SHELLMOUND
EXTENSION

UPDATED & REVISED

SOIL RECYCLING EDITION

HEALTH & SAFETY PROGRAM

City of Emeryville
Shellmound Extension Project

Prepared by

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ROUTE 80 FLYOVER SHELLMOUND EXTENSION EMERYVILLE, CALIFORNIA

HEALTH & SAFETY PROGRAM

ENCAPCO SOIL EDITION
12/95

1.0 Introduction

ENCAPCO has developed a comprehensive Corporate Health and Safety Program which includes general policies and procedures for construction projects that include occupational safety and environmental health concerns. This program is directed by a Certified Industrial Hygienist (CIH) with extensive experience in occupational and environmental health and safety. The CIH has developed this site specific Health And Safety Plan (HASP) to detail the procedures necessary to protect site workers, the public and the environment and satisfy the safety requirements of the agencies listed below. The creation of this document demonstrates ENCAPCO's knowledge of the regulations and our concern for the safety and health of our employees and the general public. The following regulatory guidelines have been incorporated into this plan.

CAL/EPA, Department of Toxic Substances Control
Management Memo # EO-95--010-MM Titled; USE CONSTITUTING DISPOSAL
29 CFR Part 1910.120
Hazardous Waste Operations And Emergency Response
CCR Title 8, 1532.1, Lead Construction Standard
California Occupational Safety and Health Standards (Cal OSHA)
CCR Title 22
Identification and Listing of Hazardous Waste Division 4, 5, Chapter 11
29 CFR Part 1910
Occupational Safety and Health Administration (OSHA), Occupational Safety and Health Standards
29 CFR Part 1926.62
OSHA Safety and Health Regulations for Lead in the Construction Industry
40 CFR Part 261
Resource Conservation and Recovery Act (RCRA) Identification and Listing of Hazardous Waste

ENCAPCO has prepared safety guidelines and procedures for all phases of our operations as well as a description of potential hazards and risks. Our project management staff will be familiar with the safety requirements prior to beginning work. The HASP will be reviewed by them and discussed. The plan will be read by all site employees who are to be involved in excavation activities, subcontractors and visitors to the

site. The Site Safety Officer (SSO) will conduct a short safety briefing at the beginning and end of each day to ensure that any problems or occurrences have been addressed. He will observe employees to determine if they are wearing proper safety clothing and equipment and inspect the site each morning and frequently during the day for potential problems. He will conduct special training sessions and meetings to discuss safety concerns. Positive aspects of the safety program will be emphasized.

ENCAPCO realizes that each project is unique and conditions can occur that significantly effect safety. We will try to anticipate problems before they occur and have appropriate responses (Emergency Response Plans and Drills). If a situation occurs which may cause noncompliance the SSO will be notified immediately and work stopped (safety shut-down) until appropriate action can be taken. This situation will be thoroughly documented. Initially, and periodically, as advised by the Certified Industrial Hygienist, ENCAPCO's safety staff will provide on-site monitoring and evaluation to identify and determine concentrations of potentially hazardous substances. The CIH and/or the SSO will recommend specific actions to minimize and/or eliminate potential problems based on their knowledge of probable sources and mechanisms of toxicity as well as possible synergistic effects.

The HASP will be enforced by the SSO under the direction of the CIH, but if an unsafe condition is noted by another individual, that individual will report it to the nearest supervisor. Work will be stopped immediately and the unsafe condition corrected.

Individuals that disregard the safety guidelines will be terminated. The Safety Officer will stress that their safety will effect the safety of others and that they will not be allowed into their work areas unless they meet all safety requirements.

1.1 Project Background

Excavation activities during the building of the Route 80 Flyover have resulted in the stockpiling of contaminated soil that has been scheduled for treatment by ENCAPCO and eventual use by Ghilotti Bros. as roadway construction material. The treatment technology to be used by ENCAPCO involves the chemical fixation of contaminated materials with dry reagents and an asphaltic emulsion mixture. This process is further discussed under separate cover in ENCAPCO's Analytical Report for Shellmound Street Extension, dated December 1995 (Ref. ENCAPCO Proj. No. EPW 108-95).

The soil planned for treatment has been found to be contaminated with lead (Pb) at levels averaging approximately 750 milligrams per kilogram or parts per million by weight, (mg/kg and ppm by wt., respectively). Other metal contaminants include Copper (Cu), chromium (Cr), and zinc (Zn). Diesel has also been detected in the soil at approximately 1,300 ppm by wt..

1.2 Project Objectives

This contract requires that contaminated soils be treated using soil chemical fixating and stabilization methods in order to achieve Soluble Threshold Limit Concentrations (STLCs) below applicable contaminant levels that would result in the soil being characterized as hazardous ENCAPCO will accomplish this objective by utilizing the process refereed to in Section 1.1. The estimated duration for the soil treatment is ten working days.

1.3 Site Description and Background

The Route 80 Flyover is located at the junction of Interstate 80 and 580 near the Oakland/Emeryville boarder. The Flyover is being constructed to replace a portion of the Cypress Freeway that was destroyed in the 1989 Loma Prieta earthquake.

The existing freeway system crossing the Site was constructed in the 1950's. The proposed upgrade and expansion will include Route 80 from Post Mile 2.4 to 3.8.

The site, previously Barbary Coast Steel Property, is rough graded soil/slag material. The slag, a waste of the steel milling process, was deposited as fill and cast over the site from the 1880's to the 1980s. The primary slag chemical constituent of concern is lead. The Site is presently underdeveloped, with no known historic use other than as grazing lands.

Refer to Figure 1 on the following page for a vicinity map of the project site.

SOURCE: BASE MAP FROM U.S.G.S. OAKLAND WEST, CA QUADRANGLE. 7.5 MINUTE SERIES TOPOGRAPHIC MAP. PHOTOREVISED 1980.

REED INTERNATIONAL

FIGURE 1

EMERYVILLE, CALIFORNIA

VICINITY MAP

1.4 Description of Work Tasks

ENCAPCO will operate the contaminated soil chemical stabilizing process using a three man crew. Two of the crew members will be involved in loading and mixing activities within the Exclusion Zone and one will be active in the Support and Contamination Reduction Zone (CRZ).

2.0 Site Hazard Evaluation

As previously mentioned, stockpiled soil at this site has been found to be contaminated with metals and total petroleum hydrocarbons (as diesel). The contaminated soil will be managed in strict accordance with the applicable regulatory agency requirements listed in Section 1.0. The primary routes of worker exposures for this project activity are inhalation, ingestion, and skin contact.

