Section 61.0
HAZARDOUS MATERIALS

A. Purpose

The purpose of this procedure is to provide **JAGUAR ENERGY SERVICES, LLC** personnel an understanding of hazardous chemicals, their terminology, their effects, and their risks.

B. Scope

The term applies to any substance, mixture, or compound listed in the OSHA standard 29 CFR, Part 1910, Subpart Z. Carcinogens, teratogens, toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, or agents which damage the hematopoietic system, lungs, skin, eyes, or mucous membranes are covered by this procedure.

1. Personal health and the environment can be negatively impacted if safe work practices or procedures are not followed.

C. Responsibilities

1. The Safety Coordinator or his/her designee is responsible for ensuring that employees have completed the training required by this procedure.
   - (a) Additional responsibilities include:
     - (i) Ensuring that employees have been properly trained.
     - (ii) The implementation of this Policy.
     - (iii) Take corrective actions on all violations or suspected violations of this procedure.
     - (iv) Documentation of completion by each employee.

2. The Safety Director is responsible for aiding in the implementation of this Procedure.
   - (a) Additional responsibilities include:
     - (i) Keeping the Safety Coordinator informed of any incidents related to this Procedure.

(ii) Conducting inspections to identify any violation of this Policy.

3. The supervisor in charge of each crew is responsible for taking reasonable care to protect the environment, while conducting their work activities according to the requirements in this procedure.
   (a) Additional responsibilities include:
      (i) Pre-job and daily inspections of the work area and written confirmation that conditions are safe.
      (ii) Ensure that all affected **JAGUAR ENERGY SERVICES, LLC** personnel have been made aware of the company's environmental procedures.
      (iii) Ensure that all employees follow the procedures in this policy.
      (iv) Report any environmental incidents to the Safety Coordinator.

4. **JAGUAR ENERGY SERVICES, LLC** personnel are responsible for taking reasonable care to protect the environment, while conducting their work activities according to the requirements in this procedure.
   (a) Additional responsibilities include:
      (i) Completing the required training on this Policy.
      (ii) Implementing the training on this Policy.
      (iii) Recognizing hazards that could impact **JAGUAR ENERGY SERVICES, LLC**'s Environmental Policy.

D. Procedure

For employee protection, Safe Work Practices, and proper handling of hazardous materials refer to the Hazcom Section.

1. Hazardous chemicals are specifically defined under the federal standard.

2. The term applies to any substance, mixture or compound listed in the OSHA standard 29 CFR, Part 1910, Subpart Z such as:
   (a) Carcinogens
   (b) Teratogens
   (c) Toxic agents

(d) Reproductive toxins
(e) Irritants
(f) Corrosives
(g) Sensitizers
(h) Hepatotoxins
(i) Nephrotoxins
(j) Neurotoxins
(k) Agents which damage the:
    (i) Hematopoietic system
    (ii) Lungs
    (iii) Skin
    (iv) Eyes
    (v) Mucous membranes

3. Other references of Hazardous Chemicals as listed in:
   (a) Annual Report on Carcinogens issued by the National Toxicology Program (NTP)
   (b) Monographs by the International Agency for Research on Cancer (IARC)
   (c) Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment, by the American Conference of Governmental Industrial Hygienists (ACGIH).

4. The rule includes mixtures in its definition of hazard substances. It defines a mixture as a combination of two or more substances, but does not include combinations that result from chemical reactions.
   (a) Mixtures which contain hazardous chemicals in amounts of 1% or more are considered hazardous.
   (b) Mixtures with carcinogens in amounts of 0.1% or more are considered hazardous.
       (i) Mixtures composed of the possibility of releasing the hazardous chemical in amounts above the OSHA permissible exposure limit or above the Threshold Limit Value, are also considered hazardous.

5. Terminology
   According to the federal rule, a hazardous chemical is any chemical which is either a physical hazard or a health hazard.
   (a) Physical hazards are chemicals which can explode, burst into flame, or create other external conditions which can harm you.

(i) Determination of which chemicals are physical hazards is relatively clear cut, because the physical properties and reactions of chemicals can be evaluated by scientific testing.

(b) Physical Hazards are substances that can produce a dangerous situation outside of your body, such as:

(i) **Combustible Liquid**: Means a liquid having a flash point at or above 100 deg. F(37.8 deg. C), but below 200 deg. F(93.3 deg. C)

(ii) **Compressed Gas**: Means a gas or mixture of gases:

(i) being in a container, with an absolute pressure exceeding 40 psi at 70 deg. F(21. deg. C).

