



# COCHISE COUNTY

## CONFINED SPACE PROGRAM OSHA Regulation 29 CFR 1910.146

### COCHISE COUNTY ADMINISTRATIVE PROCEDURE

#### Confined Space Program

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## 1. Purpose

Confined spaces have proven to be deadly to individuals who did not properly recognize the hazards associated with an entry. The purpose of this program is to control and protect employees from confined space hazards by providing specific procedures and safe work practices that comply with applicable state and federal regulations pertaining to confined space entry, including the 29 CFR 1910.146 OSHA Confined Space standard.

### Program Objectives:

- Assess feasibility of reducing the number of confined spaces;
- Limit the number of confined space entries;
- Identify, evaluate, and eliminate potential hazards in the confined spaces prior to entry;
- Establish and verify contractors have an acceptable permit system for entry into confined spaces.

## 2. Scope and Application

This program applies to all Cochise County contractors who are required to enter a confined space during normal work hours and during certain non-routine or emergency operations. All permit-required confined space work shall be completed by third party contractors. County employees are not allowed to enter a permit-required confined space. Appendix B lists the applicable Cochise County confined space work areas.

## 3. Types of Confined Spaces

### Confined Space (CS)

A CS is a space that is large enough, and so configured, that an employee can bodily enter and perform assigned work. It has limited or restricted means of entry or exit and is NOT designed for continuous employee occupancy.

### Non-Permit Confined Space (NPCS)

A NPCS is a confined space that does not contain or have the potential to contain any atmospheric hazard capable of causing death or serious physical harm.

### Permit-Required Confined Space (PRCS)

A PRCS is a confined space that has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains a material that has the potential to engulf an entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor sloping downward and tapering to a smaller cross-section; or
- Contains any other recognized safety or health hazard.

## 4. Locations of Confined Spaces

Benson Transfer Station  
Bisbee Transfer Station  
Douglas Transfer Station  
Sierra Vista Transfer Station  
Willcox Transfer Station

- Transfer Station confined spaces are: The walking floor pit leading to the trailer; underneath the walking floor; and sump pump pit and tunnel leading to sump pump pits.
- Mobile Water Tanks

These above areas become Permit-Required Confined Spaces when welding in these areas is required.

Always a Permit Required Confined Space: Sierra Vista Juvenile Detention Center  
Muffin Monster Sewage Grinder

## 5. Responsibilities: Departmental

### Department Director/Elected Official

- Oversee the departmental confined space program, ensuring that all the program requirements are fully implemented.
- Assign as Program Coordinator an employee(s) to be responsible for implementation of the confined space program in that department.
- Provide the Program Coordinator with adequate time and resources to implement the requirements of this program.
- Enforce compliance with this program.

### Program Administrator (County Risk Mgmt. Administrator)

- Establish the County's written Confined Space Program and revise as necessary.
- Function as a resource for Program Coordinators on confined space topics.
- Annually evaluate the effectiveness of the written program.

### Program Coordinator

- Identify confined spaces on Cochise County property; maintain departmental assessments of the confined space.
- Develop department-specific operating procedures for confined space operations.
- Perform and document periodic audits of confined space entries.
- Coordinate with contractors.
- Annually review the program with the Program Administrator.

## 6. Responsibilities: Permit-Required Confined Space Entry

### Contractors

The pertinent Program Coordinator will:

- Inform the contractor, prior to bid, that the workplace contains permit spaces, and that entry is allowed only through compliance with a permit-required confined space program meeting the needs of 29 CFR 1910.146, if required.
- Advise the contractor of the elements, including the hazards identified and the department's experience with the space that make it permit-required.
- Advise the contractor of this Cochise County Confined Space Program.
- Debrief the contractor at the conclusion of entry operations regarding any hazards confronted or created during entry operations.

### The Contractor will:

- Obtain available information regarding permit space hazards and entry operations from the pertinent Program Coordinator.
- Inform the Program Coordinator of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces.
- Coordinate activity with the Program Coordinator.
- Implement measures to prevent unauthorized entry.
- Identify and evaluate hazards of the permit spaces before anyone enters the space.
- Develop and implement the means, procedures, and practices necessary for safe permit space entry operations.

### Designated Entry Supervisor

- Understand the requirements of the confined space permit system and the duties of authorized entrants, attendants, and entry supervisors; understand atmospheric testing and rescue and emergency procedures.
- Verify and document that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Authorized to terminate the entry and cancel the entry permit at any time and upon exit of all entrants and cancels the entry permit, as required by the permit system.
- Verify that rescue personnel are trained and on site and that the means for summoning appropriately trained emergency services are operable.
- Remove unauthorized individuals who enter or who attempt to enter the permit space during entry

operations.