Physical hazards usually associated with excavation activities are also present. These hazards are addressed within this HASP and in additional detail in ENCAPCO's Injury and Illness prevention Program.

2.1 Chemical Hazard Analysis

In addition to lead, the project involves a site where soils have been found to be contaminated with, copper, chromium, and zinc. These other elements as summarized below, have been found in lesser quantities than lead, however, they will be monitored in order to maintain a margin of safety.

Lead

Metal:	Noncombustible solid in bulk form. Heavy, ductile, soft gray solid.
OSHA:	0.05 mg/m3
Route:	Inhalation, ingestion, contact skin and eyes
Symptoms:	Weak, lassitude, insomnia; facial pallor; palpitations eye, anorexia, low-weight, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; nephropathy; irritation eyes; hypotension

Copper

Metal: Noncombustible solid in bulk form, but powdered form may ignite. Finely divided black particulate dispersed in air.

NIOSH: 1.0 mg/m3

Route: Inhalation, Contact skin and eyes

Symptoms: Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough, weak, lass; irritated eyes, upper respiratory tract; metallic or sweet taste; discoloration skin, hair

Chromium

Metal: Steel-gray lustrous metal that may exist in one of three valence states in compounds, brittle hard solid

OSHA: 1.0 mg/m3
NIOSH: 0.5 mg/m3

Route: Inhalation, ingestion, eye and skin contact

Symptoms: Chromium metal ore has been reported to cause lung allergy. Chromium fumes can cause "metal fume fever", a flu-like illness lasting about 24 hours with chills, aches, cough and fever. Chromium particulate can irritate the eyes

Zinc

Metal: Noncombustible solid. White particulate dispersed in air.

NIOSH: 5.0 mg/m3

Route: Inhalation, contact

Symptoms: Conjunctivitis; irritation nose, throat; cough, copious sputum; chest pain, pulmonary fibrosis, coronary fever; cyanosis; tachycardia pneumonia; burn skin irritation skin, eyes.

TPH as Diesel

Liquid Fuel: Semi-volatile combustible liquid. Gray-green in color

OSHA: NE
ACGIH: NE
NIOSH: NE

Route: Inhalation, ingestion, contact

Symptoms: drowsiness, CNS depression, coma, hemorrhaging, pulmonary edema, pneumonitis, renal involvement, death

2.2 Physical Hazard Analysis

The physical hazards for this project include those associated with heavy equipment and excavation such as:

- √ Traffic control
- √ Ladders
- √ Power activated tools
- √ Air tools
- √ Noise
- √ Dust

As mentioned, these hazards are also addressed in ENCAPCO's Injury And Illness Prevention Program submitted for this project under separate cover.

3. Site Control Measures

The establishment of work zones will help ensure that personnel are properly protected against the hazards present, and that work activities and contamination are confined to appropriate areas. During site operations ENCAPCO will establish and maintain three control zones, as illustrated in Figure 2. The three control zones are as follows:

1. *Exclusion Zone:* The area where contamination does or could occur.

2. *Contamination Reduction Zone:* The area where decontamination takes place.

3. *Support Zone:* The uncontaminated area where workers will not be exposed to hazardous substances.

Each zone will be clearly defined with appropriate access control points.

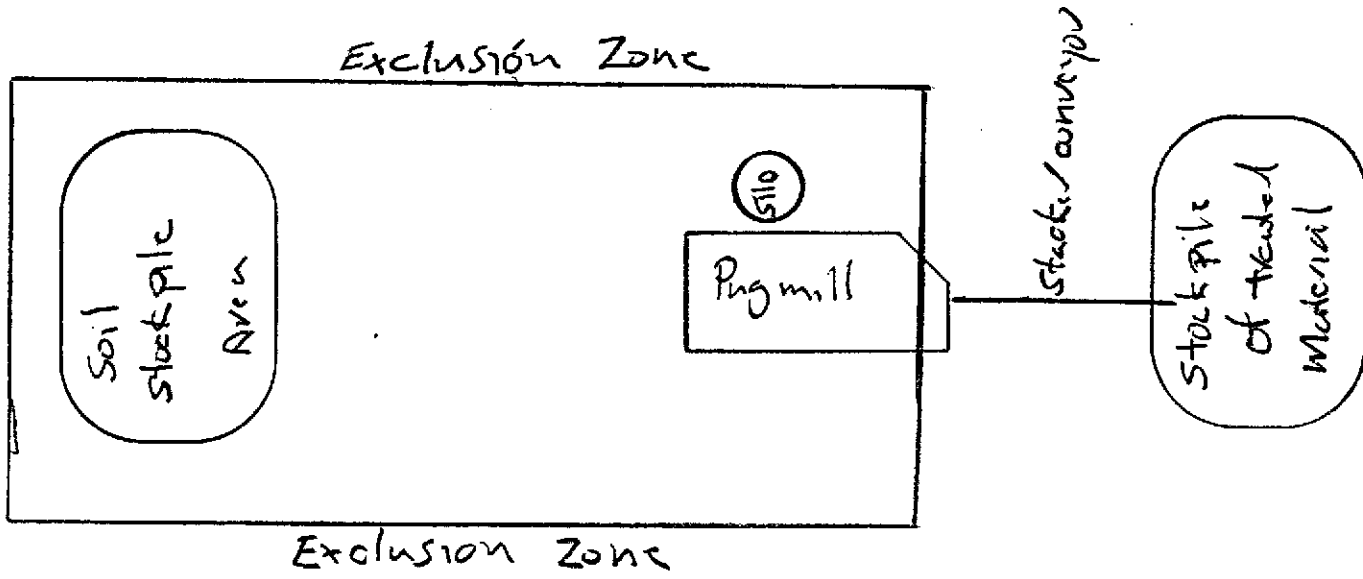
Work zone operations will be scheduled so that no employee works alone in the exclusion zone at any time. The buddy system enables co-workers to "watch out" for each other while in the proximity of potential chemical and physical hazards.