(ii) being a gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 deg. F(54.4 deg. C) regardless of pressure at 70 deg. F(21.1 deg. C).

(iii) being a liquid having a vapor pressure exceeding 40 psi at 100 deg. F(37.8 deg. C) as determined by ASTM D-323-72.

(iii) **Corrosive:** A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact.

(i) A chemical is considered to be corrosive if when tested on the intact skin of albino rabbits, it destroys or changes irreversibly the structure of the skin at the site of contact.

(ii) This term does not refer to action on inanimate surfaces.

(iv) **Explosive**: Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subject to sudden shock, pressure, or high temperature.

(v) **Flammable:** Flammable means a chemical that falls into one of the following categories:

(i) “Aerosol, flammable” means an aerosol that yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame

extending back to the valve opening).

(ii) "Gas, flammable" means a gas that forms a flammable mixture, with air at a concentration of thirteen (13) percent by volume or less.

(iii) A gas that forms a range of flammable mixtures with air higher than twelve (12) percent by volume.

(vi) **"Liquid, flammable"** means any liquid having a flash point below 100 deg. F (37.8 deg C).

(vii) **"Solid, flammable"**

(i) A solid that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing processing.

(ii) A solid which can be ignited readily, and when ignited burns so vigorously and persistently as to create a serious hazard.

(iii) A chemical shall be considered to be a flammable solid, if it ignites and burns with a self-sustained flame at a rate greater than one tenth of an inch per second along its major axis.

(viii) **"Organic peroxide"** means an organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic molecule.

(ix) **"Oxidizer"** means a chemical that initiates or promotes combustion in other materials.

(x) **"Pyrophoric"** means a chemical that will ignite spontaneously in air at a temperature of 130 deg. F (54.4 deg. C) or below.

(xi) **"Unstable (reactive)"** means a chemical will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shock, pressure, or temperature.

(xii) **"Water-reactive"** means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

(c) **Health hazards** are chemicals which harm you after they get into your body. The term health hazard refers to any

chemical which is a carcinogen, a toxin, a reproductive hazard, a sensitizer, or an agent which damages the skin, lungs, blood, eyes, nervous system, or mucous membranes. Some examples of them are:

(i) **"Carcinogen"** means a chemical that causes cancer. It is a carcinogen if:

(i) It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen.

(ii) It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program.

(ii) **"Highly toxic**" means a chemical falling within any of the following categories:

(i) A chemical that has a median lethal dose (LD50) of 50 milligrams or less per kilogram of body weight, when administered orally to albino rats weighing between 200 and 300 grams each.

(ii) A chemical that has a median lethal dose (LD50) of 200 milligrams or less per kilogram of body weight, when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

(iii) A chemical that has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

(iii) **"Irritant"** means a chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

(iv) **"Sensitizer"** means a chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

(v) **"Toxic"** means a chemical falling within any of the following categories:

(i) A chemical that has a median lethal dose (LD50) of more than 50 milligrams per kilogram, but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats.

(ii) A chemical that has a median lethal dose (LD50) of more than 200 milligrams per kilogram, but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits.

(iii) A chemical that has a median lethal concentration (LC50) in air of more than 200 parts per million, but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter, but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats.

6. A chemical is considered to be a health hazard when at least one study conducted in accordance with scientific principles, shows that **acute** or **chronic** health effects may occur in exposed persons.

(a) An **acute health** effect usually occurs rapidly after a short-term exposure to a health hazard and is of short duration.

(b) A **chronic health** effect generally occurs as a result of long-term exposure to a health hazard and is of long duration.

7. The federal rule states that health hazards are more difficult to ascertain than physical hazards because some signs and symptoms of exposure, such as shortness of breath, are difficult to measure and may occur in non-occupationally exposed people.
   (a) The problem is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential.

