RO219

ConocoPhillips

76 Broadway
Sacramento, CA 95818
phone 916.558.7676
fax 916.558.7639

October 13, 2004

Mr. Don Hwang
Alameda County Health Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502



Re: **Document Transmittal**
Fuel Leak Case
76 Station 5043
449 Hegenberger Road
Oakland, CA

Dear Mr. Hwang:

Please find attached the *Work Plan for Dual Phase Vacuum Extraction Pilot Test, dated 10/11/04* for the above referenced site. I declare, under penalty of perjury, that to the best of my knowledge the information and/or recommendations contained in the attached proposal or report is true and correct.

If you have any questions or need additional information, please call me at (916) 558-7666.

Sincerely,

Thomas H. Kosel
Site Manger, Risk Management and Remediation
ConocoPhillips
76 Broadway, Sacramento, CA 95818

Attachment
cc: Roger Batra, TRC

TRC

Customer-Focused Solutions

October 11, 2004 TRC Project No. 42-0144-02

Mr. Don Hwang
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502-6577



ATTN: MR. DON HWANG

SITE: 76 STATION NO. 5043
449 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

RE: WORKPLAN FOR DUAL-PHASE VACUUM EXTRACTION PILOT TEST

Dear Mr. Hwang:

On behalf of ConocoPhillips, TRC submits this Workplan for a Dual-Phase Vacuum Extraction (DPVE) Pilot Test for 76 Station No. 5043, located at 449 Hegenberger Road in Oakland, California (Figure 1). The Pilot Test will be conducted using TRC's Mobile Treatment System (MTS), a truck-mounted, dual-phase soil-vapor and liquid extraction system.

The objective of the DPVE test is to evaluate its effectiveness in removing hydrocarbon mass in soil and groundwater at localized "hot spot" in the vicinity of MW-6.

PRE-FIELD WORK ACTIVITIES

A site and job specific health and safety plan that promotes personnel safety and preparedness during the planned activities has been developed for this work and is included in Appendix A. On the morning of the day that the field activities are to commence, a "tailgate" safety meeting will be conducted with onsite workers to discuss applicable health and safety issues and concerns related to the specific work.

In addition, prior to commencement of onsite work, TRC will notify the Bay Area Air Quality Management District (BAAQMD) of the proposed dual-phase vacuum extraction activities.

DUAL-PHASE VACUUM EXTRACTION PILOT TESTING ACTIVITIES

TRC proposes to conduct a 72-hour DPVE pilot test. The MTS unit is capable of removing vapor- and dissolved-phase hydrocarbons from the subsurface. Vapor-phase hydrocarbons can be removed at air flow rates of up to 350 cubic feet per minute (cfm) using a high vacuum liquid

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Telephone 925-688-1200 • Fax 925-688-0388

ring pump (>28 inches of mercury), and groundwater can be extracted at flow rates of up to 10 gallons per minute (gpm).

During Pilot Testing activities, the blower inlet vacuum, airflow rates and hydrocarbon vapor concentrations will be measured periodically (typically every 30 minutes). Monitoring well MW-6 will be used as the extraction wells for extracting groundwater and soil vapor (Figure 2). Select wells will be used as observation wells to monitor hydraulic and pneumatic radii of influence.

The extracted vapors and liquid are separated at the MTS within an 80-gallon knockout pot. The water is then transferred to a temporary onsite storage tank (up to 6,500 gallons) pending profiling and off-site disposal at an appropriate facility. Soil vapor is abated using a propane-fired thermal oxidizer capable of treating hydrocarbon vapors with greater than 98% efficiency for non-methane hydrocarbons.

The amount of hydrocarbon recovery will be calculated based on influent airflow rates and field measurements of hydrocarbon vapor concentrations, and will be used to determine the remedial effectiveness of the system.

A total of five influent vapor samples will be collected during the event: one at the start of the test, one at the end of each day, and one at the end of the test. Vapor samples will be submitted to a state certified laboratory for analysis of total purgeable petroleum hydrocarbons as gasoline (TPPH), methyl tertiary butyl ether (MTBE), ethanol and benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Method 8260B.

Groundwater samples will be collected from the extraction well prior to system start-up and following system shutdown. Post system shutdown samples will be collected after sufficient time to allow the groundwater to recharge and for contaminant concentrations in groundwater to equilibrate. Samples will be submitted to a state certified laboratory for analysis of TPPH, MTBE, and BTEX by EPA Method 8260B and TPH-D (EPA Method 8015).

TECHNICAL REPORT

Following completion of field work and receipt of laboratory results, a summary report will be prepared which will include field sheets, a data summary sheet, and laboratory analytical results. The report will also include an evaluation of results and recommendations.

A compliance report documenting effluent vapor concentrations and hydrocarbon abatement will be submitted to the BAAQMD within 30 days from the end of the event.

Should you have any questions regarding this workplan, please contact Mark Trevor at (925) 688-2467.