- Determine when responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, so that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

Note: The Entry Supervisor need not be a member of supervision. An Entry Supervisor may also serve as an Attendant or as an Entrant, if he/she is trained and equipped for each role he/she fills. The duties of an Entry Supervisor may be passed from one individual to another during an entry operation.

#### Designated Entrant

- Understand the hazards or potential hazards that may be faced during entry and be trained on the mode, signs or symptoms, and consequences of the exposure to suspected hazardous atmospheres.
- Be trained to utilize all equipment required for confined space operations and be able to communicate with the Attendant to enable the Attendant to monitor entrant status and to enable the Attendant to alert Entrants of the need to evacuate the space in the event of an emergency or changing conditions.
- Alert the Attendant whenever the Entrant recognizes any warning signs or symptoms of exposure to a dangerous situation, or the Entrant detects a prohibited condition.
- Exit from the permit space as quickly as possible whenever an order to evacuate is given by the Attendant or the Entry Supervisor.

#### Designated Attendant

- Understand the hazards that may be faced during entry by entrants, and be trained on the mode, signs or symptoms, and consequences of exposure to hazardous atmospheres.
- Continuously maintain an accurate count of Entrants in the permit space and ensure that the entrance roster accurately identifies who is in the permit space.
- Enter the permit space for rescue only if he/she has been properly trained and equipped for rescue operations and if they have been relieved by another Attendant.
- Establish a means to communicate with Entrants **continuously** to monitor Entrant status and to alert Entrants of the need to evacuate the space.
- Monitor activities inside and outside of the space to determine if it is safe for Entrants to remain in the space.
- Order the Entrants to evacuate the permit space immediately if the Attendant:
  - Detects a prohibited condition.
  - Detects the behavioral effects of exposure to atmospheric hazards in an Entrant;
  - Detects an Entrant alarm that signifies a change of condition or other emergency;
  - Detects a situation outside the space that could endanger the Entrants; or
  - Cannot effectively and safely perform all the duties required by this section.
- Summon rescue and other emergency services as soon as he/she determines that Entrants may need assistance to escape from permit space hazards.
- Give to the first EMS personnel on scene a copy of the Confined Space Entry Permit, Safety Data Sheets (SDS), if applicable, and any other pertinent information that will facilitate the rescue.

## 7. Education and Training

Cochise County shall provide training so that all employees understand they are not allowed to enter permit-required confined spaces.

Training shall be provided:

- On the confined space surveys;
- When there is a change in assigned duties;
- Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained.

## 8. Permit-Required Confined Space Procedures

### Identification of Permit-Required Confined Spaces

Appendix B lists the identified confined spaces on Cochise County property and whether County employees or contractors will conduct the entry. All permit-required confined space work shall be completed by third party contractors. County employees are not allowed to enter a permit-required confined space. Cochise County evaluates each workplace to identify any permit-required confined spaces, using the Confined Space Decision Flow Chart (Appendix A).

The affected department shall inform their affected employees (i.e., those employees that work around the space) of the existence and location of and the danger posed by the permit spaces. Employee notification shall be accomplished by posting danger signs on the space entryway.

Departments shall post signage on all identified confined spaces. The signage shall read:

“DANGER – PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER”

### Permit System

A Confined Space Entry Permit is required when entering Permit-Required spaces. Before entry is authorized, the measures required for safe entry shall be documented by preparing an entry permit. See Appendix C for Confined Space Entry Permit forms.

Before entry begins, the contractor's entry supervisor identified on the permit shall perform the on-site hazard assessment, complete the permit, and sign the entry permit to authorize confined space entry.

The completed permit shall be made available at the time of entry to all authorized entrants, by posting it at the entrance of the space, so that entrants can confirm that pre-entry preparations have been completed.

The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit. The duration of a permit shall not exceed ten (10) hours or one work shift.

The contractor's entry supervisor shall terminate entry and cancel the entry permit when:

- The entry operations covered by the entry permit have been completed; or;
- A condition that is not allowed under the entry permit arises in or near the permit space.

Each department shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit-required confined space program. Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

### Alternate Entry Conditions

Departments that have contractor's employees who are required to enter permit required confined spaces may use alternate procedures for entry provided that the following conditions are met.