8. You should be familiar with several other terms frequently used in discussing hazardous chemicals.
   (a) **Exposure** is subjection to a hazardous chemical through any route of entry into the body.
      (i) Determination of exposure usually includes establishing how much, by what route, how frequently, and for how long the exposure took place.
   (b) **Toxin** is a chemical which is capable of affecting the fertility of the parents or offspring, or the production of offspring, including the causing of chromosomal damage (mutations), and harmful effects on fetuses (teratogenesis).
      (i) A substance which is **toxic** is harmful to living organisms.
   (c) The **toxicity**, or harmfulness, of a substance can range from mild to extreme depending on the following five factors:
      (i) The nature of the chemical itself.
      (ii) The amount and duration of exposure.
      (iii) The **susceptibility** of the person exposed, which is affected by preexisting conditions such as medications, genetic traits, cigarette smoking, poor nutrition, or preexisting health conditions.
   (d) **Protective measures** used, such as engineering controls, ventilation systems, and personal protective equipment, such as respirators or gloves.
   (e) **External conditions,** such as temperature, wind speed, air flow, humidity.
      (i) External conditions can affect the dispersion of the hazardous chemical in the environment, its availability for absorption, and the amount and speed of absorption.
   (f) The **target organ** is the part of the body most directly and significantly harmed by exposure to a hazardous chemical.

(g) Target organs and their effects are:

(i) Silica and asbestos are agents which irritate or damage pulmonary tissue in the lungs.

(i) The signs and symptoms of these are coughing, tightness in chest, or shortness of breath.

(ii) Carbon tetrachloride and nitrosamines are hepatotoxin chemicals which produce liver damage.

(i) The signs & symptoms of these are jaundice and liver enlargement.

(iii) Halogenated, hydrocarbons, and uranium are nephrotoxins chemicals which produce kidney damage.

(i) The signs and symptoms of these are edema and proteinuria.

(iv) Mercury and carbon disulfide are neurotoxin chemicals, which produce their primary toxic effects on the nervous system.

(i) The signs and symptoms of these are narcosis, behavioral changes, and decrease in motor functions.

(v) Carbon monoxide and cyanides are agents which act on the blood or hemato-poietic system by, decreasing hemoglobin function and deprive the body tissues of oxygen.

(i) The signs and symptoms of these are cyanosis and loss of consciousness.

(h) Lead and PCB's are reproductive toxin chemicals which affect the reproductive capabilities, including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

(i) The signs and symptoms of these are birth defects and sterility.

(i) Ketones and chlorinated compounds are chemicals that cause cutaneous hazards which affect the dermal layer of the body.

(i) The signs and symptoms of these are defattening of the skin, rashes, and irritation.

(j) Organic solvents and acids are chemicals that cause eye hazards such as eye irritation or loss of visual capacity.

(i) The symptoms and signs of these are conjunctivitis and corneal damage.

9. OSHA exempts certain substances even though they meet the definition of a hazardous chemical.
   (a) These are articles in which the chemical is contained so that there is no potential for exposure during normal use.
   (b) The FDA regulated items such as household products used in household quantities for household purposes with household frequency.

10. A hazardous chemical which exerts a **local effect** harms only the part of the body it contacts. Corrosives, such as acids, for example, burn the skin upon contact.

11. Hazardous chemicals which have a **systemic effect** travel through the body by being absorbed into the bloodstream and affect multiple organ systems. Chloroform, for example, exerts a systemic effect, affecting the liver, kidneys, and central nervous system.

12. The **body burden** is the amount of a hazardous chemical which has accumulated in a person's body over a period of time.
   (a) This accumulation can occur whenever someone absorbs more of a hazardous chemical than they can get rid of.

13. **Warning properties** are signals given by hazardous chemicals that indicate exposure to them.
   (a) A hazardous chemical with good warning properties gives an immediate indication of its presence by causing pain, discomfort, or breathing problems.
   (b) Some hazardous chemicals have no warning properties at all.
   (c) They are tasteless, odorless, and painless to absorb, yet still may be harmful.

14. A **carcinogen** is any cancer-producing agent and is regulated by OSHA if:
   (a) It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen
   (b) It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program

15. A **mutagen** is a chemical or physical agent which induces genetic mutations.

16. A **Teratogen** is an agent or factor that causes the production of physical or functional defects in the developing embryo.

17. A **reproductive hazard** is a chemical which affects a person's ability to produce children by causing chromosomal damage, mutations, or other harmful effects on the fetus.

18. Routes of Entry

Routes of entry are not the same for every harmful chemical.

(a) There are three routes of entry that hazardous chemicals can enter your body:
- (i) By contact with your skin.
- (ii) By inhalation.
- (iii) By ingestion.

(b) You can absorb some chemicals more easily, or in larger amounts, by one route of entry than by another.

