Best Practices Guide

For

Confined Space Safety

Risk Management Services
Maine Municipal Association

The Hazards of Confined Spaces

Confined spaces in the municipal workplace typically include sewers, tanks, cisterns, clarifiers, pits, ducts, and pipe chases. These spaces can be thought of as *"condensed danger"*. Confined space hazards, such as toxic air, insufficient oxygen, explosive gases, drowning, and falls exist in other work areas, but by their nature confined spaces concentrate these hazards in the smallest possible area. Like a corrosive solution that becomes more and more dangerous as it is concentrated, confined spaces are condensed danger where mistakes usually result in the death of one or more employees. Even minor injuries quickly become serious in a confined space, because rescue is difficult, time to medical treatment is longer, and it is impossible for rescue personnel to be "gentle" during confined space rescues.

Even if your employees do not enter and work in confined spaces, you still must have a confined space safety program. Many injuries and fatalities occur each year from "unauthorized" entries trying to retrieve dropped material from a space or making just a "quick" entry to "check something out". For this reason, safety standards require that every employer survey their workplace for confined spaces and implement measures to prevent unauthorized entry such as awareness training, posting of signs and strict enforcement of safety policies.

The most common killer in confined spaces is some type of hazardous atmosphere. This can be insufficient oxygen due to bacteria in rotting material, inert gases or rusting metal, hydrogen sulfide gas from rotting matter or sewage, carbon monoxide from running engines, welding fumes, or vapors from paints and solvents used in the space.

Other common fatal hazards include drowning or suffocation by being buried in loose material, suffocation by entrapment in tight spaces, fires/explosions, falls and accidental startup of machinery.

Common causes of injuries in confined spaces include falls, cuts, burns and heat injuries, being struck by falling objects and strains due to awkward work positions.

Any entry work in confined spaces requires well-trained personnel, the right safety equipment, a well thought out and documented entry plan, and an emergency plan in case something goes wrong.

What is a "Confined Space"?

A *"confined space"* is any enclosed space that meets all three of the following criteria:

1. **It can be bodily entered by an employee**. Its size, configuration, and access would allow a person to get completely inside of it.

2. **<u>It has limited access and egress</u>.** The way in and out do not meet the standards for safe exits. As a general rule, if you have to use a ladder, stairway over 70 degrees steep, or enter through anything smaller than a typical room door, the space meets this criteria. Pipes and other obstacles inside the space may also make it meet this criteria.

3. **<u>It was not designed for continuous occupancy by employees</u>**. It was not designed for people to work in under normal, day-to-day, conditions. For example, some underground pumping stations meet criteria 1 and 2, but are provided with lighting and ventilation that makes them acceptable workplaces.

Some confined spaces in the workplace are easy to recognize, such as enclosed tanks, sewer manholes, large diameter pipelines, and wet wells.

Some confined spaces are not so easy to recognize. For example, how about that air receiver in the garage with a man way access, pipe chases, crawl spaces, tank berms, tank trucks, sander bodies, well pits, or clarifiers.

It is important to note that a confined space can have an open top and many fatal accidents have occurred in spaces without any roof or top enclosure.

Note that the definition of a *confined space* has <u>nothing</u> to do with any hazards being present or possible! At this point in the process, all confined spaces must be considered hazardous and therefore **<u>Permit Required Confined Spaces</u>**.

A thorough hazard analysis (Appendix B) can be performed to determine whether or not a confined space is ***permit required*** or ***non-permit***.

<u>Permit Required Confined Spaces</u> have either not been analyzed for hazards or have been analyzed and determined to have the *potential* for one or more of the following hazards:

1. **A hazardous atmosphere**- explosive/flammable, toxic, or suffocating.
2. **An engulfment hazard**- liquid flows or standing liquids that could drown someone working inside, or loose material such as wood chips, sand, gravel, or sludge that could bury someone working inside.
3. **An entrapment hazard**- that someone could fall into and suffocate due to pressure on the upper torso. Most entrapment hazards fall into one of three categories:
    a. **The "Cone Trap"** found in the bottom of cyclones and precipitators.
    b. **The "Cylinder Trap"-** a pipe or similar opening in the bottom of a confined space, big enough for someone to fall into. The pipe up to an elevated water tower is a good example.
    c. **The "wedge trap"-** converging walls that could entrap someone who fell into them. They are commonly found in grain bins, larger boilers, sand hoppers, and sometimes in sander bodies.

