**CHEMICAL-BIOLOGICAL AWARENESS**

This policy is designed to provide awareness and to protect the health of Piedmont Service Group (PSG) employees if they come in contact with a substance below. This policy establishes general procedures to be followed.

**ANHYDROUS AMMONIA AWARENESS**

This policy is designed to provide awareness and to protect the health of Piedmont Service Group (PSG)

employees if they come in contact with anhydrous ammonia. This policy establishes general procedures to be followed.

The purpose of this policy is to protect the health of PSG employees who may be exposed to ammonia and

to establish general procedures when ammonia is encountered. As always, the Safety Data Sheet will detail how to use it safely.

Anhydrous Ammonia – used in manufacturing, refrigeration and agriculture – is a pungent, suffocating, colorless and toxic gas or liquid that, when concentrated, is corrosive to human tissue upon contact, according to NIOSH. As a fertilizer, Anhydrous Ammonia gas is compressed into liquid and mixed with other plant growth enhancers. It can also be applied in gaseous form, where it combines with the moisture in the dirt, resulting in ammonia-enriched fertilizer soil.

“As liquid, Anhydrous Ammonia is released from its container into the air, it expands rapidly, forming a large cloud that acts like a heavier-than-air gas for a period of time,” the Centers for Disease Control and Prevention adds. “Because the vapors hug the ground initially, the chances for humans to be exposed are greater than with other gases.”

**What Happens**

A worker can be exposed to anhydrous ammonia in several ways. How severely a worker is injured will depend on the length of the exposure, as well as the concentration level of the gas or liquid.

Here’s what NIOSH wants employers and workers to know about Anhydrous Ammonia exposure:

**Eye exposure:** Mild or moderate exposure to the eyes can result in irritation and a burning feeling, whereas severe exposure can lead to inflammation of the eye’s membranes, swelling and sloughing of the eye’s surface cells, and temporary or even permanent blindness.

**Ingestion:** Although uncommon, ingesting ammonia is hazardous. Symptoms can range from mild to moderate – such as vomiting, abdominal pain and burns to the mouth, esophagus and stomach – to severe, including corrosive damage to the mouth, throat and stomach.

**Inhalation:** Inhaling ammonia gas can cause breathing problems, wheezing or chest pain. Asphyxiation may occur in poorly ventilated or enclosed areas, according to the Agency for Toxic Substances and Disease Registry.

**Skin exposure:** Mild to moderate skin exposure to ammonia can result in swelling and stinging pain; severe exposure to the skin can cause inflammation, blistering, tissue death and penetrating burns. Additionally, a worker may experience a frostbite injury if exposed to liquefied ammonia gas.

**What To Do**

NIOSH recommends a number of first aid responses for Anhydrous Ammonia exposure. However, regardless of the type of exposure, the first step should be to remove the affected worker from the source of the exposure.

**Eyes:** Wash eyes out with tepid water for a minimum of 15 minutes.

**Ingestion:** Ensure the victim’s airway is unobstructed. Refrain from inducing vomiting or administering anything by mouth. Provide supplemental oxygen if needed.

**Inhalation:** Check the victim’s respiratory function and pulse, ensure the airway is free of obstructions and administer oxygen if the person is having breathing problems.

**Skin:** If a severe exposure has occurred, remove the victim’s clothing (to at least their undergarments) and thoroughly wash the victim’s contaminated skin with soap and water. Take care not to break the victim’s skin during decontamination, as this may lead to further injury.

Victims should seek immediate medical attention after these initial actions have been taken.

**You Need To Know**

Any facility we work in that may contain Anhydrous Ammonia will have an emergency plan and safe handling requirements. These will be understood and followed. As a minimum, when working with Anhydrous Ammonia, we will use the following:

ACGIH® TLV® - TWA: 25 ppm

ACGIH® TLV® - STEL [C]: 35 ppm

**Eye/Face Protection:**Wear chemical safety goggles. A face shield (with safety goggles) may also be necessary.

**Skin Protection:**Wear chemical protective clothing e.g. gloves, aprons, boots. In some operations: wear a chemical protective, full-body encapsulating suit and self-contained breathing apparatus (SCBA). [Suitable materials](http://www.ccohs.ca/oshanswers/prevention/ppe/trade_name.html) include: butyl rubber, Viton®, Viton®/butyl rubber, Trellchem® HPS, Trellchem® VPS, Tychem® TK.

**Respiratory Protection:**

Up to 250 ppm:  
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against ammonia; or Any supplied-air respirator.

**ASBESTOS**

The purpose of this policy is to protect the health of PSG employees who may be exposed to asbestos and to establish general procedures when Asbestos Containing Material (ACM) is encountered.

It is the policy of PSG that all employees with the potential of encountering asbestos, be trained in the physical properties of asbestos, health hazards of Asbestos, and the procedures to follow when encountering Asbestos Containing Materials (ACM).

**Training**

All employees that may encounter Asbestos (airborne or in place materials) during the course of construction are required to receive Asbestos Awareness training.

This Training shall include the physical properties of Asbestos, examples of Asbestos containing material, health hazards of Asbestos and procedures to follow when encountering ACM.

**Physical Properties & Common ACM**

Asbestos is a generic term describing a family of naturally occurring fibrous silicate minerals. As a group, the minerals are noncombustible, do not conduct heat or electricity and are resistant to many chemicals. Although there are several other varieties that have been used commercially, the most common asbestos mineral types likely to be encountered in buildings are chrysotile (white asbestos), amosite (brown asbestos), and crocidolite (blue asbestos). Among these, white asbestos is by far the most common asbestos mineral.

