Section 65.0
RCRA AND HAZARDOUS WASTE

A. Purpose

The purpose of this procedure is to establish procedures, formal training guidelines, and expectations for **JAGUAR ENERGY SERVICES, LLC** personnel working at RCRA sites that help **JAGUAR ENERGY SERVICES, LLC** comply with federal standards.

1. The laws covering these activities are:
   - (a) Resources Conservation Recovery Act **(RCRA)**
   - (b) Comprehensive Environmental Response, Compensation, and Liability Act, or Superfund Act **(CERCLA)**
   - (c) Superfund Amendment and Reauthorization Act **(SARA)**
   - (d) Occupational Safety and Health Administration Laws **29 CFR 1910.120** Interim Final Rule - Hazardous Waste Workers
   - **(e)** **29 CFR 1910.1200** Hazard Communication (Right-To-Know)
   - **(f)** **29 CFR 1910.120** Hazardous Waste Operations and Emergency Response "HAZWOPER" Final Rule

B. Scope

This procedure applies to any personnel working at a RCRA site.

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) 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 protecting the safety of personnel and the environment while working at a RCRA site.
   (a) Additional responsibilities include:
      (i) Ensuring that all affected **JAGUAR ENERGY SERVICES, LLC** personnel have been made aware of the **JAGUAR ENERGY SERVICES, LLC** procedures on this matter.
      (ii) Ensuring that all employees follow the procedures in this policy.
      (iii) Report any environmental incidents to the Safety Coordinator.

4. **JAGUAR ENERGY SERVICES, LLC** personnel are responsible for protecting the safety of personnel and the environment while working at a RCRA site.
   (a) Additional responsibilities include:
      (i) Completing the required training on this Policy.
      (ii) Implementing the training received on this Policy.
      (iii) Recognizing hazards that could impact the **JAGUAR ENERGY SERVICES, LLC**.
      (iv) Making their supervisor aware of any hazard encountered.

D. Procedure

1. Introduction

OSHA regulations require the development of a written Safety and Health Plan for each hazardous waste site cleanup operation.
   (a) The plan must evaluate, identify, control safety and health hazards.
   (b) Establishes the policies and procedures necessary to protect the workers and the public from possible hazards at the site.

(c) The plan must:
  (i) Detail the specific chain of command
  (ii) Address tasks and objectives of the operations
  (iii) Address the operations site specific procedures
(d) The employer must develop the plan before any work begins and must go over the plan with each and every worker before anyone enters the site to begin work.
(e) Provide for Emergency Response.
(f) The plan must be revised and updated whenever new information becomes available; it is a "living document".
(g) The plan must be kept on site and be accessible to all workers and their representatives.
(h) See Appendix I for sample plan.

2. Most of the cleanups are known as "remedial actions" and are of the non-emergency type.
  (a) They normally last over a long period of time (months to years).
  (b) They begin after the more immediate (emergency) problems have been controlled.
  (c) The work involves getting rid of the hazardous material and restoring the site to a normal situation.

3. Many activities are needed, involving:
  (a) Many people
  (b) Different skills and crafts
  (c) Much equipment
    (i) Some equipment will be built just for waste cleanup work
  (d) Support facilities and crews.

4. There is plenty of time before the cleanup starts to develop a very thorough safety and health plan.
  (a) This is should be done at the same time that the general work plan for the site is being developed.
  (b) At most sites of this type, the site has been thoroughly investigated and studied and the materials on the site found, identified and the risks assessed.

5. Even though a lot is known about the hazards at a site, the safety and health plan must provide for unexpected site emergencies which may happen as the work is being done.

(a) Being prepared for unexpected emergencies and having plans is the best way to reduce or eliminate possible injuries.

6. Engineering Controls, work practices and PPE shall be used to reduce and maintain exposure limits.
   (a) Feasible engineering controls include the use of pressurized cabs or control booths on equipment and/or the use of remotely operated material handling equipment.

7. To develop the site safety and health plan a great deal of background information is collected and used.
   (a) This includes not only information about the hazards (chemicals, explosives, radioactive materials, etc.) at the site but also information on:
      (i) Surrounding populations and use of land
      (ii) Normal weather conditions
      (iii) Type of ground (topography)
      (iv) Soil
      (v) Underground water

8. Content

The law requires as a minimum, that the site safety and health plan must:

(a) Name the key persons and alternates responsible for safety and health at the site.
   (i) One person must be designated as the safety and health officer.
   (ii) This person must be present on site, be responsible to the employer and have the authority and knowledge needed to make the plan work.

(b) Describe the safety and health risks for each site task and operation.
   (i) This includes information on all known or suspected hazards.

(c) Describe the level of worker training required, including any special training that is needed.

(d) Describe the personal protective gear to be worn during various site operations.

(e) Describe any site specific medical monitoring requirements.

(i) OSHA regulations describe the minimum medical monitoring required.
(ii) The **JAGUAR ENERGY SERVICES, LLC** may adopt stricter medical requirements, but not weaker ones.

(f) Describe the program for periodic air monitoring, personnel monitoring, and environmental sampling.
(i) This should cover the types and frequency of monitoring, instruments used and the methods of calibration and maintenance of equipment.

(g) Describe site control measures.
(i) This includes site work zones, use of the "buddy" system and site communication.
(ii) A site map should also be included.

(h) Establish decontamination procedures for persons and equipment.

(i) List the standard operating procedures for the site.

(j) Describe a plan that would tell how to respond to emergencies, should they happen, including the necessary personal protective equipment.

(k) Detail confined space entry procedures.

9. Each safety and health plan is specific to each hazardous waste site.
(a) Each plan will be different from any others, even though all plans may contain similar types of information.

10. Of the eleven major parts of the plan listed above, the following are covered in other sections of the program and will not be covered in any detail in this part (Appendix I-Part I, Site Safety and Health Plans).

(a)

Part #	Covered in Section
(i) I	Hazard Identification
(ii) I	Hazards at Waste Sites
(iii) II	Health Effects of Chemicals
(iv) III	Personal Protective Equipment
(v) VII	Air Monitoring
(vi) IV	Decontamination Procedures
(vii) V	Part 2 Standard Operating Procedures
(viii) V	Part 2 Emergency Procedure/Self Rescue
(ix) V	Part 2 Standard Operating Procedures

2. The information presented in the above sections of this plan are general in nature.
   (a) Personnel should recognize that when they are working on a specific site this general information will be changed to meet the specific requirements of that site.
   (b) The specific information in the site safety and health plan prepared for that site should be used.

3. As mentioned above, many of the eleven topics that the regulations require be included in the safety and health plan are covered in other sections of this program.
   (i) Those not covered are discussed in the following paragraphs.

4. Key Personnel and Alternates (Organization)

One person must be designated as the site Safety and Health Officer (S&HO).
   (a) He may also have other duties; however, safety and health at the site are his/her primary responsibility.
   (b) This person must be present on the site, be responsible to the employer and have the authority and knowledge needed to put the plan in action.
   (c) There is normally a second person who is asked to act in the absence of the safety and health officer.
   (d) The S&HO is responsible for checking the site operations to be sure everything is being done as the plan requires.
   (e) If workers cannot get satisfactory answers to safety problems they should go directly to the S&HO.

5. In addition to the site safety and health officer, the key personnel assigned to various site operations are normally included.

6. Emergency telephone numbers and addresses must be listed in the plan. (and posted in a conspicuous place).

7. An organization chart should be included, so that those who are in authority and responsible are clearly known by the workers.

8. Examples of some of the key personnel normally listed are:
   (a) Project Team Leader (or manager)
   (b) Site Safety and Health Officer
   (c) Field Team Leader

(d) Emergency Coordinator
(e) Command Post Supervisor
(f) Decontamination Station Coordinator
(g) Rescue Team Member

9. It is important that each worker knows who to contact regarding the various problems that occur in waste site cleanup activities.
   (a) Other personnel who may be identified at some sites are the:
      (i) Security Officer
      (ii) Financial Officer
      (iii) Scientific Advisor
      (iv) Toxicologist
      (v) Chemist
      (vi) etc.

10. Site Specific Medical Monitoring

Medical monitoring requirements vary from site to site depending on the conditions at a given site.
   (a) They may also vary from worker to worker depending on the routine tasks each is doing.
      (i) For example, if an employee is constantly exposed to noisy equipment, hearing monitoring might be necessary.
   (b) While it is often impossible to identify every toxic substance at a waste site, certain types of substances or chemicals are more likely to be found than others.
      (i) For these types the health effects are known and medical monitoring can often be carried out to follow the effect of these particular chemicals on the workers' health.
   (c) The safety and health plan at every site will identify the standard medical monitoring program for each type of worker at that site.
      (i) If any special medical monitoring requirements are added, they must also be listed in the plan.
   (d) The program shall be provided to the employees at no cost.
   (e) Personnel who may be exposed to health hazards for 30 days or more a year or required to wear a respirator 30 or more days a year are required to be included in the medical surveillance program.
      (i) Personnel that are required to wear a respirator will be included in the Respiratory Plan as per 29 CFR 1910.134.

(f) Personnel who are injured or develop symptoms due to exposure of hazards must be included in the medical surveillance program.

(g) All members of the HAZMAT Team must be included in the medical surveillance program.

11. Air Monitoring Requirements

Air monitoring shall be used to identify and qualify airborne levels of hazardous substances.

(a) The monitoring will be addressed before initial entry and periodically thereafter.

(b) The monitoring shall be conducted where there is a possible IDLH and where ever exposure may be possible.

(c) The following shall be identified:
- (i) Task- specific conditions
- (ii) Duration
- (iii) Hazards
- (iv) Potential hazards
- (v) Guide for PPE assessment

(d) The planned activities at the site generally establish how often monitoring is done to ensure worker protection.

(e) The safety plan must also tell about maintenance and calibration procedures relative to each instrument used.

12. Decontamination Procedure

Each project undertaken will require a site-specific Decontamination Procedure, but the same basic procedure will apply to all procedures developed.

(a) A site-specific Decontamination Procedure will be developed for each project undertaken that will minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.
- (i) It will be communicated to all employees.
- (ii) It will be implemented before any employees or equipment are allowed to enter areas on the site where potential for exposure to hazardous chemicals exist.

(b) All employees leaving a contaminated area will be appropriately decontaminated when leaving a contaminated area.

(c) All contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.

(d) Decontaminated procedures shall be monitored by the site safety and health supervisor to determine their effectiveness.
  (i) When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

(e) Decontaminated shall be performed in geographical areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

(f) PPE and equipment shall be decontaminated, cleaned, laundered, maintained as needed to maintain their effectiveness.

(g) Employees who non-impermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower.

(h) The clothing shall be disposed of or decontaminated before it is removed from the work zone.

(i) Unauthorized employees shall not remove protective clothing from the change room.

(j) Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of 29 CFR 1910.141.

(k) If temperature conditions prevent the efficient use of water then other effective means for cleansing shall be provided and used.

13. Standard Operating Procedures

Standard Operating Procedures (SOP's) have been developed for a huge number of activities and operations.