FIGURE 2

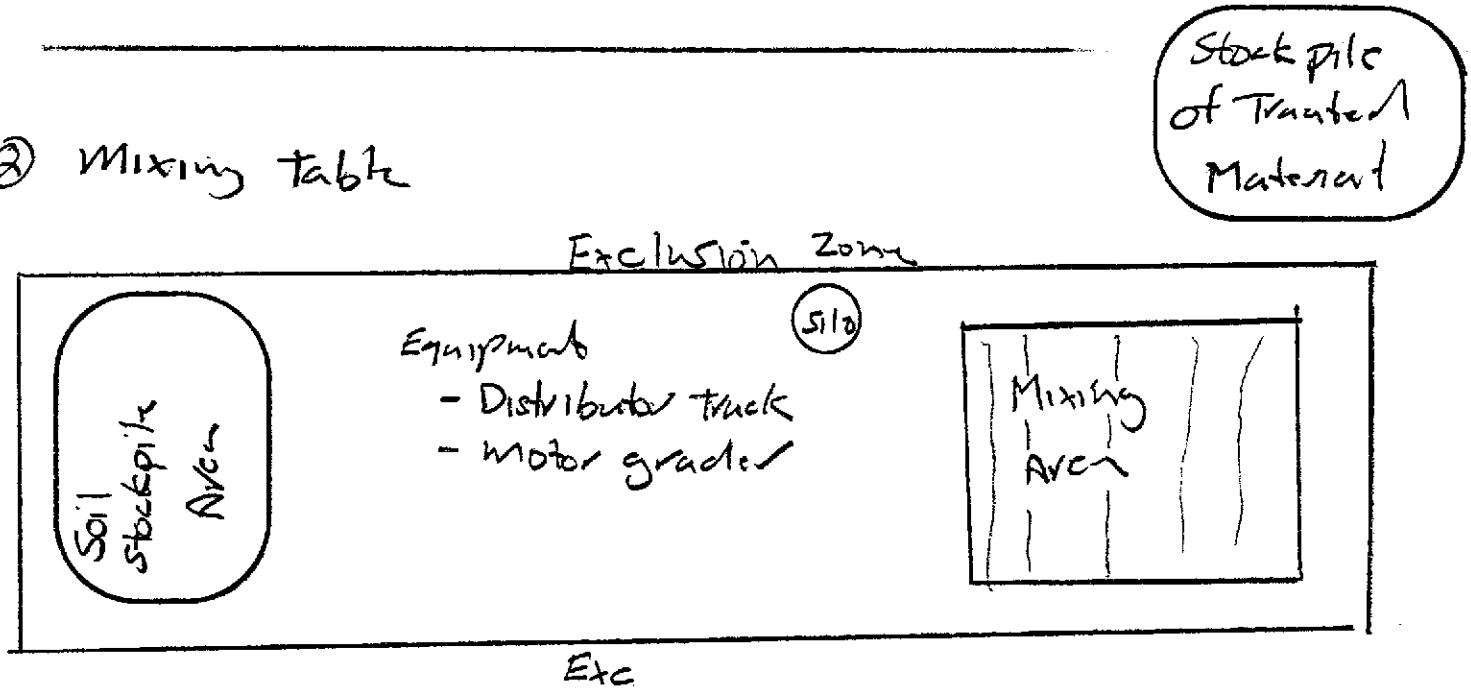
PROJECT SITE DRAWING

Processing of Material options

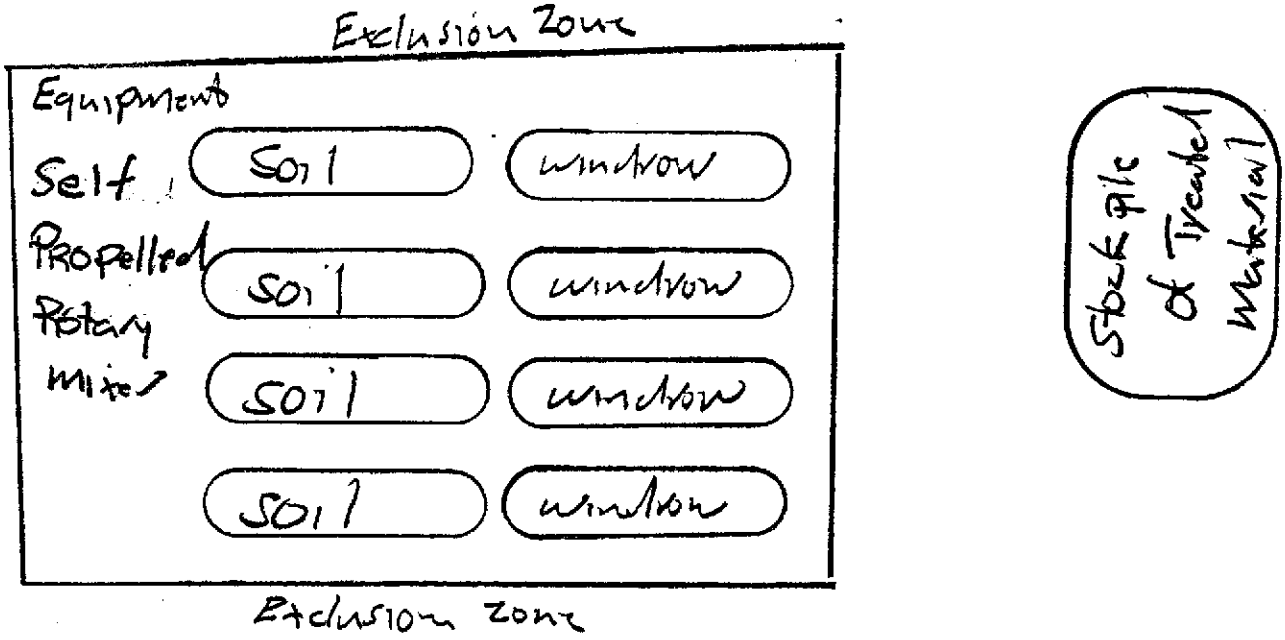
① central plant Mixing



② Mixing table



(3) Travel Mixing



Stock pile of Treated Material

These work zones will be delineated on the site map, as illustrated in Figure 2 with access points and specific units or equipment (i.e., project office, parking area, first aid/emergency care, hazardous substance storage, holding tanks, equipment storage, decontamination area, and other appropriate items.

Communication and security will be controlled from the project office and comply with facility guidelines and procedures. We understand the critical nature of this project in regard to employee health and safety and a telephone will be maintained at this location for emergency communication. Access during working hours must be through the project office. Unauthorized personnel will not be allowed beyond the project office.

No outside personnel will be allowed access to the records or the site area without written permission of the Contracting Officer. A list of authorized visitors for the project will also be maintained. All authorized visitors (client's staff, associated subcontractors) will not be allowed on-site without the proper training, safety equipment, escort and conformance with the following:

- Review of Health and Safety Plan
- Sign-in/Sign-out Sheets
- Liability Waivers
- Presentation of Training Certification and Medical Fitness

4.0 Work Zones

4.1 Zone 1 - Exclusion Zone

An exclusion zone will be maintained around the site by placement of signs, barricades and barricade tape as necessary. The size and shape of the exclusion zone (as shown previously in Figure 2) will be large enough to encompass the potentially hazardous zone around the work site. All personnel will enter and exit the exclusion zone through the contamination reduction corridor, Zone 2. The location of the CRZ and Support Zone will be determined on-site. Each of the zones will be configured so as to provide ease of access and sufficient area to conduct respective activities without being too large to safely manage.