1. Demonstrate that the only hazard posed by the permit space is an actual or potential hazardous atmosphere.
2. Demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry.
3. Air monitoring and inspection data that supports items 1 and 2.
4. If initial entry into the permit space is necessary to obtain the data required for items 1 and 2, then the entry must include all the requirements for a permit required confined space entry including the provision for rescue and emergency services.
5. Provide documentation of items 1, 2, and 3 to each employee who enters the permit space under the alternate method.

### Reclassification of Confined Space

A space classified by Cochise County as a permit-required confined space may be reclassified by

an Entry Supervisor as a non-permit confined space under carefully documented conditions.  
Note: The control of a potential hazard or condition, such as Lockout/Tagout, may not meet the criteria for elimination of a hazard.

If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.

If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed under the permit-required confined space requirements. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, that permit space may be reclassified as a non-permit required confined space if the hazards remain eliminated.

**NOTE: The use of forced air ventilation to *control* atmospheric hazards does not constitute the elimination of the hazard.**

The Entry Supervisor shall document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification must be made available to each employee entering the space.

If hazards arise within a permit space that has been declassified to a non-permit space, then each employee shall immediately exit the space. The Entry Supervisor shall reevaluate the space and determine whether it must be reclassified as a permit space.

#### Changing Conditions

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

#### Conditions for Entry

Any condition making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.

Before an employee enters the space, the internal atmosphere shall be tested in order, with a calibrated direct reading instrument for the following conditions:

- Oxygen content.
- Flammable gases and vapors.
- Potential toxic air contaminants.

#### Work Practice

The Entry Supervisor shall evaluate and consider all work practices that will be performed during the Confined Space Entry to avoid introduction of an additional hazard(s) and to determine if a work practice will change or contribute to a change in the atmospheric conditions of the confined space.

## **9. Rescue and Emergency Services for Permit-Required Confined Space**

The Cochise County Department responsible for hiring the contractor shall ensure that the contractor's rescue plan is complete and effective to react to potential emergencies that the specific permit-required space may present.

The County shall make sure the contractor has provided each member of the rescue team with, and is trained to use properly, the personal protective equipment and rescue equipment necessary for making rescues from permit spaces. Notification of/to Emergency Services may not meet the OSHA Standard for Rescue and/or Retrieval of employees entering a confined space. Contact must be made with those Emergency Services to ensure they can respond to confined space rescue calls.

Each member of the contractor's rescue service shall be trained to perform the assigned rescue duties. Each member of the rescue service shall also receive the training required of authorized entrants.

Each member of the contractor's rescue team shall practice making permit space rescues at least once every 12 months, by means of a simulated rescue operation in which they remove dummies, mannequins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

Each member of the contractor's rescue team shall be trained in basic first aid and in Cardiopulmonary Resuscitation (CPR). To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

Retrieval systems shall meet the following requirements:

- Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head. Wristlets may be used if it can be demonstrated that the use of the chest or fullbody harness is unfeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.
- The other end of the retrieval line shall be attached to a mechanical device (NON-MOTORIZED) or fixed point outside the permit space in so that rescue can begin immediately. A mechanical rescue device is mandatory at permit required confined space vertical entries greater than 5 feet deep.
- If an injured entrant is exposed to a substance for which a Safety Data Sheet (SDS) or other similar written information is required to be kept at the worksite, that SDS shall be made available to the medical facility treating the exposed entrant.

## 10. Ventilation

Continuous forced air ventilation shall be used, as follows:

- Employees may not enter the space until forced air ventilation is documented as having maintained acceptable entry level conditions for any hazardous atmosphere;
- The forced air ventilation shall be so directed as to ventilate the immediate areas where employees are present and shall continue until all employees have left the space, and;
- The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.

Ventilation fans and hoses shall be deployed in such a manner to reduce bends in the hose or ducting. All hoses shall be maintained on a level surface whenever possible. Once continuous ventilation ductwork has been placed and is documented to be effective in controlling the atmospheric conditions, ductwork shall be protected by barricades or other means, to prevent compression, collapsing, or kinking of the hose.