4. **Any other recognized serious safety or health hazard**- such as moving conveyors, agitators, electrical energy, steam, corrosives, burn hazards, cut hazards, fall hazards over 4' or others capable of causing serious injury or death.

Permit Required Confined Spaces require a written, signed entry permit from a designated *Entry Supervisor*, and all of the safety precautions listed in this document before any employee can enter. When possible, they should be posted with an OSHA/ANSI "DANGER" sign containing the language "CONFINED SPACE ENTER BY PERMIT ONLY" or something very similar.

Non- Permit Confined Spaces have, after a thorough and documented hazard analysis, been found to either:

1. not contain any serious safety/health hazards, such as those listed above for permit required spaces, nor have the potential to contain any such hazards, or;
2. contain only hazards, such as machinery or engulfment potential that can be completely removed without entering the space, while preparing it for entry.

   Example- After hazard analysis of a sander body for a Public Works dump/plow truck, the team determines that it is a confined space but the only two serious hazards are engulfment from shifting sand and the chain conveyor. A written entry procedure is developed that requires looking into the sander to ensure that no material remains that could shift and entrap an entrant, and lockout of the hydraulics operating the conveyor is required. The sander body is then listed and posted as a "non-permit confined space."

Non- Permit Required Confined Spaces require that a written procedure be strictly followed each time that a space is entered. This may include procedures for isolation/lock-out, cleaning, fall protection, cool down, personal protective equipment (PPE) and possibly a two-person work rule. ALL non-permit confined spaces should be posted with an OSHA/ANSI "WARNING" sign containing the language "CONFINED SPACE FOLLOW ENTRY PROCEDURE." Whenever feasible, the procedure should be included as a panel on the sign or otherwise posted at the entrance point.

WARNING- If your employees cannot strictly follow the written entry procedure for a non-permit confined space, then you are obligated to reclassify it as a permit required confined space!

Developing a Confined Space Safety Program

EVERY EMPLOYER must develop a written confined space safety program, regardless of whether or not they have any confined spaces or plan to enter them. The minimum acceptable standard for a confined space program can be found in OSHA Standard 1910.146- Permit Required Confined Spaces. (The State of Maine has adopted the Federal OSHA Standards as minimal heath and safety standards for the public and private sectors).

The first steps in this process are:

1st- Conduct a confined space inventory for your workplace. Using the criteria outlined above for confined spaces, thoroughly inspect all facilities and work areas for confined spaces. Appendix A is a form that you may use as an inventory record.

REMEMBER- You are looking for confined spaces to which your employees may be exposed to the hazards of, not just spaces that you "own."

If, at this point, you determine that your facilities and workplaces contain no confined spaces at all, simply file a dated, signed statement that an inventory was done and no confined spaces exist. You are finished unless confined spaces are added in the future!

2nd- Determine whether or not your employees will enter confined spaces. If you have confined spaces, but your employees will not be entering them, then a simplified confined space safety program must be written and implemented. It must include:

1. Notification of all employees of the location and hazards presented by confined spaces. This should include some type of "awareness" or recognize and avoid training.

2. Posting of OSHA/ANSI DANGER signs warning of a confined space and instructing employees to "keep out" or "do not enter". Where signs cannot be used (i.e. storm sewer manholes) some equally effective means must be used to warn employees. This could include training or a posting somewhere in the workplace, in an area that is highly visible.

3. A process to address any contractors that may have to enter your confined spaces in the future. As a minimum, this must include:

    a. Methods of informing contractors about confined spaces in their worksites and potential hazards.
    b. Convey your own confined space safety procedures.
    c. Debriefing of the contractor after the job to determine if any problems were encountered.