(c) Skin Contact
- (i) Hazardous chemicals can get into your body through contact with your skin.
- (ii) This can happen because some toxic substances can overcome your skin's natural protective barrier.
- (iii) Your skin's protective barrier is a thick layer of dead cells, which provides a wall between the outside environment and the blood vessels and tissue underneath.
- (iv) Intact or undamaged skin provides an oily barrier that seals your skin and keeps out water-soluble materials.
- (v) Just as other oily surfaces shed water, the oily surface of your skin helps prevent the absorption of water-soluble materials.
- (vi) Some hazardous chemicals such as acids or alkalis, can dissolve or destroy you skin's protective layer.
- (vii) Mechanical injuries, like scrapes or cuts, can also damage this layer.
- (viii) Most of these injuries have obvious effects on your skin; you feel pain and see redness.

(ix) Some hazardous chemicals can damage your skin in ways that are more subtle.

(x) **Organic solvents**, for example, can dissolve lipids, which means they can remove you skin's oily barrier leaving it dry, chapped, and cracked.

(i) Organic solvents can eventually destroy the protective layer of dead cells in your skin.

(ii) Organic solvents are usually clear, pleasant-smelling liquids made from carbon and hydrogen atoms.

(iii) They are used to dissolve other substances like inks, dyes, and paint pigments.

(xi) Examples of organic solvents are:

(i) Strippers
(ii) Thinners
(iii) Degreasers
(iv) Cleaners
(v) Paint removers
(vi) Paints
(vii) Glues
(viii) Fuels
(ix) Soaps
(x) Detergents**.**

(d) In paints and glues, the organic solvent is called the vehicle.

(i) It is the substance that keeps the pigment or glue in solution when you apply it to a surface.

(ii) Because solvents evaporate so rapidly, you may not realize that they have touched your skin.

(e) If an organic solvent strips away your skin's oily layer, the solvent can be absorbed directly into your bloodstream.

(i) This happens because the organic solvents dissolve the oily barrier, and then mix with fats and oils to form a solution.

(f) If solvents remove your skin's protective barrier, hazardous substances that are not easily absorbed through intact, healthy skin can be absorbed into your body.

(g) The size of the skin area that is exposed to an organic solvent determines the severity of the effect.

(h) When a large area of skin is exposed, a large amount of the substance is likely to be absorbed.

(i) Thus, the effect is more serious if the substance splashes all over your body, than it would be if you dipped your hand into a vat or pan containing the substance.

(i) The length of time your skin is exposed to organic solvents is also important. In general, the longer the substance remains in contact with your skin, the more you will absorb.

(i) This is why it is important to remove any hazardous substance from your skin as quickly as possible.

(j) You can protect yourself by avoiding direct contact with any hazardous chemicals that can be absorbed through your skin.

(k) Avoid using products containing organic solvents, for example, to remove paint or glue from your skin.

(l) If you work with products that contain organic solvents, you should wear impermeable gloves, aprons, boots, and other protective clothing.

(i) Be sure these items are made from materials that give you adequate protection.

(m) Finally, avoid prolonged contact with these hazardous chemicals which can damage protective clothing over time.

(i) Whenever possible, rinse your protective equipment with water, or another appropriate liquid, while you are still wearing it.

(ii) If that is not possible, change your protective clothing frequently.

(iii) If a hazardous chemical does come in contact with your skin, rinse it off immediately, change any clothing that has come in contact with the substance, then shower before you put on different clothing.

(n) You will know that you have come in contact with some organic solvents because of an obvious skin irritation.

(o) Others, such as benzene and trichloroethylene, have poor warning properties.

(i) They do not tell you that you have been exposed.

(i) There is no burning, pain, redness, or irritation.

(ii) Thus, you should be especially alert when you use them, so you can act immediately if your skin is exposed.

19. Inhalation

Hazardous chemicals are often airborne in the form of dusts, fumes, smokes, or vapors. Your lungs are another route of entry for hazardous chemicals.

(a) When you inhale, hazardous chemicals can come into contact with your respiratory system.

(b) Your nose is the first line of defense of the respiratory system. It traps the larger particles, those approximately 5 microns and larger, in a mucous layer so they are not absorbed.

(c) The next line of defense is in the larger tubes of your lungs.

(d) Smaller particles are deposited on a mucous layer here, because they are too heavy to stay in the air.

(e) They are removed by tiny hairs called cilia, which beat in an upward motion and move the foreign materials up and out of your lungs.

(f) Smoking a cigarette can paralyze these tiny cilia and allow these particles to enter the lungs.

(g) Coughing also helps to remove these materials.

(h) Some tiny particles, one micron or less in size, can travel all the way into the air sacs of your lungs when oxygen and carbon dioxide are exchanged.

