Confined Space Entry Training for Decentralized Wastewater Workers

Safety and Health Investment Project (SHIP)

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Confined Spaces
Resources
Chapter 296-809 WAC

Helpful Tools

Rules in Other Chapters that Cover Confined Spaces

General Safety and Health Standards, Chapter 296-24

- WAC 296-24-69507, Confined Spaces
- WAC 296-24-70007, Work in Confined Spaces
- WAC 296-24-71507, Work In Confined Spaces
- WAC 296-24-71509 through -71519, Ventilation in Confined Spaces
- WAC 296-24-960(10), Working on or near Exposed Energized Parts

Safety Standards for Telecommunication, Chapter 296-32

- WAC 296-32-340, Underground lines a cable vaults

Safety Standards for Electrical Workers, Chapter 296-45

- WAC 296-45-205, Enclosed Spaces
- WAC 296-45-215, Underground Electrical Installations
- WAC 296-45-225, Underground Residential Distribution (URD)

Safety Standards for Longshore and Stevedore, Chapter 296-56

- WAC 296-56-60053, Hazardous Atmospheres and Substances
- WAC 296-56-60235(2), Welding, Cutting (hot work)
- WAC 296-56-60235(6), Welding, Cutting (hot work)

Pulp, Paper, and Paperboard Mills and Converters, **Chapter 296-79**

- WAC 296-79-230, Vessel or Confined Area Requirements

Safety Standards for Grain Handling Facilities, Chapter 296-99

- WAC 296-99-040 What practices must an employer follow for entry into grain storage structures

Safety Standards for Construction Work, Chapter 296-155

- WAC 296-155- 203 and 20307, Confined Spaces
- WAC 296-155-280 (1)(b) and 280(5)(d)(ii), Temporary Heating Devices
- WAC 296-155-410(7), Welding and Cutting Fire Prevention
- WAC 296-155-415(2), Ventilation and Protection in Welding, Cutting, and Heating
- WAC 296-155-415(3), Ventilation and Protection in Welding, Cutting, and Heating
- WAC 296-155-655, General Protection Requirements
- WAC 296-155-657, Requirements for Protective Systems
- WAC 296-155 part Q, Underground Construction

Safety Standards for Shipyards, Ship Breaking and Repair, Chapter 296-304

- WAC 296-304-01005, Competent Person
- WAC 296-304-020 through 02015, Confined and Enclosed Spaces and other dangerous Atmospheres in Shipyard Employment
- WAC 296-304-030 through -03009, Surface Preparation and Preservation
- WAC 296-304-040 through -04013, Welding, Cutting, and Heating
- WAC 296-304-080 through -08011, Tools and Related Equipment

Safety Standards for Fire Fighters, Chapter 296-305

- WAC 296-305-05003, Confined Space Rescue Operations

Example Confined Space Entry Programs
Use with the Confined Spaces book, Chapter 296-809 WAC

These example confined space entry programs are provided for your information, and to help you determine the information needed for your program.

To develop an effective program for your facility or work environment, you will need to identify work conditions both typical to your industry and unique to your workplace. You also need to consider other rules. For a list of rules in other chapters that cover confined spaces, see the Resources section of the Confined Spaces book.

Example Confined Space Entry Program for Sewer Entry
The sections that follow apply only to permit-required confined space entry. The information on alternate entry has been identified with a title.

POTENTIAL HAZARDS
Check the boxes after you have reviewed your workplace for these hazards.

Employees could be exposed to the following:

□ **Engulfment and drowning**

□ **Presence of toxic gases**
Equal to or more than 10 ppm hydrogen sulfide measured as an eight-hour time-weighted average. If the presence of other toxic contaminants is suspected, specific monitoring programs will be developed.

□ **Presence of explosive/flammable gases**
Equal to or greater than ten percent of the lower flammable limit (LFL)

□ **Oxygen deficiency**
A concentration of oxygen in the atmosphere equal to or less than 19.5% by volume.

ENTRY PERMITS
Review the information in this section.

- All sewers are considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise.
- Any employee required or permitted to pre-check or enter a sewer has successfully completed, at a minimum, the training outlined in our training procedures.
- A written copy of operating and rescue procedures as required by these procedures is at the worksite for the duration of the job.
- The sewer entry permit is completed before approval can be given to enter a sewer.
- The permit verifies completion of items required to protect employees.
- The permit is kept at the job site for the duration of the job.
- If circumstances cause an interruption in the work or a change in the alarm conditions for which entry was approved, a new sewer entry permit needs to be completed.

CONTROL OF ATMOSPHERIC AND ENGULFMENT HAZARDS

Review the information in this section.

Surveillance

- The surrounding area is surveyed to avoid hazards such as drifting vapors from tanks, piping, or sewers.

Testing

- The sewer atmosphere is tested to determine whether dangerous air contamination or oxygen deficiency exists.
- A direct reading gas monitor is used.
- Testing is performed by a supervisor who has successfully completed the gas detector training for the monitoring method used.
- The minimum parameters to be monitored are oxygen deficiency, Lower Flammable Level (LFL), and hydrogen sulfide concentration.
- A written record of the pre-entry test results is made and kept at the worksite for the duration of the job.
- Affected employees are able to review the testing results.
- The most hazardous conditions will determine when work is being performed in two adjoining, connected spaces.

Space ventilation

- Mechanical ventilation systems, where required, are set at one hundred percent of the outside air.
- Where possible, open additional manholes to increase air circulation.
- Use portable blowers to increase natural circulation if needed.
- After a suitable ventilation period, repeat the testing.
- Entry may not begin until testing has demonstrated that the hazardous atmosphere has been eliminated or controlled.

ENTRY PROCEDURES

Review the information in this section.

Table HT-1

Entry Procedures for Confined Space Conditions

If you have any of the following conditions	Then follow these procedures
Testing demonstrates the existence of dangerous or deficient conditions and additional ventilation cannot reduce concentrations to safe levels	- All personnel are trained - A self-contained breathing apparatus is worn by any person entering the sewer. - At least one worker stands by the outside of the sewer ready to give assistance in case of emergency. - The rescue worker has a self-contained breathing apparatus available for immediate use. - There is at least one additional worker within sight or call of the standby worker. - Continuous powered communications is maintained between the worker within the sewer and standby personnel.
The atmosphere tests as safe but unsafe conditions can reasonably be expected to develop	
It is not feasible to provide for immediate exit from spaces equipped with automatic fire suppression systems and it is not practical or safe to deactivate such systems	
An emergency exists and it is not feasible to wait for pre-entry procedures to take effect	

ALTERNATE ENTRY

Review the information in this section.

Certification

- Sewers may be entered without the need for a written permit or attendant if the space can be maintained in a safe condition for entry by mechanical ventilation alone.
- All sewers are considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise.
- Any employee required or permitted to pre-check or enter a sewer will have successfully completed, at a minimum, the training outlined in our training procedures.
- A written copy of operating and rescue procedures as required by these procedures needs to be at the worksite for the duration of the job.
- The sewer pre-entry checklist is completed by the lead worker before entry into a sewer. This list verifies completion of items listed below. This checklist is kept at the job site for the duration of the job.

- If circumstances dictate an interruption in the work, reevaluate the sewer and complete a new checklist.