**Friable Asbestos**

Friable asbestos material means finely divided asbestos or asbestos-containing material or any asbestos-containing material that can be crumbled, pulverized or powdered by hand pressure.

Individual fibers in friable asbestos-containing material can potentially become airborne and can then present a health hazard.

Friable material commonly used in buildings include sprayed fibrous fireproofing, decorative or acoustic texture coating and thermal insulation.

**Non-friable Asbestos**

Non-friable asbestos includes a range of products in which asbestos fiber is effectively bound in a solid matrix from which asbestos fiber cannot normally escape.

However, cutting, breaking, sanding, drilling or similar activities can release asbestos fiber from even non-friable asbestos materials. Non-friable material commonly used in buildings include cement tiles or boards, resilient floor coverings and asphalt roofing product.

**Asbestos Health Hazards**

All forms of asbestos cause lung cancer and malignant mesothelioma.  And all can cause asbestosis, a progressive fibrotic disease of the lungs.  Generally, workers who develop asbestos-related diseases show no signs of illness until many years after their first exposure. The time between first exposure and the appearance of lung cancer can be anywhere from 10 years to 45 years. The following are diseases and conditions associated with exposure to asbestos.

**• Asbestosis** is characterized by a progressive scarring of the lung tissue. This decreases the lung’s ability to expand and contract, resulting in difficult breathing or shortness of breath. Asbestosis generally develops 10 to 15 years after exposure and while early detection is possible by x-ray and lung function tests, tissue damage is irreversible and continues to progress even after exposure has ceased. Reduced lung capacity puts extra strain on the heart and in cases of severe asbestosis, respiratory failure can lead to death. There is no cure or effective treatment for asbestosis.

**• Mesothelioma** is a form of cancer found in the cells of the pleura (lining of the chest cavity and lungs) and the peritoneum (lining of the abdominal cavity). Symptoms of pleura mesothelioma include breathlessness, weakness, weight loss, loss of appetite, chest and back pain and coughing. Symptoms of peritoneum mesothelioma include abdominal pain and swelling, weight loss, loss of appetite and nausea. The only known cause of mesothelioma is asbestos exposure with a latency period of up to 45 years. Both types of mesothelioma spread rapidly and survival beyond two years after diagnosis is rare.

**• Lung cancer** is the most common cancer caused by asbestos exposure, but exposure has also been associated with cancer of the larynx and cancer of the gastrointestinal tract, including the esophagus, stomach, colon and rectum.

**• Pleura plaques** are areas of scarring on the lining of the lung (pleural) surface**.** While pleura plaques do not normally cause a reduction in life expectancy, the affected worker may experience pain on breathing and decreased chest expansion.

**Procedures to Follow When Encountering ACM**

All ACM shall be identified, and employees should be made aware of its location in the building or project.

When asbestos contained material is discovered during the course of construction, a report shall be immediately made to your supervisor or the safety director. No work shall proceed until the asbestos has been abated. This will not be self-performed. This will be contracted out.

When the job requires work in the area of ACM, one should avoid touching or disturbing the ACM. This includes:

• Do not drill holes, cut, break or sand ACM.

• Do not move ACM.

• Do not hang anything from ceilings covered with asbestos materials.

• Do not pin or hang anything on walls covered with asbestos materials.

**BENZENE**

The purpose of this procedure is to establish the minimum requirements for Benzene exposure on Piedmont Service Group (PSG) job sites.

**Scope**

This procedure applies to all PSG employees, contractors, subcontractors and visitors associated with a PSG job site.

**Procedure**

Each site shall make every attempt to prevent the possibility of incidents and accidents through compliance with safety regulations, through training employees to properly perform their job activities and through employee involvement in safe work activities.

This program has been developed and implemented to protect PSG employees performing repair work in bulk storage facilities who have the potential of being exposed if the tank, structure, vessel or piping previously held benzene-containing material. This program addresses the health hazards of benzene, work practices, and control measures to minimize potential exposure to benzene.

**Benzene Hazards**

Benzene is an aromatic hydrocarbon that is produced by the burning of natural products. It is also a fractional component of products derived from coal and petroleum. Found in gasoline and other fuels, it is used in the manufacture of plastics, detergents, pesticides, and many other organic chemicals. Workers in industries that make or use benzene may be exposed to this chemical. These include the rubber industry, oil refineries, chemical plants, shoe manufacturers, and gasoline-related industries. Benzene is also used to make some types of lubricants, dyes, detergents, drugs, and pesticides. Other people who may be exposed to benzene at work include steel workers, printers, lab technicians, gas station employees, and firefighters.

Research has shown benzene to be a carcinogen (cancer-causing). About half of the exposure in the US to Benzene is from smoking tobacco or second hand smoke.

Benzene is highly flammable. The lower flammability limit (LFL) and upper flammability limit (UEL) of benzene is 1.2% and 7.8%, respectively, and the flash point of benzene is 12 degrees °F (−11.63 °C, 262 K ). As a result, all sources of ignitions must be controlled. Containers of benzene and associated equipment (such as pumps) should be properly grounded and bonded to minimize the potential build-up of static electricity.

Long-term exposure may affect bone marrow and blood cell production.

Short-term exposure to high levels of benzene can cause drowsiness, dizziness, unconsciousness, and death.