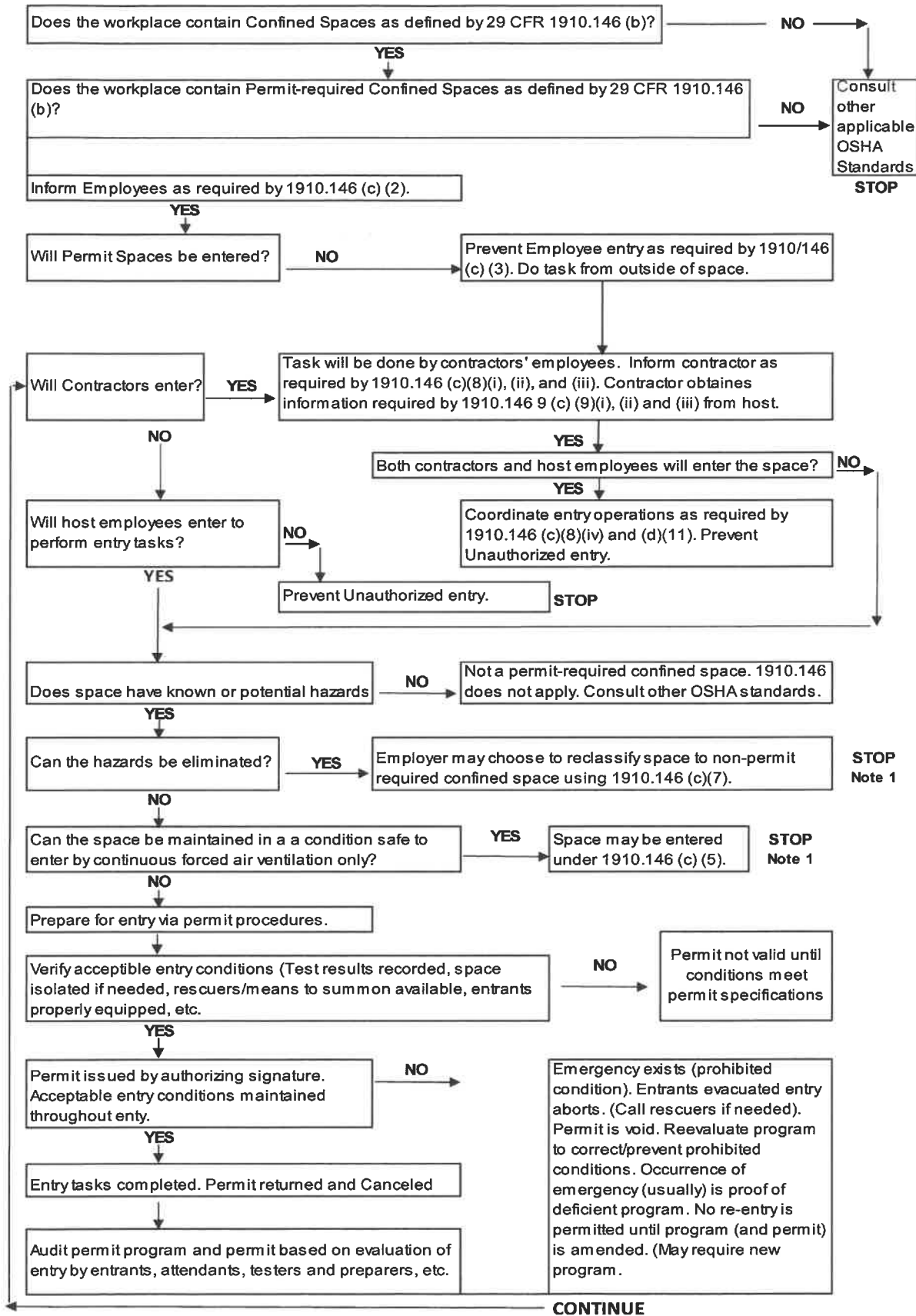
The atmosphere within the space shall be tested at pre-determined intervals, or continuously to ensure that the forced air ventilation is preventing the accumulation of a hazardous atmosphere. If a hazardous atmosphere is detected during an entry where forced air ventilation is utilized:

- Each employee shall leave the space immediately,
- The space shall be evaluated to determine how the hazardous atmosphere developed;
- And measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

Passive ventilation techniques shall be verified by atmospheric testing to determine acceptable entry conditions, prior to confined space entry. Mechanical venting or exhausting techniques shall be verified by atmospheric testing to determine acceptable entry conditions, prior to confined space entry.