3rd Develop a permit system. If your employees will enter confined spaces, you must develop a written comprehensive confined space permit system, which addresses the following elements:

Training of all entrants, attendants, entry supervisors, rescuers and atmospheric testing personnel. Preparation of spaces by draining, washing, flushing, providing safe access, control of fall hazards, and traffic safety. Isolation of confined spaces by proper lockout, blanking of lines, or double block and bleeds.Atmospheric Testing to ensure a safe entry environment.Ventilation of confined spaces to ensure safe working

conditions. Equipment for safe entry work, such as low voltage or explosion proof lighting, personal protective equipment, fall protection, retrieval systems, communication aids etc. Attendant requirements for every permit entry. Rescue provisions in case of an emergency.

Detailed Elements of a Permit Required Confined Space Entry Program

Each of the 8 elements above must be thoroughly thought out and put in writing. You need to spell out exactly how each one will be addressed in your workplace. This will set the framework for training, equipment purchases, assignment of duties, selection of permit forms and actual entry work to be conducted.

1. **TRAINING**

   There are five groups of employees who must be trained initially and provided with "refresher" training as often as necessary to ensure proper practices under your written program:

   Entrants- Employees who will actually enter and work in confined spaces must be trained in the potential hazards of confined spaces, effects of exposure to common atmospheric contaminants found in confined spaces, the details of how your confined space program works, how to recognize situations requiring that the entry be terminated (prohibited conditions) and proper use of all safety equipment used for entries in your workplace.

   Attendants- Employees who will stay outside and watch over the entrants and the safe work conditions at the entry site must have additional training in the duties of being an attendant, procedures to follow if a prohibited conditions occur and emergency procedures. This should include the proper operation of any external rescue equipment, such as tripods, that they may be required to use.

   Entry Supervisors- Employees who will issue entry permits, brief entrants and attendants and be responsible for overall supervision of the entries need extensive training and experience in the recognition of confined space hazards, assignment of proper safety controls, permit procedures, briefing procedures, and supervision of entry tasks. A Entry Supervisor, because of his/her level of training can also be the Attendant or Authorized Entrant.

   Atmospheric Testers- The employees responsible for air testing must have detailed training in recognizing potential for different hazardous atmospheres in confined spaces, calibration and operation of gas meters, use of stain tubes and other testing equipment used, and proper field testing techniques.

   Rescuers- Rescue personnel require extensive training and must demonstrate simulated rescues from representative confined spaces at least once per year. Even if

the rescue team is not made up of your employees, you are still responsible to ensure that they are capable of performing rescues from your spaces and properly trained.

2. PREPARATION

Any hazards associated with opening a particular space must be properly addressed. This may include securing heavy covers or using mechanical advantage devices for lifting. Open manholes must be guarded with warning ribbons six feet back, standard railings, or be constantly attended. Traffic safety should be established in accordance with the Manual of Uniform Traffic Control Devices, Chapter 6. Some spaces have a high risk of flammable/explosive atmospheres and should be tested through a pick hole or other opening even before the cover is removed.

Whenever possible, spaces should be cleaned/flushed and purged to the degree that personal protective equipment (PPE) is not needed for residues. If this is not feasible, then proper PPE must be required for the hazards present.

Some spaces may require a cool down period.

3. ISOLATION

Some spaces, such as sewer manholes, cannot be completely isolated by lockout/tagout procedures, so other acceptable means must be used to provide for the safety of entrants. This may include temporary blockage of lines, pumping/diverting of flows, using spotters upstream, and notifying entities that could create large unexpected flows before the entry begins.

Written lockout procedures, specific to confined space entry, should be developed and use to ensure that employees cannot be injured by unexpected product flows or startup of electrical, mechanical, pneumatic, hydraulic, or thermal energy sources.

If the failure of a single locked valve would result in a release of dangerous energy into a confined space, or create an engulfment hazard, then additional isolation must be performed. Blank flanges, disconnection and misalignment of pipes, removal of “spool” sections of pipe or double block and bleeding (two valves locked closed with a drain locked open in between) are all options.

