

Benzene

1. Purpose

The purpose of this policy is to protect USPL employees and contractors from overexposure to benzene.

2. Scope

This policy applies to all USPL employees and contractors who work in areas or perform tasks that could cause exposure to benzene.

The following sections of this safety manual contain related policies and should be consulted for specific requirements and guidance:

• Air Monitoring	• Hazardous Waste Operations and Emergency Response (HAZWOPER)
• Confined Space Entry	• Personal Protective Equipment (PPE)
• Excavations	• Respiratory Protection
• Hazard Communication (HAZCOM)	• Toxic Substances Control Act (TSCA)

3. Minimum Requirements

	Minimum Requirements	Supporting Documentation
1.	USPL locations shall establish <i>regulated areas</i> wherever the airborne concentration of benzene exceeds, or can reasonably be expected to exceed, 1 ppm . Regulated areas shall be posted appropriately. <i>Note:</i> USPL's routine activities at operating facilities do not have any permanent regulated areas; however, temporary areas may be established due to petroleum spills or projects.	Section 8
2.	Appropriate respiratory equipment shall be used if airborne benzene concentrations exceed 1 ppm. Respiratory protection shall also be used in emergency situations (i.e. to perform cleanup actions inside the "hot zone") if the airborne benzene concentration is unknown and suspected to be above 1ppm.	Section 9
3.	Employees and Supervisors shall follow all requirements for benzene emergency exposure incidents.	Section 10 and Appendix I

4. Definitions

Action Level—An airborne concentration of benzene that is used to determine exposure monitoring frequency, medical surveillance, and annual training requirements. The OSHA Action Level for benzene is 0.5 ppm as an 8-hour TWA.

Benzene—A sweet-smelling, chronically toxic, colorless liquid hydrocarbon (C₆H₆). Benzene is a naturally occurring component of crude oil and gasoline in low concentrations (usually < 5%). Long-term exposure to benzene is known to cause anemia and leukemia.

Emergency exposure to benzene—An exposure that occurs when an employee is exposed to an unusually high and unexpected level of benzene (above 1 ppm) without respiratory protection. The exposure may come from gasoline or crude oil vapor or liquid. Emergency exposures may result from spills, leaks, line or hose ruptures, unprotected exposure during emergency response or emergency cleanup events, or a dousing with gasoline or crude oil. Health Services will consult with the Industrial Hygienist to determine the appropriate medical response. See Section 10 and Appendix I for more information about responding to emergency exposure incidents.

Permissible exposure limit (PEL)—An exposure limit that is set and enforced by OSHA. The PEL is the maximum amount or concentration of a chemical or agent that a worker may be exposed to. This limit is based on the maximum exposure limit described by the regulation.

Regulated area—An area where the airborne concentration of benzene exceeds, or can reasonably be expected to exceed, 1 ppm.

Time-weighted average (TWA)—The exposure level or concentration averaged over a period of time, usually over a given work period (e.g., an 8-hour workday, a 15-minute period). The average is determined by sampling for the contaminant throughout the time period.

5. Roles and Responsibilities

- A. Employees are responsible for reporting and appropriately responding to any unplanned release of benzene or benzene-containing materials (see Sections 10 and 12 and Appendix I).
- B. Supervisors are responsible for:
 - 1. Assisting employees responding to emergency releases of benzene and benzene-containing materials.
 - 2. Immediately reporting the incident in accordance with the Incident Reporting Policy (see Sections 10 and 12 and Appendix I).
 - 3. Coordinating the implementation of benzene exposure controls, including engineering controls and use of appropriate PPE.
- C. Safety Coordinators are responsible for:
 - 1. Assisting in identifying areas, procedures, tasks, and other factors that can result in exposure to benzene.
 - 2. Assisting in implementing benzene exposure controls.
 - 3. Providing guidance during emergency exposure incidents in consultation with USPL Health Services and Industrial Hygiene.
- D. The Industrial Hygienist is responsible for:
 - 1. Developing and coordinating benzene exposure monitoring.
 - 2. Recommending and assisting with the implementation of benzene exposure controls.
 - 3. Maintaining benzene exposure records.
 - 4. Consulting with the Health Services Advisor as needed.
- E. Health Services Advisor is responsible for:
 - 1. Providing guidance during emergency exposure incidents.
 - 2. Coordinating the benzene-related medical surveillance program.