Sincerely,
TRC

Mark Trevor
Project Geologist

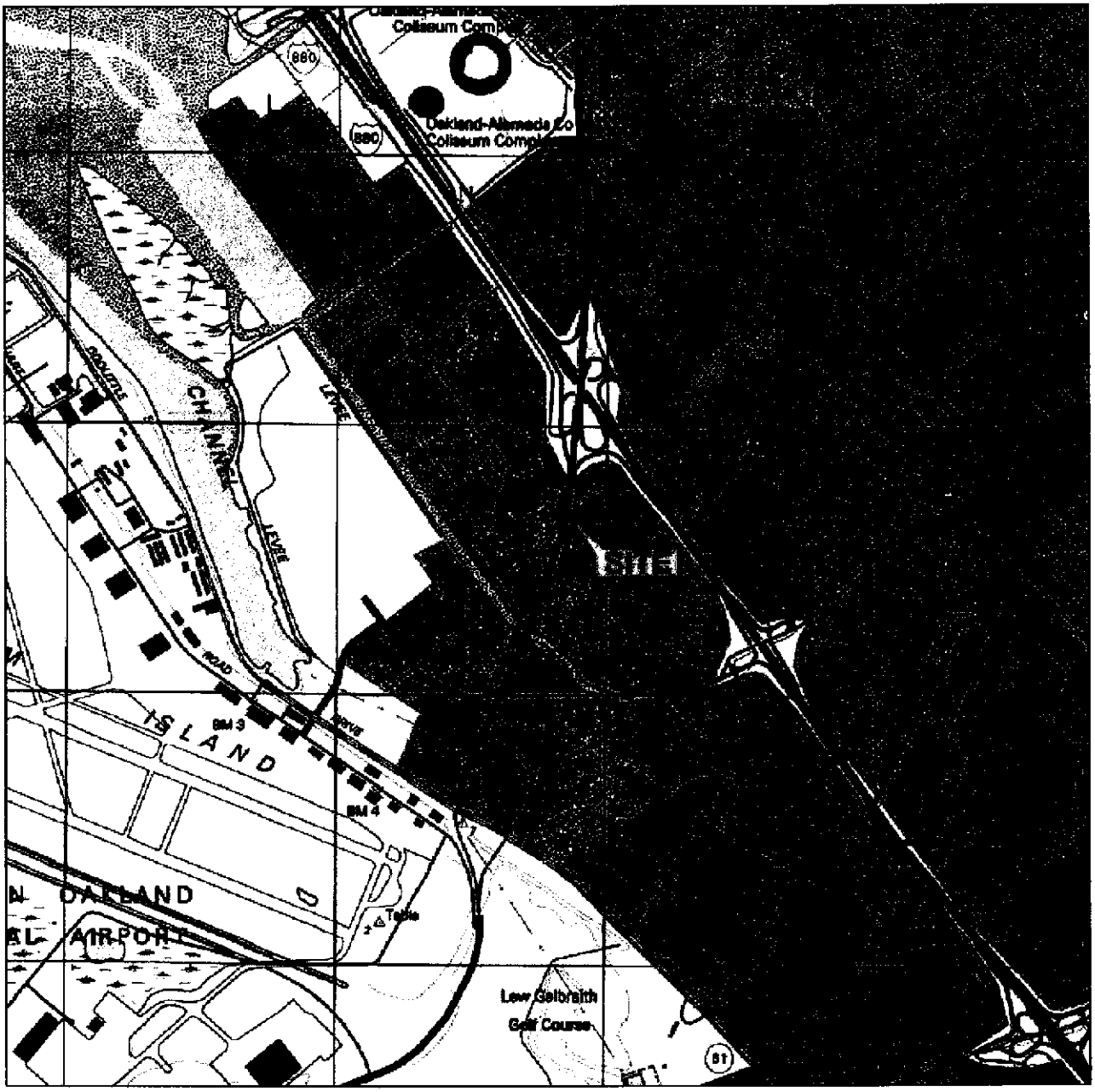

Amy Wilson, P.E.
Senior Project Engineer

Roger Batra
Senior Project Manager

Attachments:

| | |
|---|---|
| Figure 1: | Vicinity Map |
| Figure 2: | Site Plan |
| Figure 3: | Dissolved-Phase TPPH Concentration Map (April 6, 2004) |
| Figure 4: | Dissolved-Phase Benzene Concentration Map (April 6, 2004) |
| Figure 5: | Dissolved-Phase MTBE Concentration Map (April 6, 2004) |
| Appendix A: | Health and Safety Plan |

cc: Mr. Thomas Kosel, ConocoPhillips (electronic upload)




1 MILE 3/4 1/2 1/4 0 1 MILE

SCALE 1 : 24,000

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SOURCE:

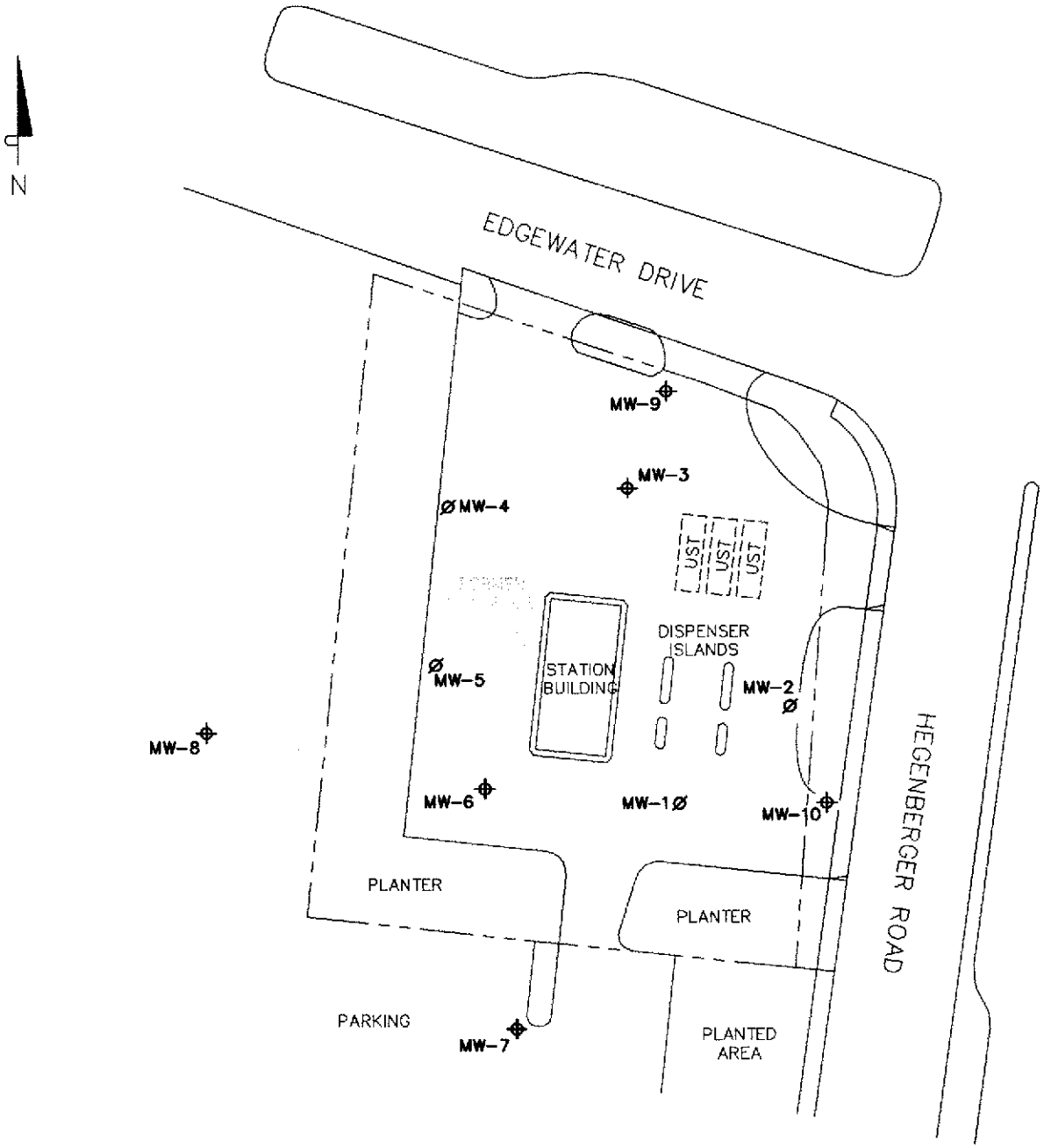
United States Geological Survey
7.5 Minute Topographic Maps:
San Leandro Quadrangle
California


**VICINITY MAP**

76 Service Station #5043
449 Hegenberger Road
Oakland, California

TRC

**FIGURE 1**




APPROXIMATE SCALE (FEET)

0 60 120

**LEGEND**

- Approximate property line
- MW-10 ⌖ Groundwater monitoring well
- MW-5 Ø Abandoned well