Control of atmospheric and engulfment hazards

- Pumps and lines:
  - All pumps and lines which may reasonably cause contaminants to flow into the sewer are disconnected, blinded, and locked out, or effectively isolated by other means to prevent development of dangerous air contamination or engulfment.
  - Not all lateral lines to sewers or storm drains require blocking. However, where experience or knowledge of use indicates a reasonable potential for contamination of air or engulfment into an occupied sewer, then all affected lateral lines are to be blocked.
  - If blocking or isolation requires entry into the sewer, the provisions for entry into a permit-required confined space are implemented.
- Surveillance:
  - The surrounding area is surveyed to avoid hazards such as drifting vapors from the tanks, piping, or sewers.
- Testing:
  - The atmosphere within the sewer will be tested to determine whether dangerous air contamination or oxygen deficiency exists.
  - Detector tubes, alarm only gas monitors, and explosion meters are examples of monitoring equipment that may be used to test sewer atmospheres.
  - Testing is performed by a lead worker who has successfully completed the gas detector training for the monitoring method to be used.
  - The minimum parameters to be monitored are oxygen deficiency, LFL, and hydrogen sulfide concentration.
  - A written record of the pre-entry test results are made and kept at the worksite for the duration of the job.
  - The supervisor will certify in writing, based upon the results of the pre-entry testing, that all hazards have been eliminated or controlled.
  - Affected employees are able to review the testing results.
  - The most hazardous conditions will determine when work is being performed in two adjoining, connecting spaces.

Entry procedures

When entering without permit or an attendant, entry into and work within may proceed if:

- There are no non-atmospheric hazards present
- The pre-entry tests show there is no dangerous air contamination or oxygen deficiency within the space; and there is no reason to believe that any is likely to develop
- Continuous testing of the atmosphere in the immediate vicinity of the workers within the space is accomplished
- Workers will immediately leave the sewer when any of the gas monitor alarm set points are reached as defined
- Workers will not return to the area until a supervisor who has completed the gas detector training has used a direct reading gas detector to evaluate the situation and has determined that it is safe to enter.
- If you are entering a space without a permit or an attendant

- Arrangements for rescue services are not required for entries that do not require a permit.
- See the “rescue” section for instructions regarding rescue planning where an entry permit is required.

RESCUE

Review the information in this section and check the boxes that apply.

- □ Call the local rescue services for rescue**.**
- □ Rescue entries into sewers are made only by trained and properly equipped personnel.
- □ If immediate hazards to injured personnel are present, workers at the site implement emergency procedures without entering the sewer.
- □ Continuous gas monitoring is performed during all sewer entry operations. If alarm conditions occur, entry personnel exit the sewer and a new sewer entry permit is issued.
- □ When dangerous air contamination is attributable to flammable or explosive substances, lighting and electrical equipment needs to be Class 1, Division 1 rated per National Electrical Code (NEC) and no ignition sources may be introduced into the area.
- □ When it is practical, the full-body harness is used to suspend a person upright and a hoisting device or similar apparatus is available for lifting workers out of the sewer.
- □ If at any time the use of a hoisting device or full-body harness and attached lifeline may endanger the worker, their use may be discontinued.

- *Review and follow the requirements for any of the situations in Table HT-2, Procedures for Removing Workers from Sewers.*

Table HT-2
Procedures for Safely Removing Workers from Sewers

If	Then
There is any questionable action or non- movement by the worker inside	− Perform a verbal check. − Immediately remove the worker from the sewer if there is no response or a questionable response from them
The worker is disabled due to falling or impact	− Do not remove the worker from the sewer unless there is immediate danger to the worker's life. − Notify local rescue personnel immediately. − Make sure the standby worker doesn't enter the sewer in this case. ▪ Only trained rescue personnel (wearing self-contained breathing apparatus-SCBA) may enter to perform a rescue. − Make sure all workers entering the space use a full- body harness with attached lifeline with the free end of the line secured outside the entry opening. − Make sure the standby worker uses the lifeline to attempt to rescue a disabled worker without entering the space and summons rescue services based on their assessment of the situation.

Example Confined Space Entry Program for Meat and Poultry Rendering Plants

Cookers and dryers are horizontal, cylindrical vessels equipped with a center, rotating shaft and agitator paddles or discs. If the inner shell is jacketed, it is usually heated with steam at pressures up to 150 psig (1034.25 kPa). The rotating shaft assembly of the continuous cooker or dryer is also steam heated.

Cooker and dryer operations can be either batch or continuous. Multiple batch cookers are operated in parallel. When one unit of a multiple set is shut down for repairs, make means available to isolate that unit from the others which remain in operation.

POTENTIAL HAZARDS
Check the boxes after you have reviewed your workplace for these hazards.

The recognized hazards associated with cookers and dryers include the risk that employees could be:

□ Struck or caught by rotating agitator.
□ Engulfed in raw material or hot, recycled fat.
□ Burned by steam from leaks into the cooker/dryer steam jacket or the condenser duct system if steam valves are not properly closed and locked out.
□ Burned by contact with hot metal surfaces, such as the agitator shaft assembly, or inner shell of the cooker/dryer.
□ Subjected to heat stress caused by warm atmosphere inside cooker/dryer.
□ Injured by slipping and falling on grease in the cooker/dryer.
□ Electrically shocked by faulty equipment taken into the cooker/dryer.
□ Burned or overcome by fire or products of combustion.
□ Overcome by fumes generated by welding or cutting done on grease covered surfaces.

Permits

- The supervisor is always present at the cooker/dryer or other permit entry confined space when entry is made.
- The supervisor:
  - Follows the pre-entry isolation procedures described in the entry permit when preparing for entry,
    and
  - Makes sure the protective clothing, ventilating equipment, and any other equipment required by the permit are at the entry site.
- The permit specifies how isolation is accomplished and any other preparations needed before making entry. This is especially important in parallel arrangements of cooker/dryers
  so you don't have to shut down the entire operation to allow safe entry into one unit.

CONTROL OF HAZARDS

Check the boxes that apply after you have addressed the hazards below.

Mechanical

□ Lock out main power switch to agitator motor at main power panel.
□ Affix tag to the lock to inform others that a permit confined space entry is in progress.

Engulfment

□ Close all valves in the raw material blow line.
□ Secure each valve in its closed position using chain and lock.
□ Attach a tag to the valve and chain warning that a permit confined space entry is in progress.
□ The same procedure is used for securing the fat recycle valve.

Burns and heat stress

□ Close steam supply valves to jacket and secure with chains and tags.
□ Insert solid blank at flange in cooker vent line to condenser manifold duct system.
□ Vent cooker/dryer by opening access door at discharge end and top center door to allow natural ventilation throughout the entry.
□ If faster cooling is needed, use a portable ventilation fan to increase ventilation.
□ Cooling water may be circulated through the jacket to faster reduce both outer and inner surface temperatures of cooker/dryers.
□ Check air and inner surface temperatures in cooker/dryer to assure they are within acceptable limits before entering, or use proper protective clothing.