4. ATMOSPHERIC TESTING

Careful thought and planning must be given to the required atmospheric testing for each confined space. The typical oxygen level, flammable atmosphere (LEL), and hydrogen sulfide tests conducted by common confined space air monitors may be appropriate for a domestic sewer system space, but substances in the space and materials used in the space can create other dangerous atmospheres requiring additional testing.

Painting, use of solvents, welding and burning in confined spaces can create dangerous atmospheres that cannot be detected with common gas meters. Some toxic welding fumes and gases such as ozone and oxides of nitrogen are difficult or impossible to monitor in real time.

WARNING- Before allowing the use of any solvents, paints or welding/burning equipment in a confined space, review the MSDS and consult an Industrial Hygienist! Numerous fatalities have occurred when products safe to use in a well-ventilated area have been used in confined spaces.

Unless a confined space is completely clean, and there is no risk of changing conditions, continuous air monitoring should be conducted.

Confined spaces should be initially tested top to bottom and side to side. A single point test may miss hazards.

Test instruments must be maintained and calibrated in accordance with the manufacturer's recommendations. An annual factory calibration is typical, along with pre-use calibrations using certified test gas mixtures.

It is critical that employees using air-testing equipment understand not only how to operate it properly, but also its limitations. For example, some sensors will give false levels at cold or hot temperatures, and others are cross sensitive, actually reading for several different gases.

Employees have the right to witness the initial atmosphere test of a confined space that they will enter. This should be accounted for in the planning process.

Testing must be completed before an entry permit is signed, and must show acceptable entry conditions for each parameter. If ventilation is in place, it should be shut down before testing, to show "worst case" conditions.

5. VENTILATION

As a general rule, all confined spaces should be ventilated prior to and during entry. Not only does ventilation reduce the risk of hazardous atmospheres, but also it allows employees to work more comfortably and less likely to take shortcuts that can lead to mishaps.

There are two types of ventilation that should be considered:

General Dilution Ventilation- This is simply moving large quantities of fresh air into the space, or drawing large quantities of stale air from the space using blowers and flexible ducts. If there is only a single opening, then flexible duct must be used to either force fresh air into the far end or draw from this area to prevent "dead spots".

Special low profile saddles are available to allow flex duct to pass though a man way and still allow personnel access.

General dilution ventilation is appropriate for spaces where the concern is gases or vapors from products, residues, or bacterial action in the space. It **IS NOT** effective against dusts, welding fumes or gases, or vapors from paints, sealers, resins, or solvents used in confined spaces.

Local Exhaust Ventilation- This involves drawing air adjacent to the operation, such as painting and exhausting it to a safe area away from any access points. For some operations, such as welding, the intake must be very close- within 12". Local exhaust for particulates such as dusts, mists and welding fumes must have adequate velocity and volume flow to capture and transport the contaminants.

Confined space ventilation requires an adequate supply of blowers and flexible duct for the types of operations performed. If spaces containing potential flammable atmospheres will be ventilated, or if flammable vapors will be moved, then proper Class/Division rated explosion proof equipment must be used. Proper static grounding must also be observed.

6. EQUIPMENT NEEDED FOR SAFE ENTRY

This will vary from entry to entry, but some common considerations are:

Access to safety equipment- Such as temporary railings, traffic control equipment, fall protection devices, safety ribbon, scaffolding, ladders etc.

Lighting- Low voltage lighting is preferred for confined space entry. All electrical equipment must be GFCI protected and tested before each entry. If flammable atmospheres are possible, lighting equipment should be Class/Division rated for the type of hazardous atmosphere possible.

Personal protective equipment- This varies greatly between entries but at a minimum includes proper eye protection and safety footwear. It may also include hardhats, rubber waders, chemical protective clothing, hearing protection, distress alarms, and respirators- either for specific hazards present or for escape.

An industrial hygienist should be consulted for respiratory protection needs in confined space entry.