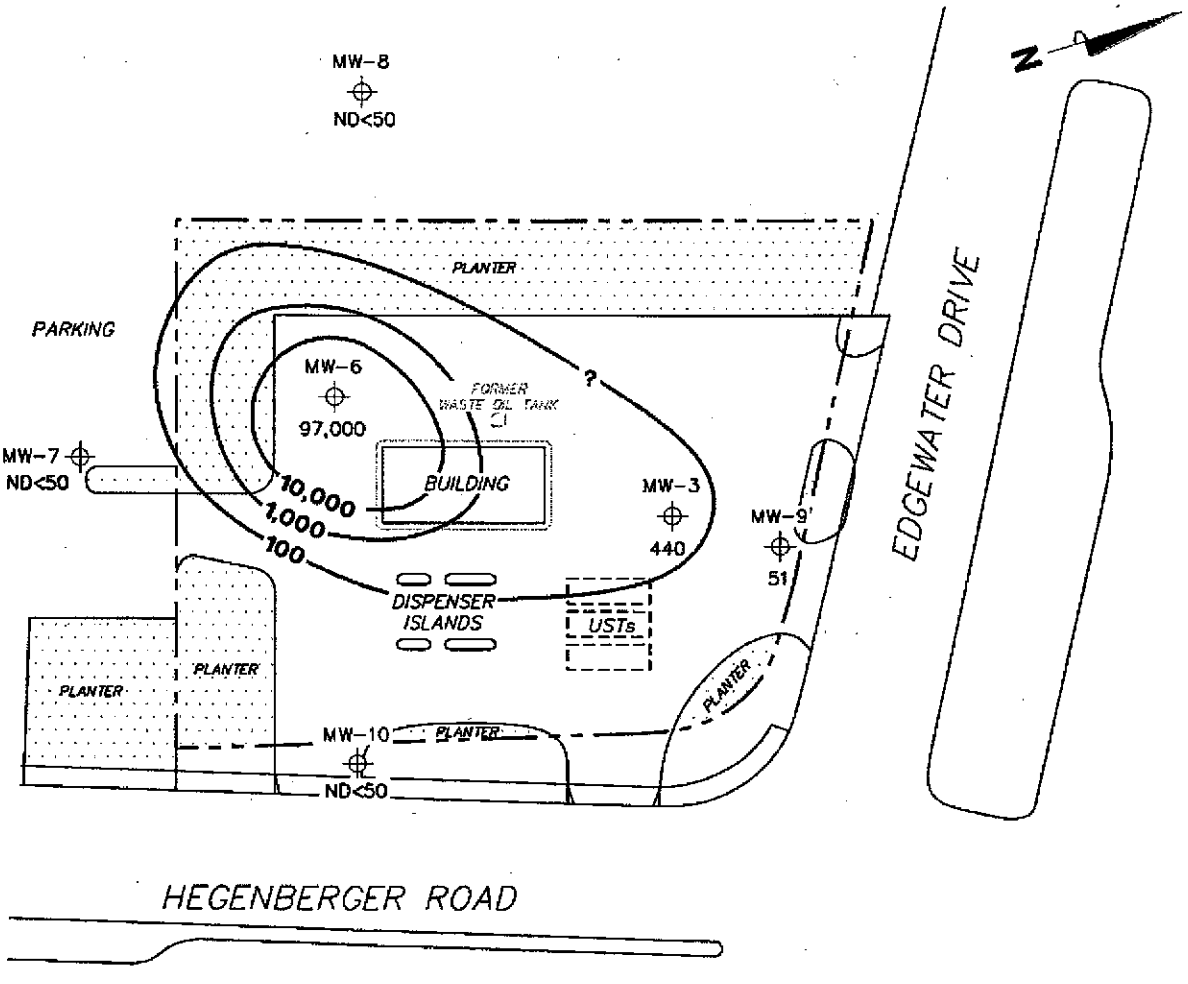
SOURCE: Site plan by Gettler-Ryan, May 2001.

**SITE PLAN**

76 Service Station #5043
449 Hegenberger Road
Oakland, California

TRC

**FIGURE 2**




NOTES:

Contour lines are interpretive and based on laboratory analysis results of groundwater samples. TPPH = total purgeable petroleum hydrocarbons. µg/l = micrograms per liter. ND = not detected at limit indicated on official laboratory report. UST = underground storage tank. Results obtained using EPA Method 8260B.

LEGEND

MW-10 ⊕ Monitoring Well with Dissolved-Phase TPPH Concentration (µg/l)

10,000 Dissolved-Phase TPPH Contour (µg/l)