**Physical Characteristics:**

Benzene is a colorless, highly flammable liquid with a pleasant, sweet odor. However, the odor of benzene does not provide adequate warning of its hazard. The following are the physical characteristics of benzene:

• Synonyms: cyclohexatriene, benzol, phenyl hydride

• Molecular weight: (78.11 g mol−1)

• Boiling point: 176°F (Fahrenheit) (80 °C)

• Melting point: 43° F (6.12 °C)

• Specific gravity (water=1): also referred to as relative density (0.8765(20) g/cm)

• Vapor Pressure: 75 mm Hg

• Flashpoint: 12° F (−11.63 °C, 262 K)

• Lower flammability limit (LFL): 1.2%

• Upper flammability limit (UFL): 7.8%

• Relative vapor density (air=1): 2.7

• Incompatibilities and reactivites: strong oxidizers, many fluorides and perchlorates, and nitric

acid

**Health Hazards:**

Benzene may enter the human body through inhalation, skin absorption, and/or ingestion. Exposure above established exposure limits may cause short-term (acute) or long-term (chronic) health effects. Symptoms caused by acute benzene exposure include the following:

• Breathlessness

• Irritability

• Euphoric or giddy

• Irritation of eyes, nose, and respiratory tract

• Headache

• Dizziness

• Nausea

• Intoxication

• Severe acute exposures may lead to convulsions and loss of consciousness.

•Repeated or prolonged exposure to benzene, even at relatively low concentrations, may result in `various blood disorders.

• Skin absorption is a potential route of exposure, skin and eye contact with benzene-containing liquid shall be minimized.

• Ranging from anemia (i.e., deficiency in the oxygen-carrying capacity of the blood) to leukemia (blood cell cancer), an irreversible and terminal disease.

**Airborne Exposure Limits:**

Potential airborne exposure to benzene may be evaluated by comparing atmospheric concentrations to the most recent Permissible Exposure Limits (PELs), Threshold Limit Values (TLVs), and Recommended Exposure Limits (RELs). The PELs are published and enforced by OSHA as legal standards. The TLVs are established by the CGIH as recommended industry standards.

**Airborne Exposure Limits for Benzene**

| **Standard Set By** | **Exposure Limit** | [**Health Effect Codes**](https://www.osha.gov/dts/chemicalsampling/toc/field.html#healthcode) **-- Health Effects and Target Organs** |
| --- | --- | --- |
| **OSHA PEL - General Industry**  See [29 CFR 1910.1028](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10042) | 1 ppm TWA  5 ppm STEL | HE1 -- leukemia |
| HE7 -- central nervous system excitation followed by central nervous system depression |
| HE8 -- loss of consciousness, respiratory paralysis, death (very high concentrations) |
| HE12 -- nonmalignant blood disorders (bleeding, anemia, aplastic anemia, thrombocytopenia, leukopenia) |
| HE14 -- eye, nose, and respiratory irritation |
| **OSHA PEL - Sectors Excluded from General Industry**  See [29 CFR 1910.1000 Table Z-2](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9993)  (See also ANSI Z37.40-1969 - Note: These values apply to the industry segments exempt from the 1 ppm 8-hour TWA and 5 ppm STEL of the benzene standard at [29 CFR 1910.1028](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10042).) | 10 ppm TWA  25 ppm Ceiling  50 ppm Maximum peak above ceiling (10 minutes) | HE12 -- blood disorders (anemia, leukopenia, aplastic anemia) |
| HE14 -- eye, nose, and respiratory irritation |
| **OSHA PEL - Construction Industry**  See [29 CFR 1926.1128](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10898) | 1 ppm TWA  5 ppm STEL | HE1 -- leukemia |
| HE7 -- central nervous system excitation followed by central nervous system depression |
| HE8 -- loss of consciousness, respiratory paralysis, death (very high concentrations) |
| HE12 -- nonmalignant blood disorders (bleeding, anemia, aplastic anemia, thrombocytopenia, leukopenia) |
| HE14 -- eye, nose, and respiratory irritation |
| **OSHA PEL - Shipyard Employment**  See [29 CFR 1915.1028](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10320) | 1 ppm TWA  5 ppm STEL | HE1 -- leukemia |
| HE7 -- central nervous system excitation followed by central nervous system depression |
| HE8 -- loss of consciousness, respiratory paralysis, death (very high concentrations) |
| HE12 -- nonmalignant blood disorders (bleeding, anemia, aplastic anemia, thrombocytopenia, leukopenia) |
| HE14 -- eye, nose, and respiratory irritation |
| **NIOSH REL** | 0.1 ppm TWA  1 ppm STEL  Ca | HE1 -- leukemia |
| HE4 -- gastrointestinal irritation and anorexia; cardiac sensitization |
| HE7 -- central nervous system depression; convulsions and paralysis; polyneuritis |
| HE11 -- pulmonary edema, pneumonia |
| HE12 -- bone marrow damage, aplastic anemia |
| HE14 -- eye, mucous membrane, and skin irritation; dermatitis |
| **ACGIH TLV®** (1996) | 0.5 ppm (1.6 mg/m3) TWA  2.5 ppm (8 mg/m3) STEL  A1  Skin  BEI® | HE1 -- leukemia, including acute myelogenous leukemia |
| [**CAL/OSHA PELs**](http://www.dir.ca.gov/title8/5155table_ac1.html)  (See also [Section 5218](http://www.dir.ca.gov/title8/5218.html)) | 1 ppm TWA  5 ppm STEL  Skin |  |

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**Controlling Benzene Exposures:**

A site-specific benzene control plan shall be prepared for projects where potential benzene exposure is anticipated. This site-specific benzene control plan should address the following:

• Regulated areas

• Exposure monitoring

• Medical surveillance

• Engineering and work practice controls

• Respiratory protection

• Protective clothing

• Training

The site-specific benzene control plan (to include contingency planning) should include a schedule for development and implementation of the engineering and work practice controls. The site-specific benzene control plan will include any additional facility specific benzene plant safety rules and must be reviewed and approved by the respective PSG Project Manager and Safety Director.