Fire and fume hazards

□ Careful site preparation, such as cleaning the area within four inches (10.16 cm) of all welding or torch cutting operations, and proper ventilation are the preferred controls.
□ All welding and cutting operations are required to be done based on WISHA's Welding standard, chapter 296-24 WAC, Part I, Welding, cutting, and brazing (found in another book).
□ Proper ventilation may be achieved by local exhaust ventilation, or the use of portable ventilation fans, or a combination of the two practices.

Electrical shock

□ Electrical equipment used in cooker/dryers needs to be in serviceable condition.

Slips and falls

□ Remove residual grease before entering cooker/dryer.

Attendant

□ The supervisor is the attendant for employees entering cooker/dryers.

Rescue

□ When necessary, the attendant calls the employer's trained rescue team or the local fire services as previously.

Example Confined Space Entry Program for Workplaces where Portable Tanks are Fabricated or Serviced

During fabrication
These tanks and dry-bulk carriers are entered repeatedly throughout the fabrication process. These products are not configured identically, but the manufacturing processes by which they are made are very similar.

Sources of hazards
In addition to the mechanical hazards arising from the risks that an entrant would be injured due to contact with components of the tank or the tools being used, there is also the risk that a worker could be injured by breathing fumes from welding materials or mists or vapors from materials used to coat the tank interior. In addition, many of these vapors and mists are flammable, so the failure to properly ventilate a tank could lead to a fire or explosion.

Control of hazards
- Welding
  - Use local exhaust ventilation to remove welding fumes once the tank or carrier is completed to the point that workers may enter and exit only through a manhole. (Follow the requirements of chapter 296-24 WAC, Part I, Welding, cutting and brazing, found in another chapter).
  - Do not ever bring welding gas tanks into a tank or carrier that is a permit entry confined space.
- Application of interior coatings/linings
  - Control atmospheric hazards by forced air ventilation sufficient to keep the atmospheric concentration of flammable materials below ten percent of the lower flammable limit (LFL) (or lower explosive limit (LEL), whichever term is used locally).
  - Provide the appropriate respirators and use them in addition to providing forced ventilation when the forced ventilation doesn't maintain acceptable respiratory conditions.

Permits
Because of the repetitive nature of the entries in these operations, an "area entry permit" will be issued to cover production areas where tanks are fabricated so that entry and exit are through manholes.

Authorization
Only the area supervisor may authorize an employee to enter a tank within the permit area. The area supervisor determines that conditions in the tank trailer, dry-bulk trailer, or truck, for example, meet permit requirements before authorizing entry.

Attendant

- The area supervisor designates an employee to maintain communication by employer specified means with employees working in tanks to make sure they're safe.
- The attendant may not enter any permit confined space to rescue an entrant or for any other reason, unless authorized by the rescue procedure and, and even then, only after calling the rescue team and being relieved by an attendant by another worker.

Communications and observation

- Communications between the attendant and entrants has to be maintained throughout entry.
- Methods of communication that may be specified by the permit include voice, voice- powered radio, tapping or rapping codes on tank walls, and signaling tugs on a rope.
- The attendant's need to observe the work activities such as chipping, grinding, welding, spraying, for example, that require deliberate operator control to make sure they continue normally.
- These activities often generate so much noise that the necessary hearing protection makes communication by voice difficult.

Rescue Procedures

Acceptable rescue procedures include entry by a team of employee-rescuers, use of public emergency services, and procedures for breaching the tank.

- The area permit specifies which procedures are available, but the area supervisor makes the final decision based on circumstances.

Note:

Certain injuries may make it necessary to breach the tank to remove a person rather than risk additional injury by removal through an existing manhole.

- The supervisor makes sure that no breaching procedure used for rescue would violate terms of the entry permit.
- For example, if the tank has to be breached by cutting with a torch, the tank surfaces to be cut need to:
    - Be free of volatile or combustible coatings within four inches (10.16 cm) of the cutting line
      and
    - The atmosphere within the tank has to be below the LFL.

Retrieval line and harnesses

- The retrieval lines and harnesses generally required under this rule are usually impractical for use in tanks. The internal configuration of the tanks and their interior baffles and other structures would prevent rescuers from hauling out injured entrants.
- However, unless the rescue procedure calls for breaching the tank for rescue, the rescue team needs to be trained in the use of retrieval lines and harnesses for removing injured employees through manholes.

REPAIR OR SERVICE OF "USED" TANKS AND BULK TRAILERS

Sources of hazards

In addition to facing the potential hazards encountered in fabrication or manufacturing, tanks or trailers which have been in service may contain residues of dangerous materials, whether left over from the transportation of hazardous cargoes or generated by chemical or bacterial action on residues of non-hazardous cargoes.

Control of atmospheric hazards

A "used" tank needs to be brought into areas where tank entry is authorized only after the tank has been emptied, cleansed of any residues without employee entry, and purged of any potential atmospheric hazards.

Welding

- In addition to tank cleaning for control of atmospheric hazards, coating and surface materials need to be:
  - Removed four inches (10.16 cm) or more from any surface area where welding or other torch work will be done
    and
  - Make sure the atmosphere within the tank remains well below the LFL.
- Follow the requirements of chapter 296-24 WAC, Part I, Welding, cutting and brazing, found in a separate book, at all times.

Permits

- An entry permit needs to be issued prior to authorization of entry into used tank trailers, dry- bulk trailers, or trucks.
- In addition to the pre-entry cleaning requirement, this permit needs to require the employee safeguards specified for new tank fabrication or construction permit areas.

Authorization

- Only the area supervisor may authorize an employee to enter a tank trailer, dry-bulk trailer, or truck within the permit area.
- The area supervisor determines that the entry permit requirements have been met before authorizing entry.

Confined Space Entry Programs
Use with the Confined Spaces book, Chapter 296-809 WAC

This helpful tool gives you examples of confined space entry programs, including a fill-in-the- blank form, for different workplace situations. The examples are provided to help you determine what information to include in a program for your workplace.

The examples include:

- A fill-in-the-blank template
- 3 examples showing content information to consider for the following specific workplaces:
  - Sewer spaces
  - Meat and poultry rendering plants
  - Portable tank fabricating or servicing

You are responsible for implementing and maintaining your written program.

FILL-IN-THE-BLANK TEMPLATE

The following is a fill-in-the-blank template for a confined space entry program. You are responsible for:

- Providing the actual content
  and
- Implementing and maintaining your written program.

Complete this document by adding your specific information to meet the requirements of WAC 296-809-30002, *Develop a written permit-required confined space program.*

(Insert company name)

CONFINED SPACE ENTRY PROGRAM OVERVIEW

This confined space entry program:

Identifies all permit-required confined spaces in our workplace and
Describes our procedures for worker safety and health in permit-required confined spaces

Employees will participate in developing and implementing the program in the following ways:
(Insert how your employees will participate)

_____

_____

_____

_____

(Insert company name) _____ will treat all confined spaces as permit-required spaces until they have been evaluated **and** are documented to be nonpermit.

ROLES & RESPONSIBILITIES

The following shows which employees are responsible for the tasks outlined:

For information only
Remove this box from your completed program

In addition to the roles below, you may want to designate:

- Someone with overall responsibilities for your program
  or
- One person with all the responsibilities.

