambient air contains 20.8% oxygen. OSHA considers an atmosphere containing less than 19.5 percent oxygen by volume to be oxygen deficient. Colby does not allow entry into any confined spaces that are below 20.3% oxygen.

4.19 **Oxygen enriched atmosphere:** Per OSHA an atmosphere containing more than 23.5 percent oxygen by volume is considered oxygen enriched. Colby College does not allow entry above 20.8% oxygen.

4.20 **Permit-required confined space (permit space):** A confined space that has one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant;
3. 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
4. Contains any other recognized serious safety or health hazard.
4.21 **Permit-required confined space program (permit space program):** Colby's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

4.22 **Permit system:** Colby's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

4.23 **Prohibited condition:** Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

4.24 **Rescue service:** The personnel designated to rescue employees from permit spaces.

4.25 **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. When possible, retrieval systems must be used at Colby College regardless of the type of confined space. In spaces that have conditions that do not permit non-entry retrieval, such as spaces with piping, steam lines or large bends, all potential hazards must be removed before entry and the atmosphere monitored.

4.26 **Testing:** The 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.

## 5.0 RESPONSIBILITIES

5.1 Responsibilities for oversight and implementation of Colby College's Confined Space program are assigned below. Identified personnel may designate tasks assigned to them to a qualified employee or vendor, as appropriate.

5.2 **Environmental, Health, and Safety (EHS) Director**
- Oversee the surveying and identification of Colby's permit confined spaces;
- Provide as-needed assistance to the Confined Space Coordinators;
- Provide classroom training to affected employees in accordance with this Program and the OSHA standard;
- Conduct rescue training for applicable employees;
- Authorize and coordinate with contractors as deemed appropriate or as requested by the Confined Space Coordinators and Assistant Director for Operations;
- Maintain the written Program;
- Conduct an annual review of the program and issued permits to ensure effectiveness of the program; and
- Act as a backup entry supervisor for all of Colby College.

5.3 **Assistant Director for Operations, Physical Plant**
- In conjunction with the EHS Director, ensure that all contractors have the qualification and capabilities to meet the requirements of this plan and the OSHA Standard; and
- Act as a backup entry supervisor for all of Colby College.
5.4 **PPD Stockroom Manager**
- Store and maintain all necessary tools meters, rescue equipment associated with this plan; and
- Maintain copies of all completed entry permits for a minimum of 12 months.

5.5 **Steam Plant Engineer in Charge, Entry Supervisor (Steam Plant Only)**
- Ensure that all confined spaces have been identified, and labeled in the steam plant;
- Ensure that all affected Steam Plant employees have been trained before working under a confined space permit;
- Ensure affected employees entering confined spaces comply with the procedures in this plan and the OSHA Standard;
- Inspect and verify proper operation of confined space access equipment before allowing entry to the space; and
- Verify the atmospheric test record, authorize specific confined space entries and sign the permit as the entry supervisor before allowing Colby College employee access to any confined space operation within the Steam Plant.

5.6 **Supervisor of Mechanical and Electrical Services, Entry Supervisor (All confined spaces not located in the Steam Plant)**
- Ensure that all confined spaces have been identified, and labeled throughout campus with the exception of the Steam Plant;
- Ensure that all affected Colby College employees have been trained before accessing a confined space;
- Ensure affected employees entering confined spaces comply with the procedures in this plan and the OSHA Standard;
- Inspect and verify proper operation of confined space access equipment before allowing entry to the space; and
- Verify the atmospheric test record, authorize specific confined space entries and sign the permit as the entry supervisor before allowing Colby College employee access to any confined space operation on campus.

5.7 **Authorized Entrants**
- Complete annual confined space program training and fully understand the hazards of Colby College confined spaces;
- Recognize and react to symptoms of exposure;
- Always use the required equipment to access confined spaces;
- Maintain radio or verbal contact with the attendant at all times; and
- Follow the procedures listed in this plan and instructions from the Entry Supervisors or attendants.

5.8 **Authorized Attendants**
- Complete annual confined space program training and fully understand the hazards of Colby College confined spaces;
- Recognize and react to symptoms of hazard exposure and potential behavioral effects;
5.9 Outside Contractors

- When required, will submit their Confined Space Entry program procedures, in writing, to the EHS Director or PPD’s Assistant Director for Operations;
- Comply at all times with all requirements of this Program and OSHA Confined Space Entry regulations (Reference 3.1); and
- Comply with the safety requirements in Colby College’s Contractor Handbook.

6.0 PROCEDURE

6.1 All confined spaces located at the Colby College shall be investigated, inventoried and access shall be restricted/denied until the location has been cleared for entry in accordance with this policy.

6.1.1 The EHS Director and/or identified PPD Supervisors will survey all potential permit require confined spaces and catalog the space on Appendix A, Survey of Confined Spaces at Colby College.