**DISSOLVED-PHASE TPPH CONCENTRATION MAP**
**April 26, 2004**

76 Station 5043
449 Hegenberger Road
Oakland, California

TRC

SCALE (FEET)
0 60

**FIGURE 3**

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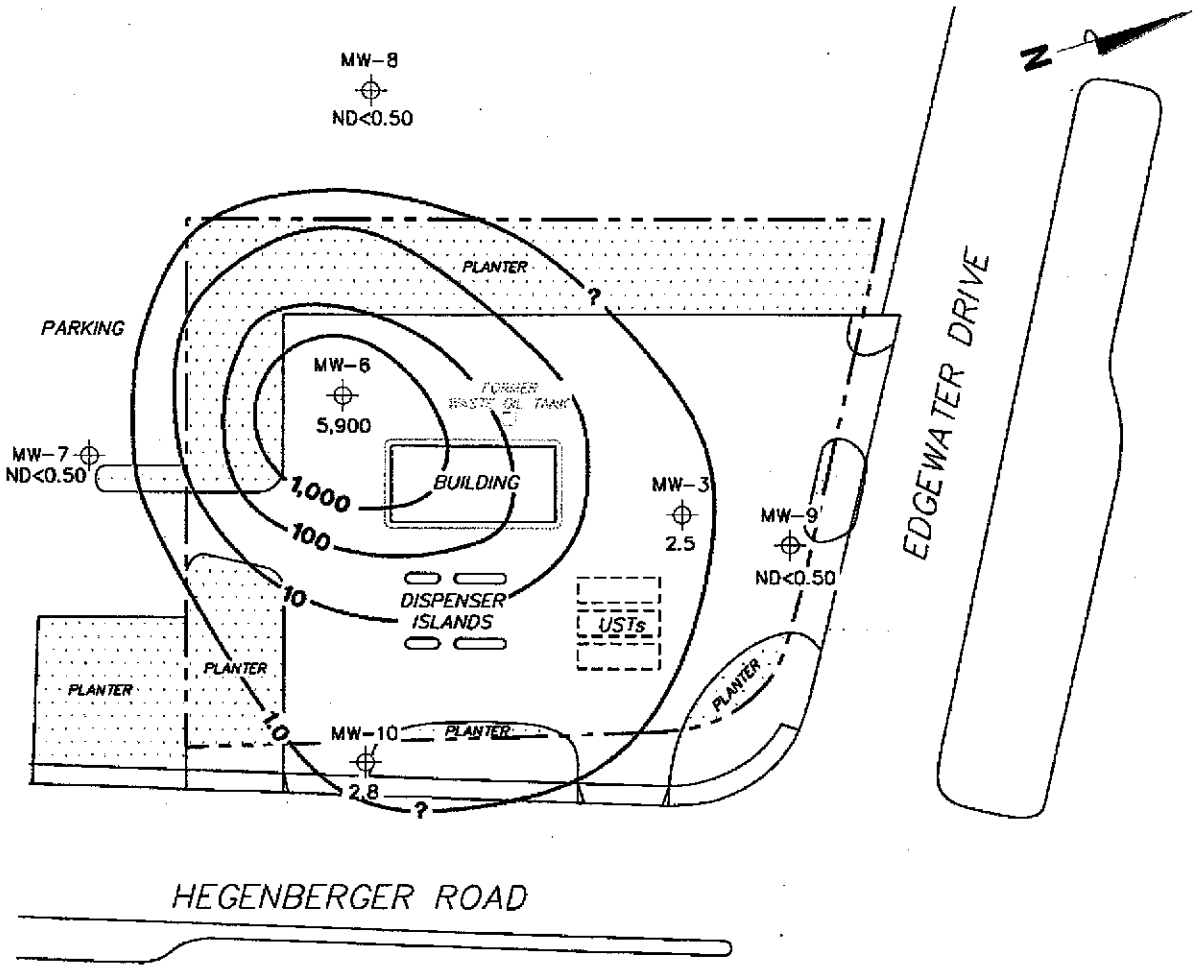


NOTES:

Contour lines are interpretive and based on laboratory analysis results of groundwater samples. µg/l = micrograms per liter. ND = not detected at limit indicated on official laboratory report. UST = underground storage tank.

LEGEND

MW-10 ⊕ Monitoring Well with Dissolved-Phase Benzene Concentration (µg/l)

—1,000— Dissolved-Phase Benzene Contour (µg/l)

**DISSOLVED-PHASE BENZENE CONCENTRATION MAP**
**April 26, 2004**

76 Station 5043
449 Hegenberger Road
Oakland, California

TRC

SCALE (FEET)
0 60

**FIGURE 4**

PS=1:1 5043-003

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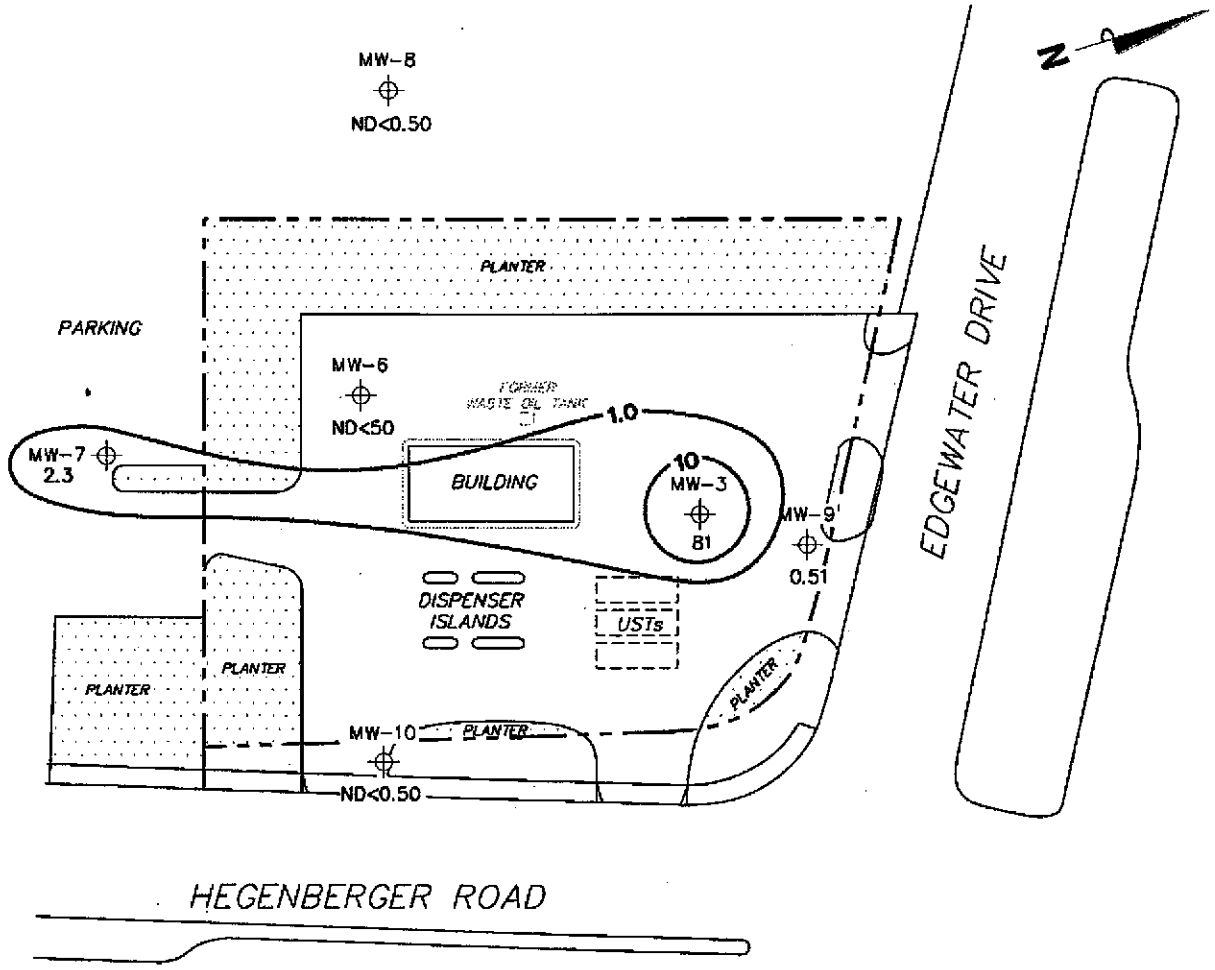