Retrieval systems- For horizontal access, this may be nothing more elaborate than a harness on the entrant with an attached rope, tied off to a fixed object outside the space. For vertical entries, like manholes, an approved retrieval device, such as a tripod, stanchion, or derrick device and harnesses with shoulder rings are required.

Powered hoists and cranes must NEVER be used as retrieval devices.

Entrants going into a confined space though a vertical opening, such as a manhole should either be lowered in or belayed while climbing down, by an approved retrieval device. Falls at the point of entry are a common cause of serious injuries and deaths in confined space entry operations.

Communication aids- If verbal/visual contact cannot be maintained with the attendant by all entrants, then some form of communication aid must be used. Portable radios **ARE NOT** acceptable since they are not "open circuit" continuous communication and are ineffective underground and in many types of spaces. There are several "diver's telephone" type systems on the market that provide continuous communication as well as evacuation and distress alarms.

The attendant also needs a reliable on-site means of calling for help in an emergency. How this will be done should be clearly communicated during the pre-entry briefing. A cell phone or portable radio are good options.

7. ATTENDANT

Older safety standards referred to this person as an "observer" and required little if any training. The Attendant, however, must be well trained, trusted, and briefed to perform specific duties during the entry.

Training must include:

A. Detailed knowledge of your permit entry program.
B. Duties of Attendants.
C. Possible symptoms of hazardous atmosphere exposure.
D. Actions to take in the event of a prohibited condition or emergency.

Duties of the Attendant include:

A. Remaining outside of the space at all times. (NO PART OF THE BODY CAN BREAK THE PLAIN OF THE OPENING)
B. Performing no duties or activities that interfere with the ability to diligently execute all Attendant duties.
C. Prevent unauthorized entry. Only those listed on the permit and briefed by the Entry Supervisor are authorized to enter.
D. Remain in contact with all Entrants at all times and monitor their safety.
E. Ensure that all conditions of the permit are followed, such as continuous air monitoring, ventilation, PPE and work practices.
F. Evacuate the space and contact the Entry Supervisor if a prohibited condition occurs.

G. In the event of an emergency, notifies the proper emergency responders. If provisions for external rescue is in place, they may retrieve entrants this way. **UNDER NO CIRCUMSTANCES MUST AN ATTENDENT ENTER THE SPACE.**

8. RESCUE

There are two types of rescue provisions that must be addressed for each entry- External and Internal.

External Rescue (no-entry)- Is a provision for the attendant to pull or retrieve entrants from the space if incapacitated. For horizontal, level entry, this may be a harness and lifeline tied to a fixed object outside the space. For vertical entry, an approved rescue hoist device is required.

External rescue provisions must be used on all entries, unless they would not contribute to the rescue of a downed entrant. Examples of cases where it would not be required would be a situation where multiple turns in the space would prohibit pulling the entrant out, or where multiple entrants would make it impossible to manage the lines without tangling. In any case, it is recommended that all entrants wear harnesses to assist in their rescue if an emergency occurs. A single lifeline or retrieval line left in the space may also aid one entrant in helping another out if they should suffer a medical emergency etc.

Internal Rescue (entry)- Is a ***trained, qualified, and equipped*** rescue team that can respond and enter confined spaces to effect rescue. Regardless of who this is, the employer must have a written agreement with them to respond and the employer is responsible to ensure that they are capable of performing rescues from the spaces that will be entered and aware of the hazards that can be expected. Simply saying “call the fire department” is not acceptable. Some fire departments perform confined space rescue, some do not. Some are trained and equipped for simple horizontal entry or manhole rescues, but cannot perform high angle rescues from tanks. The SCBA used by fire departments is ineffective in some confined space rescue situations.

Some good practices are:

A. Providing your rescue service with a list of confined spaces, contents and entry configurations.
B. Having the rescue team perform a “validation drill” by retrieving an employee or dummy from a representative space. (The regulation requires that they perform such a drill annually to be qualified as a rescue team anyway.)