**Regulated Areas**

Areas where the TLV-TWA (i.e., 0.5 ppm) is reasonably expected to be exceeded must be regulated. Only authorized personnel shall be allowed in the regulated areas. Signs (bearing the following legend) shall be posted at the entrances of regulated areas:

**DANGER-BENZENE-CANCER HAZARD-FLAMMABLE- NO SMOKING**

**AUTHORIZED PERSONNEL ONLY-RESPIRATOR REQUIRED**

**Exposure Monitoring**

Potential employee exposures to benzene shall be assessed by conducting representative personal air sampling in the employee’s breathing zone. Full-shift TWA personal air samples should be collected during worst-case exposure conditions for each job classification in each regulated work area. Full-shift air-monitoring may be discontinued if the air-samples, collected during worst-case conditions, results in TWA air concentrations of benzene are below OSHA’s Action Level.

Short-term air sampling may be discontinued if the short-term air samples collected during worst-case conditions result in air concentrations of benzene below the TLV-STEL of 2.5 ppm (established by ACGIH).

Air sampling for benzene may be conducted using a photoionization detector (PID) calibrator to show a corresponding benzene concentration, which is capable of providing a "real-time" response. Air monitoring may also be conducted by collecting an air sample on a sorbent (charcoal) tube or a passive (charcoal) dosimeter and subsequently sent to a laboratory accredited by the American Industrial Hygiene Association (AIHA) for analysis.

Portable monitors, continuous monitoring and passive dosimeters are also methods of sampling and monitoring. **Monitoring must have an accuracy to a 95% confidence level of not less than +/- (plus or minus) 25% for concentrations of benzene greater than or equal to 0.5 ppm.** For more specific monitoring requirements and air sample methods refer to CFR 1910.1028, Appendix D.

**Notification of Air-Sampling Results**

Written notification of representative personal air-sampling exposure data shall be provided to employees within 15 working days after receipt of the air-sampling results.

**Medical Surveillance**

A medical surveillance program shall be available to employees whose exposure to benzene is anticipated to be at or above the TLV-TWA for 30 or more days per year. Medical surveillance shall also be provided to those employees whose exposure is anticipated to be at or above two times the TLV-TWA for 10 or more days per year. Prior to being permitted to work in the regulated area, each employee must receive a medical exam performed by or under the supervision of a licensed physician. No initial medical examination is required if adequate records indicate that the employee has been examined in accordance with this benzene control program within the previous 12 months.

**Additional Exams and Referrals**

Medical examination shall be provided to an employee if the employee develops signs and symptoms commonly associated with benzene exposure. Where the results of the complete blood count required for the initial and periodic examinations indicates any of the following abnormal conditions exist, then the blood count shall be repeated within two weeks:

• The hemoglobin level or the hematocrit falls below the normal limit as determined by the laboratory for the particular geographical area and/or these indices show a persistent downward trend from the individual’s pre-exposure norms.

• The thrombocyte (platelet) count varies more than 20 percent below the employee’s most recent values or falls outside the normal limit as determined by the laboratory; or

• The leukocyte count is below 4,000 per mm3 or there is an abnormal differential count.

If the abnormality persists, the examining physician shall refer the employee to a hematologist or an internist for further evaluation. At that time, the employee shall be removed from areas of air concentrations greater than the TLV-TWA until such time as the physician in consultation with the hematologist/internist determines that the employee can return to his/her usual job.

**Emergency Examinations**

If an employee is exposed to benzene in an emergency situation:

• The employee shall provide a urine sample at the end of the employee’s shift, and a urinary phenol test shall be performed on the sample within 72 hours.

• The urine specific gravity shall be corrected to 1.024. If the result of the urinary phenol test is below 75 milligrams of phenol per liters of urine, no further testing is required.

• If the result of the urinary phenol test is equal to or greater than 75 mg phenol/L of urine, the employee shall receive a complete blood count at monthly intervals for duration of three months following the

emergency exposure. This blood count shall include erythrocyte count, leukocyte count with differential and thrombocyte count. If any abnormalities exist, additional exams and referrals are required.

**Engineering and Work Practice Controls**

Prior to PSG entering any tanks or vessels or performing work on any structure that had previously been in service, the tank, structures, etc. must be cleaned and gas free. PSG customer and/or facility owner shall be responsible for performing any required tank cleaning. Any exceptions must be reviewed and approved in accordance with the corporate risk analysis process and the Safety Director.

In addition, tanks, vessels, pipelines, and structures shall be properly isolated and locked and tagged out in accordance with PSG's LOTO program.

Fire extinguishers, when provided, must be readily available.

Smoking will be prohibited in areas where benzene is used or stored.

**Respiratory Protection**

All employees within a regulated area must wear an appropriate respirator as determined by the exposure monitoring. See below for specific, respiratory protection equipment based on the level of exposure to benzene:

|  |  |
| --- | --- |
| **Airborne concentration of benzene** | **Respirator type** |
| Less than or equal to 5 ppm | Half-mask air-purifying respirator with organic vapor cartridge. |
| Less than or equal to 25 ppm | Full face piece respirator with organic vapor cartridges; or full face piece gas mask with chin-style canister1. |
| Less than or equal to 50 ppm | Full face piece powered air-purifying respirator with organic vapor canister |
| Less than or equal to 500 ppm | Supplied-air respirator with full face piece in positive-pressure mode. |
| Greater than 500 ppm or unknown concentration | Self-contained breathing apparatus with full face piece in positive pressure mode.  Full face piece positive-pressure supplied-air respirator with auxiliary self-contained air supply. |
| Escape | Any organic vapor gas mask; or any self-contained breathing apparatus with full face piece. |
| Firefighting | Full face piece self-contained breathing apparatus in positive-pressure mode. |

Prior to wearing a respirator, respirator users must complete a medical evaluation and fit test in accordance with PSG's Respirator Program requirements. Respirator users must complete a pulmonary function test and a specific evaluation of the cardiopulmonary system shall be made at the time of the pulmonary function test. Pulmonary function tests must be conducted every three years if an employee may be exposed at or above the TLV-TWA of benzene and wears a respirator for at least 30 days a year.