(a) Each site will use the necessary SOP's but they may be modified to fit that site's specifics so that all personnel fully understands how the job is to be performed.

14. Examples of Safety and Health Plans

Actual safety and health plans will vary widely in length and detail depending on the size and completeness of any given cleanup site.

(a) One could be brief (6-10 pages) for a simple site and still cover all the essentials.
  (i) However, the plans for most sites are much longer (60-150 pages) because of the complex nature of most sites.

(b) Appendix I is a sample site safety and health plan that can be used or modified for use as a Site-Specific Safety and Health Plan.

(c) Review this plan with the key personnel at the project, fill in the blanks, and modify as necessary.

(d) The following personnel should be involved in the development of the plan.

(i) Project Team Leader (or manager)
(ii) Site Safety and Health Officer
(iii) Field Team Leader
(iv) Emergency Coordinator
(v) Command Post Supervisor
(vi) Decontamination Station Coordinator
(vii) Rescue Team Member

15. Standard Operating Procedures: Part II

There are many guides or procedures for performing the variety of work associated with activities at hazardous waste sites.

(a) These may be administrative, technical or management oriented.

(b) Personnel may have been administered procedures of these types in other work activities in which you have been involved (e.g., construction, maintenance, etc.).

(i) Such procedures are used to provide uniform instructions for accomplishing a specific job.

(c) Safety oriented procedures are also part of most types of work you have encountered before.

(i) However, at hazardous waste sites, the safety oriented procedures become a major part of the preparation for work activity.

(ii) The unknown conditions, the large number of potentially hazardous chemicals and the differing types of hazards (i.e., toxicity, radiation, fire, and explosion) require the development of extensive and comprehensive standard operating safety procedures.

(iii) These are more complicated than those needed for more routine and predictable conditions such as asbestos removal.

16. Development of Standard Operating Procedures

The major consideration in preparing for hazardous waste site operations is the health and safety of site personnel.

(a) Work must be done efficiently and in a manner that protects both the worker and surrounding environment, including community residents.

(b) The right equipment and trained personnel, combined with standard operating procedures, help reduce the possibility of harm to site personnel.

(c) For procedures to be effective they must be:

(i) Written in advance.

(i) Developing and writing safe, practical procedures is difficult when responding to an actual situation.

(ii) Based on the best available information, operational principles, and technical guidance.

(iii) Field tested, reviewed, and revised when necessary by competent safety professionals.

(iv) Used for training and periodic retraining of personnel.

(d) Many of the procedures involved in hazardous waste site cleanup activities are primarily concerned with health and safety.

(i) In concept and principle, these are general in nature and independent of the type of site or incident.

(ii) These are then adapted or changed to meet site-specific requirements.

(iii) Each hazardous waste site must be evaluated to determine its hazards and risks.

(e) Personnel must go on site to accomplish specific tasks.

(f) Work is required to prevent or reduce harmful substances from leaving the site due to the nature of human activities.

(g) Containment, cleanup, and disposal activities may be required.

(h) These activities require that safety procedures be developed or existing procedures modified so that on-site personnel are protected during operations.

17. Site Control

(a) Work Zones

(i) A work zone on a site where hazardous substances are involved may contribute to the unwanted movement of contaminants from the site to uncontaminated areas.

(ii) Site personnel and equipment may become contaminated and transfer the material into clean areas.

(iii) Material may become airborne due to its volatility or the disturbance of contaminated soil may cause it to become windblown.

(iv) To minimize the movement of hazardous substances from the site, contamination control procedures are needed.

(v) Two general methods are used:

(i) Establishing site work zones

(ii) Removing contaminants from people and equipment (decontamination).

(b) Control at the Site

(i) A site must be controlled to reduce the possibility of:

(i) Contact with any contaminants present

(ii) Removal of contaminants by personnel or equipment leaving the site.

(c) The possibility of exposure or movement of substances can be reduced or eliminated in a number of ways including:

(i) Setting up security and physical barriers to exclude unnecessary personnel from the general area.

(ii) Minimizing the number of personnel and equipment on site consistent with effective operations.

(iii) Establishing work zones within the site.

(iv) Establishing control points to regulate access to work zones.

(v) Conducting operations in a manner to reduce the exposure of personnel and equipment and to eliminate the personnel for airborne movement.

(vi) Using appropriate decontamination procedures.

(d) One method of preventing or reducing the movement of contaminants is to identify zones on the site in which various types of operations occur.

(i) Movement of personnel and equipment between zones and onto the site itself would be limited by access control points.

(e) Normally three adjoining zones are used:

(i) Zone 1 - Exclusion Zone
(ii) Zone 2 - Contamination Reduction Zone
(iii) Zone 3 - Support Zone

WORK ZONES AT A HAZARDOUS WASTE SITE

Figure 1 is a typical arrangement of these three zones.

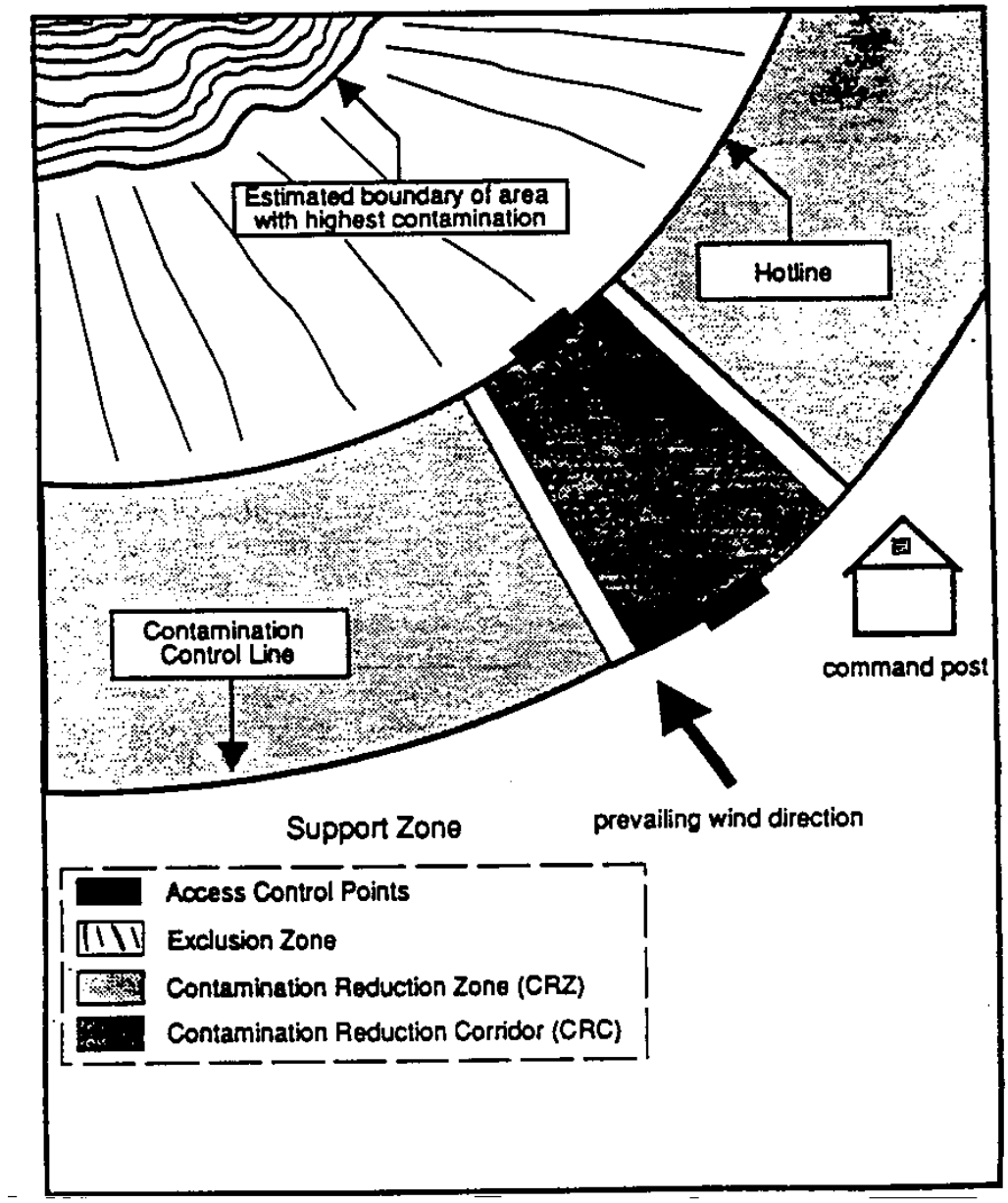


figure 1

1. Zone 1 - Exclusion Zone

The **exclusion zone**, the innermost of three areas, is the zone where contamination does occur.

(a) All people entering the exclusion zone must wear the appropriate level of protection.

(b) An entry and exit check point must be established at the boundary of the exclusion zone to regulate the flow of personnel and equipment into and out of the zone and to confirm that the procedures established to enter and exit are followed.

(c) The outer boundary of Zone 1, the **hotline,** is initially established by visually surveying the immediate surroundings of the site and determining where the hazardous substances involved are located

(i) Where there is any:

(i) Drainage

(ii) Leachate

(iii) Spilled material

(d) Help in determining the boundaries is also provided by data from the initial site survey indicating the presence of organic or inorganic vapors/gases or particulates in air, combustible gases, and radiation, or the results or water and soil sampling.

(e) Additional factors that should be considered include the distances needed to prevent fire or an explosion from affecting personnel outside the zone, the physical area necessary to conduct site operations, and the potential for contaminants to be blown from the area.

(f) Once the hotline has been determined, it should be physically secured, fenced, or well-defined by landmarks.

(g) As operations proceed, the boundary often may be relocated as information becomes available from hazard assessment or monitoring.

2. Subareas Within the Exclusion Zone

All personnel within the exclusion zone must wear the required level of protection.

(a) Personal protective equipment is designated based on site-specific conditions including the type of work to be done and the hazards that might be encountered.

(b) Frequently within the exclusion zone, different levels of protection are justified.

(c) Subareas are specified and clearly marked as to whether Level A, B, or C protection is required.

(d) The level of protection is determined by the measured concentration of substances in air, potential for contamination, and the known or suspected presence of highly toxic substances.

(e) Different levels of protection in the exclusion zone might also be designated by job assignment.

(i) For example, collecting samples from open containers might require Level B protection, while, for walk-through ambient air monitoring, Level C protection might be sufficient.

(ii) The assignment, when appropriate, of different levels of protection within the exclusion zone generally makes for a more flexible, effective, and less costly operation while still maintaining a high degree of safety.

3. Zone 2 - Contamination Reduction Zone (CRZ)

Between the exclusion zone and the support zone is the contamination reduction zone which provides a transition between contaminated and clean zones (See figure 2).

(a) This zone serves as a buffer to further reduce the probability of the clean zone becoming contaminated or being affected by other existing hazards.

(i) It provides additional assurance that the physical transfer of contaminating substances on people, equipment, or in the air is limited through a combination of decontamination, distance between exclusion and support zones, air dilution, zone restrictions, and work functions.