C. Have a system of notifying the rescue team and placing them on standby for entries taking place.

The Permit Entry Process

A confined space permit is a checklist to ensure that everything goes right, so a tragedy does not occur. It should never be considered "paperwork" to fill out. It is used by the Entry Supervisor to outline the 5 Specifics of the entry:

- SPECIFIC trained employees.
- Permission to enter a SPECIFIC space.
- To perform SPECIFIC work.
- For a SPECIFIC period of time.
- Under a SPECIFIC set of conditions.

When it is determined that an entry must be made:

1. The Entry Supervisor outlines the work to be done and evaluates the potential hazards. This may involve reviewing MSDS, safety procedures, and even consulting with a safety professional or industrial hygienist.
2. The Entry Supervisor identifies the employees who will enter and who will be the Attendant. He/she verifies that they are properly trained in confined space entry.
3. The Entry Supervisor identifies the safety controls needed for the entry on the permit form, and gives it to the entry team to gather equipment and prepare the space *without entering it*.
4. The entry team prepares the space by protecting, isolating, draining, flushing, ventilating etc. and gathering all PPE and safety equipment needed.
5. The Atmospheric Tester conducts the initial air quality tests and if acceptable, records the data on the permit.
6. The Entry Supervisor inspects the site to ensure that everything is ready to go and briefs the Entrants and Attendant on all aspects and requirements of the permit. This will include specific emergency procedures. He/she then signs the permit authorizing entry.
7. The Attendant observes the operation and performs all duties, ensuring that the permit is followed. The Entry Supervisor visits as often as needed to ensure that permit conditions are being followed.
8. If an unexpected or prohibited condition occurs (gas alarm, unauthorized entry, ventilation failure etc.) the Attendant evacuates the space, terminates the entry and contacts the Entry Supervisor to start over again.
9. When the entry is complete, or the permit expires, the Attendant evacuates the space, terminates the permit, and closes up the space.
10. The permit is reviewed by the Entry Supervisor and the entry team is debriefed.
11. The permit is filed for a period of one year.

APPENDIX

A- Example Confined Space Inventory Form.

B- Confined Space Hazard Analysis Form.

C- Non-Permit Confined Space Entry Procedure.

D- Confined Space Entry Permit Example.

APPENDIX A- Example Confined Space Inventory Form

Space Name	Location	Contents	Access	Permit/Non-Permit*

*** Warning!- Confined Spaces should only be classified as "non-permit" after a thorough and documented hazard analysis.**

APPENDIX B- CONFINED SPACE HAZARD ANALYSIS FORM

Space _____ Date _____

Analysis performed by _____

Materials normally found/stored in space _____

Type of work anticipated during entries into this space _____

Potential Hazards of Space (indicate Yes or No for each hazard potential):

1. **Hazardous Atmosphere**

   Flammable-

   Microbial action ___ Products in space ____

   Spills/products released into space ___ Dusts ___

   Oxygen deficient-

   Microbial action ___ Chemical Reaction/rust ___

   Adsorption ___ Dilution/displacement ___

   Oxygen enrichment-

   Oxidizers ___ Oxygen gas ___

   Toxic-

   Microbial action ___ Stored material ___ Reactions ___

   Combustion ___ Anticipated operations/product use in space ___

   Specific hazardous contaminants (yes/no)

   Methane ___ Hydrogen sulfide ___ Sulfur Dioxide ___

   Carbon Monoxide ___ Ozone ___ Organic vapors ___

   A potential for hazardous atmosphere requires the space to remain "Permit Required".

2. Engulfment

Standing liquid- drowning hazard ___ Liquid flows- drowning hazard ___

Solids/powders shifting material entrapment ___

These hazards require the space to remain "Permit Required" unless they can be removed during preparation (i.e. lockout) without entering the space .

3. Constriction Hazards

Cone trap ___ Cylinder trap ___ Wedge trap ___

These hazards require the space to remain "Permit Required".