**Protective Clothing and Equipment**

Personal protective clothing and equipment (such as boots, gloves, sleeves, and aprons) and splash-proof safety goggles shall be worn and selected after reviewing the SDS and completing the Job Hazard Analysis.

**Training**

Employees shall be provided with information and training at the start of a project that involves benzene exposure as part of PSG's Hazard Communication Program. Such training must be documented and shall include the following topics:

• Short-term and long-term health effects of benzene exposure.

• Symptoms of benzene exposure.

• Regulated areas.

• Benzene exposure monitoring.

• Plant specific benzene contingency planning.

• Engineering controls, work practice controls, and personal protective equipment.

• Medical surveillance.

• Site-specific benzene exposure control plan.

**Recordkeeping**

PSG will maintain an accurate record of all benzene air-sampling surveys and medical surveillance records for the duration of employment plus 30 years. The air-sampling records shall include:

• The dates, number, duration, and results of air-samples.

• Description of the procedure used to determine representative employee exposures.

• Description of the sampling and analytical methods used.

• Type of respiratory protection equipment worn.

• The name, social security number, job classification and exposure levels of the employee monitored and all other employees whose exposure the measurement is intended to represent.

• The medical surveillance records shall include the name and social security number of the employee. The employer’s copy of the physician’s written opinion on the initial, periodic and special examinations and all tests, opinions, and recommendations.

• Employee medical complaints related to exposure to benzene.

• Copy of the information provided to the physician.

• Copy of the employee’s medical and work history related to exposure to benzene or any other hematological toxins.

**HYDROGEN SULFIDE**

This policy for the prevention of hazardous employee exposure to Hydrogen Sulfide (H2S) is adopted by Piedmont Service Group (PSG)in accordance with the following OSHA regulations:

§1910.1200 – **Hazard Communication Standards for Employers**

PSG has implemented this policy to ensure that no employee is exposed to Hydrogen Sulfide (H2S) at levels in excess of the PEL (permissible exposure limit is 20 PPM). This policy is available to all employees upon request. The Safety Coordinator is the assigned supervisor responsible for ensuring the following engineering controls and work practices are enforced.

**Training**

The Safety Director will provide employees with information and training at the time of their initial assignment to a work area where H2S is present. Training will address characteristics and health effects of H2S. If exposures are above the action level, employees will be provided with information and training at least annually thereafter. Necessary employee training will be documented to include:

• Identity of the employee trained.

• The signature and title of the employee trainer.

• The date of the training.

Employees will be informed of all regulated areas and will be properly trained in entrance procedures, safety requirements, and practices while in regulated areas.

**Characteristics of Hydrogen Sulfide**

H2S is a colorless, extremely poisonous gas that has the characteristic odor of rotten eggs. The sense of smell becomes rapidly fatigued and can NOT be relied upon to warn of the continuous presence of H2S. Large amounts of H2S are obtained in the removal of sulfur from petroleum.

**Hydrogen Sulfide is:**

• Extremely toxic. 100 ppm is the IDLH (Immediately Dangerous to Life or Health concentration.)

• Colorless.

• Solubility in water at 68 °F is 0.4% by weight.

• Flammable Gas.

• Incompatible and reacts with strong oxidizers, strong nitric acid, and metals.

• UEL (upper explosive [flammable] limit in air) is 44.0% by volume (at room temperature).

• LEL (lower explosive [flammable] limit in air) is 4.0% by volume (at room temperature) Contact and exposure occurs through inhalation, skin and/or eye contact.

• Target organs are the eyes, respiratory system, and central nervous system.

Health effects and symptoms include: irritation of the eyes and respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation (blisters), dizziness, headache, lassitude (weakness, exhaustion), irritability, insomnia; gastrointestinal disturbance.

**Potential employee exposure to Hydrogen Sulfide includes:**

• Drilling Operations

• Recycled Drilling Mud.

• Water from sour crude wells

• Blowouts

• Tank Gauging (tanks at producing, pipeline, and refining operations)

• Field Maintenance

• Tank batteries and wells, etc.

In the event of an emergency where H2S is released at hazardous levels, employees not wearing sufficient PPE for the situation will be immediately evacuated to a safe area until the hazard is contained. Employees working at jobsites where there is a potential for exposure to an H2S hazardous atmospheres will be supplied with personal monitoring equipment which must be carried outside of clothing on the worker at all times when in the work area.

In the event that PEL of H2S are exceeded within any facility where employees are contracted to work, all work will be stopped and employees evacuated until the facility’s management can ensure that H2S levels are brought down to an acceptable level for safe work. The management of any facility where PSGcontracts to work must provide a list of all operations in the facility where H2S is emitted. Facility management will provide a copy of the facility’s contingency plan provisions.

All required signs and labels will be posted in areas of potential exposure to H2S. All containers or materials containing H2S will be appropriately labeled to indicate the contents and the hazards of the contents.

**Gas Detectors/ Monitors**

PSG will ensure each employee will use a portable gas detector as required in all high hazard areas. The gas monitor will be calibrated per the manufacturer’s recommendations. Each monitor will contain a current calibration sticker on the monitor providing the date of calibration. At the beginning of each day a bump test is required to be completed on the monitor when in use per the requesting owner client and manufacturer’s guidelines. This is to ensure the monitor and alarms are functioning correctly.