6.1.2 All confined spaces at Colby College with potential or recognized safety hazards will be designated as a permit required confined spaces. If the hazard can be control before entry or by constant ventilation alternate entry procedures may be permissible.

6.1.3 All permit required confined spaces listed in Appendix A will be labeled as:

DANGER
Permit-Required Confined Space
DO NOT ENTER

6.2 The hazards associated with entry into a confined space vary in degree (from least severe to the most severe) as follows:

1. A non-permit space which does not contain any serious safety hazard;
2. A permit-required space in which all hazards are eliminated through lockout/tagout or ventilation prior to entry;
3. A permit space wherein the only hazard is atmospheric, and for which continuous, forced-air ventilation alone is sufficient to control; and
4. A permit space that contains or has the potential to contain, both atmospheric and non-atmospheric (physical) hazards.

6.3 Permit Required Confined Spaces
6.2.1 To access a permit required confined space the following steps must be completed:

- The entry supervisor shall perform a visual inspection of the permit-required confined space, document the general purpose of entry, nature of hazards on the entry permit, and shall conduct or verify pre-entry air monitoring to determine if the space contains a hazardous atmosphere and document all results on the Confined Space Permit (Appendix B). If the space is deep and may contain air layers, the entry supervisor will test atmosphere every four feet.

- If the permit-required confined space is determined by the Entry Supervisor as safe for entry, then a permit will be issued. A permit will not be if issued if the space has a significant variations in oxygen levels (-.5% & +0%), detectable LEL, or detectable chemical exposure. If a permit is denied, the EHS Director will identify the measures to be taken in order for a permit to be awarded and entry into the permit-required confined space shall be prohibited until EHS Director deems the space safe for entry and issues a permit;

- If an entry permit is awarded, the Entry Supervisor shall complete and post the entry permit at the entry portal of the permit-required confined space before any employees enter the space. If the permit cannot be posted the entry supervisor will maintain the completed copy at the entrance;

- The authorized entrant shall wear a gas meter issued by the PPD stockroom for continuous air monitoring of the atmosphere in the permit-required confined space. When work is complete, the authorized entrant shall return the personal four gas meter to the stockroom;

- Only the assigned tasks or activities identified on the permit shall be conducted within the permit-required space and the duration of the permit may not exceed the time required to complete those assigned tasks or activities. If the assigned work goes beyond the planned time period or work tasks/activities other than those identified on the permit become necessary, the entrant shall leave the space and inform the Entry Supervisor of the expiration of the permit or of the newly proposed work tasks or activities. The Entry Supervisor shall re-evaluate the space in regard to the proposed work task or activity and modify the permit;

- Prior to entry the entry supervisor or attendant will notify the Security Department via radio to verify reception and provide basic details on the entry;

- The Entry Supervisor shall supervise the entry team’s implementation of the means, procedures and practices necessary
for safe entry operations which include, but are not limited to, the following:

- Isolating the permit space by blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; using a double block and bleed system; using lockout or tagout procedures; or blocking or disconnecting all mechanical linkages;
- Purging, flushing, or ventilating the permit-required confined space as necessary to eliminate or control atmospheric hazards; and
- Providing pedestrian, vehicle, or other barriers (e.g., barricades, tape) to protect entrants from external hazards whenever a permit-required space is entered; and

6.4 Temporary Reclassification of Permit Confined Spaces

6.4.1 Under certain conditions, select spaces may temporarily reclassified from a permit-required confined space to non-permit-required space. This action can facilitate entry into the space by reducing the entry requirements (retrieval gear). The specific conditions necessary to allow this temporary reclassification are as follows:

- All hazards within the permit space are eliminated prior to entry through isolation techniques (e.g., lockout/tagout, line blocking, purging) which must be accomplished without having to enter the space;
- The space poses no atmospheric hazard (actual or potential) during entry. Any atmospheric hazard eliminated shall remain eliminated throughout the duration of the entry operation. Note: The use of continuous forced air ventilation to control an atmospheric hazard does not “eliminate” the hazard and thus does not constitute compliance with this condition;
- The Entry Supervisor shall test the atmosphere from outside the space and document this reclassification on the Confined Space Permit and that all hazards in the space have been eliminated. The Confined Space Permit is then made available to all employees entering the space by posting of the permit at the entry point to the space; and
- The reclassification remains valid only for as long as the hazards remain eliminated. If a hazard is detected during entry, all employees will immediately evacuate the space and the Entry Supervisor and EHS Director will evaluate the space to determine how the prohibited conditions developed and implement measures to eliminate the prohibited conditions and prevent its recurrences before any subsequent re-entry.
6.5 Alternate Entry Procedures for Permit-Required Confined Spaces

6.5.1 Alternate entry procedures can be used to access the confined spaces listed in Appendix A. Alternative entry procedures are applicable only if the hazard present in a confined space is an **actual or potential atmospheric hazard that can be controlled through continuous ventilation alone**.