Responsibility:	**Person assigned this responsibility:**
Evaluate our work locations and determine: ✓ [Check appropriate box(es)] • Confined space(s) exist at the worksite. • Permit-required confined space(s) exist at the worksite.	
Evaluate the confined space(s) to determine whether hazards are present.	
Evaluate hazards and determine the appropriate entry procedure for the space. **Note:** • Until evaluated and documented otherwise, all confined spaces will be considered permit-required spaces. • Alternate entry procedure may apply when the only hazard remaining in the space is a potential hazardous atmosphere controlled by the use of forced air ventilation.	
Re-evaluate the space when the use, configuration, or hazards of a confined space change.	
Monitoring and testing as follows: • Conduct initial monitoring to identify and evaluate any potentially hazardous atmospheres • Complete atmospheric testing in the following order: – Oxygen – Combustible gases – Toxic gases and vapors • Record the data *(specify location)* • Keep these records on-site in *(Specify location*	
Inform exposed or potentially-exposed employees of the existence and hazards of confined spaces using the methods described below under "Control Confined Space Entry."	

Provide employees entering confined spaces, or their designated representative, an opportunity to observe pre-entry testing and any subsequent testing.	
- All test results will be provided to the entrants or their representatives upon request. - The space will be re-evaluated if entrants or their representatives believe that the permit space was inadequately tested.	
Make sure that all equipment needed for safe entry into any confined space is available and in proper working order.	
Conduct a review using the canceled entry permits to identify and correct any deficiencies in our program.	

IDENTIFY CONFINED SPACES AND HAZARDS

The following table provides a list of our confined spaces and hazards:

For information only
Remove this box from your completed program.

If you have a list of confined spaces and their hazards, you can attach it instead of completing this table.

Confined Spaces and Hazards

Confined Space (name or number)	**Type of Space** (tank, hopper, sump, pit etc.)	**Location**	**Hazards**
(Insert your confined space information)			

CONTROL OF CONFINED SPACE ENTRY

We use the following method(s) to inform employees about the existence and hazards of confined spaces, and prevent unauthorized entry:

- ✓ (Check appropriate box(es))
- □ Posting danger signs at each permit space reading "Danger-Confined Space - Do Not Enter"

(Insert additional means you use to prevent entry)

_____

_____

_____

For information only
Remove this box from your completed program

The methods used to prevent entry must be effective. The following are examples of effective methods:

- Using barriers
- Specialized tools under management's control to open the space
- Supplementing these measures with training and signs

PERMIT ENTRY PROCEDURES

Our entry procedures for permit spaces include the following:

For information only
Remove this box from your completed program

Examples of entry permits are included in the resource section.

You may have multiple entry procedures. Specific examples of some of the procedures you may use to enter and complete work include the following:

-Procedure 001 Lockout/Tagout (LOTO)
-Procedure 002 Atmospheric monitoring
-Procedure 003 Job Hazard Analysis

ALTERNATE ENTRY PROCEDURES

For information only
Remove this box from your completed program.

Complete this section **only** when using alternate entry.

Our permit spaces that have as their only hazard an actual or potential hazardous atmosphere may use alternate entry procedures. These alternate entry procedures do not require the use of an entry permit.

Alternate entry procedures can be used for the spaces listed in the following table:

Confined Space Name or Number	Hazards	Method of Hazard Elimination	Potential Hazardous Atmosphere	Ventilation Equipment Required
(insert your specific information)				

We will do all of the following when using alternate entry procedures:

- Eliminate unsafe conditions before removing entrance covers.
  - After removing entrance covers, promptly guard the opening with a railing, temporary cover, or other temporary barrier to prevent accidental falls through the opening and protect entrants from objects falling into the space.
  - Certify that pre-entry measures have been taken (such as safe removal of the cover and having protection needed to gather pre-entry data), with the date, location of the space, and signature of the person certifying.
  - Make the pre-entry certification available to each entrant before entry.
- Before an employee enters the confined space, test the internal atmosphere with a calibrated, direct-reading instrument for all of the following, in this order:
  1. Oxygen content
  2. Flammable gases and vapors
  3. Potential toxic air contaminants.

- Provide entrants, or their authorized representatives, with an opportunity to observe the pre-entry and periodic testing.
  - Make sure the atmosphere within the space is not hazardous when entrants are present.
- Use continuous forced air ventilation, as follows:
  - Wait until the forced air ventilation has removed any hazardous atmosphere before allowing entrants into the space.
  - Direct forced air ventilation toward the immediate areas where employees are, or will be, and continue ventilation until all employees have left the space.
  - Provide the air supply from a clean source and make sure it does not increase hazards in the space.
- Test the atmosphere within the space as needed to make sure hazards do not accumulate.
- If a hazardous atmosphere is detected during entry, we will do all of the following:
  - Evacuate employees from the space immediately.
  - Evaluate the space to determine how the hazardous atmosphere developed.
  - Implement measures to protect employees from the hazardous atmosphere before continuing the entry operation.
  - Verify the space is safe for entry before continuing the entry operation.
- The written documentation is available to each employee entering the space or to that employee's representative at the confined space bulletin board.

CLASSIFY A CONFINED SPACE AS A NONPERMIT SPACE

For information only

Remove this box from your completed program.

Complete this section **only** when you classify a space as nonpermit. See Nonpermit Space Documentation Form in this section.

- A space will be classified nonpermit only for as long as all the hazards remain eliminated.
- If someone must enter the space to eliminate of any of the hazards, we will follow all the requirements listed under the permit entry procedures.
- Documentation that no permit-required confined space hazards exist will include the following:

- The date, location, and signature of the person making the determination.
- How we determined that no permit-required confined space hazards exist.
- Documentation will be available to entrants or their authorized representatives by posting at the entry to the space.

The following spaces can be classified as nonpermit spaces by following the listed methods of hazard elimination:

Date	**Location of Confined Space**	**Hazards**	**Method of Hazard Elimination**
(Input your specific information)			

NONPERMIT SPACE DOCUMENTATION FORM

Nonpermit confined space name or number	*(Insert your specific information here)*
Location	
Documentation	
Date	
Signature	

TRAINING

- We will provide permit space training to employees at the following times:
  - When hired, so new employees are aware of our confined spaces
  - Before they are assigned permit space entry duties
  - When their assigned duties change and
  - When there is a change in a space that creates hazards for which they have not been trained.

For information only

Remove this box from your completed program.

Following are 6 basic categories of training, based on duties and potential exposure:

1. Awareness training provided to all employees potentially exposed to permit spaces, covering the following:

   a. The location and hazard of each space
   b. The company program for confined spaces
   c. Emphasis on **not** entering the space for any reason.

2. Entry and exit training for the following team members:
   a. Entrants
   b. Attendants
   c. Supervisors
   d. Rescue team members

3. Training on how to manage confined space entries for entry supervisors.
4. Rescue training for rescue team members. 5.Pre-entry procedure training for all:
   a. entrants
   b. supervisors
   c. Attendants
   d. Rescue team members

6. Training on evaluating and testing confined spaces for:
   a. Entry supervisors
   b. Staff assigned to test and evaluate the space

7. Retraining for employees when you have any reason to believe they are not proficient at their confined pace duties.

OUR RESPONSIBILITIES FOR CONTRACTORS

For information only
Remove this box from your completed program.

Complete this section **only** when you hire a contractor to work in your confined space(s).