(b) Decontamination procedures take place in designated areas within the CRZ which are called **Contamination Reduction Corridors (CRC)**. They begin at the hotline.

(i) Normally there are two:

(i) One for personnel

(ii) One for heavy equipment

(ii) Depending on the size of the operation, more than two corridors may be necessary.

(iii) Exit from the exclusion zone must be through a contamination reduction corridor.

(iv) As operations proceed, the area around the decontamination station may become contaminated but to a much lesser degree than the exclusion zone.

(v) On a relative basis, the amount of contaminants should decrease from the hotline to the support zone due to the distance involved and the decontamination procedures used.

(c) The boundary between the support zone and the contamination reduction zone is the **contamination control line**.

(i) It separates the possibly low contamination area from the clean support zone.

(ii) Access to the contamination reduction zone from the support zone is through a control point.

(iii) Personnel entering this area would wear the prescribed personal protective equipment, if required, for working in the contamination reduction zone.

(d) Entering the support zone requires removal of any protective equipment worn in the contamination reduction zone.

(i) The personnel stationed in the CRZ are usually the site safety officer, Personnel Decontamination Station (PDS) operators, and the emergency response personnel.

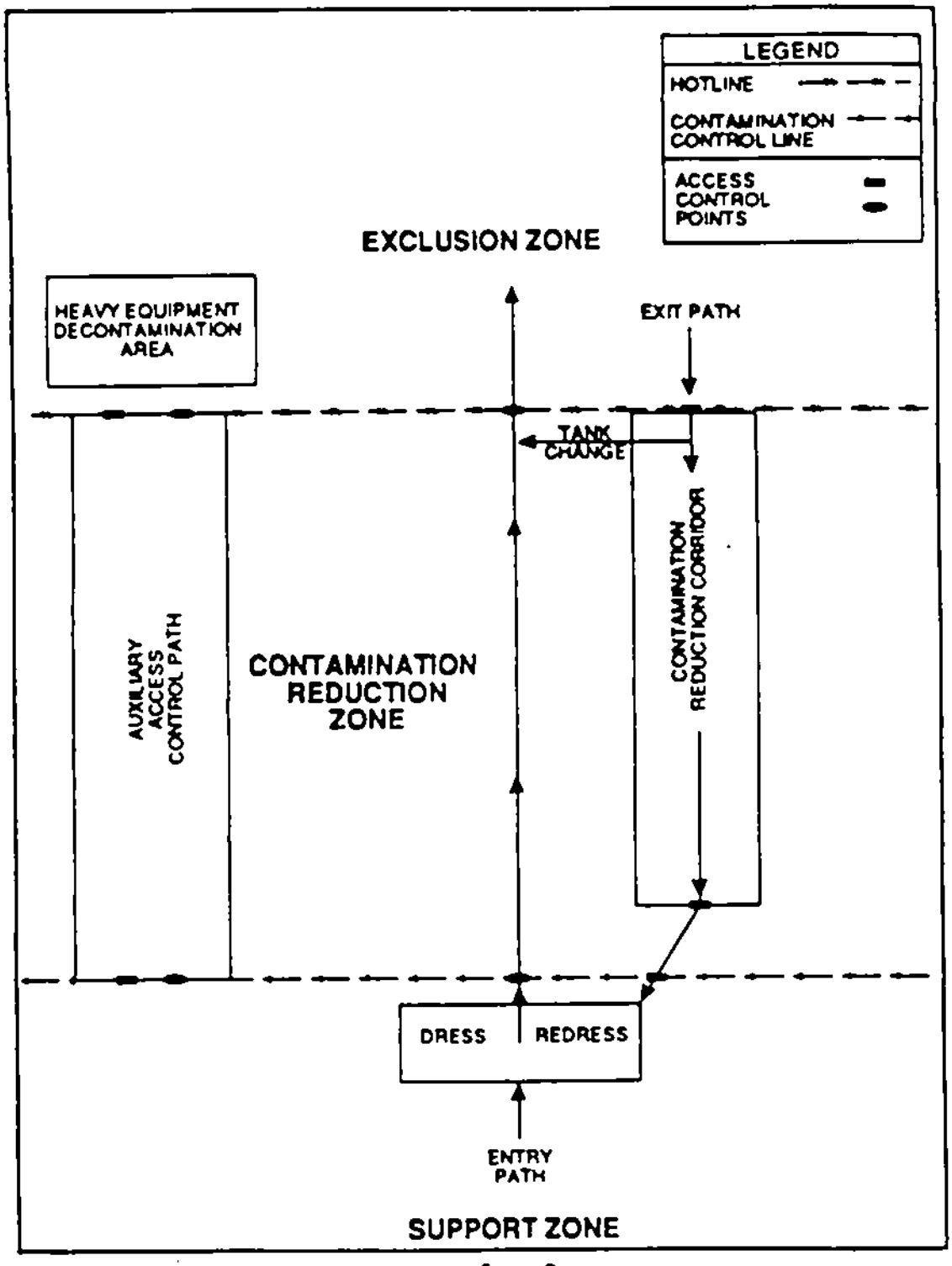


figure 2

(a) The CRZ must be well designed to facilitate:
- (i) Decontamination of equipment, personnel, and samples.
- (ii) Emergency response: transport for injured personnel (safety harness, stretcher), first-aid equipment such as bandages, blankets, eye wash, splints, and water, and containment equipment (absorbent, fire extinguisher).
- (iii) Equipment resupply: air tank changes, personal protective clothing and equipment such as booties and gloves, sampling equipment (bottles and glass rods), and tools.
- (iv) Sample packaging and preparations for on site or off site laboratories.

2. Zone 3 - Support Zone

The support zone, the outermost part of the site, is considered a non-contaminated or clean area.

(a) Support equipment (command post, equipment trailer, etc.) is located in the zone and traffic is restricted to authorized response personnel.

(b) Since normal work clothes are appropriate within this zone, potentially contaminated personnel clothing, equipment, and samples are not permitted, but are left in the contamination reduction zone until they are decontaminated.

(c) The command post is always located in the support zone.
- (i) The command post should serve as the communication center for all on site and off site activities relative to the operation.

(d) The location of the command post and other support facilities in the support zone depends on a number of factors, including:
- **(i) Accessibility**
  - (i) Land surface characteristics
  - (ii) Open space availability
  - (iii) Locations of highways, railroad tracks
  - (iv) Other limitations
- **(ii) Wind direction**

(i) The support facilities should be located upwind of the exclusion zone.

(ii) However, shifts in wind direction and other conditions may be such that an ideal location based on wind direction alone does not exist.

(iii) Resources

(i) adequate roads, power lines, water, and shelter

3. Emergency Procedures, First aid and Self-Rescue: Part III

(a) The Possibility of Emergencies at a Hazardous Waste Site

(i) The best way to deal with emergencies is to prevent them in the first place.

(ii) On a well-run site, emergencies should be few and far between.

(iii) But it is not possible to totally rule out the chance of an emergency.

(iv) This makes basic planning and worker training very important.

(v) A hazardous waste site involves conditions which make mishaps and rescues more complicated.

(vi) Communication is more difficult than usual.

(vii) The possibility of dangerous conditions makes mistakes more costly.

(viii) Hazards may not be obvious.

(ix) There are many things that can go wrong.

(x) Advance training is the best way to limit the damage done by any emergency.

(b) No studies were found on hazardous waste emergency problems.

(i) However, NIOSH studied 25 cases where emergencies developed in situations involving chemicals and confined spaces.

(ii) In 19 of the 25 cases where rescue was attempted, rescuers were either killed or injured.

(iii) These 19 cases involved 13 deaths and 30 injuries to the rescuers.

(iv) Only 5 of the original victims were saved.

(v) This study provides a powerful example of why emergency procedures and training must be put together at every waste sight.

(c) The basic causes of emergencies can be divided into two basic types:

(i) Waste-related:

(i) Fire
(ii) Explosion
(iii) Leak
(iv) Reaction of incompatible chemicals
(v) Collapse of containers
(vi) Discovery of radioactive materials
(vii) Release of toxic vapors

(ii) Worker and site-related:

(i) Minor slip or fall
(ii) Chemical exposure
(iii) Major accident (vehicle accident or electrocution).
(iv) PPE failure
(v) Stress problem (heat)

(d) Advanced Planning is the key to preventing and controlling emergencies.

(i) The best way to deal with emergencies is to plan ahead.
(ii) A plan can serve to set our procedures for handling a variety of situations.
(iii) By describing the roles to be played by different personnel, it can ensure teamwork instead of life-threatening delays.
(iv) The plan can also be used to train all site employees and to be the basis for mock drills so that all parties become familiar with procedures.
(v) Every hazardous waste site must have an emergency or "contingency" plan.
(i) It must be part of the overall site safety plan.

(e) The important elements of a contingency plan are:

(i) Chain of Command - The plan must identify all the individuals and teams who will participate in emergency operations.
(i) The lines of authority must be clear, so that everybody knows who is in charge, and what each person must do.

(ii) One person must be put in control of the program, although a back-up person is also needed.

(iii) A team approach is often used, where several individuals will be assigned as the rescue team, or a first-aid team.

(iv) The plan should include off site support teams, such as ambulance services, firefighters, and other contacts.

(ii) Site Map - To avoid any confusion, it is important to have a site map ready at all times to be used for emergency purposes.

(i) Pins and colored flags can be used to mark the location to victims, hazard areas, equipment, and so on.

(ii) The map also provides important information on hazard areas, site terrain, work crew locations, access road, nearby homes, and evacuation routes.

(iii) Communication and Locator Systems - In an emergency, the need for effective communication is very important.

(i) Yet, communications on a waste site may be severely limited because PPE makes speaking difficult.

(ii) Also, outside communication is important.

(iii) The contingency plan must address this issue with an effective system.

(iv) Radios or field telephones are often used.

(v) Bull horns, blasts on an air horn, whistles, hand signals, and colored flags are all examples of good backup systems.

(vi) It is important that any method chosen be clearly understood by all, and that it be practiced and used in drills.

(vii) It is also important to have a special set of emergency signals to get attention in a hurry.

(viii) A locator system is also needed for any sound emergency plan.
(ix) A locator system is similar to what is used in a coal mine.
(x) Each worker going into the mine must have an ID tag at a checkpoint above ground.
(xi) In this way there is no misunderstanding as to how many workers are below ground at any one time.
(xii) Every hazardous waste site must have at least a basic locator system.
(xiii) This is usually a site map in the command post in the support zone area.
(xiv) The names and location of the crew going onto the site are listed, and the names are taken off the entry board when the crew comes off the site.

(iv) Whatever system is used, it must meet some basic requirements:
(i) It must be written down.
(ii) It must be kept current.
(iii) It must be easy to locate.
(iv) It must be kept outside of the hot zone.
(v) It must allow one to know where the crew is.

(v) A simple system using pins or written entries is called a "passive" locator system.
(i) Systems which use radios or transmitters worn by individual workers are known as "active" locator systems.
(ii) You can see why a locator system is an important part of any emergency plan.
(iii) You can also see why having a checkpoint system is important to ensuring a safe site.