Any item taken into the exclusion zone will be assumed to be contaminated, and must be decontaminated before the item leaves the area. Vehicles, equipment and materials brought into the exclusion zone will remain in the exclusion zone until no longer necessary to the project, and/or until properly decontaminated.

The required personal protective equipment for use by personnel working in, or entering the exclusion zone will be Level C, which will consist of gloves, steel-toe boots, hard hats, safety glasses, Typek suit, ear plugs as needed, as a minimum half face respirator equipped with HEPA filters. Dust control measures will be implemented, and dust monitoring using a hand held particulate monitor will be used to downgrade to Level D if possible.

4.2 Zone 2 - Contamination Reduction Zone (Decontamination Zone)

The decontamination reduction zone will consist of a decontamination corridor and equipment drop near the exit of the exclusion zone. The contamination reduction zone will contain:

- Equipment decontamination facility;
- Personnel decontamination facility;
- Plastic sheeting on which to place and segregate reusable equipment;
- Wash basins, decontamination solutions, scrub brushes and a water source for the decontamination of reusable equipment;
- Emergency response and first aid equipment, including portable eyewash/bench showers, first aid kits and fire extinguishers;
- Clearly marked trash barrels or drums with plastic liners for the placement and disposal of expendable items such as gloves and protective clothing. The required Personal Protective equipment for use by personnel working or entering the contamination reduction zone will be Level C.

All personnel and equipment exiting through the exclusion zone will do so through the decontamination zone.

4.3 Zone 3 - Support Zone (Clean Zone)

The support zone is the location of the functions needed to keep the operations in the exclusion and contamination reduction zones in order, and will consist of the area outside the contamination reduction zone.

Emergency telephone numbers and hospital route maps will be kept in an obvious location in the support zone. First aid supplies will be available in the support zone. Eating, drinking and smoking will be allowed in this area. ENCAPCO's basic work uniform will consist of hard hats, steel toed boots, and work clothes.

5.0 ENCAPCO Accident Prevention

5.1 Housekeeping

The work areas will be cleaned on a daily basis. Tools, materials, extension cords, hoses will be stored and maintained such that they do not cause tripping hazards. Walkways will be maintained clear of excavated materials and other debris. Storage areas will be kept free of combustible and flammable debris. Work areas will be inspected daily in order to maintain adequate housekeeping. Refuse containers will be emptied when full or more frequently when necessary.

5.2 Safety Promotion

All personnel employed to perform any on-site work under this contract will be given orientation training prior to the commencement of any work activities. In addition to this prior training a periodic refresher training will be conducted during the weekly safety meetings. In addition each employee will receive a minimum of 24 hours of field experience under the direct supervision of an experienced trained supervisor.

Training will be conducted at the construction safety meetings. This training will include refresher training. The meetings will include an explanation of changes in work tasks or procedures, changes in schedule, and changes in field administration, and will be conducted by the site supervisor. A record of those meetings will be kept in the project manual and will be available for review at any time.

5.3 ENCAPCO Accident Investigation and Reporting

ENCAPCO will record and report all Accidents/incidents which occur in the execution of this contract. This will consist of a record of exposure work-hours and OSHA form 200. Any accident / incident resulting in injury or potential injury will be reported to the Owner and a copy of ENCAPCO's Superintendent's Accident Investigation Form will be forwarded to the Contracting office within 24 hours.

The accident scene will not be disturbed, except for emergency and rescue measures, until released by the investigating official. A written record of all first aid treatments will be maintained on-site. Employees are responsible for reporting all job related injuries or illness as soon as possible to their immediate

supervisor. The supervisor is responsible for reporting all injuries to the contracting officer within twenty-four hours of report.

6.0 Health and Safety Personnel

Refer to the project organizational chart on the following page.

6.1 Name of CIH/SSO and Areas of Responsibility

The Certified Industrial Hygienist (CIH) for this project will be Philip Bumala. A copy of Mr. Bumala's certification is included in Attachment 2.

The Site Safety Officer (SSO) for this project will be Mr. Bob McCarrick. Evidence of Mr McCarrick's 40 hour HAZWOPER training is provided in Attachment 3 along with ENCAPCO's other personnel certificates.

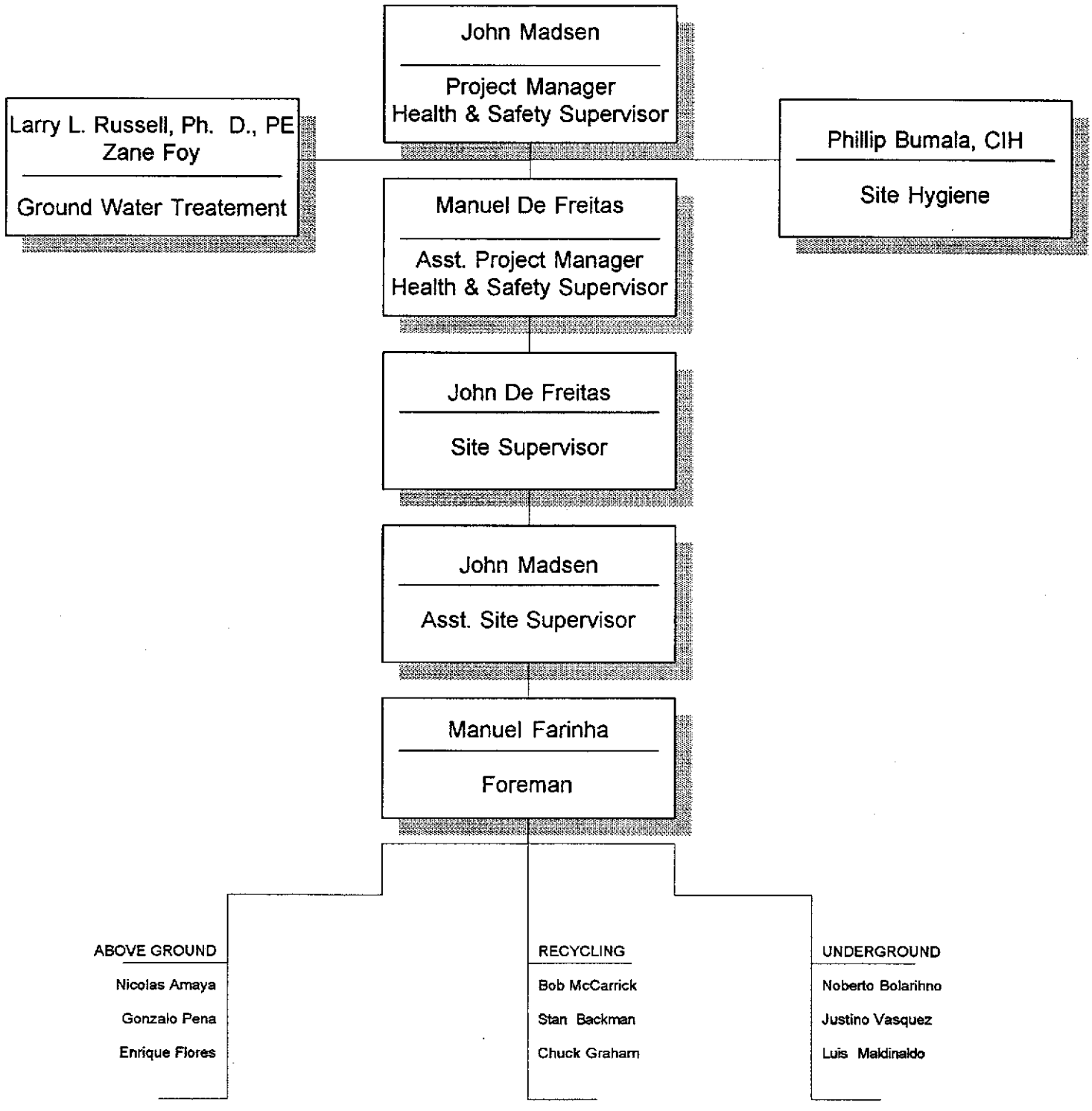
The CIH is responsible for assuring development of the HASP as follows:

- Updating the HASP Program Guidelines when appropriate.
- Direct and oversee the air monitoring program, if implemented.

The SSO is responsible for providing reports to the Contract Manager on the status of hazards and health and safety activities.

- Direct liaison activities with EPA, OSHA and other government agency personnel involved with hazardous waste Health & Safety
- The SSO will report to the Project Manager and will direct the health and safety activities at each assigned site.
- Direct the auditing program to ensure that policy and procedures of the HASP are being met.
- Implement the site HASP.
- Directly supervise health and safety activities during all work performed.
- Verify that personnel performing H&S duties on Level C or D sites are qualified, trained and prepared to implement the site HASP and provide H&S oversight on each project.

UNDERGROUND PROJECT
ORGANIZATIONAL CHART
SHELLMOUND EXTENSION
CITY OF EMERYVILLE
Ghilotti Bros./M.J.B. Pipeline/ENCAPCO



- All site employees will comply with the guidelines set forth in the HASP and will perform tasks in the safest possible manner. Example guidelines include:
- Read and understand the assigned HASP.
- Perform work safely.
- Report any unsafe conditions to their immediate supervisor.
- Be aware and alert for signs and symptoms of exposure to site contaminants.

7.0 Health and Safety Training

Health and safety training and hazard communication will be implemented as addressed below and in accordance with ENCAPCO's Injury And Illness Prevention Program (IIPP) submitted under separate cover. In addition, ENCAPCO will present a health and safety awareness pre-construction session prior to the project startup.

7.1 Site-Specific Training of On-site Personnel

Training of on-site personnel will be the responsibility of the SSO who will oversee daily tailgate safety meetings in addition, formal weekly health and safety meetings will be conducted.

8.0 Recognition of Hazardous Materials

Hazard recognition is defined as the tool provided to personnel in order to better understand what a hazard is; the physical and chemical properties that produce characteristics which may be hazardous, the characteristics which are hazardous and why they are hazardous, how these materials enter and progress through human and environmental pathways of dispersion, and all available sources to determine the problem associated with hazardous material spills or waste sites.

Potential effects of any exposure are dependent on several factors such as: toxicity of substance, time frame of exposure, concentration of substance producing the exposure, general health of person exposed, and individual use of hazard reduction methods. All materials that are used on the job site will be accompanied by Material Safety Data Sheets, all materials will be used in accordance with the manufacturer's instructions and safety precautions.

ENCAPCO has incorporated a hazard communication program to communicate to employees their right to know about "Hazardous or Toxic Substances" located in the work place and to provide a hazard communication program through labeling, warnings, material safety data sheets and training. A notice that a "Master List" of material safety data sheets and individual MSDS will be provided through the SSO.

An explanation of the "Right to Know" law, Material Safety Data Sheets and the location of an operation that could result in employee exposure to a "Hazardous or Toxic Substance" shall be given during the new employee orientation program. Existing employees shall receive the information during the weekly safety meetings. New hazardous or toxic substances introduced into the work place shall also be covered in the daily Safety Meetings

ENCAPCO will explain to employees, as needed:

- The locations, properties and health effects of chemicals used;
- The proper use of personal protective equipment, including respirators, if needed.
- Containers of hazardous chemical leaving the work place shall be labeled, tagged or marked.

9.0 Use of Material Safety Data Sheets (MSDSs)

Copies of MSDSs for the contaminates and other materials at this site will be on-site within the Support Zone with the master MSDS file at ENCAPCO's office in Dublin, CA.

10. Use of Safety Equipment

ENCAPCO's Project Manager (PM) shall be responsible to assure employees use the appropriate personal protective equipment and are trained in the proper use of such equipment.

The SSO shall be available to train employees in the selection and use of personal protective equipment.

11.0 Use of Personal Protective Equipment / Action Levels

Personal protective equipment and clothing is used to isolate individuals from chemical and physical hazards. All activities will be performed in a minimum of level D. Upgrading or downgrading personal protective equipment will follow the action level detailed in Section 11.1. When conditions for upgrading to a higher levels of personal protection exist all work in the affected area will cease and the conditions creating the change evaluated. Engineering control measures will be the first choice at abating levels of hazards in the work area.

Personnel must wear protective equipment when site activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated by site activities, or when direct contact with skin absorption substances may occur. Respiratory equipment protects the lungs, gastrointestinal tract, and eyes against airborne contaminant. Chemical resistant clothing protects the skin from contact with skin absorbable chemicals. Site specific factors will determine the level of protection that will be utilized.

11.1 Action Levels

The action level that would trigger upgrading respiratory protection, PPE , engineering controls, and/or work stoppage has been based on the level of lead in soil. Lead is pervasive throughout the project site and has a corresponding PEL that is the lowest among the group of soil metal contaminants.