6.5.2 Steam vaults must be managed under the requirements below. Specifically, when working directly on live steam lines, valves or pumps, steam must be shut down at the CHP prior to entry into a confined space. This does not apply when for visual observations only.

- Verify that the only hazard posed by the space is an actual or potential hazardous atmosphere, and that any hazards involving high noise levels, lockout-tagout, drowning, excessive heat or cold, slips, trips, fall or other hazards have been eliminated;
- Ventilate the space for 30 minutes prior to entry and throughout the time period while operations are being completed in the space;
- Before entering the space the designated Entry Supervisors shall test the atmosphere for oxygen content, flammable gases and vapors and potential toxic air contaminants to ensure there is no hazardous atmosphere in the space;
- Authorized entrant shall wear a personal gas meter for the duration of the work being performed in the space;
- Any spaces with a vertical entrance (manhole) are guarded with railing before entry;
- An attendant will remain outside of the space and in communication with the employees in the space throughout the duration of the operation; and
- All alternate entry requirements have been met and documented on the Confined Space Permit.

6.6 Contractors

- If an outside contractor is hired to perform work within a permit-required confined space at Colby College, the PPD Project Manager shall contact EHS Director or Confined Space Entry Supervisors to inform the vendor on the potential hazards.
- When only contracted employees are entering the space, it is the responsibility of the contractor to provide all necessary equipment and personal to meet the requirements of OSHA and this policy. Colby supervision will at no time provide equipment or supervise contractor only confined space entries.
- When employees from the College and the Contractor will be working together in or near permit-required confined space(s), the entry supervisor shall coordinate entry operations with the entry supervisor of the outside contractor and Colby equipment will be used.
6.7 Rescue and Emergency Service

6.7.1 Colby College employees will only perform non-entry rescues from permit required confined spaces in the event of an emergency.

- Each entrant into a permitted confined space shall wear retrieval gear consisting of a body harness and retrieval line attached to a rescue tripod which can be operated by the attended outside the space. The specific entry equipment is detailed in Appendix E. **Note: the use of the retrieval gear is not required in confined spaces where the hazard has been eliminated or is only atmospheric and controlled with ventilation.**

- Prior to donning the gear the employee must inspect the harness, retrieval line and retrieving device to ensure that it is operational.

- If in the course of his/her duties outside a permit-required confined space, an attendant becomes aware that an entrant needs assistance in escaping from the space, the attendant shall retrieve the employee by using the retrieval device on the tripod. **Attendants shall never enter the space to attempt a rescue and always remain outside the permit-required confined space during entry operations until relieved by another attendant.**

- The Attendant will notify Security by two-way radio as soon as possible if a rescue is required/performed.

- The EHS Director must be informed anytime a Colby employee is rescued from a confined space.

6.7.2 If Colby College cannot complete the rescue due to equipment failure or other complications the Waterville Fire Department shall perform permit-required confined space rescue in accordance with 29 CFR 1910.146(k)(1).

- The entry supervisor shall inform the Waterville Fire Department of the hazards they may confront when called upon to perform a permit-required confined space rescue.

7.0 TRAINING

7.1 The EHS Director will provide annual training of the requirements of this plan, confined spaces at Colby College and OSHA 1910.146. This training is provided to each employee serving as an authorized entrant, attendant, and entry supervisor during any type of confined space operation.

7.2 The purpose of this training is to provide the individual with an understanding, knowledge and the skills necessary for:

- Colby College specific confined spaces and policies;
- Use of confined space access equipment;
- Hazardous atmospheres and monitoring equipment;
- Safe entry into a permit-required and non-permit required confined space; and
- Rescue operations and equipment.

7.3 Training shall be provided as follows:
7.4 Training programs shall establish employee proficiency in the duties required of authorized entrants, attendants and entry supervisors. Training programs and records shall be maintained by Environmental Health and Safety for three years subsequent to the initial training period.

8.0 RECORDS

8.1 Current copies of this plan will be maintained in the office of each Entry Supervisor and the EHS Director.

8.2 Training records will be retained by the EHS Director until the next training is received by the employee.

8.3 The completed Confined Space Access permits will be maintained for a minimum of three years.

9.0 ENFORCEMENT

9.1 Colby College employees who fail to follow the responsibilities and procedures described in this Program will be subject to disciplinary action.
APPENDIX A: SURVEY OF CONFINED SPACES AT COLBY COLLEGE
APPENDIX B: COLBY COLLEGE CONFINED SPACE ENTRY PERMIT
APPENDIX C: CONFINED SPACE ENTRY EQUIPMENT