A copy of this Confined Space Entry Program will be provided to each contractor involved in permit space entry work at our company. Each contractor will be briefed on the following:

- The location of the permit spaces at our facility.
- Entry into permit spaces is only allowed by following the written entry program.
- The reasons for listing the space as a permit space, including both of the following:
  - The identified hazards
  - Our experience with the particular space.
- Precautions we have implemented to protect employees working in or near the space.
- Who will debrief the contractor at the completion of entry operations, or during entry if needed, on whether any hazards were confronted or created during their work.

OUR RESPONSIBILITIES WITH HOST EMPLOYERS

For information only
Remove this box from your completed program.

Complete this section **only** when you are a contractor working in someone else's confined space.

Our entry supervisor will do the following to make sure entry operations are coordinated with host employers:

- Obtain any information on the hazards of the permit space and information from previous entry operations
- Determine if other workers will be working in or near the space.
- Coordinate entry operations with other workers
- Inform the host employer of the permit space program that we follow.
- Hold a debriefing conference at the completion of the entry operation, or during the entry operation if needed, to inform the host employer of any hazards confronted or created during work in the space.

RESCUE AND EMERGENCY SERVICES

We have developed the following rescue and emergency action plan:

For information only
Remove this box from your completed program.

1. Insert your specific company rescue and emergency plan here.
2. For more information about rescue from confined spaces, see the Helpful Tool *Evaluating Rescue Teams or Services*.
3. You need to use non-entry rescue procedures and equipment, unless this would increase the risk of injury to the entrant or would be ineffective.
4. For entry rescue, see Entry Rescue Plans in this section.
5. This section is **not** required for the following confined space entries:
   – Classified and documented nonpermit spaces.
   – Proper use of alternate entry procedures.

ENTRY RESCUE PLANS

Following are 3 options for you to consider when developing rescue plans as outlined in the helpful tool, Evaluating Rescue Teams or Services, which is located in the Resources section of the Confined Spaces book.

Option 1

The entry supervisor will contact _*(name of rescue service)*_ at _*(phone number)*_ to do both of the following:

- Coordinate entry
- *Schedule an entry date and time.*

Option 2

Complete the following information.

Train employees on the specific procedures for summoning the rescue and emergency services. Name of rescue service: _____

Telephone number: _____

Location: _____

Approximate response time: _____

Name of emergency medical service: _____

Telephone number: _____

Location: _____

Approximate response time: _____

Option 3

The specific procedures for summoning rescue and emergency services for our workplace are: _____

_____

_____

_____

_____

Following are the permit spaces that require stand-by rescue services during entry. The rescue service will be available at the space during the entire entry procedure to ensure prompt entrant rescue.

Permit Spaces Requiring Stand-by Rescue Services	
Permit space:	**Stand-by rescue service name and telephone number:**

PERMIT-REQUIRED CONFINED SPACE PROGRAM REVIEW

For information only
Remove this box from your completed program.
This section is **not** required if you only enter nonpermit spaces or use alternate entry procedures

At least every 12 months we will conduct a review using canceled entry permits to identify any deficiencies in our program. We will conduct a review immediately if there is reason to believe that the program does not adequately protect our employees, such as the following situations:

- Unauthorized entry of a permit space
- Discovery of a hazard not covered by the permit
- Detection of a condition prohibited by the permit
- An injury or near-miss during entry
- Change in the use or configuration of the space or
- Employee complaints of permit space program ineffectiveness.

Corrective measures will be documented by revising the program. Employees will participate in revising the program, and will be trained on any changes.

If no permit space entry operations are conducted during the year, no review is needed.

Sample Confined Space Entry Permits
Use with Chapter 296-809 WAC, Confined Spaces

The following 3 fill-in-the-blank confined space entry permits can be modified to fit your particular entry. Make sure you use only the appropriate portions of the forms to create your own entry permit.

You can also design your own entry permit. You're **not** required to use the fill-in-the-blank entry permits provided here.

CONFINED SPACE ENTRY PERMIT
Sample 1

Date:		
Site location or description:		
Purpose of entry:		
Supervisor(s) in charge of crews:	Type of crew (welding, plumbing, etc)	Phone #:
Permit duration:		
Communication procedures (including equipment):		
Rescue procedures (also see emergency contact phone numbers at end of form):		

REQUIREMENTS COMPLETED (PUT N/A IF ITEM DOESN'T APPLY)	**DATE**	**TIME**	**REQUIREMENTS COMPLETED** (PUT N/A IF ITEM DOESN'T APPLY)	**DATE**	**TIME**
Lockout/De-energize/Try-out			Supplied Air Respirator (N/A if alternate entry)		
Line(s) Broken-Capped-Blank			Respirator(s) (Air Purifying)		
Purge-Flush and Vent			Protective Clothing		
Ventilation			Full Body Harness w/ "D" ring		
Secure Area (Post and Flag)			Emergency Escape Retrieval Equip		
Lighting (Explosive Proof)			Lifelines		
Hotwork Permit			Standby safety personnel (N/A if alternate entry)		
Fire Extinguishers			Resuscitator—Inhalator (N/A if alternate entry)		

Add other specific information, if needed, or attach additional instructions or requirements. See the following examples in bold print.			
Line(s) to be bled/blanked:			
Ventilation equipment:			
PPE clothing:			
Respirator(s):			
Fire extinguisher(s):			
Emergency retrieval equipment:			

AIR MONITORING

Substance Monitored	**Permissible Levels**		**Monitoring Results**					
Time monitored (put time)	*Record the time*							
Percent Oxygen	19.5% to 23.5%							
LEL/LFL	Under 10%							
Toxic 1:	_____PEL	____STEL						
Toxic 2:	_____PEL	____STEL						
Toxic 3:	_____PEL	____STEL						
Toxic 4:	_____PEL	____STEL						

REMARKS:

Air Tester Name	ID#	Instrument Used	Model # or Type	Serial # or Unit

ATTENDANTS AND ENTRANTS

Attendant(s) (Required for all confined space work except alternate entry)	**ID#**		**ID#**

REMARKS:

SUPERVISOR AUTHORIZATION - ALL CONDITIONS SATISFIED

Department or phone number: _____

EMERGENCY CONTACT PHONE NUMBERS

AMBULANCE: SAFETY: OTHER:

FIRE: RESCUE TEAM:

CONFINED SPACE ENTRY PERMIT
Sample 2

Date and time issued:			
Job site/space I.D.:			
Equipment to be worked on :			
Standby personnel:			
Date and time expires:			
Job supervisor:			
Work to be performed:			
1. Atmospheric Checks: Time: _____			
Oxygen _____%			
Explosives _____%L.F.M.			
Toxic _____PPM			
2. Tester's signature: _____			
3. Source isolation (No Entry):	N/A	Yes	No
Pumps or lines blinded, disconnected, or blocked:	□	□	□
4. Ventilation modification :	N/A	Yes	No
Mechanical:	□	□	□
Natural Ventilation only :	□	□	□

5. Atmospheric check after isolation and ventilation:

Oxygen: _____% >19.5%

Explosive: _____% L.F.M. <10%

Toxic: _____PPM <10PPM H_2S

Time: _____

Tester's signature: _____

6. Communication procedures:

_____

_____

7. Rescue procedures:

8. Entry standby and backup persons successfully completed required training?	Yes	No
	❑	❑
Is it current?	❑	

9. Equipment:	N/A	Yes	No
Direct reading gas monitor-tested:	❑	❑	❑
Safety harnesses and lifelines for entry and standby persons:	❑	❑	❑
Hoisting equipment:	❑	❑	❑
Powered communications:	❑	❑	❑
SCBA's for entry and standby persons:	❑	❑	❑
Protective clothing:	❑	❑	❑
All electric equipment listed: Class I, Division I, Group D and non-sparking tools	❑	❑	❑

10. Periodic atmospheric tests:

Oxygen _____% Time_____ Oxygen _____% Time

Oxygen _____% Time_____ Oxygen _____% Time

Explosive _____% Time_____ Explosive _____% Time

Explosive _____% Time_____ Explosive _____% Time

Toxic _____% Time_____ Toxic _____% Time

Toxic _____% Time_____ Toxic _____% Time

We have review the work authorized by this permit and the information contained here. Written instruction and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit not valid unless all appropriate items are completed.