(vi) It is typical for the checkpoint control person to record the following information:
(i) Name of person.
(ii) Status (in or out).

(iii) Time of entry.
(iv) Anticipated exit time.
(v) Zone or area to be entered.
(vi) Name of buddy or team.
(vii) Task to be performed.
(viii) Location of task.
(ix) Type of PPE, work and air time left.
(x) Type of rescue equipment.

(vii) Equipment Needs - The contingency plan must address the need for rescue equipment.
(i) It must describe where such equipment is kept and when it is to be used.
(ii) Level A equipment should be kept even if the job itself uses Level C equipment.
(iii) Extra air tanks and escape SCBAs are also important emergency equipment.
(iv) First aid equipment and wire basket litters are needed for emergency situations at any hazard site.
(v) Basic fire-fighting equipment is also common.

(viii) Training and Drills - An emergency plan is not meaningful unless training and drills are done on a regular basis.

(ix) Training should meet the following guidelines:
(i) Be directly related to emergencies possible at that site.
(ii) Be brief but repeated often.
(iii) Provide an opportunity for skills to be practiced.
(iv) Be as realistic as possible.
(v) Include everyone.
(vi) Training records should be kept on site.

(f) Escape Routes, Refuges, and Self Rescue

(i) One important part of an emergency plan is to consider ways in which workers in the hot zone can go to safety in case of a problem.

(ii) There are two different ways to provide safety:
(i) One is to arrange for escape routes
(ii) The other is to provide safety stations in the site area.
(iii) These are reviewed below.

(iii) Escape Routes - Normally, workers exit through the decontamination sequence near the site command post.
- (i) But is it possible that a severe problem such as a fire or explosion could cut workers off from this exit.
- (ii) Because of this, it is typical to provide 2 or more escape routes at different ends of the site.
- (iii) These escape routes may change, based on wind direction.
- (iv) It is not good to have an escape route that is downwind from most of the chemicals.
- (v) Escape routes must be posted and marked each day depending on wind direction and other factors.
- (vi) Barricade tape, traffic cones, or other signs are simple but important ways to do this.

(iv) Besides wind direction, the suitability of the terrain is a big part of choosing an escape route.
- (i) If there are streams, elevated areas, or other barriers to easy access, then they must be accounted for or another route chosen instead.
- (ii) This is because such obstacles cannot be taken for granted when workers are in heavy protective gear.
- (iii) Cleated ramps (chickenboards) with railing should be provided over streams or ditches.
- (iv) Plenty of ladders should be available when work is done in trenches.
- (v) Areas that do not offer safe escape but which might otherwise be used by mistake in an emergency should also be marked off.
- (vi) Much consideration should be given if the site involves buildings or confined areas that involve manholes or hatches.

(vii) Openings must be large enough for workers with protective gear to be able to maneuver.

(v) The escape routes should be marked on the site map so that work crews can make note of them as they enter the work area.

(g) Refuges

(i) A refuge is a safety station set up to provide relief in a situation which is less of an emergency.

(i) It is located in a relatively safe area such as upwind in a specially cleared spot.

(ii) The refuge can be used to take a short rest break, to meet with other crew members, or get relief from mild heat stress.

(iii) The refuge is never used for eating, drinking, smoking or air changes.

(ii) The refuge does include some basic items:

(i) A sitting or resting area, shaded if possible

(ii) Wind indicator

(iii) First-aid supplies

(iv) Water for decontamination

(v) Communication equipment

(vi) Special air monitoring devices

(vii) Bolt cutters and hand tools

(viii) Fire extinguishers.

(iii) Depending on the site setup, a refuge may sometimes be located in the support zone, as well as, near the safe exit off the site.

(i) This type of refuge is used in case the entire site must be evacuated.

(ii) It has the same type of supplies, plus extra air tanks.

(iv) Safe Distances - In some types of emergencies where chemical releases are likely, evacuation may involve moving to a "safe distance" away from the chemical.

(i) Different evacuation distances have been prepared for different chemicals, depending on how toxic they are and how easily they disperse.

(ii) There are also computer programs which can predict the movement of chemicals given temperature, wind and other conditions.

(iii) For example, a small chlorine leak might call for a safe distance of 140 feet, but a large chlorine leak might require an evacuation of a one-mile area.

(iv) Safe distances for typical and "worst case" situations are sometimes developed as part of contingency plans.

(h) The Emergency Response Procedure

(i) Contingency plans include a basic sequence of procedures to be followed to ensure that response is done in an orderly and complete manner.

(ii) A typical sequence is given below.

(i) Notification

(i) It is every worker's job to sound the alarm if they notice a problem.

(ii) It is important to provide the basic details:

(i) WHAT happened?

(ii) WHERE did it happen?

(iii) WHO did it happen to?

(iv) WHEN did it happen?

(v) HOW did it happen?

(vi) TO WHAT EXTENT did it happen?

(vii) WHAT HELP is needed?

(j) Size Up

(i) The next step to be taken is to use the above information to figure out what must be done to deal with the situation.

(ii) This is where training, judgment, and experience are valuable. The chain of command must answer the following questions:

(i) What type of incident has occurred?

(ii) What are the casualties?

(iii) What could happen next?

(iv) What can be done to deal with the situation?

(k) Request for Assistance

(i) It is always important to request assistance from doctors or firefighters as soon as possible, if they are needed

(l) Response
- (i) Based on the size-up, the appropriate rescue or response can be started.
- (ii) This is where teamwork and planning pay off.
- (iii) Response includes rescue, getting chemical hazards under control, and evacuation if needed.

(m) Follow-up
- (i) This is where the entire emergency is reviewed prior to restarting work.
- (ii) Supplies may need to be restocked, government agencies might be notified, and any revisions of the contingency plan must be made.
- (iii) This is also when the cause of the emergency must be identified to ensure that it does not happen again.

4. First - Aid and Emergency Treatment

First-aid and emergency treatment are central to a successful program.

(a) Plans for first-aid should be part of the overall medical program for the site.

(b) A first-aid team must be established, so that there are always some individuals on the site with advanced first-aid ability.

(c) The first-aid station should be located next to the clean end of the decontamination area.

(d) Arrangements must be made for a doctor who can be paged on a 24-hour basis.

(e) The doctor should have ready access to the information about the chemicals on the site, and the workers' medical histories.

(f) All first-aid personnel must be aware of emergency response for heat stress problems.

(g) Drills should be held on a regular basis.

B. Worker Training Requirements

Each classification of **JAGUAR ENERGY SERVICES, LLC** personnel who work at hazardous waste sites are required by law to be trained in:

1. Equipment Operators, General Laborers, Supervisors, and Management prior to being allowed to participate in or supervise field activities.
   (a) Four hour Hazwoper
   (b) Recognition and understand of health hazards
   (c) Hazardous waste sites safety
   (d) How to protect yourself and your fellow workers against these hazards.
   (e) Firefighting
   (f) Use of Personal Protective Equipment
   (g) Work Practices which minimize hazardous risks
   (h) Safe and proper use of Engineering Controls
   (i) Equipment operation and maintenance

2. General Site Workers, Equipment Operators, General Laborers, and Supervisors prior to being allowed to participate in or supervise field activities.
   (a) Forty hour Hazwoper
   (b) Three days of field experience
   (c) Recognition and understand of health hazards
   (d) Hazardous waste sites safety
   (e) How to protect yourself and your fellow workers against these hazards.
   (f) Firefighting
   (g) Use of Personal Protective Equipment
   (h) Work Practices which minimize hazardous risks
   (i) Safe and proper use of Engineering Controls
   (j) Equipment operation and maintenance
   (k) CPR/First Aid

3. Occasional Workers, Ground Water Monitors, Land Surveying, and Geophysical Surveyors prior to being allowed to participate in or supervise field activities.
   (a) Twenty four Hazwoper
   (b) One day of field experience
   (c) Recognition and understand of health hazards
   (d) Hazardous waste sites safety
   (e) How to protect yourself and your fellow workers against these hazards.
   (f) Firefighting
   (g) Use of Personal Protective Equipment
   (h) Work Practices which minimize hazardous risks
   (i) Safe and proper use of Engineering Controls
   (j) CPR/First Aid

4. Workers that are required to wear respirators are required to have an additional sixteen hours and two days of field experience.

5. Management and Supervisors prior to being allowed to participate in or supervise field activities.
   (a) Forty hour Hazwoper
   (b) Three days field experience
   (c) Recognition and understand of health hazards
   (d) Hazardous waste sites safety
   (e) How to protect yourself and your fellow workers against these hazards.
   (f) Firefighting
   (g) Use of Personal Protective Equipment
   (h) Work Practices which minimize hazardous risks
   (i) Safe and proper use of Engineering Controls
   (j) Equipment operation and maintenance
   (k) CPR/First Aid

6. Proof of training must be documented and available.

C. Frequency of Training

1. Before personnel are allowed to work.
   (a) Yearly thereafter
   (b) Retraining if an individual shows lack of proficiency

SITE SAFETY AND HEALTH PLAN TABLE OF CONTENTS

SAFETY AND HEALTH PLAN

RECA SITE LOCATION _____

Prepared for: _____ By: _____

1.0 INTRODUCTION

This Safety and Health Plan (hereinafter called the **PLAN**) describes the program to be implemented by _____ Construction, Inc. (hereinafter called the Contractor) when performing remediation work for the _____ at the _____ Site in _____.

Safeguarding the Contractor's employees, subcontractors and neighbors in the adjacent communities is a key part of this project. All work will be conducted in accordance with applicable federal, state and local regulations (OSHA, EPA, etc.).

This Plan identifies procedures to be followed to minimize the potential for personnel exposure to contaminants known to be, or suspected of being, present at the site. All Contractor's employees and subcontractors who perform field work during the project will be required to read this Plan, and acknowledge receipt and understanding of this Plan by signing Appendix A and submitting it to the Contractor's Project Manager before performing any field activities.

2.0 KEY PERSONNEL

The Contractor's Project Manager, _____ has the primary responsibility for all on-site activities associated with the remedial (clean-up) work to be done at the _____ Site. Although safety and health is the responsibility for the Safety and Health program, it is assigned to the Safety and Health Officer (S&HO).

2.1 Safety and Health Officer (S&HO)

The Safety and Health Officer (S&HO) is _____, and his/her telephone number is _____. The S&HO has overall responsibility for the implementation of this PLAN and the

approval of any changes, modifications and/or additions to it. He has authority to:

a. Upgrade protection levels as required.
b. Suspend work due to Safety and Health Program violations, health related incidents and other increased risk situations.
c. Remove personnel from the work site if their actions endanger the health and safety of other field personnel.
d. Authorize personnel to enter the site based on medical and training requirements.