Cal-OSHA has established 0.05 mg/m3 as a time weighted average (TWA) not to exceed in an eight hour period without respirator protection for airborne lead. Cal-OSHA has also established 0.03 mg/m3 for lead as an action level requiring respirator protection and other health and safety measures. In addition to area and personnel samples, airborne lead will be indirectly assessed using real time total dust monitoring. Dust monitoring will be added to the HASP using real time MINI RAM instrumentation. The dust monitor is a hand held continuous read out device that will be used to initially determine total airborne dust levels. In addition, the monitor will be used to monitor an Action level based on the highest (ie worst case) lead levels found in the soil. The Total Dust real time on-site Action level has been determined by assessing the potential for exposure using the following conservative calculations:

- √ **Given:** Worst case total soil lead concentration equals 7200 ppm by wt.
- √ **Assume:** All available lead to be entrained with airborne dust
- √ **Recall:** The OSHA permissible exposure limit (PEL) for total dust equals 10 milligrams per cubic meter (10mg/m3)
- √ **And:** 7200 ppm by wt. = 0.72 % by wt.

√ **Then:** 10 mg/m3 total dust would result in 0.072 mg/m3 total lead as a potential respiratory exposure level _

√ **Recall:** The OSHA Action Level (AL) and PEL for lead is 0.03 and 0.05 mg/m3, respectively

√ **Given:** **The Project Action level for airborne lead is 4.2 mg/m3 total dust.**

√ **Derived From:**

$$\frac{10 \text{ mg/m3}}{0.072 \text{ mg/m3}} = \frac{x \text{ mg/m3}}{0.03 \text{ mg/m3}}$$

x mg/m3 = 4.2 mg/m3

Table 1, Airborne Lead-Level Protection

Level D without respirator	ND to Cal-OSHA Action level (AL) 0.03 mg/m^3 lead
Level C with 1/2 face respirator with HEPA filter	AL to 0.05 mg/m^3 lead
Level C with full face respirator with HEPA filter	0.100 mg/m3 to1.0 mg/m^3 lead
Level B with pressure demand supplied air line	1.0 mg/m^3 to 10 mg/m3 lead
Level B with Self Contained Breathing Apparatus (SCBA)	Greater Than 10 mg/m^3 lead

None Detected = ND *Action Level = AL*

If air monitoring results show upward trends of exposure or any contaminate meets or exceeds their action level, the SSO and CIH will report these conditions to ENCAPCO's Project Manager. ENCAPCO will implement engineering control measures to mitigate exposure such as water truck dust suppression.

12.0 Relevant First Aid Procedures

The Safety Officer, or his designate, will be certified by the American Red Cross in first aid and cardiopulmonary resuscitation.

If an injured individual requires further attention, the individual will be immediately transported to the nearest hospital. A map illustrating the route to the nearest emergency medical facility will be present on-site. ***All Accidents, without regard to the severity, shall be reported in writing to the ENCAPCO's Site Safety Officer within 24 hours.***

13.0 Internal and External Communications

A telephone will be available within 500 ft. of the project site for use by ENCAPCO in the case of an emergency. The advantage of an on-site telephone is that emergency response agencies can be contacted directly.

Workers should be cognizant of the reduction of communication abilities in high noise areas. Knowledge and utilization of an emergency communication system will be critical during activities at the project site.

This emergency communication system is outlined below and in Table 2.

During the project there will be three hand-held compressed air horns located throughout the site at the following locations:

1 - Foreman's truck
1 - Excavation Zone (location to be determined)
1 - Transition Zone

One long blast will be used for emergency evacuation of the Excavation Zone. The project trailer will be the rally point. After a head count further instruction will be given.

Repeated Short Blast will be used for emergency evacuation of all personnel from the site. ENCAPCO's Site entrance will be the rally point. After a head count further instructions will be given.

Table 2, Emergency Communication Signals

1	Hand clutching throat	=	Out of air/can not breath
2	Hands on top of head	=	Need Assistance
3	Thumbs up	=	OK/I understand
4	Thumbs down	=	No/I do not understand

14.0 Use of the "Buddy" System

ENCAPCO will use the buddy system.

15.0 Environmental and Personnel Air Monitoring Program

As previously mentioned, ENCAPCO plans to assess the need for on-site respiratory protection and will conduct monitoring programs which meet specific project requirements and comply with recognized worker and environmental protection regulations.

16.0 Personnel Air Monitoring Program

The air monitoring program would be implemented to ensure minimal exposure of contaminants to personnel and protection of the environment from activities associated with this project. Other elements of a hazard abatement program would include, engineering controls, proper abatement practices, medical monitoring and on-site industrial hygiene monitoring and corrective action.

To ensure that representative air monitoring data would be collected, air monitoring locations and sample collection frequencies would be prescribed which would represent worst case personnel exposure. Worst-case scenarios would also be used to prescribe area monitoring based on the predominant downwind direction, maximum potential contamination concentrations expected and typical workday activities.

Air monitoring would be performed by using personal battery- operated continuous flow pumps in compliance with the National Institute of Occupational Safety And Health (NIOSH) instructions. The monitors would be worn by individuals working in the worst-case exposure activities. Personnel monitoring would be conducted in accordance with NIOSH Method 7082, Appendix I.

Respiratory protection would follow the action levels detailed in Section 11 if lead remains to be the primary soil contaminant. The CIH would inform the SSO of conditions requiring upgrading and downgrading respiratory protection.

17.0 Automated Real Time Monitoring

In order to acquire real time data and to make effective on the spot decisions. ENCAPCO will use a MINIRAM airborne particulate counter with a data logger and alarm. This instrument would be used under the direction of the CIH to determine the actual amount of airborne dust in the work zone. From these readings and the results from the built-in air sampler associated with the MINIRAM, a conservative estimate would be calculated for airborne lead levels. This would allow the CIH to make quality and quantitative judgments as to personal protection equipment requirements, engineering controls, environmental exposures, and other issues as work is being performed.

The data log sheets produced by the MINIRAM would be reviewed daily by the CIH for trends related to the project activities. The MINIRAM monitor would be used as a real time monitor and warning system.

Typically, sample stations would be established in the following generalized locations:

- UPWIND: To establish background air contamination levels.
- Exclusion Zone. To verify and continually confirm acceptable air quality and to determine if additional work practice contamination abatement procedures are necessary.

Area samples will be collected during excavation and back-filling activities in the following locations:

- Upwind and downwind at the site perimeter;

- In the Contamination Reduction Zone;

- Within the Exclusion Zone in areas where personnel are working.