# Appendix A 29 CFR 1910.146 Appendix A Confined Space Flow Chart



Note 1. Spaces may have to be evacuated and re-evaluated if hazards arise during entry

## Appendix B Identified Confined Spaces on Cochise County Property

Heavy Fleet Maintenance (HFM) Department Program Coordinator: Jason Faccio  
 Solid Waste Management Department Program Coordinator: Jason Faccio  
 Facilities Maintenance Department Program Coordinator: Henry Meraz

- Task 1: Repair by welding; floor or compactor at Solid Waste transfer stations (TS)
- Task 2: Weld mobile water tanks
- Task 3: Inspect mobile water tanks (Non-Permit Confined Space)
- Task 4: Maintain/repair sump pumps in manholes at Solid Waste transfer stations (TS)
- Task 5: Repair pump motor in manhole at Juvenile Detention Center (JDC)

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Task	Location	Program Coordinator	Entry/Work Performed By
1	Benson TS	Jason Faccio	Contractor only
1	Bisbee TS	Jason Faccio	Contractor only
1	Douglas TS	Jason Faccio	Contractor only
1	Sierra Vista TS	Jason Faccio	Contractor only
1	Willcox TS	Jason Faccio	Contractor only
2	Contactors's premises	Jason Faccio	Contractor only
3	Bisbee HFM Shop	Jason Faccio	HFM employees
3	Willcox HFM Shop	Jason Faccio	HFM employees
3	WRL HFM Shop	Jason Faccio	HFM employees
4	Benson TS	Jason Faccio	Contractor only
4	Bisbee TS	Jason Faccio	Contractor only
4	Douglas TS	Jason Faccio	Contractor only
4	Sierra Vista TS	Jason Faccio	Contractor only
4	Willcox TS	Jason Faccio	Contractor only
5	Sierra Vista JDC	Henry Meraz	Contractor only

## Appendix C Confined Space Entry Permit Form, Part 1 of 2

Permit-Required Space		
LOCATION:		
ADDRESS:		
CONFINED SPACE TYPE:		
DESCRIPTION:		
ENTRY PRECAUTIONS		
ENTRY INSTRUCTIONS:	PRIOR TO EVERY ENTRY	
1.		
Permit Issue Date:	Permit Expiration Date:	
Permit Issue Time:	Permit Expiration Time:	
Confined Space Supervisor	Print):	
Authorized Entrants:		
1.		
2.		
PRE-ENTRY ATMOSPHERIC TESTING	RESULTS	DIRECTION
Time:		
Oxygen Level:		
Explosive Gases:		
Toxic Gases:		
Signature of Tester:		
VENTILATION	VERIFY	DIRECTION
Mechanical Ventilation		
Passive Ventilation		
Mechanical Exhaust		
POST VENTILATION ATMOSPHERIC TESTING	RESULTS	DIRECTION
Time:		
Oxygen Level:		
Explosive Gases:		
Toxic Gases:		
Signature of Tester:		
COMMUNICATION	VERIFY	DIRECTION
Communication Procedure:		
Alarm Procedure Description:		
RESCUE	VERIFY	DIRECTION
Rescue Procedure: Medical		
Attendants/Entrants Rescue Trained		
Hoist (Required for Entry 5' or greater)		
Lifelines and/or Harness for Entrants		

**Appendix C, continued**

**Confined Space Entry Permit Form, Part 2 of 2**

PRE-ENTRY CONDITIONS AND EQUIPMENT		VERIFY	DIRECTION
Atmospheric Monitor Calibration			
Communication Equipment Test			
Hazard Assessment			
Site/Space Security -Barricades			
HAZARD ASSESSMENT		VERIFY	DIRECTION
Known Hazards: Engulfment			
Potential Hazards: Atmospheric			
Introduced Hazards: Electric			
Communication of All Hazards to Entrants:			
PPE REQUIREMENTS		VERIFY	DIRECTION
List all PPE Required for Entrants:			
CONTINUOUS/ADDITIONAL ATMOSPHERIC MONITORING			
Time		Oxygen	Explosive Toxic
Time		Oxygen	Explosive Toxic
Time		Oxygen	Explosive Toxic
Time		Oxygen	Explosive Toxic
Time		Oxygen	Explosive Toxic
Time		Oxygen	Explosive Toxic
Time		Oxygen	Explosive Toxic
Time		Oxygen	Explosive Toxic
Time		Oxygen	Explosive Toxic
DOCUMENTED SIGNATURES			
Entry Supervisor:			
Authorized Attendant:			
Competent Person/Atmospheric Testing:			
Competent Person Ventilation - Pending Conditions:			
PERMIT CANCELLATION		TIME	
Signature:			

Confined Space Permits shall be kept on file for one (1) year  
 Copies:

## Appendix D Atmospheric Testing Requirements

Atmospheric testing is required for two distinct purposes:

Evaluation of the hazards of the permit space *and* verification that acceptable entry conditions for entry into that space exist.