The S&HO's responsibilities are:

a. Implement the Site Safety and Health Plan.
b. Conduct Site inspections to monitor compliance with the approved PLAN.
c. Provide or coordinate training sessions.
d. Coordinate the Medical Monitoring Program.
e. Conduct respirator fit tests as required.
f. Coordinate the acquisition, calibration, and maintenance of air monitoring equipment, respirators and other safety equipment.
g. Direct on-site health and safety activities.
h. Report safety-related incidents or accidents to the Project Manager and fill out Lost Time Incident forms as required.
i. Perform or oversee performance of all air monitoring activity.
j. Maintain or oversee maintenance of on-site Health and Safety equipment.

2.2 Environmental Protection Agency

The EPA Project Coordinator for this project is _____ andhis/her/her telephone number is _____.

2.3 Medical Contacts

The local physician in _____ is _____ andhis/her/her telephone number is _____.

The local emergency contacts are:

_____, Fire Chief, telephone # _____

_____, Police Chief, telephone # _____

_____, Emergency Ambulance Service,
Telephone # _____

When contacting the Emergency Ambulance Service, inform the dispatcher as to the specific hazard to insure that if the injured person is contaminated, he will not be rejected. The local hospital is _____ and the number is _____

3.0 SITE DESCRIPTION ANDhis/herTORY

The _____ Site is located approximately 1 mile outside of _____ (See Appendix D) and occupies an area of approximately _____ acres. The site is _____ _____

Beginning in 1970 the Site was used by _____ for _____ In the ensuing years _____ and trash were also accumulated at the site. Initially _____ was being disposed of on-site. The site was abandoned in _____ and has been idle since that date.

As a result of complaints by neighboring residents and the local agencies, the EPA investigated the site in _____. The investigation disclosed the presence of hazardous materials on the site in various containers some of which were in imminent danger of failure because of deterioration (rust, etc.). In July 1986 an EPA contractor undertook a Removal Action to remove from the site those containers, etc., that posed an immediate threat to health and the environment. This removal action was completed in October 1986. Additional site investigations were undertaken in _____ by the EPA to determine the remaining hazards at the site and in January 1988 _____ Construction was awarded a contract to complete cleanup of the site.

4.0 HAZARD DESCRIPTION

4.1 Waste Characterization

Wastes disposed of at the site and found to be present in samples taken during the site investigation phase contain the following materials:

a. Waste Oil

b. Drip Oil
c. Flock acid
d. Peroxide
e. Mothers oxidizing agent
f. Cutting Oil
g. Pine Oil
h. Symbolic acid
i. Bovine organic
j. Super organic

These wastes may be found as liquids in drums, tanks or disposal ponds, or as contaminants in the soils, tank sludges or pond sediments at the site. Investigation has shown that a number of these contaminants have penetrated into the soil to depths up to ten (10) feet.
Chemical and toxicological characteristics of cutting oil, fecolic acid and peroxide are contained in the Hazardous Substance Identification Forms found in Appendix B.

5.0 FIELD ACTIVITIES

Activities associated with this cleanup project include:

1. Removal of all liquids in drums which are stored on the site, in the warehouse, or are buried. Buried drums must be excavated. Opening of drums with unidentified contents and sampling will be conducted prior to staging for removal.
2. Removal of sludges and sediments from the bottom of tanks.
3. Sampling the tanks.
4. Staging of drums which contain compatible materials and are to be disposed of by the same method. Building of dikes (or berms) for staging areas, using plastic to prevent spreading of contamination.
5. Overpacking of drums which are found to be leaking or in such a deteriorated condition that further handling would be hazardous. Pumping contents of deteriorated drums into new drums when drum movement is impossible.
6. Soil sampling.
7. Sampling groundwater monitoring wells (bailing).
8. Patching leaking drums.
9. Sampling pond sediment.
10. General site cleanup and organization.

For purposes of this PLAN, the activities to be carried out in this cleanup have been grouped, based on the degree of contact that field workers are likely to have with the contaminated wastes. These groupings may be revised by the Safety and Health Officer if on-site observations or monitoring indicate they are not providing adequate protection. It is the responsibility of the Site Safety and

Health Officer to assess any deficiencies found in the protection of field workers, suspend work if necessary to protect workers and revise procedures (protection levels) if any are found to be inadequate.

The following field activities are grouped by degrees of exposure:

5.1 **No Waste Contact Activities**

Activities that involve no contact with contaminated materials include:

a. Road repair, fence repairs.
b. Security services.

5.2 **Limited Waste Contact Activities**

Activities that involve indirect or potential for contact with waste include:

a. Construction of temporary staging/storage areas.
b. Decontamination of debris.
c. Collection, pretreatment and disposal of contaminated water (from decontamination operations).
d. Excavation, grading and general maintenance of site within the Exclusion Zone, but, not in areas close to sources of hazardous waste.

Direct Waste Contact Activities

Activities that involve direct contact with contaminated wastes include:

a. Waste excavation.
b. Drum opening and sampling.
c. Drum (container) handling, overpacking, pumping out.
d. Decontamination of equipment and personnel.
e. Waste bulking.
f. Pond and soil sampling.
g. Tank entry, sludge sampling and removal.
h. Air monitoring within the Exclusion Zone.

6.0 **HAZARD ASSESSMENT**

An assessment of hazards has been made for each of the groups of activities to be carried out in the cleanup.

6.1 **No Waste Contact Activities**

For activities that involve no waste contact, the primary hazards are the physical hazards associated with construction, the use of heavy equipment and heat and cold stress.

6.2 **Limited Waste Contact Activities**

For activities that involve only indirect or the potential for waste contact, the following hazards have been identified and shall be protected against:

a. Physical hazards associated with construction, material handling and the use of equipment while wearing personal protective equipment (PPE).
b. Heat/cold stress.
c. Inhalation of low concentrations of vapors or mists from acids, peroxides or organic solvents.
d. Limited skin or eye contact with acids, peroxides, oils and/or organic solvents.
e. Fire hazards due to presence of organic solvents.
f. Reaction hazards due to presence of acids and peroxides.
g. High pressure hoses and liquid transfer equipment.
h. High noise areas.

6.3 Direct Waste Contact

For activities which involve direct waste contact, the following hazards have been identified and shall be protected against:

a. Physical hazards associated with construction, material handling and the use of equipment while wearing PPE.
b. Heat/cold stress.
c. Inhalation of low concentrations of vapors or mists from acids, peroxides or organic solvents.
d. Extensive skin or eye contact with acids, peroxides, oils and/or organic solvents.
e. Ingestion of acids, peroxides, oils and/or organic solvents.
f. Fire hazards due to presence of organic solvents.
g. High pressure hoses and liquid transfer equipment.
h. High noise area.
i. Chemical reactions due to presence of acids and peroxides.

6.4 Special Situations

Since the site handled a wide range of chemicals during its 12 years of operation and the site investigations carried out to date may not have found and identified all the possible contaminants present at the site, the following additional precautions will be taken:

a. Opening and sampling of any drums whose contents are not identified will be carried out under the surveillance of the Site Safely and Health Officer, orhis/her designate, who will establish the appropriate level of PPE for this operation.
b. Moving, handling, pumping out or overpacking any drum or other container whose contents have not been identified will be done only after the Site Safety and Health Officer has established the appropriate level of PPE for the operation.

7.0 LEVELS OF PROTECTION

It is important that personal protective equipment is appropriate to protect against the potential or known hazards at the Site. Protective equipment has been selected based on the types and concentrations of substances at the Site and the possibilities for and the routes of personnel exposure. The following levels of protection are required for the following activity groups.

Activity	Level of Protection
No Waste Contact Activities	D
Limited Waste Contact Activities	C
Direct Waste Contact Activities	C/B

7.1 Level B Protection - PPE

a. Supplied-air respirator (MSHA/NIOSH approved). Respirators may be pressure-demand, self-contained breathing apparatus or pressure-demand, airline (with escape bottle for IDLH or potential for IDLH atmosphere).
b. Chemical-resistant clothing (hooded, one or two-piece chemical-splash suit; disposable chemical-resistant, one-piece suits (Saranex).
c. Long cotton underwear.*
d. Gloves (outer), chemical-resistant.
e. Gloves (inner), chemical-resistant, (Viton or North Silver Shield).
f. Boots (outer), chemical-resistant (disposable).*
g. Hard hat (face shield*).
h. Hearing protection.*

* Indicates optional equipment.

7.2 Level C Protection - PPE

a. Air-purifying respirator, full face, cartridge equipped (MSHA/NIOSH approved).
b. Chemical-resistant clothing (hooded, one-piece or two-piece chemical splash suit, disposable chemical-resistant coveralls).
c. Coveralls.
d. Long cotton underwear.*
e. Gloves (outer), chemical-resistant.
f. Gloves (inner), chemical-resistant (Viton or North Silver Shield).
g. Boots (outer) chemical-resistant, steel toe and shank.
h. Escape mask*.
i. Hearing Protection*.

* Indicates optional equipment.

7.3 Level D Protection - PPE

a. Coveralls.
b. Gloves.
c. Boots/shoes, leather or chemical resistant, steel toe and shank.
d. Safety glasses or chemical splash goggles.
e. Hard hat (face shield*).
f. Hearing Protection*.
* Indicates optional equipment.

Level A Protection - PPE

If the situation develops where Level A PPE is required the following will be required:

a. Supplied-air respirator (MSHA/NIOSH approved). Respirators may be pressure-demand self-contained breathing apparatus or pressure-demand airline (with escape bottle for IDLH or potential for IDLH atmosphere).
b. Fully-encapsulating, chemical-resistant suit.
c. All other equipment is the same as Level B.

8.0 SITE CONTROL

8.1 Site Access

Access to the _____ Site activities will be limited to authorized personnel. Such personnel include the Contractor's employees, designated equipment operators, and designated Laborers-AGC representatives. However, access into the established exclusion zone will be limited to those personnel wearing appropriate personal protective equipment and who have been properly trained. The exclusion zone will be cordoned off with flagging tape or other suitable indicators designating and exclusion zone boundary. The zone will also be monitored by the Site Safety and Health Officer to ensure personnel do not enter without proper personal protection.

Sign-in procedures may be implemented to ensure that authorized personnel only will participate in the clean up activities. The Site Project Manager will coordinate this effort and maintain the generated documentation accordingly.

8.2 Site Control

The _____ Site is not entirely secured by fencing or other suitable site control means; and the site is not routinely patrolled by police or any independent security department. Thus, certain procedures must be followed to ensure suitable site control and limitation of access so that those persons who may be unaware of site conditions are not exposed to inherent hazards.

All excavations left open and unattended by site personnel will be appropriately barricaded and visibly posted with "No Trespassing" or other appropriate signs. Well caps will be secured by suitable locking devices to prevent unauthorized access. All heavy machinery and equipment shall be locked or chained each evening upon completion of daily activities. Lastly, all potentially contaminated media, such as purged groundwater, cuttings, and soils, will be covered with plastic prior to leaving the site each day.