“Bump Test”- Briefly expose the portable detector to a known concentration of gas high enough to set off the alarm. Note the reading to ensure that it is correct. A bump test is not a calibration, but a quick way to ensure that the most important functions of the instrument are intact.

**Respiratory Protection**

PSG will ensure the company’s respiratory protection program is in accordance with 29CFR 1910.134. Each employee will receive training in respiratory protection. The training will be documented and in writing.

**Emergency Action**

PSG will ensure all employees are aware of the Owners Emergency Action Plan, including evacuation routes and alarms. Employees will participate in company emergency evacuation drills.

**LEAD**

The objective of the lead standard is to protect Piedmont Service Group (PSG) employees from the serious toxic effects of lead that may not become apparent until years of exposure have passed. Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating), it cannot be absorbed thru your skin. When lead is scattered into the air as dust, fume, or mist it can be inhaled. Failure to wash your hands prior to eating could also lead to absorption. Once lead is absorbed into your bloodstream part of it stores in your body, and can be slowly causing irreversible damage.

**Policy**

Exposure to lead occurs in several different occupations in the construction industry such as: demolition, salvage of structures, removal or encapsulation, new construction, alteration, repair, or renovation of structures that contain lead or materials containing lead. It is PSG policy not to disturb any area that is existing and may contain lead.

In addition, there are construction related activities where exposure to lead may occur such as: abrasive blasting, welding, cutting, torch burning and some maintenance operations.

This is not to say that all welding or soldering compounds would contain lead, you need to check their content before you start.

This standard would not apply if you are not working with an item containing lead - welding and soldering that does not contain lead compounds would be exempt.

Some lead containing materials will have an "Objective Information Data Sheet" demonstrating that it cannot release dust or fumes in concentrations at or above the action level under any expected condition of use - these items are exempt also. If your job has lead or lead containing materials that will become "airborne" thru dust, mist, or fumes there are specific procedures that must be followed.

**Training**

Employees shall receive training upon hiring or initial assignment and annually thereafter for those employees subjected to lead exposure. Employees are to be informed and trained on the contents of:

• The OSHA Lead Standard (Subpart D – 1926.62) and company policy.

• The specific nature of work operations which could result in exposure.

• The adverse health effects associated with excessive exposure to lead.

• The proper selection and use of respiratory protection and other PPE.

• The purpose of medical surveillance programs.

• Engineering and work practice controls.

• Employee’s rights to access medical records.

**General Work Procedures**

Engineering and work practices controls shall be implemented to reduce and maintain employee exposure to lead at or below the Permissible Exposure Limits (PEL). When feasible engineering and work practice controls are not sufficient to reduce employee exposure PSG shall supplement them by the use of appropriate respiratory protection. The following are engineering and work practice controls to be implemented when lead is determined present in the workplace:

• Respirators shall be used during the time period necessary to install or implement engineering and work practice controls, where engineering and work practice controls are insufficient or in emergency situations.

• Obtain an SDS (Safety Data Sheet) for material you are working with. Follow proper warning signs and labels, etc. as instructed on the SDS.

• Document the description of each activity in which lead is emitted, equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices if applicable.

• Approved respirators shall be worn.

• All protective clothing and equipment will be provided by PSG at no cost to employees. Protective clothing and equipment must be kept clean, or disposed of properly, depending on the equipment, clothing, respirators, gloves, etc.

• All surfaces shall be maintained as free as noticeable of accumulations of lead by using a vacuuming system, dry or wet sweeping can be used in areas where vacuuming is not effective.

**Filter Changing and Working in areas with Lead**

Some areas may have the potential to have lead on the filters, such as a shooting range. When

working in these facilities, treat them as contaminated.

The following PPE would be required:

N95 respirator. Remember to wear a respirator, (a health check and fit test is required before).

Tyvek suit, booties, chemical gloves and goggles.

Then the following procedures are required:

Throw the filters away at the facility. If you must take them with you, bag them before you put them in your vehicle. Remove the PPE, bag it and wash your hands.

Note: As long as you have less than #220 of contaminated material, you can dispose of as normal

trash. If you have more than this, it needs to be disposed of as hazardous material.

**Air Sampling & Monitoring**

The air quality must be sampled and monitored to determine if the exposure level is above the Permissible Exposure Limit (PEL) of 50 micrograms (50 ug/m (3) averaged over an 8 hour workday).

If initial determination or subsequent air monitoring reveals employee exposure to be at or above the action level, but below the PEL, PSG shall repeat air monitoring every six months and continue air monitoring at required frequencies until at least two consecutive measurements, taken at least seven days apart, are below the action level and discontinue air monitoring.

If exposure levels are above allowable levels, warning signs shall be posted stating "Exposure to lead is above the PEL". PSG shall record exposure-monitoring results.

**Medical Surveillance**

**Initial Medical Surveillance**

PSG will provide initial medical surveillance to employees occupationally exposed at any one day to lead at or above the action level (30 micrograms / cubic meter of air averaged over an 8-hour day). The initial medical surveillance shall consist of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels.

Within five (5) working days after receipt of biological monitoring results, PSG shall notify each employee in writing of his or her blood lead levels and remove from site any employees whose lead levels are excessive.

Physicians will not reveal any medical situations, discovered as a result of the physical, other than those necessary to meet this standard.

**Full Medical Surveillance**

PSG will make available full medical surveillance to all employees who are or may be exposed to lead in excess of the action level for more than 30 days a year and whose blood lead level exceeds 40 micrograms/ deciliter.

The blood lead level determination for employees exposed to lead, as stated above, shall be conducted at least every two (2) months for the first six (6) months of exposure and every six (6) months thereafter.