18.0 Areas of Restricted Access

The Exclusion Zone, or the Contamination Reduction Zone will be considered restricted access zones, access can be gained only with the proper safety indoctrination training.

19.0 Standard Safety Operating Procedures

The CODE OF SAFE PRACTICES POLICIES AND RESPONSIBILITIES are to be followed by personnel working on the project. Refer to the IIPP submitted under separate cover.

20.0 Accident Prevention

20.1 Work site inspection and hazard correction procedures

Work site inspection and hazard correction procedures shall be assured by inspection, by the SSO assigned to this project. An injury free work place will be the goal of ENCAPCO's using the philosophy that all injuries can be prevented.

The following infractions will be grounds for dismissal on the first offense:

1. Drunkenness or drinking on the job site.
2. Motor vehicle Accident while under the influence of alcohol or drugs.
3. Possession of any firearm on the job site.
4. Fighting on the job site.
5. Involvement in any Accident while engaging in any form of misconduct.
6. Failure to use seat belts while driving.
7. Failure to wear hard hat while on construction-site.
8. Failure to remove facial hair as required "Respirator Protection Policy".

21.0 Accident Response and Loss Control Procedures

1. Superintendents and the Safety Officer will be responsible to investigate and correct any condition or action which may cause bodily injury or adverse health effects.

2. Follow-up inspections shall be made to assure hazards found during inspection are corrected in a timely manner.

22.0 Medical Surveillance

All ENCAPCO field personnel are required to have annual medical evaluations in accordance with the company's Health and Safety Program policy. Additional re-evaluations will be considered in the event of chemical over-exposure while working on this site, or at the discretion of the Contracting Officer, the CIH/SSO, or the occupational physician.

The chemicals typical of this site can affect specific organ systems producing characteristic health effects. The medical evaluation will, therefor, focus on the liver, kidney, nervous system, blood systems, lung functions, and skin examination.

Laboratory testing will include complete blood count, determination of baseline preproject and post-project blood metal levels.

ENCAPCO will submit evidence that all contractor personnel have received a proper medical examination, including a certification of fitness of work, seven days prior to allowing personnel on-site. Evidence of a medical examination will also be submitted within fifteen days after conclusion of the work. The name of the occupational physician performing the medial examination and surveillance shall also be included on the certification.

23.0 Emergency and Contingency Planning

This contingency plan, as developed under the requirements of the 29 CFR 1910.120, applies to the "on-site emergency responses" only.

23.1 Lines of Authority/Communication

The SSO is the primary authority for directing site operations under emergency conditions. All communications both on and off-site will be directed through the ENCAPCO's Operations Manager.

23.2 Emergency Telephone Numbers

In the even of an accident or emergency situation, immediate action must be taken by the first person to recognized the event. First aid equipment is located on-site. Notify (1) the Site Safety Officer, and (2) the Project Manager and / or Health and Safety Manager about the situation immediately after emergency procedures are implemented. Emergency telephone numbers are provided below:

Project/Site Telephone Numbers

	Affiliation	Number	Individual
1)	ENCAPCO Project Site:	(510) 414 7752 Mobile (510) 702 9566 Pager	Bob McCarrick Site Safety Officer (SSO) and Project Manager
2)	ENCAPCO Dublin Office:	(510) 829 9595	Ken Monlux General Manager
3)	ENCAPCO Project Pager:		
4)	City of Emeryville:	(510) 596 4333	Juan Arreguin, Project Engineer
5)	STRATUS Environmental	800 370 5657 (510) 746 9902 Pager: (510) 918 1090 Mobile:	Philip A. Bumala, CIH Project Certified Industrial Hygienist
6)	REED International	(510) 549 2913	Larry L Russell, Ph.D., P.E. Consulting Project Engineer
7)	Police	911	
8)	Fire	911	
9)	Ambulance	911	
10)	Hospital, Doctor's Hospital	(510) 724 5000	
11)	Alta Bates	(510) 204 4444	
12)	Poison Control Center:	911 or 1-800-662-9886	

23.3 Medical

Nearest Hospital(s): Doctor's Hospital And Alta Bates

DIRECTIONS TO: DOCTORS HOSPITAL

TAKE INTERSTATE 80 EAST TO APPIAN WAY. PROCEED NORTH ON APPIAN WAY APPROXIMATELY 3/4 OF A MILE. THE HOSPITAL IS LOCATED ON THE EAST SIDE OF APPIAN WAY AT THE INTERSECTION OF APPIAN WAY AND MANN DRIVE.

DIRECTIONS TO: ALTA BATES

PROCEED NORTH ON HOLLIS STREET, ABOUT 3 MILES. TURN RIGHT ONTO ASHBY AVENUE (EAST), ABOUT 4 MILES. THE HOSPITAL IS LOCATED ON THE SOUTH SIDE OF ASHBY AVENUE.

23.4 Usual Procedure for Injury

1. Call for ambulance/medical assistance, if necessary. Notify the receiving hospital of the nature of physical injury or chemical overexposure.

2. If time allows, send/take pertinent information (i.e. Material Safety Data Sheet-MSDS) to medical facility.

3. If the injury is minor, proceed to administer first aid and then immediately notify the SSO.

4. Project Manager and Health and Safety manager must be notified of situation.

23.5 Emergency Treatment

When transporting an injured person to a hospital, bring this Site Safety Plan to assist medical personnel with diagnosis and treatment.

In all cases of chemical overexposure, follow standard procedures as outlined below for poison management, first aid, and, if applicable, cardiopulmonary resuscitation. Four different routes of exposure and their respective first aid/poison management procedures are outlined below:

1. Ingestion:

Refer to MSDS for specific recommendation and/or CALL THE POISON CONTROL CENTER AT: 911 FOR INSTRUCTIONS .

2. Inhalation:

Move the person from the contaminated environment. Initiate CPR if necessary. Call, or have someone call, for medical assistance. Refer to MSDS for additional specific information. If necessary, transport the victim to the nearest hospital as soon as possible.

3. Skin Contact:

Wash off skin with a large amount of water immediately. Remove any contaminated clothing and rewash skin using soap, if available. Transport person to a medical facility if necessary.

4. Eyes:

Hold eyelids open and rinse the eyes immediately with copious amounts of water for 15 minutes. If possible, have the person remove his/her contact lenses (if worn). Never permit the eyes to be rubbed. Transport person to a hospital as soon as possible.

24.0 Evacuation Procedures

Various emergencies may warrant a site evacuation. These may include: fire, explosion, chemical release, or personal injury.