(i) Many of the blood vessels in these air sacs are close to the surface, so your blood can easily take on oxygen and get rid of carbon dioxide.

(j) Because these blood vessels are so close to the surface, they can easily absorb toxic materials into your bloodstream.

(k) Some hazardous chemicals can cause mild to severe damage to lung tissue.

(l) Others pass right into the bloodstream without harming the lungs.

(m) When you absorb hazardous chemicals through your lungs, they are immediately distributed to all of your body's tissues without passing through your liver, whose function is to detoxify wastes.

(n) When hazardous chemicals come in contact with the liver cells, the liver often metabolizes or chemically alters these materials into a less hazardous form that can be quickly excreted.

(o) Some hazardous chemicals irritate your nose or upper airways.

(p) The irritation can make you cough, feel a burning sensation or heaviness in your chest, or make you wheeze and have difficulty breathing.

(i) These reactions are warning signs that your lungs are in contact with a hazardous substance.

(q) Other hazardous chemicals that enter through the respiratory system have poor warning properties.

(i) Because these substances do not cause irritation, you may be exposed to them without being aware of them.

(ii) So it is important to pay special attention to any hazardous chemical that can get into the air in your workplace.

20. Ingestion

The third route of entry is the gastrointestinal system, which includes your stomach.

(a) It may not seem like an important route of exposure for people who work in industry.

(b) We all know we should not taste or eat the material used in the workplace.

(i) You can ingest them without realizing it.

(c) You can ingest a hazardous chemical when you eat, drink, or smoke at your work station.

(i) Small quantities of toxic dust or vapor can dissolve in food or a beverage you leave uncovered.

(ii) If you get a toxic dust or liquid on your hands, you can transfer it to your food or a cigarette.

(iii) You then swallow the toxic substance when you put the food or cigarette in your mouth.

(d) Many hazardous chemicals are not easily absorbed through your gastrointestinal tract or are absorbed only in small quantities.

(i) When gastrointestinal absorption does occur, the materials are detoxified by the liver before they are distributed to other body tissues.

(ii) This protective mechanism is not fool proof.

(iii) The liver can not detoxify every substance.

(iv) Some substances destroy the liver cells, and sometimes the detoxifying process produces a substance that is even more toxic.

21. When you consume more of a toxic material than you can excrete in a day, your body stores it and begins accumulating a body burden.

(a) Over many years, you can build up a significant body burden from daily ingestion of tiny quantities of toxic chemicals.
(b) This can happen with lead and some other metals.
(c) Even if you do not eat at your work station, you can ingest hazardous substances if you store food near your workstation or if you do not wash your hands before you eat.
(d) You can protect yourself with good personal hygiene.
    (i) Never eat, smoke, or drink at your work station.
    (ii) Do not store foods or smoking materials that are unwrapped or in open containers in your work area.
    (iii) Always wash your hands and dry them properly with a paper towel or a clean rag before you eat, drink, or smoke.

22. When you understand the ways your body can absorb hazardous substances, and you take the appropriate precautions, you can reduce your risks and avoid suffering from their toxic effects.
(a) Hazardous chemicals cannot affect your health if your body does not absorb them.
(b) Your body cannot absorb hazardous chemicals unless you contact them with your skin, inhale them into your lungs, or ingest them by eating or smoking contaminated materials.

23. Basic Safe Handling Procedures
(a) Materials Safety Data Sheets (MSDS) **must** be obtained for any chemical used within the plant or field area.
    (i) These sheets should be available from the chemical supplier.
    (ii) They **must** be kept in a well-marked location in the shop or office.
(b) Avoid breathing dust, vapors, or fumes.
    (i) Stay upwind of escaping dust vapors or fumes and/or wear appropriate equipment.
(c) Protective equipment **must** be worn when handling toxic chemicals or volatile products which could cause severe burns.
    (i) If these products come in contact with the skin, wash the affected area at once with water.
    (ii) Consult the MSDS for other first aid treatment. Seek medical attention, if needed.

(d) An employee exposed to acids, chemical inhibitors, ammonia, caustic soda, tetraethyl lead, hydrogen sulfide (H2S), aluminum chloride, other toxic substance, gas, or vapor should report the incident to the supervisor as soon as possible.

(e) Toxic chemicals, oil field sludge and other waste materials **must** be disposed of in an approved manner and in compliance with OSHA guidelines and policies.