3. Maintaining applicable medical records.

6. Exposure Limits

- A. Benzene exposure shall not exceed 1.0 part per million (ppm) unless respiratory protection is used in accordance with the Respiratory Protection Policy.
- B. An Action Level of 0.5 ppm as an 8-hour TWA shall be used to determine additional monitoring, medical surveillance, and additional employee training.

7. Exposure Monitoring

Exposure monitoring is managed by the Industrial Hygienist.

7.1. Monitoring Frequency

- A. At a minimum, representative 8-hour TWA exposures shall be determined on the basis of at least one sample representing the full-shift exposure for each job classification in each work area where benzene-containing materials are present.
 1. If full-shift sampling reveals employee exposures at or above the Action Level (0.5 ppm as an 8-hour TWA) but at or below the PEL, monitoring shall be repeated for that position at that location at least every year.
 2. If sample results reveal exposures above the PEL, the monitoring for that group of employees shall be repeated at least every six months.

Note: USPL may alter the monitoring schedule from every six months to annually or may terminate monitoring altogether if two consecutive measurements taken at least seven days apart reveal exposure levels below the Action Level.
 3. Where initial monitoring shows results below the Action Level, monitoring for that employee or group of employees may be discontinued until
 - a) there is reason to believe that employee exposure levels might have changed; or
 - b) once every five years; or
 - c) as directed by the Industrial Hygienist.
- B. Area monitoring and /or surveys shall be performed after the cleanup of spills, ruptures, leaks, or other emergency exposures involving benzene-containing materials. This monitoring shall be performed to ensure that benzene levels have returned to levels below 1.0 ppm.
- C. Exposure monitoring will be conducted within 30 days of
 1. the introduction of new benzene-containing materials into the workplace, or
 2. a change in the production process, control equipment, personnel, or work practices that may result in new or increased exposures to benzene.

7.2. Monitoring Methods

- A. Employee exposure levels shall be determined from personal breathing zone air samples that are representative of the employee's normal workday and routine tasks.
- B. Breathing zone air samples shall be taken with collection media such as charcoal tubes, organic vapor monitor (OVM) badges, etc.

1. These sampling devices (which are usually attached to the collar or shoulder area of the employee's shirt, coat, or other outer garment) shall be no more than two feet from the nose and mouth.

7.3. Notification of Monitoring Results

- A. Affected employees shall be notified of the results of any benzene exposure monitoring within 15 days of receipt of the results.
 1. This notification shall be in writing.
 2. Notification shall be sent to each employee or be posted in an appropriate, easily accessible location.
- B. Whenever the PEL is exceeded, affected employees shall be notified of the corrective action being taken to reduce employee exposure to below the PEL.
 1. This notification shall be in writing.
 2. Notification shall be sent to each affected employee or posted in an appropriate, easily accessible location.

7.4. Contractor Requirements

- A. Contractors shall be responsible for benzene exposure monitoring of their personnel in the following situations:
 1. If they are performing work in areas where benzene-containing materials may be present; and
 2. If exposure to benzene is likely.
- B. Contractors shall make copies of all personal monitoring and survey results available to the USPL Industrial Hygienist.

8. Regulated Areas

- A. USPL locations shall establish regulated areas wherever the airborne concentration of benzene exceeds, or can reasonably be expected to exceed, 1.0 ppm.