8.3 Work Zones

To restrict the movement of contaminants from the Site to uncontaminated areas, three work zone areas shall be set up and appropriately marked (See Appendix D). The three (3) work zones shall be as follows:

a. Zone 1: Exclusion Zone
The Exclusion Zone is the zone where contamination does or could occur. All persons entering this zone shall wear the level of protection set forth in the Hazard Assessment Section and prescribed by the S&HO. (Level C is minimum).

b. Zone 2: Contamination Reduction Zone
The Contamination Reduction Zone provides a transition zone between contaminated and clean areas of the Site. This zone shall be located directly outside the Exclusion Zone. All personnel and equipment leaving the Exclusion Zone shall be decontaminated in this zone. Procedures for decontamination are specified in Section 11.

c. Zone 3: Support Zone
The Support Zone shall be an uncontaminated area from which operations shall be directed. It is essential that contamination be kept out of this area.

9.0 MEDICAL MONITORING PROGRAM

9.1 Pre-work Assignment Physical Examination

The Contractor requires all of its field workers to pass a comprehensive preemployment medical examination prior to working at hazardous waste sites. The examination includes:

a. Complete medical and occupationalhis/hertory.
b. Full physical examination.

c. Vital systems check.
d. Screening audiometry.
e. Visual acuity.
f. Pulmonary function test.
g. Electrocardiogram.
h. Chest X-Ray.
i. Blood test, including CBC, SMA 24, and PCB Blood Levels.
j. Urinalysis, including microscopic.
k. Drug screen.
l. Back motion tests.

Other special tests as deemed necessary by the **JAGUAR ENERGY SERVICES, LLC** Physician. A copy of the Medical Certificate is illustrated in Appendix C.

Following the results of the hands-on physical and the laboratory tests, the physician determines whether the employee is:

a. Qualified to work in areas where exposure to chemicals or physical stress is possible.
b. Physically able to use protective equipment, including respirators.

9.2 **Annual and Exit Examination**

The Contractor conducts an identical program on an annual basis and at employee termination. Additional testing may be conducted when special or unusual conditions exist.

9.3 **Medical Support Services**

The **JAGUAR ENERGY SERVICES, LLC** physicians provide medical consultation services to advise on medical and health questions as they arise and evaluation and care of individuals with work related exposures, injuries or illness.

9.4 **Emergency Medical Care and Treatment**

Prior to starting work at the site, the Contractor will contact local emergency organizations (i.e., hospital, ambulance, fire, bomb squad, police, etc.) to insure that they are adequately prepared to respond to potential emergencies.

Emergency telephone numbers and a map and directions to the nearest medical treatment facility will be conspicuously posted at the Site.

Emergency showers, eye wash fountains and first aid equipment will be readily available on-site. The Site Safety and Health Officer will be certified in First Aid and CPR.

In the event of an injury or chemical exposure, employees will be transported to the nearest medical treatment facility. Employees suffering from chemical exposure will be accompanied by a Material Safety Data Sheet giving specific information about the chemicals.

10.0 TRAINING REQUIREMENTS

10.1 Basic Training

All employees who will perform work at the site must have completed a 40 hour hazardous waste site training program as required under 29 CFR 1910.120.

10.2 Site Specific Training

Employees assigned to the site will be given a minimum of three days of site specific training and field experience to include the following topics:

a. Acute and chronic effects of the toxic chemicals found at the Site.
b. Routes of potential exposure and field activities which could result in such exposure.
c. Need for personal protection, types of protection, its effectiveness and limitations.
d. Proper use and fitting of respiratory protective equipment.
e. Medical surveillance program.
f. Work zones established at the Site.
g. Prohibited activities in the Exclusion and Contamination Reduction Zone.
h. Engineering controls and safe work practices associated with employee's work assignment including dust control measures and use of "buddy system."
i. Personnel and equipment decontamination procedures.
j. Emergency response procedures.
k. Basic operational safety, emphasizing hazards expected on-site.
l. Drum handling procedures.
m. Tank/Vacuum trailer loading/unloading.
n. Spill Control
o. Sampling procedures.
p. Site communications.

10.3 Emergency Response Training

Employees will be given emergency response training according to the following:

a. Each employee will participate in a site evacuation drill during the first full week of field activities.
b. The Site Safety and Health Officer, or another member of the Contractor's management designated by the Safety and Health Officer, having a current First Aid and CPR certification (via an established program) will review these procedures.
c. At least one member of each work crew shall receive training in the use of portable fire extinguishers in accordance with OSHA regulation 29 CFR 1910.157G.

11.0 DECONTAMINATION

11.1 General

Each time an employee enters the Contamination Reduction Zone from the Exclusion Zone he/she must make a thorough self-examination. Equipment must be removed without exposure to the wearer. Hands and face must be scrubbed before eating or use of tobacco products to avoid accidental ingestion of wastes. Footwear must be changed prior to leaving the Contamination Reduction Zone to avoid "tracking" of contamination outside the secure area.

When leaving the site for the day, or if there is any indication the protective gear has been breached, immediate showering is required. For workers wearing PPE during the work day, showering at the end of the day is recommended for personal hygiene reasons.

Shower facilities will be designed in the same manner as the work areas, with the prewash area segregated from the post wash area and any work or "street" clothes carefully separated. Only after satisfactory showering in such a facility may the employee relaxhis/her or her vigilance to accidental chemical exposure.

11.2 Personnel Decontamination Facilities

The Contractor will provide and maintain the following facilities for personnel decontamination in the Contamination Zone. (The decontamination layouts for Protection Levels A, B and C are shown in Figures 1, 2 and 3 on pages 42, 43, and 44 respectively.) The following stations will be maintained:

Station 1 Segregated Equipment Drop equipped with plastic drop cloths for deposit of hand carried equipment.

Station 2 Boot, Suit, Outer Glove Wash equipped with two No. 3 wash tubs for washing boots, suits and gloves, decon solution or detergent and water.

Station 3 Boot Cover and Glove Rinse equipped with two No. 3 wash tubs for rinsing boot covers and gloves, and potable water.

Station 4 Tape Removal equipped with 20 gallon container with a plastic liner.

Station 5 Boot Cover Removal equipped with a bench or stool and a 20 gallon plastic-lined container.

Station 6 Outer Glove Removal equipped with a 20 gallon, plastic-lined container.

Station 7 Suit and Safety Boot Wash equipped with two No. 3 wash tubs, decon solution or detergent and water, 2-3 long handled brushes.

Station 8 Suit and Safety Boot Rinse equipped same as Station 7 except potable water is used.

Station 9 Tank Change equipped with replacement air cylinders, boot covers and outer gloves.

Station 10 Safety Boot Removal equipped with 30-50 gallon lined container and bench or stool.

Station 11 Fully Encapsulating Suit and Hard Hat Removal equipped with bench or stool and a drop cloth.

Station 12 SCBA Backpack Removal equipped with table.

Station 13 Inner Glove Wash equipped with a basin, bucket, decon solution or detergent and water, small table.

Station 14 Inner Glove Rinse equipped with a water basin or bucket and a small table.

Station 15 Face Piece Removal equipped with a lined container or a small table.

Station 16 Inner Glove and Boot Removal equipped with two 20-30 gallon lined containers.

Station 17 Inner Clothing Removal equipped with 30-50 gallon container and liners.

Station 18 Field Wash equipped with a shower or basins, small table, soap, water and towels.

Station 19 Redress equipped with table, chairs, lockers and clean clothes.

11.3 **Clothing**

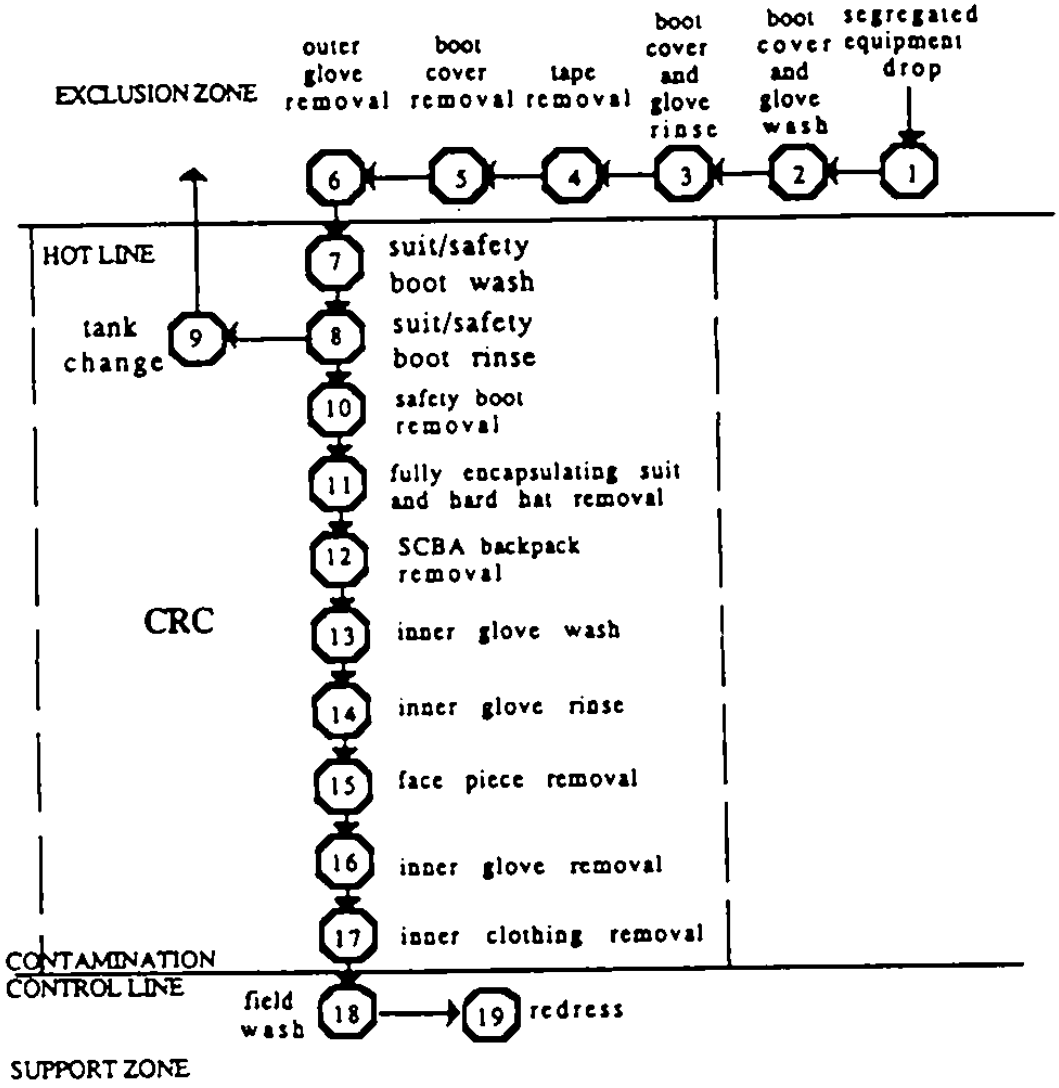
The Contractor shall provide all required safety clothing. Safety clothes shall be left in the change facility. No safety clothing (including boots) shall be worn or carried out of the project area unless properly decontaminated. Soiled safety clothes shall be appropriately disposed of.