If blood levels are at or greater than 40 micrograms/deciliter, then blood sampling at least every two (2) months until two (2) consecutive analyses show blood levels below 40 micrograms/deciliter.

If the employee is removed from exposure to lead, then blood sampling at least monthly during removal period.

**Medical Examination & Consultation**

PSG will make available medical examination and consultation to employees according to the following schedule:

• At least annually for any employee who had a blood lead level at or above 40 ug/dl.

• When an employee notices signs or symptoms associated with lead intoxication.

• When employee desires medical advice on ability to have a healthy child.

• When employee demonstrates difficulty in breathing during respirator fit test.

Medical surveillance will be provided by PSG at no cost to the employee and will be performed by or under the supervision of a licensed physician at a reasonable time and place.

PSG shall establish and maintain an accurate record for each employee subject to medical surveillance. The record shall include the following:

• The name, social security number and description of the employee duties.

• A copy of the physician’s written opinion.

• Results of any airborne exposure monitoring done on or for the employee.

• Any employee medical complaints related to exposure to lead.

In addition, PSG will ensure that the examining physician keeps the following medical records:

• Copy of the medical examination results.

• Description of the laboratory procedures and any guidelines used to interpret the test results.

• Copy of the biological monitoring results.

If an employee is removed from current exposure to lead, PSG shall establish and maintain the following record(s):

• Name and social security number of the employee.

•The date that the employee was removed and the date on which the employee was returned to former job status.

• A brief explanation on how removal was accomplished.

• A statement whether the removal was for reason of elevated blood lead level.

**Hygiene Facilities & Practices**

No food, beverages, or tobacco products can be in the area. Clean change areas shall be provided, as well as facilities to wash your hands and face prior to eating, drinking, smoking, or applying cosmetics.

Where feasible, shower facilities may be provided in areas where exposure to lead exceeds the PEL.

Clean change areas equipped with separate storage facilities for protective work clothing and equipment and street clothes will be provided for employees where airborne exposure to lead is above the PEL. Employees will not be allowed to leave the workplace wearing protective clothing or equipment worn during the work shift.

PSG will provide lunchroom facilities or eating areas that are as free as practicable from lead contamination and which are readily accessible to the employees.

**MOLD**

**Overview**

Concern about indoor exposure to mold has been increasing as the public becomes aware that exposure to mold can cause a variety of health effects and symptoms, including allergic reactions. This document presents guidelines for the remediation/cleanup of mold and moisture problems in commercial buildings and residences; these guidelines include measures designed to protect the health of building occupants and remediators.

Molds can be found almost anywhere; they can grow on virtually any organic substance, as long as moisture and oxygen are present. There are molds that can grow on wood, paper, carpet, foods, and insulation. When excessive moisture accumulates in buildings or on building materials, mold growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed. It is impossible to eliminate all mold and mold spores in the indoor environment. However, mold growth can be controlled indoors by controlling moisture indoors.

Molds reproduce by making spores that usually cannot be seen without magnification. Mold spores waft through the indoor and outdoor air continually. When mold spores land on a damp spot indoors, they may begin growing and digesting whatever they are growing on in order to survive. Molds gradually destroy the things they grow on.

Many types of molds exist. All molds have the potential to cause health effects. Molds can produce allergens that can trigger allergic reactions or even asthma attacks in people allergic to mold. Others are known to produce potent toxins and/or irritants. Potential health concerns are an important reason to prevent mold growth and to remediate/clean up any existing indoor mold growth.

Since mold requires water to grow, it is important to prevent moisture problems in buildings. Moisture problems can have many causes, including uncontrolled humidity. Some moisture problems in buildings have been linked to changes in building construction practices during the 1970s, 80s and 90s. Some of these changes have resulted in buildings that are tightly sealed, but may lack adequate ventilation, potentially leading to moisture buildup. Building materials, such as drywall, may not allow moisture to escape easily. Moisture problems may include:

• Roof leaks.

• Landscaping or gutters that direct water into or under the building.

• Unvented combustion appliances.

• Delayed maintenance or insufficient maintenance are also associated with moisture problems in schools and large buildings

Moisture problems in portable classrooms and other temporary structures have frequently been associated with mold problems.

When mold growth occurs in buildings, adverse health problems may be reported by some building occupants, particularly those with allergies or respiratory problems. Remediators should avoid exposing themselves and others to mold‐laden dusts as they conduct their cleanup activities. Caution should be used to prevent mold and mold spores from being dispersed throughout the air where they can be inhaled by building occupants

**Health Effects and Symptoms Associated with Mold Exposure**

• Allergic Reactions

• Asthma

• Hypersensitivity Pneumonitis

• Irritant Effects

• Opportunistic Infections

**Mold Toxins (Mycotoxins), Toxic Molds**

• Microbial Volatile Organic Compounds (mVOCs)

• Glucans or Fungal Cell Wall Components (also known as B‐(1 ‐ ‐ > 3) – D – Glucans)

• Spores

**Molds in the Environment**

Molds live in the soil, on plants and on dead or decaying matter. Outdoors, molds play a key role in the breakdown of leaves, wood, and other plant debris. Molds belong to the kingdom Fungi, and unlike plants, they lack chlorophyll and must survive by digesting plant materials, using plant and other organic materials for food. Without molds, our environment would be overwhelmed with large amounts of dead plant matter.

Molds produce tiny spores to reproduce, just as some plants produce seeds. These mold spores can be found in both indoor and outdoor air, and settled on indoor and outdoor surfaces. When mold spores land on a damp spot, they may begin growing and digesting whatever they are growing on in order to survive. Since molds gradually destroy the things they grow on, you can prevent damage to building materials and furnishings and save money by eliminating mold growth.