Note: USPL does not have any permanent regulated areas for benzene. Examples of locations that might be temporarily designated as regulated areas for benzene include:

 1. An empty gasoline storage tank with an internal benzene airborne concentration of 1.0 ppm or greater.
 2. The site of an uncontrolled release, based on the volume of material spilled and the concentration of benzene.
- B. The regulated area shall be demarcated from the rest of the work site by physical means or signs that limit access to only authorized, properly equipped personnel.
- C. Signs with the following warning shall be posted at all entrances to the regulated area:

DANGER
BENZENE
MAY CAUSE CANCER
HIGHLY FLAMMABLE LIQUID AND VAPOR DO NOT
SMOKE
WEAR RESPIRATORY PROTECTION IN THIS AREA
AUTHORIZED PERSONNEL ONLY

9. Personal Protective Equipment

- A. Appropriate respiratory equipment shall be used if airborne benzene concentrations exceed 1 ppm.
 - 1. Respiratory protection shall also be used in emergency situations (i.e. to perform cleanup actions inside the "hot zone") if the airborne benzene concentration is unknown and suspected to be above 1ppm.
- B. All respiratory equipment shall be used in accordance with USPL's Respiratory Protection policy.
 - 1. Organic vapor cartridges on air-purifying respirators worn to prevent benzene exposure shall be changed out at the beginning of each shift or if breakthrough is suspected.
- C. All personal protective equipment shall be used in accordance with the Personal Protective Equipment (PPE) policy and PPE Matrix.

10. Emergency Exposure Response Procedures

This section specifies the procedures to be implemented if an emergency benzene exposure occurs. See also Appendix I for a flowchart summarizing the actions required in responding to emergency exposure incidents.

10.1. Employee Actions

- A. Affected employees shall take these steps *immediately*:
 - 1. Activate an emergency shutdown, as appropriate, and leave the area.
 - 2. Remove any saturated clothing including shoes, as quickly as possible.
 - 3. Wash any affected body area with soap and lukewarm water.
- B. Affected employees shall take these steps as soon as possible *and* before the end of the workday:
 - 1. Inform the Supervisor or available site management of the incident.
 - 2. Report any symptoms or possible health related complications potentially related to the exposure.
 - 3. Report any potential damage to equipment to the Supervisor or available site management.
- C. If directed by the Health Services Advisor or Supervision, affected employees will report to their local medical provider for a medical evaluation, clinically indicated testing and possible treatment. As part of the evaluation, a biological specimen may be requested.
- D. At any time after the incident, affected employees will report any symptoms or possible health related complications potentially related to the exposure to Supervision.

10.2. Supervisor Actions

- A. To report the incident, the Supervisor will record the following information and communicate it to the Health Services Advisor:
 - 1. Identity of exposed employee
 - 2. Location and time of exposure
 - 3. What the employee was doing when the benzene exposure occurred
 - 4. How long the employee was exposed
 - 5. If there was significant skin contact, how much of the body was affected and how much time elapsed before the material was washed off
- B. The Health Services Advisor, Industrial Hygienist, and Supervisor will consult and determine whether the extent of exposure requires the employee to undergo a medical examination, evaluation and/or testing.

11. Medical Surveillance

- A. A medical surveillance program is available to those employees who are or may be exposed to benzene at the following levels:
 - 1. At or above the Action Level for 30 days or more per year
 - 2. At or above the PEL for 10 days or more per year
 - 3. At or above an exposure level of 10 ppm for 30 days or more in one year prior to December 10, 1987, while employed by BP or one of its predecessor companies

Note: There are no USPL employees who meet the above criteria and are required to be included in a benzene medical surveillance program.

12. Training

- A. Employees who work in areas where benzene-containing materials are present shall receive training and information specific to benzene, the OSHA benzene standard (29 CFR 1910.1028), and medical surveillance provisions at the time of assignment.

13. Contractor Requirements

- A. Contractors performing work activities in locations where benzene-containing materials are stored and handled shall be informed of the hazards of benzene per the OSHA Hazard Communication standard.
- B. Contractors performing work activities in areas where benzene-containing materials may be present and exposure to benzene is likely shall be responsible for monitoring the benzene exposure of their personnel. Copies of all monitoring results shall be made available to the USPL Industrial Hygienist.

14. Recordkeeping

- A. USPL will maintain employee exposure monitoring records for at least 40 years after termination of employment.

15. References

1. OSHA, U.S. Department of Labor, 29 CFR 1910.1000, "Air Contaminants."
2. OSHA, U.S. Department of Labor, 29 CFR 1910.1028, "Benzene."
3. BP Global Records Retention Schedule dated 14 March 2016.

Appendix I

Benzene Emergency Exposure Incident Actions