Permit prepared by: _____
Entry Supervisor

Approved by: _____
Unit Supervisor

Review by: _____
Operations Manager

This permit is to be kept at the job site. Return this job site copy to the unit supervisor following job completion.

Entrants Name	Sign in	Sign out	Sign in	Sign out

CONFINED SPACE ENTRY PERMIT

Sample 3

PERMIT VALID FOR 8 HOURS ONLY. ALL PERMIT COPIES MUST REMAIN AT THE SITE UNTIL JOB IS COMPLETED.		
Date:	Site location /description:	
Purpose of entry:		
Supervisor (s) in charge of crews	Type of Crew	Telephone #

Communication procedures:

_____

_____

Rescue procedures (telephone number at bottom):

_____

_____

BOLD INDICATES MINIMUM REQUIREMENTS TO COMPLETE AND REVIEW PRIOR TO ENTRY
Note: For Items that do not apply, enter N/A in the blank.

REQUIREMENTS COMPLETED	DATE	TIME	REQUIREMENTS COMPLETED	DATE	TIME
Lockout/De-energize/Tagout			Full Body Harness w/"D" Ring		
Line(s) Broken-Capped-Blank			Emergency Escape Retrieval Equipment		
Purge-Flush and Vent			Lifelines		
Ventilation			Fire Extinguishers		
Secure Area (Post and Flag)			Lighting (Explosive proof)		
Breathing Apparatus			Protective Clothing		
Resuscitator - Inhalator			Respirator(s) (Air Purifying)		
Standby Safety Personnel			Burning and Welding Permit		

Continuous Monitoring: ❑ Yes ❑ No

Periodic Monitoring Frequency: _____

Test(s)	Permissible entry level
Percent of oxygen	19.5% TO 23.5%
Lower flammable limit	Under 10%
Carbon monoxide	+35 PPM
Aromatic Hydrocarbon	+1 PPM *5 PPM
Hydrogen Cyanide	(Skin) *4 PPM
Hydrogen Sulfide	+10 PPM *15 PPM
Sulfur Dioxide	+2 PPM *5 PPM
Ammonia	* 35 PPM

***** Short-term exposure limit: Employees can work in the area up to 15 minutes.
+ 8 hour Time Weighted Average: Employees can work in the area 8 hours (longer with appropriate respiratory protection).

REMARKS: _____

GAS TESTER NAME & CHECK #: INSTRUCTIONS USED:
MODEL &/OR TYPE: SERIAL &/OR UNIT #:

SAFETY STANDBY IS REQUIRED FOR ALL CONFINED SPACE WORK

SAFETY STANDBY PERSON(S) CHECK#

CONFINED SPACE ENTRANT(S) CHECK #

SUPERVISOR AUTHORIZATION - ALL CONDITIONS SATISFIED:

Department or phone number: _____

EMERGENCY CONTACT PHONE NUMBERS:

Ambulance: _____ Fire: _____ Safety: _ Gas coordinator: _____

Sewer System Entry
Use with Chapter 296-809 WAC, Confined Spaces

This helpful tool provides additional information on sewer system entries because these entries differ from other confined space entries in the following ways:

- The space usually can't be isolated.
- The atmosphere may suddenly become lethally hazardous, for example toxic, flammable, or explosive atmospheres may enter the work area from another portion of the system.
- Unlike other types of work where entry is rare, a sewer worker's usual work environment is a permit-required confined space.

Entrants

Your designated entrants should be employees who:

- Are thoroughly trained in your sewer entry procedures and
- Can demonstrate that they follow entry procedures when entering sewers

Monitoring the Atmosphere

Consider the unique circumstances of your sewer system when preparing for entry, including the unpredictability of the atmosphere. Only you can decide, based upon knowledge and experience, what are the best types of testing instruments for any specific entry operation.

- Make sure entrants are equipped with, and trained to use, atmospheric testing equipment that is capable of identifying at least the following:
  - Oxygen concentrations of less than 19.5%
  - Flammable gas or vapor of 10% or more of the lower flammable limit (LFL)
  - Hydrogen sulfide of 10 parts per million (ppm) or more
  - Carbon monoxide of 35 ppm or more
- The selected testing instruments should be carried and used by the entrants to:
  - Continuously monitor the atmosphere and
  - Warn the entrants of any potential atmospheric hazards, in the direction of travel.

- If several entrants are working together in the same immediate location, you will need to decide how many test instruments are required.
- Calibrate atmospheric testing equipment according to the manufacturer's instructions.
- Oxygen or broad range tests are best suited when actual or potential contaminants **have not yet** been identified.
    - Unlike substance-specific tests, these enable overall reading of the hydrocarbons (flammables) present in the space.
        - They do not measure the levels of specific substance contamination.
- Substance-specific tests, which measure levels of specific substances, are important when actual and potential contaminants **have** been identified. They:
    - Are vitally important when deciding on appropriate entry conditions and proper protection for entrants (for example, with ventilation and personal protective equipment)
    - May not detect other potentially lethal atmospheric hazards when the sewer environment suddenly and unpredictably changes.

Protecting Against Surge Flow and Flooding

To the extent possible, sewer crews should develop and maintain a relationship with the local weather bureau and fire and emergency services. In this way, sewer work may be delayed, or interrupted and entrants withdrawn, whenever the following occur:

- Sewer lines are suddenly flooded by rain or fire suppression activities
- Flammable or other hazardous materials are released into sewers due to industrial emergencies or transportation accidents.

Large Bore Sewers

You may need to use special equipment when entering large bore sewers. This equipment could include the following:

- Self-contained breathing apparatus (SCBA) for escape purposes
- Waterproof flashlights
- Boats, rafts, and personal flotation devices (PFDs)
- Radios
- Rope stand-offs for pulling around bends and corners

Evaluating Rescue Teams or Services
Use with the Confined Spaces book, Chapter 296-809 WAC

This helpful tool will help you do the following for permit-required confined spaces in your workplace:

- Evaluate the type of rescue services you need and
- Determine how well rescue services perform

Select and use either on-site rescue teams or off-site rescue services that will minimize the potential for harm to both entrants and rescuers.