1. **Evaluation testing.** The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity to identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed, and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data, and development of the entry procedure, should be done by, or reviewed by, a technically qualified professional (e.g., OSHA consultation service, or certified industrial hygienist, registered safety engineer, certified safety professional, certified marine chemist, etc.) based on evaluation of all serious hazards.
2. **Verification testing.** The atmosphere of a permit space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing (i.e., actual concentration, etc.) should be recorded on the permit in the space provided adjacent to the stipulated acceptable entry condition.
3. **Duration of testing.** Measurement of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer.
4. **Testing stratified atmospheres.** When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested approximately 4 feet (1.22 m) in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.
5. **Order of testing.** A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen deficient atmosphere. Combustible gases are tested for next because the threat of fire or explosion is both more immediate and more life threatening, in most cases, than exposure to toxic gases and vapors. If tests for toxic gases and vapors are necessary, they are performed last.

## Appendix E Sewer System Entry

Sewer entry differs in three vital respects from other permit entries; first, there rarely exists any way to completely isolate the space (a section of a continuous system) to be entered; second, because isolation is not complete, the atmosphere may suddenly and unpredictably become lethally hazardous (toxic, flammable or explosive) from causes beyond the control of the entrant or employer, and third, experienced sewer workers are especially knowledgeable in entry and work in their permit spaces because of their frequent entries. Unlike other employments where permit space entry is a rare and exceptional event, sewer workers' usual work environment is a permit space.

(1) *Adherence to procedure.* The employer should designate as entrants only employees who are thoroughly trained in the employer's sewer entry procedures and who demonstrate that they follow these entry procedures exactly as prescribed when performing sewer entries.

(2) *Atmospheric monitoring.* Entrants should be trained in the use of, and be equipped with, atmospheric monitoring equipment which sounds an audible alarm, in addition to its visual readout, whenever one of the following conditions are encountered: Oxygen concentration less than 19.5 percent; flammable gas or vapor at 10 percent or more of the lower flammable limit (LFL); or hydrogen sulfide or carbon monoxide at or above 10 ppm or 35 ppm, respectively, measured as an 8-hour time-weighted average. Atmospheric monitoring equipment needs to be calibrated according to the manufacturer's instructions. The oxygen sensor/broad range sensor is best suited for initial use in situations where the actual or potential contaminants have not been identified, because broad range sensors, unlike substance-specific sensors, enable employers to obtain an overall reading of the hydrocarbons (flammables) present in the space. However, such sensors only indicate that a hazardous threshold of a class of chemicals has been exceeded. They do not measure the levels of contamination of specific substances. Therefore, substance-specific devices, which measure the actual levels of specific substances, are best suited for use where actual and potential contaminants have been identified. The measurements obtained with substance-specific devices are of vital importance to the employer when decisions are made concerning the measures necessary to protect entrants (such as ventilation or personal protective equipment) and the setting and attainment of appropriate entry conditions. However, the sewer environment may suddenly and unpredictably change, and the substance-specific devices may not detect the potentially lethal atmospheric hazards which may enter the sewer environment.

Although OSHA considers the information and guidance provided above to be appropriate and useful in most sewer entry situations, the Agency emphasizes that each employer must consider the unique circumstances, including the predictability of the atmosphere, of the sewer permit spaces in the employer's workplace in preparing for entry. Only the employer can decide, based upon his or her knowledge of, and experience with permit spaces in sewer systems, what the best type of testing instrument may be for any specific entry operation.

The selected testing instrument should be carried and used by the entrant in sewer line work to monitor the atmosphere in the entrant's environment, and in advance of the entrant's direction of movement, to warn the entrant of any deterioration in atmospheric conditions. Where several entrants are working together in the same immediate location, one instrument, used by the lead entrant, is acceptable.

(3) *Surge flow and flooding.* Sewer crews should develop and maintain liaison, to the extent possible, with the local weather bureau and fire and emergency services in their area so that sewer work may be delayed or interrupted, and entrants withdrawn whenever sewer lines might be suddenly flooded by rain or fire suppression activities, or whenever flammable or other hazardous materials are released into sewers during emergencies by industrial or transportation accidents.

(4) *Special Equipment.* Entry into large bore sewers may require the use of special equipment. Such equipment might include such items as atmosphere monitoring devices with automatic audible alarms, escape self-contained breathing apparatus (ESCBA) with at least 10-minute air supply (or other NIOSH approved self-rescuer), and waterproof flashlights, and may also include boats and rafts, radios, and rope stand-offs for pulling around bends and corners as needed.