4. Other Serious Safety and Health Hazards

Hazardous energy/accidental startup-

Moving machinery ___ Electrical ___ Steam ___

Hydraulic ___ Pneumatic ___ Stored energy ___

Sharp objects/impalement hazards- ___

Chemical skin hazards ___ Hazardous Heat ____ Hazardous Cold ____

Other hazards likely to result in serious injury or death? ___

_____

_____

_____

<u>CONCLUSION</u> (Choose one)

__ This space has potential hazards that make it a permit required confined space.

__ This space has no potential serious safety and health hazards, and is reclassified as a non-permit confined space. (Entry procedure must be developed).

__ This space has potential serious safety and health hazards, but they can be removed before entry into the space, and it is reclassified as a non-permit confined space. (Entry procedure must be developed).

APPENDIX C- NON-PERMIT CONFINED SPACE ENTRY PROCEDURE

Space name _____

Location _____

Date of adoption _____

Authorized by _____

1. **Site/space preparation:**

2. **Safety equipment required:**

3. **Personnel requirements:**

Warning!- The use of solvents, paints, welding, burning or other work that adds potential hazardous atmospheres to this space renders it "PERMIT REQUIRED".

APPENDIX D- CONFINED SPACE ENTRY PERMIT EXAMPLE

IDENTIFICATION
Location_____
Confined Space Name _____

Date:	Expiration Date:	Time: am pm	Expiration Time:

Note: This Permit is valid for one entry team during a single entry. Maximum duration of the permit will be 8 hours . All copies shall remain at the job site until work has been completed.

Description of Space:
_____
_____
Reason for entry: (e.g., welding, cleaning, etc.)_____

AUTHORIZED PERSONNEL

Entrants	Attendants	Contractors

EQUIPMENT REQUIRED

What type of communication equipment will be used to maintain contact with entrants? ( ) radio ( ) phone ( ) visual contact ( ) other _____
What type of communication equipment will be available to contact emergency services? ( ) radio ( ) phone Emergency Contact_____ Phone #_____
Is respiratory protective equipment required for this job? ( )Yes ( )No
If yes, has each member of the entry team completed respirator training, physicals and fit testing?
( )Yes ( )No
If yes, what type? ( ) SCBA ( ) supplied air ( ) PAPR ( ) full face ( ) half mask cartridge used: _____
Is personal protective clothing required for this job? ( )Yes ( )No If yes, What type?
( ) coveralls ( ) splash suit ( ) leather gloves ( ) chemical gloves ( ) goggles ( ) face shield ( ) ear plugs ( ) other_____
( ) ear muffs ( ) hard hat ( ) welding hood ( ) welding gloves ( ) welding jacket ( ) safety boots ( ) chemical boots
What types of hazardous energy may be present?
( ) electrical ( ) mechanical ( ) hydraulic ( )chemical ( )pneumatic ( ) thermal
How will these hazards be eliminated or controlled?
_____
_____
_____
_____

What other hazards may the worker be exposed to?
_____
_____

Supervisor's Name (Print)_____

Signature_____ **Date**_____

ATMOSPHERIC TESTING

Type of gas monitor_____ Date of last calibration_____

	Initial	#2	#3	#4	#5	#6	# 7	#8	#9	#10
Oxygen (between 19.5% and 23.5%)										
Flammables/combustibles (less than 10% of L.E.L.)										
Carbon Monoxide										
Nitrogen Oxide										
Hydrogen Sulfide										

TOXIC CONTAMINANTS

Chemical Name (Is the MSDS present?)	MSDS	PEL	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10

THIS PERMIT MUST BE POSTED NEAR THE ENTRANCE OF THE SPACE DURING ENTRY

ADDITIONAL REQUIREMENTS

Check List	(Initial the appropriate box)		
	YES	NO	N/A
All warning/caution signs, barricades, etc. are posted and in place.			
Hazardous energy has been locked and tagged.			
An emergency escape plan has been developed.			
Safety life lines and retrieval system are secured and in place,			
Space has been properly ventilated.			
Required personal protective equipment is available and in use.			
Fire Extinguisher Present.			

PERMIT HAS BEEN TERMINATED/CANCELED

BY_____**REASON**_____

DATE_____