NOTES:

Contour lines are interpretive and based on laboratory analysis results of groundwater samples.
MTBE = methyl tertiary butyl ether.
µg/l = micrograms per liter. ND = not detected at limit indicated on official laboratory report.
UST = underground storage tank. Results obtained using EPA Method 8260B.

LEGEND

MW-10 ⊕ Monitoring Well with Dissolved-Phase MTBE Concentration (µg/l)

10 Dissolved-Phase MTBE Contour (µg/l)

**DISSOLVED-PHASE MTBE CONCENTRATION MAP**
**April 26, 2004**

76 Station 5043
449 Hegenberger Road
Oakland, California

TRC

SCALE (FEET)
0 60

**FIGURE 5**

PS=1:1 5043-003

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# APPENDIX A

# HEALTH AND SAFETY PLAN

# SITE HEALTH AND SAFETY PLAN

Dual Phase Extraction Event
76 Station No. 5043
449 Hegenberger Road
Oakland, California

## 1.0 PLAN SUMMARY

This Site Health and Safety Plan (SHSP) establish responsibilities, requirements, and procedures for the protection of personnel while performing activities at the above-referenced site. This site-specific plan conforms to the TRC Corporate Health and Safety Plan, Hazard Communication Program, and Injury and Illness Prevention Program (IIPP).

During site work, the use of proper health and safety procedures, in accordance with applicable Cal/OSHA regulations shall be required. Site-specific conditions may necessitate modification of the SHSP; however, except in emergency situations no deviations from the plan may be implemented without the prior notification and approval of the Site Safety Officer (SSO).

## 2.0 SITE INFORMATION

This SHSP considers the physical, chemical, and environmental hazards that may be encountered during work activities at the site. Operations associated with this SHSP will be conducted in accordance with an approved workplan. Any changes required or made to the planned activities will be immediately communicated to site personnel by the SSO. Summary information for this project is provided in the following table.

| | |
|---|---|
| Health and Safety Plan date: | October 2004 |
| Principal activities: | Dual-phase extraction |
| Site description (see Attachment A for site map): | Active Service Station |
| Approximate depth to groundwater: | 3 fbg |
| Contaminants of concern (see Attachment B): | Hydrocarbons in soil and groundwater |

## 3.0 SITE SAFETY AUTHORITY

Contact information and names of authorized personnel are listed below. A description of responsibilities follows.

| Role | Name | Company | Telephone |
|---|---|---|---|
| Site Safety Officer | Dave York | TRC | (949) 283-4584 |
| Alternate Site Safety Officer | Mark Trevor | TRC | (925) 260-6389 |
| Project Manager | Roger Batra | TRC | (925) 688-2466<br>(925) 260-6403 cell |
| Local IIPP Coordinator | Kristen Meade | TRC | (925) 260-7638 |
| Client Contact | Thomas Kosel | ConocoPhillips | (916) 558-7666<br>(916) 346-8111 cell |

**Site Safety Officer**: The SSO is responsible for briefing site personnel on potential physical and chemical hazards prior to work start-up, during operations, and whenever other health and safety matters need to be addressed. The SSO will be in charge of conducting the daily Tailgate Safety Meetings. The SSO will see that this SHSP is available onsite and is understood and signed by personnel entering the site. The SSO is also responsible for implementing emergency response procedures when necessary. In the event the SSO is unable to perform these duties, the Alternate SSO will be responsible.

**Project Manager**: The Project Manager (PM), in coordination with the SSO, is responsible for implementing health and safety requirements, including seeing that the SHSP is prepared and available onsite. The PM is the central point of contact for the SSO, Client, and Field Personnel, and has overall responsibility for site operations.