Personnel encountering a hazardous situation shall **instruct others on-site to evacuate the vicinity IMMEDIATELY** AND CALL THE (1) Safety Officer, and (2) the Project Manager for instructions.

The site *must not* be re-entered until the situation has been corrected.

The following Signals will be utilized for site evacuation/emergencies:

One long blast will be used for emergency evacuation of the Exclusion Zone. Immediately outside the site entrance gate will be the rally point. After a head count further instruction will be given.

Repeated Short Blast will be used for emergency evacuation of all personnel from the site. Immediately outside the site entrance gate will be the rally point. After a head count further instructions will be given.

Additionally, as part of the contingency plan ENCAPCO will provide Dry 20A-80 B:C-type chemical fire extinguishers for the Foremen' truck, each active work area and any other site locations where flammable materials present a fire risk.

ENCAPCO will provide one "industrial" first aid kit maintained and fully stocked, and two stretchers. Should active work areas be so isolated or separated as to make one first aid location impractical, then first aid stations will be established as required in close proximity to work, but not inside a hazardous work area. First aid kit locations will be specially marked and provided with adequate water and other supplies necessary to cleanse and decontaminate burns, wounds, or lesions.

25. Personal Protective Equipment and Clothing

It is anticipated that Level C protection will be used during soil treatment activities. The decision to make changes in the levels of protection will be made jointly by the CIH and the SSO. The anticipated level of personal protective equipment is detailed below:

Exclusion and Contamination Reduction Zone / Level C:

Hard Hat
Tyvek disposable overalls
Type H dual cartridge negative pressure (HEPA) filtered respirator
Safety Glasses
Leather over-ankle boots/shoes
Ear Plugs as necessary

Support Zone / Level D:

Hard Hat
Safety Glasses
Leather over-ankle boots/shoes
Ear Plugs as necessary

26.0 Posted Regulations

The Injury And Illness Prevention Program and General rules for Site Safety will be posted at ENCAPCO's site.

Additionally, the following items will be posted on the outside of the ENCAPCO's site placard for ready access in the event of an emergency:

ENCAPCO's physician's name, address and telephone number.

Ambulance service, hospital, poison control center, and fire and police department telephone numbers.

Procedure for promptly notifying the Contracting Officer of any emergencies, including his/her name and telephone number.

Specific procedures for handling personnel with excessive exposure to chemicals or contaminated soil and those suffering from heat stress or heat exhaustion.

27.0 Dust Control

Construction operations will be conducted so as to minimize the creation and dispersion of dust. However, should dust become a problem it will be controlled by the use of water being sprayed over the areas that are effected.

ATTACHMENT 1

PROJECT CERTIFIED INDUSTRIAL HYGIENIST CERTIFICATIONS

The

American Board of Industrial Hygiene®

ABIH®

organized to improve the practice of Industrial Hygiene
proclaims that

Philip A. Bumala

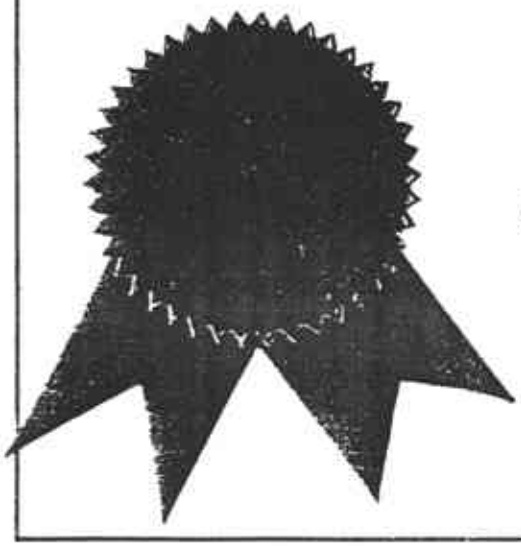
having met all requirements through
education, experience, and examination,
is hereby certified in the

COMPREHENSIVE PRACTICE
of
INDUSTRIAL HYGIENE

and has the right to use the designations

CERTIFIED INDUSTRIAL HYGIENIST

CIH



June 18, 1990
date

Carl D. Bohl, DSc., CIH.
Chairman ABIH

4605
certificate number

James R. Hawkins, C.I.H.
Secretary ABIH

EnvironMETeo (EMET) Services Inc.

Professional Development Series

This is to Certify

Philip A. Bumala, CIH

Social Security #: 566-91-7103

has attended and satisfactorily completed

8-Hour Supervisor Training Program
for
Hazardous Waste Operations & Emergency Response
(HAZWOPER)
in compliance with 29 CFR 1910.120

on January 14, 1995 in Honolulu, Hawaii

Course Director: Karl How, CIH, CHMM, PhD
Certified Industrial Hygienist
Certified Hazardous Materials Manager

Expiration Date: January 14, 1996

EnvironMETeo (EMET) Services Inc.

Professional Development Series

This is to Certify

Philip A. Bumala, CIH

Social Security #: 566-91-7103

has attended and satisfactorily completed

40-Hour Training Program
for
Hazardous Waste Operations & Emergency Response
(HAZWOPER)
in compliance with 29 CFR 1910.120

on January 9 - 13, 1995 in Honolulu, Hawaii

Course Director: Karl How, CIH, CHMM, PhD
Certified Industrial Hygienist
Certified Hazardous Materials Manager

Expiration Date: January 13, 1996

ATTACHMENT 2

ENCAPCO
CERTIFICATIONS

Certificate of Award

39841

Bob McCarrick

successfully completed the **initial 40 Hour** requirements
listed under **OSHA Regulation 29 CFR 1910.120** and **Title 8 GISO 5192**

HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

this Eigth day of December, 1995

Geo Line

Geo Line
630 University Avenue
San Jose, CA 95110

Steve Arsenault
Training Coordinator

Certificate of Training

This certifies that

Stanton Backman

has completed eight hours of

Annual Refresher Training

in

Hazardous Waste Operations

in accordance with 29 CFR 1910.120
and Cal/OSHA CCR Title 8 GISO 5192

May 23, 1995

Oakland, California

Presented by:
Environmental & Safety Resources

Liz Aragon, Director

NES℠

CERTIFICATE OF TRAINING

PRESENTED TO

STANTON L. BACKMAN

FOR HAVING SUCCESSFULLY COMPLETED

A TRAINING COURSE IN

40-Hour Hazardous Waste Operations Training

PRESENTED BY

NETWORK ENVIRONMENTAL SYSTEMS,℠ INC.

Richard Langevin CIH

NES Coordinating Trainer

October 1-5, 1990

Date

Jerry Zucklin CHMM