For any rescue team or service, your evaluation should consist of the following two elements:

- An **initial evaluation** where you decide whether a rescue team or service is adequately trained and equipped to perform the kind of rescues needed at your workplace in a timely manner.
- A **performance evaluation** on the performance of the prospective or existing rescue team or service during an actual or practice rescue.

For example:

During your initial evaluation you determined that an on-site rescue team would be more expensive but not more effective than an off-site rescue service. As a result, you hire an off-site rescue service.

After observing the off-site rescue service perform a practice rescue, you decide their training or preparedness is not adequate. You decide to select another rescue service or to form an on-site rescue team.

Initial Evaluation

The following information can help you determine the rescue service needs for your workplace.

For an off-site rescue service you need to, at a minimum, contact the service to plan and coordinate the evaluations required.

The following are examples that **do not** meet the requirements of WAC 296-809-50014,

Make sure you have adequate rescue and emergency services available:

- Posting a rescue service's number without contacting them
- Planning to rely on 911 emergency services without checking to see if they are able to provide them.

Note:
Whether a rescue service meets your workplace needs depends on all of the following:

- The confined spaces from which a rescue may be necessary
- The hazards likely to be encountered in those spaces.
- The number of entrants needing rescue.

Table HT-1 can help you determine whether a rescue service meets your permit-required confined space rescue needs. Use the column labeled "Results" to answer the questions in the "Task" column.

Table HT-1
Initial Evaluation Worksheet
(If you answer no to any of these questions, you need to consider an alternative.)

Task	Results

1. Determine the rescue response time needs for your permit- required confined spaces.
• Examples:
  • If entering an atmosphere that is potentially or immediately dangerous to life or health (IDLH), the rescue team or service needs to be standing by at the permit-required confined space, ready to enter.
  • If the danger to entrants is restricted to mechanical hazards that can cause injuries such as broken bones or abrasions, a longer response time of 10 or 15 minutes might be acceptable.
	• **_____minutes**

Task	Results
2. Consider the amount of time required for the rescue service to: • Receive notification • Arrive at the scene To find out how quickly the rescue team or service is able to get from its location to your permit-required confined spaces, you need to consider: - The location of the rescue team or service relative to your workplace - The quality of roads and highways, bottlenecks, or traffic congestion that might be encountered in transit - The reliability of the rescuer's vehicles - The training and skill of the rescuer's drivers. • Set up and be ready for entry.	• Receive notification • + _____minute s Arrive at the scene +_____minutes • Comments: • Set up and be ready for entry. +_____minutes =_____minutes Does this amount of time meet your needs from Task 1? Yes ❑ No ❑
3. Determine the availability of the rescue service by considering: a. Is the rescue service available at the times of the day when you will be entering permit-required confined spaces?	Yes ❑ No ❑

Task	Results
b. Are key members of the rescue service available at these times?	Yes ❑ No ❑
c. If the rescue service becomes unavailable while an entry is underway, can they notify you so you can instruct the attendant to abort the entry immediately?	Yes ❑ No ❑
4. Determine if the rescue service meets all of the requirements in the Performance Evaluation Worksheet found in Table HT- 2.	Yes ❑ No ❑ If you answered "**yes**" above, how soon can the plan be implemented? _____ If you answered "**no**" and this can't be resolved, then you need to consider an alternative.
5. Determine if a 911 service is willing to perform rescues at your workplace: a. If you call 911, is a responder available?	Yes ❑ No ❑
b. Will the 911 responder be willing to perform rescue?	Rescue ❑ First Aid Only ❑ If you answered "**first aid only**," then an alternative is required.
c. Have you made sure the 911 responders can perform rescues in your spaces?	Yes ❑ No ❑
6. Determine if there is an adequate communication method between the attendant and the prospective rescuer: Can a request for rescue be transmitted without delay?	Yes ❑ No ❑

Performance Evaluation

WAC 296-809-50014, *Make sure you have adequate rescue and emergency services*, requires rescue practice at least once every 12 months if the team or service has not successfully performed a rescue within that time. This practice exercise provides you with an opportunity to evaluate the rescue service under conditions similar to your permit-required confined spaces.

First, as part of any practice session, the rescue service or another qualified party should perform a critique of the practice rescue, so that deficiencies can be corrected in:

- Procedures
- Equipment
- Training
- Number of people

Then, you should review the results of the critique and any corrections made for deficiencies identified by a "no" answer in Table HT-2. This will help you determine whether the service could be quickly upgraded to meet your needs.

Table HT-2 will help you determine:

- If the rescue service meets all of the performance requirements in WAC 296-809-50014, *Make sure you have adequate rescue and emergency services*
  and
- What changes may be necessary.

Use the right column labeled "Results" to answer the questions in the "Task" column.

Table HT-2 Performance Evaluation Worksheet
(If you answer no to questions 1-12, you need to take corrective action)

Task	Result
1. Have all team members been trained as entrants, including the potential hazards of all permit-required confined spaces, or of representative spaces, from which rescue may be needed?	Yes ❑ No ❑
2. Can team members recognize the signs, symptoms, and consequences of exposure to any hazardous atmospheres that may be present in those permit-required confined spaces?	Yes ❑ No ❑
3. Is every team member: a. Provided with and properly trained in the use of any PPE that may be needed to perform rescues in the facility, such as air-line respirators or fall arrest equipment?	Yes ❑ No ❑
b. Properly trained to perform functions during rescues, and to use any rescue equipment, such as ropes and backboards, needed in a rescue attempt?	Yes ❑ No ❑
4. Are team members trained in the first-aid and medical skills needed to treat victims injured or overcome by the types of hazards that may be encountered in the permit spaces at the facility?	Yes ❑ No ❑
5. Do all team members perform their duties safely and efficiently?	Yes ❑ No ❑
6. Do the team members focus on their own safety before considering the safety of the victim?	Yes ❑ No ❑
7. If necessary, can the rescue service properly test the atmosphere to identify acceptable entry conditions?	Yes ❑ No ❑
8. Can the rescue team members identify the information that applies to the rescue from: a. Entry permits	
b. Hot work permits	Yes ❑ No ❑
c. Safety Data Sheets (SDSs)?	Yes ❑ No ❑
9. Has the rescue service been informed of any hazards that may arise from outside the permit-required confined space, such as those caused by future work near the space?	Yes ❑ No ❑

Task	Result
10. If necessary, can the rescue service properly rescue injured employees from a permit space that has any of the following: a. A limited size opening (less than 24 inches (60.9 cm) in diameter)?	Yes ❑ No ❑
b. Limited internal space?	Yes ❑ No ❑
c. Internal obstacles or hazards?	Yes ❑ No ❑
11. If necessary, can the rescue service safely perform an elevated (high angle) rescue?	Yes ❑ No ❑
12. Determine if the rescue service has a plan for each type of rescue operation at your workplace. a. Does the rescue service have a plan for each of the kinds of permit space rescue operations at your workplace?	Yes ❑ No ❑
b. Is the plan adequate for all types of rescue operations that may be needed at your workplace?	Yes ❑ No ❑
13. Rescue practice may occur in representative confined spaces or in the most restrictive spaces. When planning a practice include any of the following features that exist in your permit-required confined spaces:**Space Access** **Horizontal** -- The entrance is located on the side of the permit space. Use of retrieval lines could be difficult.	Is this type of rescue a possible situation at your workplace? Yes ❑ No ❑ ❑ A description is attached.
Vertical -- The entrance is located: - On the top of the permit-required confined space so that rescuers must climb down **or** - The bottom of the permit space so that rescuers must climb up, to enter the space. Rescuers may need special knowledge to safely retrieve an injured entrant.	Is this type of rescue a possible situation at your workplace? Yes ❑ No ❑ ❑ A description is attached.