**Field Personnel**: Field Personnel are responsible for understanding and complying with this SHSP. Field Personnel include both TRC employees and Subcontractors hired by TRC. Field Personnel are required to participate in briefings prior to commencement of site work; attend daily Tailgate Safety Meetings; and acknowledge receipt and understanding of the SHSP by signing the Compliance Log at the end of this plan.

**Supervisor/Offsite Coordinator**: The Supervisor/Offsite Coordinator, typically the TRC branch manager, should be contacted when mobilization of support from a TRC office is needed, and in case of an emergency requiring offsite assistance.

## 4.0 SITE CONTROL

Site control requires the establishment of a regulated area with designated work zones, evacuation protocol, location of medical assistance, site security, and communication guidelines that include a "Buddy System."

### 4.1 REGULATED AREA(S)

Each site will have an established Exclusion Zone with controlled access, and a Support Zone. Supervision and strict control of access to regulated areas is necessary to protect site personnel as well as the public.

**Exclusion Zone:** *(a.k.a. "Hot Zone")* This is the area where personnel may be subject to chemical or physical hazards. It is the zone of known or suspected contamination, where equipment operation and/or environmental sampling will take place. The Exclusion Zone is to be clearly identified and isolated with cones, barricades, or high visibility caution tape. Personnel working in the Exclusion Zone will at a minimum use Level D personal protective equipment as described in **Section 7.0.**

The outer boundary of the Exclusion Zone *("Hot Line")* will be established by the SSO, so that sufficient area is available to conduct operations while providing a protective buffer for persons and property outside the zone.

**Support Zone:** *(a.k.a. "Safe Zone")* This is the area outside the Exclusion Zone where administrative and other support functions are located. Adverse exposure to contaminants and physical hazards are unlikely in the Support Zone.

### 4.2 EVACUATION PROTOCOL

Evacuation protocol and routes from the site will be established by the SSO, and communicated to Field Personnel during the Tailgate Safety Meeting(s) prior to initiating work. Evacuation protocol will be implemented as needed in emergency situations. In the event of an evacuation, personnel will meet at a pre-established location and the SSO will do a "head count" to see that everyone has left the hazard area.

Emergency Response procedures are outlined in **Section 12.0.** Directions to the nearest medical facilities are provided in **ATTACHMENT C.**

### 4.3 SITE SECURITY

Appropriate security measures will be established in coordination with the site owner/operator and communicated to site personnel. The objective of these measures is to (1) protect the public from potential exposure to physical/chemical hazards; (2) avoid public interference with personnel and safe work practices; and (3) prevent theft or vandalism of equipment at the site.

### 4.4 COMMUNICATION

Communication is an important aspect of the site control program as well as the entire SHSP. Personnel should keep in mind that hazard assessment is a continuous process, and any potentially unsafe condition must be reported immediately to the SSO.

Onsite personnel will use the "Buddy System" and maintain communication or visual contact between team members during site operations. The Buddy System is used to provide assistance, monitor for chemical exposure and heat stress, and obtain emergency assistance for co-workers when necessary.

Site personnel will be familiar with the following emergency hand signals:

| | |
|---|---|
| Hand gripping throat: | Can't breathe. Respirator problems. |
| Grip team member's wrist or both hands on team member's waist: | Leave site immediately, no debate! |
| Thumbs up: | Yes. I'm all right. I understand. |
| Thumbs down: | No. Negative. |

## 5.0 HAZARD ASSESSMENT

Hazard assessment is essential for establishing hazard reduction measures. Hazard assessment will consist primarily of site inspections and monitoring. Known operational hazards (heavy equipment, overhead lines, etc.) and site characterization data (contaminant location, concentration, etc.) are also considered in the assessment. The following is a list of potential hazards associated with the activities planned for this site:

| | |
|---|---|
| **Physical Hazards** | Heavy equipment<br>Overhead lines and underground utilities<br>Explosion and fire<br>Traffic - vehicular and pedestrian<br>Tripping, slipping, and falling<br>Head, foot, eye, and back injuries<br>Falling objects<br>Sharp objects<br>Electrical equipment<br>Welding hazards<br>Excavation and trenching |
| **Chemical Hazards** | Diesel, gasoline / benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tert butyl ether (MTBE)<br>Environmental samples, purge water |
| **Environmental Hazards** | Noise exposure<br>Weather - heat, cold, rain, fog<br>Biological - plants, animals/insects, pathogens |
| **Confined Spaces** | Hazardous atmospheres (Oxygen content; flammable, explosive, or toxic gases)<br>Engulfment potential<br>Restricted movement; limited space for entry/exit |

Walk-though safety inspections will be conducted by the SSO daily and as conditions change. Inspection results will be communicated to the work crews during the morning Tailgate Safety Meetings and as needed.

## 6.0 HAZARD REDUCTION

Personnel are required to exercise reasonable caution at all times during work activities. Failure to follow safety protocols and/or continued negligence of health and safety policies will result in expulsion of a crew member from the site and may result in termination of employment. In general, the potential for hazardous situations will be reduced by the following activities:

- ***Implementing engineering controls***
- ***Using personal protective equipment***

- ***Performing air monitoring***

Engineering Controls, corresponding to the hazard assessment for work at this site, are outlined below in **Sections 6.1 through 6.4**. Personal protective equipment (PPE) and air monitoring guidelines are outlined in **Sections 7.0 and 8.0**, respectively.