Moisture control is the key to mold control. Molds need both food and water to survive; since molds can digest most things, water is the factor that limits mold growth. Molds will often grow in damp or wet areas indoors. Common sites for indoor mold growth include bathroom tile, basement walls, areas around windows where moisture condenses and near leaky water fountains or sinks. Common sources or causes of water or moisture problems include roof leaks, deferred maintenance, condensation associated with high humidity or cold spots in the building, localized flooding due to plumbing failures or heavy rains, slow leaks in plumbing fixtures and malfunction or poor design of humidification systems. Uncontrolled humidity can also be a source of moisture leading to mold growth, particularly in hot, humid climates.

**Health Effects and Symptoms Associated with Mold Exposure**

When moisture problems occur and mold growth results, building occupants may begin to report odors and a variety of health problems, such as headaches, breathing difficulties, skin irritation, allergic reactions, and aggravation of asthma symptoms; all of these symptoms could potentially be associated with mold exposure.

All molds have the potential to cause health effects. Molds produce allergens, irritants and in some cases, toxins that may cause reactions in humans. The types and severity of symptoms depend, in part, on the types of mold present, the extent of an individual’s exposure, the ages of the individuals and their existing sensitivities or allergies.

**Specific reactions to mold growth can include the following:**

• Allergic Reactions

• Inhaling or touching mold or mold spores may cause allergic reactions in sensitive individuals. Allergic reactions to mold are common – these reactions can be immediate or delayed. Allergic responses include hay fever‐type symptoms, such as sneezing, runny nose, red eyes and skin rash (dermatitis). Mold spores and fragments can produce allergic reactions in sensitive individuals regardless of whether the mold is dead or alive. Repeated or single exposure to mold or mold spores may cause previously non‐sensitive individuals to become sensitive. Repeated exposure has the potential to increase sensitivity.

• Asthma

• Molds can trigger asthma attacks in persons who are allergic (sensitized) to molds. The irritants produced by molds may also worsen asthma in non‐allergic (non‐sensitized) people.

• Hypersensitivity Pneumonitis

• Hypersensitivity pneumonitis may develop following either short‐term (acute) or long‐term (chronic) exposure to molds. The disease resembles bacterial pneumonia and is uncommon.

• Irritant Effects

• Mold exposure can cause irritation of the eyes, skin, nose, throat, and lungs, and sometimes can create a burning sensation in these areas.

• Opportunistic Infections

• People with weakened immune systems (i.e., immune‐compromised or immune‐suppressed individuals) may be more vulnerable to infections by molds (as well as more vulnerable than healthy persons to mold toxins). Aspergillus fumigatus, for example, has been known to infect the lungs of immune‐compromised individuals. These individuals inhale the mold spores which then start growing in their lungs. Trichoderma has also been known to infect immune‐ compromised children.

• Mold Toxins (Mycotoxins)

• Molds can produce toxic substances called mycotoxins. Some mycotoxins cling to the surface of mold spores; others may be found within spores. More than 200 mycotoxins have been identified from common molds and many more remain to be identified. Some of the molds that are known to produce mycotoxins are commonly found in moisture‐damaged buildings. Exposure pathways for mycotoxins can include inhalation, ingestion, or skin contact. Although some mycotoxins are well known to affect humans and have been shown to be responsible for human health effects, for many mycotoxins, little information is available.

• Aflatoxin B1 is perhaps the most well-known and studied mycotoxin. It can be produced by the molds Aspergillus flavus and Aspergillus parasiticus and is one of the most potent carcinogens known. Ingestion of Aflatoxin B1 can cause liver cancer. There is also some evidence that inhalation of Aflatoxin B1 can cause lung cancer. Aflatoxin B1 has been found on contaminated grains, peanuts and other human and animal foodstuffs. However, Aspergillus flavus and Aspergillus parasiticus are not commonly found on building materials or in indoor environments.

Much of the information on the human health effects of inhalation exposure to mycotoxins comes from studies done in the workplace and some case studies or case reports. Some molds can produce several toxins and some molds produce mycotoxins only under certain environmental conditions. The presence of mold in a building does not necessarily mean that mycotoxins are present or that they are present in large quantities.

**Note:** Information on ingestion exposure, for both humans and animals, is more abundant — wide range of health effects has been reported following ingestion of moldy foods including liver damage, nervous system damage and immunological effects.

**Microbial Volatile Organic Compounds (mVOCs)**

Some compounds produced by molds are volatile and are released directly into the air. These are known as microbial volatile organic compounds (mVOCs). Because these compounds often have strong and/or unpleasant odors, they can be the source of odors associated with molds. Exposure to mVOCs from molds has been linked to symptoms such as headaches, nasal irritation, dizziness, fatigue and nausea. Research on MVOCs is still in the early phase.

**Glucans or Fungal Cell Wall Components (also known as ß‐(1–>3)‐D‐ Glucans)**

Glucans are small pieces of the cell walls of molds which may cause inflammatory lung and airway reactions. These glucans can affect the immune system when inhaled. Exposure to very high levels of glucans or dust mixtures including glucans may cause a flu‐like illness known as Organic Dust Toxic Syndrome (ODTS). This illness has been primarily noted in agricultural and manufacturing settings.

**Spores**

Mold spores are microscopic (2‐10 um) and are naturally present in both indoor and outdoor air. Molds reproduce by means of spores. Some molds have spores that are easily disturbed and waft into the air and settle repeatedly with each disturbance. Other molds have sticky spores that will cling to surfaces and are dislodged by brushing against them or by other direct contact. Spores may remain able to grow for years after they are produced. In addition, whether or not the spores are alive, the allergens in and on them may remain allergenic for years.