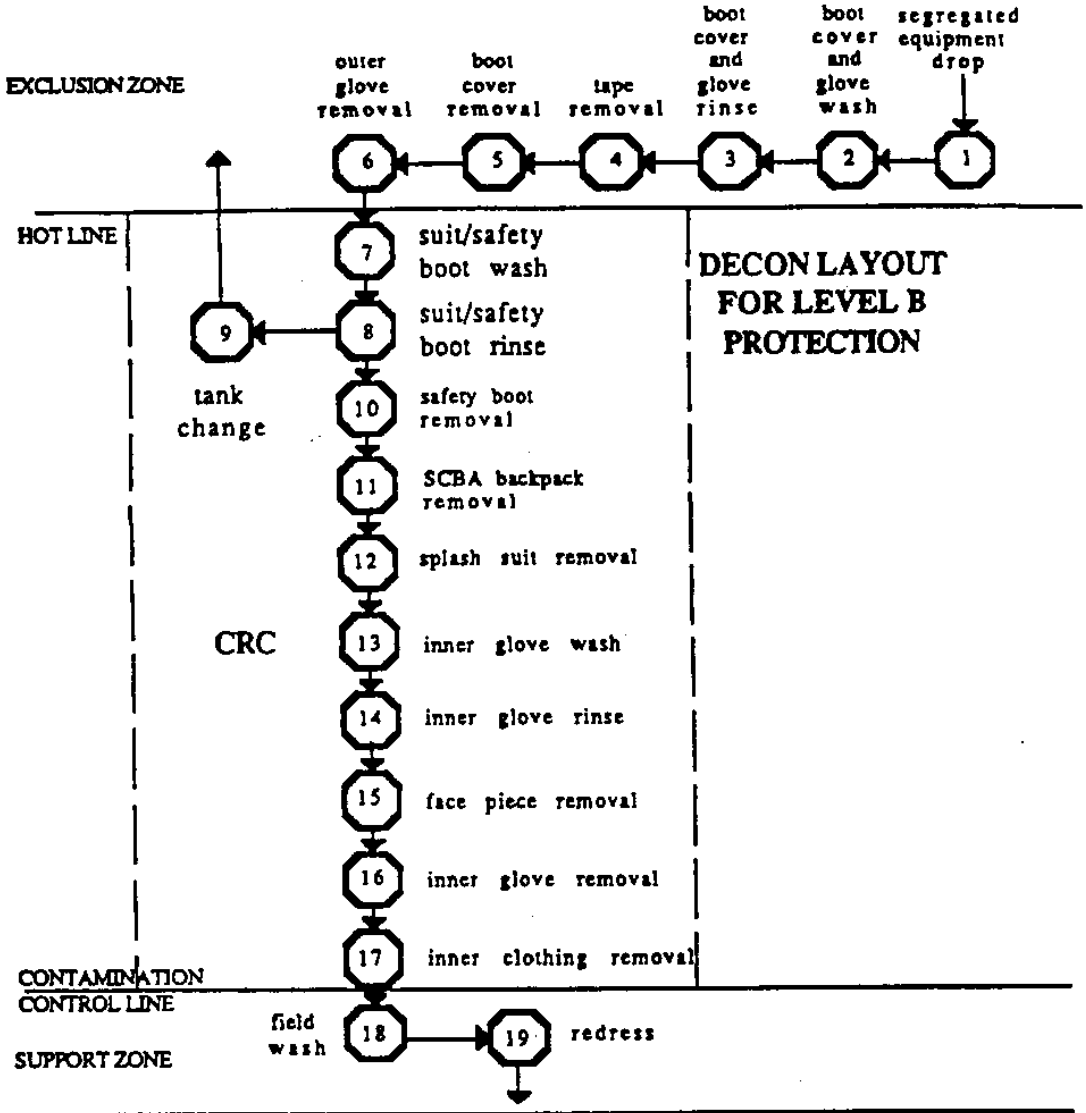
11.4 **Respirators**

All required respirators will be provided and maintained by the Contractor and will be cleaned daily. Cleaning and maintenance will be accomplished in accordance with the appropriate OSHA standards (29 CFR 1910.134).

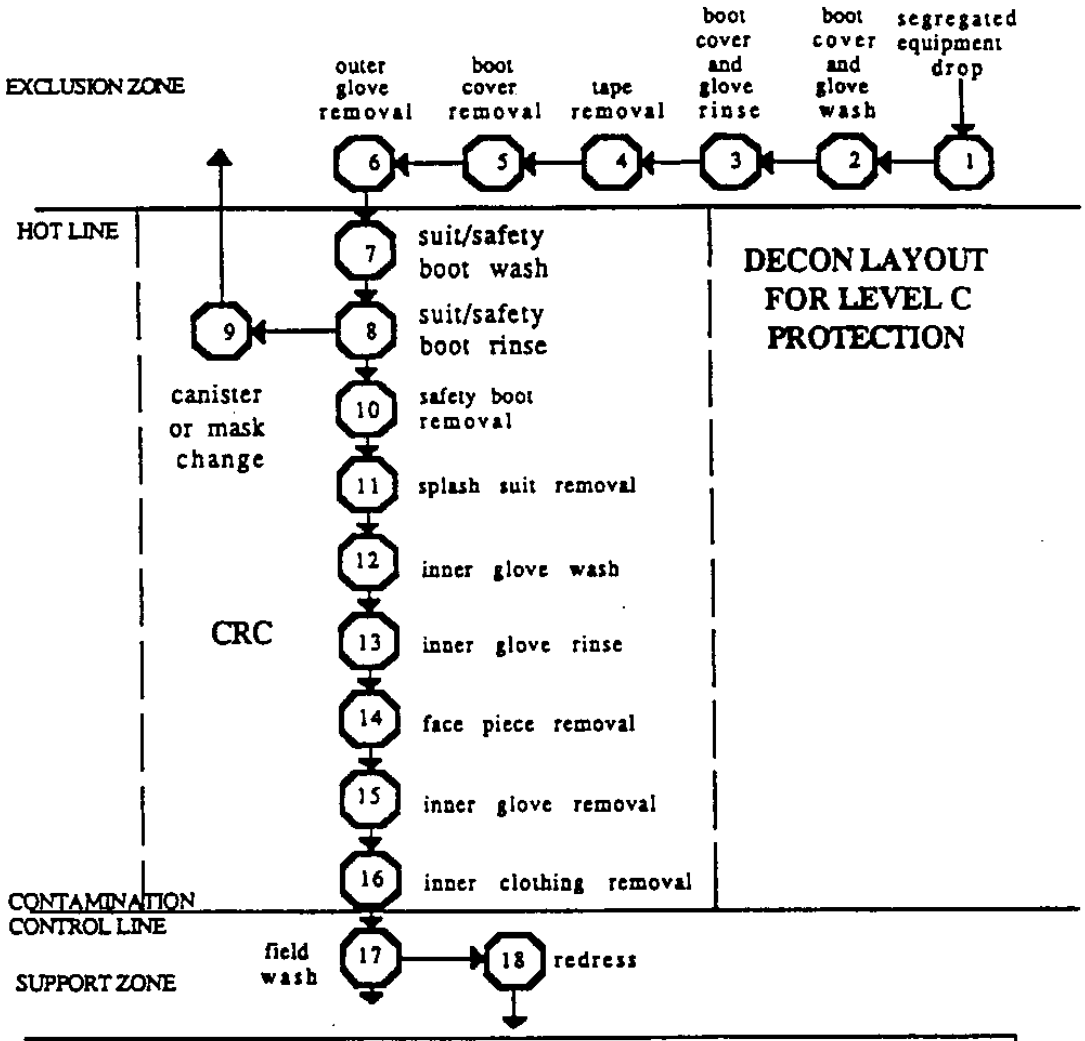
11.5 **Packaging of Waste Items**

All disposable clothing and other contaminated material will be placed in containers for storage on-site. Personnel will make a conscious effort to minimize the volume of contaminated materials. Legible and understandable precautionary labels will be affixed prominently to containers of contaminated scrap, waste, debris and clothing. Containers will be disposed of with other solids in the approved RCRA landfill.





SIT	STATION NUMBER																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
2	●	●	●	●	●	●	●	●	●										
3	●						●	●		●	●	●			●	●	●	●	●
4	●						●	●	●										



SIT	STATION NUMBER																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2	●	●	●	●	●	●	●	●	●									
3	●						●	●		●	●			●	●	●	●	●
4	●						●	●	●									

Change, Shower, Lunch and Break Facilities

Change, shower, lunch and break facilities will be provided by the Contractor and all personnel must enter and leave the work site through facility. The Contractor will provide toilets in the shower and change facility and additional units elsewhere on the Site.

11.8 Equipment Decontamination Procedures

Decontamination of equipment is essential to avoid spread of contamination to clean areas.

Key elements in decontamination are inspection and washing. The latter may require high pressure detergent solution application depending on the level of soil attachment. (Frequency of lubrication, etc., may therefore also be affected). Since wash water is then contaminated, a collection system is required.

11.9 Equipment Decontamination Facilities

Any items taken into the Exclusion Zone will assumed to be contaminated before the item leaves the Exclusion Zone. In general, vehicles, equipment and materials brought into the Exclusion Zone will remain in the Exclusion Zone until no longer necessary to the project.

All contaminated vehicles and equipment will be decontaminated before they are taken off-site. Verification of decontamination will be made by wipe test(s). The Contractor will set up controls to assure that contaminated items do not leave the Exclusion Zone.

The Contractor will provide and maintain the following facilities for equipment decontamination:

a. Equipment decontamination pad.
b. Contaminated Water Collection System.
c. High pressure water or steam cleaners.
d. Degreasers.
e. Trisodium Phosphate Detergent.
f. Wire brushes and scrapers.

12.0 Site Standard Operating Procedures

12.1 Work Practices

Workers will be expected to adhere to the established safety practices for their respective specialties (e.g., drum handling, sampling, laboratory analysis, construction).

a. The need to exercise caution in the performance of specific work tasks is made more acute due to weather conditions, restricted mobility, and reduced peripheral vision caused by the protective gear itself, the need to maintain the integrity of the protective gear, and the increased difficulty in communicating caused by respirators.

b. Work at the site will be conducted according to established procedures and guidelines for the safety and health of all involved.

c. Among the most important of these principles for working at the site are:
   (1) In any unknown situation, always assume the worst conditions and plan responses accordingly.
   (2) Employ and use "buddy system." Establish and maintain communication.
   (3) Minimize contact with excavated or contaminated materials.
   (4) Plan work areas, decontamination areas, and procedures to accomplish this.
   (5) Do not place equipment on drums or on the ground.
   (6) Do not sit on drums or other materials.

d. Employ disposable items when possible to minimize risks during decontamination and possible cross-contamination during sampling-handling.
   (7) This will require a commonsense approach to potential risks and costs.

e. Smoking, eating, or drinking after entering the work zone and before decontamination will not be allowed.
   (8) Oral ingestion of contaminants is probably the second most likely means of introduction of the toxic substances into the body (inhalation being first).

f. Avoid heat and other work stresses related to wearing the protective gear.
   (9) Work breaks should be planned to prevent stress-related accidents or fatigue.

g. Maintain monitoring systems.
   (10) Conditions can change quickly if sub-surface areas of contamination are penetrated.

h. Be observant of not only one's own immediate surrounding but also that of others.
   (11) Everyone will be working under constraints of awareness and it is a team effort to notice and warn of impending dangerous situations.
   (12) Extra precautions are necessary when working near heavy equipment while utilizing personal protective gear.
   (13) Vision, hearing, and communication are restricted by the protective gear.

i. Use of contact lenses will not be allowed on-site.
   (14) These prevent proper flushing should corrosive or lachrymose substances enter the eyes.

j. Site operations requiring Level C or greater protection will require the removal of facial hair (except mustaches) to allow a proper face piece fit.

k. Withdrawal from a hazardous situation to reassess procedures is the preferred course of action.

l. Be aware that chemical contaminants may aggravate or worsen symptoms of other illnesses or intoxication.
   (15) Avoid excess use of alcohol and working when ill.