Task	Result
Entrance Size **Restricted** – An entrance with a smallest dimension of 24 inches or less. Entrances of this size are too small for a rescuer to enter the space while using a self-contained breathing apparatus, or allow normal spinal immobilization of an injured employee.	Is this type of rescue a possible situation at your workplace? Yes ❑ No ❑ ❑ A description is attached.
Unrestricted – An entrance with a smallest dimension greater than 24 inches. These entrances allow relatively free movement into and out of the permit space.	Is this type of rescue a possible situation at your workplace? Yes ❑ No ❑ ❑ A description is attached.
Internal configuration **Open** -- no obstacles, barriers, or obstructions within the space. For example, a water tank.	Is this type of rescue a possible situation at your workplace? Yes ❑ No ❑ ❑ A description is attached.
Obstructed -- The space contains some type of obstacle, requiring a rescuer to maneuver around it. For example, a baffle or mixing blade. Large equipment such as a ladder or scaffold brought into a space for work purposes is considered an obstacle if the positioning or size makes rescue more difficult.	Is this type of rescue a possible situation at your workplace? Yes ❑ No ❑ ❑ A description is attached.
Elevated -- A space where the entrance is above grade by 4 feet or more. This type of space usually requires knowledge of high angle rescue procedures because it is difficult to package and transport an injured employee to the ground from the entrance.	Is this type of rescue a possible situation at your workplace? Yes ❑ No ❑ ❑ A description is attached.
Non-elevated -- A space with the entrance located less than 4 feet above grade. The rescue team can transport an injured employee normally.	Is this type of rescue a possible situation at your workplace? Yes ❑ No ❑ ❑ A description is attached.

Atmospheric Testing of Permit-Required Confined Spaces
Use with Chapter 296-809 WAC, Confined Spaces

Atmospheric testing of permit-required confined spaces is used so you can do both of the following:

1. Evaluate potential atmospheric hazards
2. Verify that acceptable atmospheric entry conditions exist

Evaluate Hazards

- Collect and analyze data on the atmosphere of your space using equipment that's sensitive enough and specific enough for any hazardous atmosphere that may arise. This will enable you to:
  - Develop appropriate entry procedures and
  - Maintain acceptable entry conditions.

- Have a technically-qualified individual perform, or at least review, the following:
  - Evaluate and interpret the data
  - Identify all serious hazards
  - Develop appropriate entry procedures

Note:
Examples of technically-qualified individuals include:
- WISHA industrial hygiene consultant
- Qualified industrial hygienist
- Qualified registered safety engineer
- Qualified safety professional
- Certified marine chemist

Verify that Acceptable Entry Conditions Exist

Verify that acceptable entry conditions exist by doing the following:

- If the space may contain a hazardous atmosphere, test for all potential contaminants.
  - Use the equipment specified on your permit, for the time specified by the manufacturer, to determine whether contaminants are within the range of acceptable entry conditions.
  - Measure for the time recommended by the manufacturer.
- Perform tests in this order:
  - First, perform a test for oxygen. Most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen-deficient atmosphere.
  - Next, test for combustible gases. They present an immediate threat to life, through inhalation, fire, or explosion.
  - Last, if necessary, test for toxic gases and vapors.
- Record test results, such as the actual concentration, in the appropriate space on the permit.
  - When monitoring atmospheres that may be stratified, also do the following:
    - Test the atmospheric envelope at a distance of approximately 4 feet (1.22 m) in the direction of travel, and to each side.
  - If using a sampling probe, adapt the entrant's rate of progress to the sampling speed and detector response.

OSHA FactSheet

Procedures for Atmospheric Testing in Confined Spaces[1]

Atmospheric testing is required for two distinct purposes: evaluation of the hazards of the permit space and verification that acceptable conditions exist for entry into that space.

A confined space is one that is large enough to enter and perform assigned work in; it has limited or restricted ways to enter or exit the space; and it was not designed to be occupied continuously by a worker.

Evaluation testing

The atmosphere within a confined space must be tested using equipment that is designed to detect the chemicals that may be present at levels that are well below the defined exposure limits. Evaluation testing is done to:

- determine what chemical hazards are or may become present in the space's atmosphere, and
- identify what steps must be followed and what conditions must be met to ensure that atmospheric conditions are safe for a worker to enter the space.

The testing results and the decisions about what steps must be followed before entry must be evaluated by, or reviewed by, a technically qualified professional like an OSHA consultation service, a certified industrial hygienist, a registered safety engineer, or a certified safety professional. The technically qualified professional must consider all of the serious hazards in his/her evaluation or review.

A permit space is a confined space that has one or more of the following features: it has or may contain a hazardous atmosphere; it contains a material that can engulf a person who enters; it has an inside design that could trap or asphyxiate a person who enters (inwardly converging walls, or a floor that slopes downward to a smaller section); or it has any other serious safety or health hazards.

Verification Testing

Before a permit space that may have a hazardous atmosphere can be entered, the atmosphere must be tested using the steps identified on the permit (developed during evaluation testing). Verification testing is done to make sure that the chemical hazards that may be present are below the levels necessary for safe entry, and that they meet the conditions identified on the permit. Test the atmosphere in the following order: (1) for oxygen, (2) for combustible gases, and then (3) for toxic gases and vapors.[2] The testing results -- the actual test concentrations -- must be recorded on the permit near the levels identified for safe entry.

Duration of Testing

For each test required on the permit, you must allow enough time for the air from the space to be drawn into the equipment and for the sensor (or other detection device) to react to the chemical if it is present. This is considered the "minimum response time" and it will be noted by the manufacturer in the operator's manual. Be aware that you will need to add time to this "minimum response time" if you have attached hosing or a probe extension to the inlet. The additional time is needed to allow the air from the different depths of the space to be pulled into the equipment inlet.

Testing Conditions in Spaces that May Have Layered Atmospheres

For permit spaces that are deep or have areas leading away from the entry point, the atmosphere may be layered or may be different in remote areas. For these spaces, testing must be done in the area surrounding the worker, which is considered four (4) feet in the direction of travel and to each side. If a sample probe is used to do the testing, then the worker must move slowly enough so that testing is completed, keeping the equipment "response time" in mind, before he/she moves into the new area.

Retesting the Space During Entry or Before Re-Entry

Test the permit space routinely to make sure that the atmospheric conditions continue to be safe for entry.[3]

[1] Title 29 Code of Federal Regulations 1910.146, Appendix B.
[2] 29 CFR 1910.146(c)(5)(ii)(C) and (d)(5)(iii).
[3] 29 CFR 1910.146(c)(5)(ii)(F) and (d)(5)(ii).

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For more complete information:

OSHA Occupational Safety and Health Administration

U.S. Department of Labor
www.osha.gov
(800) 321-OSHA

DSTM 9/2005