(f) All chemical containers **must** be kept sealed and **must** be plainly marked.

- (i) Empty containers **must** be disposed of in a manner that will not create a hazard.
- (ii) Corroded barrels should be disposed of to prevent accidental spillage.
- **(iii)** **Do not** pressurize, cut, heat, weld, or expose empty containers to flame unless they have been thoroughly cleaned by a method approved by the supplier.

(g) If a soil area is contaminated with acid or caustic, the soil should be neutralized or removed and replaced.

(h) Any area where large quantities and/or frequent usage of toxic chemicals is undertaken **must** be posted with warning signs identifying the chemicals and their use.

(i) The MSDS should be consulted for appropriate first aid procedures for emergency treatment of chemical injuries.

- (i) Further treatment of chemical injuries and illnesses should be left entirely to a physician.

(j) Employees **must not** siphon any fluids by mouth suction.

(k) Employees involved in operations that require the handling of chemicals must know where safety showers and eyewash stations are located and how they are to be used.

(l) Acid storage containers should have suitable means of extracting the fluid from the container and gauging the fluid level so as not to expose personnel to fume inhalation or skin contact.

(m) Rooms in which concentrated acids are used **must** be open or well ventilated.

(n) When hauling acids, wear an approved wrap-around face shield that completely protects the face and eyes.

- (i) Wear rubber gloves of a material impervious to the acid and of a length sufficient to prevent the entrance of liquid into the tops.
- (ii) Also, wear rubber boots and an acid-proof apron that extends well below the top of the boots.

(iii) If conditions warrant, wear an acid-proof coat.

(o) Relieve the internal pressure of containers when the containers are received.

(i) At least weekly thereafter, check for pressure again by slowly loosening the plug of each container.

(ii) Retighten the plug immediately.

(iii) When opening a container, **always** be alert for possible sprays and splashes of acid.

(p) When diluting an acid, pour it into the water slowly and stir the water constantly.

(i) **Never** pour water into a strong acid as this may cause a violent reaction.

(ii) Specific procedures for blending and handling acid additives should be strictly followed.

(q) Carry acid in a covered container, not an open-top container. Protect glass containers against breakage and avoid spilling acid.

(r) Acid containers should not be placed near heated equipment or allowed to stand in the sun.

(i) Such practices might allow dangerous gas pressures to build up within the containers.

(ii) When a container is emptied, flush it thoroughly with water to prevent possible burns to others who may handle it.

(iii) **Do not** do any work that may cause a flame or spark around metal containers holding acid.

(s) If acid contacts the skin, flush the affected parts for 15 to 20 minutes with clear water.

(i) In case of eye injury from acid, this procedure is especially important.

(ii) Get the injured person to a physician as quickly as possible.

(iii) Some acid storage tanks are equipped with a small line used for pressuring the tank with air.

(iv) This line should contain a check valve so acid cannot back up through the line in the event the tank is overfilled.

24. Carbon Monoxide Gas (CO)

Carbon Monoxide is a colorless, odorless, highly toxic gas formed by the incomplete combustion of carbon, natural gas, gasoline, or any other carbonaceous material.

(a) Warning symptoms that usually occur with CO poisoning are headache, dizziness, and nausea.

(b) Lethal inhalation of CO can occur without any warning symptoms.

(c) Internal combustion engines are probably the most hazardous source of CO.

25. Chemicals, Fuels, Solvents, Paints, And Lime-Base Components

In any situation where an individual would expose himself/herself to a chemical, whether it would be in physical contact or inhaling the fumes, immediate first aid should be rendered without delay.

(a) Usual first aid treatment will be merely getting to fresh air or flushing the area with clear water for a period of 15 to 20 minutes or until the chemical is completely washed away.

(b) Most solvents, fuels and paints should not be left in direct contact with the skin for any extended period of time.

(i) This may result in severe skin irritation or possibly a burn.

(c) All lime-base components particularly cement, should be washed off immediately.

(i) If left in contact with the skin for long periods of time could cause the loss of the first layer of the skin due to an acidic burn that results in the curing process of cement. When chemicals are in use, employees **must** where protective equipment which **will** include eye protection and respiratory protection.

E. Training Requirements

1. **JAGUAR ENERGY SERVICES, LLC** personnel will be trained in the contents of this procedure.

F. Training Frequency

1. **JAGUAR ENERGY SERVICES, LLC** personnel will be trained according to the following schedule:

(a) Initially upon hire

(b) Yearly thereafter (In Hazard Communication).