12.2 **General Site Safety Rules**

a. There will be an informal safety meeting each morning before commencing operations.

b. The project site is divided into an EXCLUSION ZONE (i.e., WORK AREA) and a SUPPORT ZONE (i.e., Administrative Area) separated by a CONTAMINATION REDUCTION ZONE (i.e., Personnel and Equipment Decontamination Facilities). Entrance to and exit from the EXCLUSION ZONE will be via the CONTAMINATION REDUCTION ZONE. Only authorized and properly protected and trained personnel will be allowed to enter the work area.

c. All personnel and equipment must be decontaminated when passing from the EXCLUSION ZONE to the SUPPORT ZONE.
   (1) Prior to departing from the Site, or at the end of the work day, all personnel will proceed through the Decontamination Station where disposable clothing and equipment will be removed.

d. No eating, drinking, smoking or chewing will be permitted in the EXCLUSION ZONE.

e. Prior to eating, drinking or smoking, all personnel must wash their hands and faces.

f. All questions should be referred to the Site Safety and Health Officer.

g. All personnel will be required to **clean and inspect** their respirators at the end of the work day.
h. Violation of these rules will result in immediate dismissal from the site.
i. result in immediate dismissal from the site.

12.3 **Communication Procedures**

Personnel in the Exclusion Zone will remain in constant radio communication or within sight of other project personnel.

a. Any failure of radio communication requires an evaluation of whether personnel should leave the Exclusion Zone.

b. A channel will be designated as the radio frequency for personnel in the Exclusion Zone.

c. A horn blast is the emergency signal to indicate that all personnel should leave the Exclusion Zone. In addition, a loud hailer will be available.

d. The following standard hand signals will be used in case of failure of radio communications:
   (1) Hand gripping throat - Out of air, cannot breathe.
   (2) Grip partner's wrist or both hands around waist - Leave area immediately.
   (3) Rotating both hand above the head - Need assistance.
   (4) Right hand thumbs up - OK, I am alright, I understand.
   (5) Right hand thumbs down - No, negative.

13.0 Monitoring Programs

13.1 **Air-Monitoring**

A comprehensive air-monitoring program which provides both baseline and on-going air quality data, has been developed and implemented.

a. The instrumentation that will be used on site is:
   (1) Oxygen and Combustible gas - the ISD dual-sensor monitoring instrument, Model MX241.
   (2) Organic vapors and gas detection - The National Draeger bellows pump will be used with appropriate testing tube to detect (and give direct readings) the presence of organic vapors and gases.

(3) The HNU Photoionizer, Trace Gas Analyzer, Model P1101 will be used to detect and measure the concentration of organics in the air.

b. The air monitoring program includes the following:

(4) A preliminary survey of existing air quality conditions, prior to any materials handling and, if possible, under anticipated "worst case" weather conditions (hot, dry, and stagnant), to be used to establish baseline levels for input into the respiratory protection selection process.

(5) An ongoing evaluation of on-site atmospheric contaminant concentrations during site remediation activities.

(6) Perimeter monitoring of off-site downwind air quality conditions during site operations.

13.2 Self Monitoring

While at the site, the Contractor's employees will be required to self-monitor their health and that of their coworkers.

a. Visual observations include:

(1) Behavioral changes.
(2) Sensation losses.
(3) Coordination losses.
(4) Increased salivation.
(5) Gum and lip discoloration.
(6) Change in appetite.
(7) Slurred speech.
(8) Skin rashes.
(9) Pupil dilation.
(10) Weight loss.

b. Any abnormalities or changes are to be reported and investigated.

(11) Such aspects could be symptoms of toxic exposure and must not be allowed to linger without medical attention.

(12) In addition, all accidents and injuries, no matter how small or insignificant, are to be reported and investigated.

14.0 Emergency Contingency Plan

14.1 General

A comprehensive emergency response plan has been developed to handle all on-site emergencies.

a. In the event of an emergency situation (e.g. fire, explosion, significant release of toxic gas, or severe contamination of worker(s), etc.) a continuous blast (1 minute) on an air horn will be sounded from the Command Post.

b. The signal may be repeated at five minute intervals until the S&HO is assured that all site personnel recognize the initiation of the emergency plan.

c. A list of site conditions which might require implementation of the plan, includes but is not limited to:

(1) Fire or explosion on site.
(2) Serious employee injury.
(3) Accumulation of combustible gases or vapors at concentrations greater than background.
(4) Oxygen concentration below 19.5%.
(5) Unsafe working conditions, such as inclement weather, or hazardous material releases.
(6) Major release of toxic materials for which appropriate PPE is not being worn by workers.

14.2 **Responsibilities**

The site emergency coordinator is, the S&HO.his/her/her alternate, or backup is, the Site Project Manager.

a. The emergency coordinator is responsible for:

(1) Assessing the situation and determining whether an emergency exists which requires activating the plan.
(2) Directing all efforts in the area including evacuating personnel and minimizing property loss.
(3) Ensuring that outside emergency services such as fire departments, police, ambulance, and hospitals are notified when necessary.
(4) Directing the shutdown of site operations when necessary.
(5) Notifying regulatory agencies as necessary.

b. A list of key off-site response personnel, agencies and response groups is given below.

EMERGENCY CONTACT LIST

	Emergency Contact	Phone
Number		
Contractor		
	Project Manager _____	(___) _____
	S&HO _____	(___) _____
Police		
	_____ State Police	(___) _____
	_____ Town Police	(___) _____
Hospital		
	_____	(___) _____
	_____	(___)
_____		
Fire		
	_____	(___) _____
	_____	(___) _____
Doctor		
	_____	(___) _____
	_____	(___) _____
Ambulance		
	_____	(___) _____
	_____	(___) _____
Life Flight Helicopter		
	_____	(___) _____
	_____	(___) _____
EPA - Region		
	_____	(___) _____
	_____	(___) _____

State EPA

_____ (___) _____

_____ (___) _____

Directions to the nearest hospital: _____

_____

_____

_____

_____

_____

14.3 **Evacuation Plan**

All site personnel will be evacuated from the Exclusion and Contamination Reduction Zones if the Emergency Coordinator decides that their personal safety is in danger.

a. If evacuation is necessary personnel will be notified by a series of short blasts on the air horn, for a period of one minute.

b. The following procedures will apply:

i. Evacuation will take place through the normal contamination reduction corridor and the normal decontamination procedures will be followed.

ii. In the event that use of the normal contamination reduction corridor is deemed unsafe, evacuation will be through the emergency exit (located at the vehicle decontamination area).

iii. Decontamination team personnel will proceed to the alternate exit immediately upon being advised by the Emergency Coordinator.

iv. Immediately upon completion of the decontamination procedure, personnel will proceed to the Assembly Area adjacent to the Command Post.

v. Personnel not requiring decontamination (those outside the CRZ) will proceed immediately to the Assembly Area.

vi. Upon arriving at the Assembly Area personnel must check in with the checkpoint control person.

vii. First Aid technicians and Fire Brigade Personnel, upon arriving at the Assembly Area, must identify themselves to the Emergency Coordinator.

viii. The Buddy System should be followed throughout the evacuation procedure.

14.4 **Specific Situations**

The following procedures are to be followed for the specific situations listed below which do not require immediate evacuation.

14.4.1 **Personnel Injury In the Exclusion Zone**

Upon the notification of an injury in the Exclusion Zone, the designated emergency signal (continuous horn blast) shall be sounded.

a. All Site Personnel shall assemble at the decontamination line.
   i. The rescue team will enter the Exclusion Zone (if required) to remove the injured person to the hotline.
   ii. The site S&HO will evaluate the nature of the injury, and the affected person will be decontaminated to the extent possible prior to movement to the Support Zone.
   iii. The appropriate first aid shall be administered and contact will be made for an ambulance with the designated medical facility (if required).
   iv. No persons shall reenter the Exclusion Zone until the cause of the injury or symptoms is determined.

14.4.2 **Personnel Injury in the Support Zone**

Upon notification of an injury in the Support Zone, the Site Safety and Health Officer will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue, with the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk to others, the designated emergency signal (continuous horn blast) shall be sounded and all site personnel shall move to the decontamination line for further instructions. Activities on-site will stop until the added risk is removed or minimized.

14.4.3 **Fire/Explosion**

Upon notification of a fire or explosion on-site, the designated emergency signal (continuous horn blast) shall be sounded and all site personnel shall assemble at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

14.4.4 **Personnel Protective Equipment Failure**

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person andhis/her/her buddy shall immediately leave the Exclusion Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

14.5 **On-Site Emergency Facilities**

The following emergency equipment is available on the site. Locations are shown on the site map posted at the Command Post.

a. First Aid kit and reference manual.
b. Dry chemical fire extinguishers.
c. Fire hose and water supply.
d. Stretcher.
e. SCBAs.
f. Alert air horns.
g. Blankets.
h. Eye wash stations.
i. Safety showers.

14.6 **On-Site Emergency Personnel**

The following personnel have been trained in specific fields of emergency response and are present on the site during the normal working day:

a. First Aid Technicians: Title:

_____ _____
_____ _____

b. Fire Brigade
Leader: _____
Members: _____
_____ _____
_____ _____

14.7 **Emergency Spill or Discharge**

In the event of an unauthorized discharge of pollutants/contaminants into the soil, surface water, sewers or ambient air, the person first finding such an incident shall immediately notifyhis/her supervisor or the S&HO.

The supervisor/S&HO will notify immediately:

a. State Department of National Resources.
b. EPA Local Region.

14.8 **Special Procedures**

In the event personnel become contaminated in the emergency incident or are injured while contaminated and require medical treatment, specific emergency decontamination procedures, including instructions for

ambulance crews and hospital personnel are available in the Command Post.

APPENDIX B

COMPLIANCE AGREEMENT

Safety and Health Plan Compliance Agreement
_____ Mock Site - Remedial Project
I, _____ (print name), have received a copy of the Safety and Health Plan for the _____ Mock Site. I have read the plan, understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Signed:

_____ _____
Signature Date

Signed for Construction **JAGUAR ENERGY SERVICES, LLC**:

_____ _____
Signature Date