## 6.1 PHYSICAL HAZARDS AND CONTROLS

Heavy Equipment

The operation and use of heavy equipment presents the greatest potential for injury to personnel. To minimize these hazards, designated routes and specific traffic patterns will be established. Trucks will use spotters for backing. If personnel need to approach heavy equipment during operation, they will observe the following protocols: make eye contact with the operator, signal the operator to cease heavy equipment activity, and then approach the equipment to inform operator of intentions.

Only equipment that is in safe working order will be used. Only qualified personnel will be allowed to operate heavy equipment. Subcontractors will supply proof of qualifications to operate the equipment.

Those crew members directly involved in spotting for the operator will be the only personnel allowed within the operating radius of the heavy equipment. Other personnel will remain at a safe distance from these operations.

Overhead Lines and Underground Utilities

When operating heavy equipment (such as cranes or drill rigs) near overhead power lines, care will be taken to ensure that the crane boom and rigging maintain a distance of ***at least 10 feet*** from the power lines. A USA utility mark-out is required and will be performed prior to drilling, construction, or excavation to mark/clear underground utilities. In addition, the first 5 feet of soil borings will be excavated using an air-knife or hand auger.

Explosion and Fire

Liquid petroleum products readily vaporize from standing pools or saturated soil. Ignition sources pose an explosion and fire hazard (e.g., engines, impact sparking, and heat or arc from inappropriate equipment or instrumentation). A direct-reading combustible gas indicator (CGI)

will be used to evaluate the possible formation of flammable atmospheres in and around the work area. **See Section 8.0: Air Monitoring.**

Emergency services (911) are to be called immediately in case of a fire or explosion. A portable fire extinguisher will be kept onsite for use on small fires only. Only personnel trained in the proper use of fire extinguishers are authorized to use the onsite fire extinguisher.

Traffic - Vehicular and Pedestrian

Work to be conducted in the public right-of-way requires an approved traffic control plan and traffic control setup and operation. Project personnel are required to follow state and local traffic laws. Vehicles driven by company personnel will yield to bikes and pedestrians, and at railroad crossings.

Access to work areas will be limited by the SSO to essential personnel. Delineators, barriers, and/or taping will be used to cordon off the work areas, and prevent pedestrian and vehicular traffic from entering the work zones.

Tripping, Slipping, and Falling

Personnel will be reminded daily to maintain sure footing on all surfaces. Use of safety harnesses is required for personnel working ***6 feet or more*** above any surface that does not have handrails (includes riding on manlifts). Work surfaces of unknown or suspect integrity will be strengthened or overlaid with a work platform capable of supporting personnel and equipment working in the area. To minimize tripping hazards caused by construction and other debris, material will be removed daily from the work areas and stockpiled in appropriate designated storage areas. This "housekeeping" effort will be enforced by the SSO at the end of each day.

Head, Foot, Eye, and Back Injuries

Hard hats, steel toe boots, and safety glasses will be worn during site operations. To avoid back injuries, personnel will be trained in and required to use proper equipment and lifting techniques for manual material handling.

Falling Objects

Equipment and material will be lowered to the ground "slowly" using a grapple and/or skip bucket. Personnel shall not work under this equipment; nor shall personnel other than the operator ride on the equipment.

Sharp Objects

Nails, wires, saws, and cutting equipment pose potential hazards such as cuts and punctures during site work. *Only appropriate work tools are to be used.* Personnel are required to exercise caution, and should wear leather work gloves when handling or operating cutting tools, saws, and other sharp objects. A consistent housekeeping effort at the site will also help to reduce hazards from sharp objects.

Electrical Equipment

In order to prevent accidents caused by electric shock, electrical connections will be inspected on a daily basis. Equipment found to have frayed wiring or loose connections will be shut down and locked-out until a qualified electrician has effected repairs. Electrical equipment will be de-energized and tested before any electrical work is started. Equipment will be properly grounded prior to and during work.

In addition, ground fault circuit interrupters (GFCIs) will be installed whenever possible in each circuit between the power source and tool, unless the presence of a potentially explosive atmosphere precludes this procedure. In the event that generators are used to supply power, they will be equipped with GFCIs. For Mobile Treatment System activities, a grounding reel attached to the generator will be fastened to a light pole, sign or electrical fixture to ground the circuit.

Welding Hazards

Personnel who perform or observe welding operations are required to use approved welding shields or glasses. This protective equipment will be inspected prior to each use for scratches and pits that could inhibit the ability to shield harmful ultraviolet light. Personnel are required to wear protective clothing to shield their skin from the harmful ultraviolet light produced by welding operations. Personnel working near welding operations that could ignite chemical protective clothing must wear flame-retardant outer apparel (Nomex or equivalent).

Excavation and Trenching

Excavations and/or trenching ***5 feet or more*** in depth will incorporate a system of shoring, sloping of the ground, benching, or other means, as provided in CCR Title 8 Construction Orders, to prevent caving. Excavations/trenching will be inspected daily by a qualified person, and after every rainstorm or other hazard-increasing occurrence. Excavations less than 5 feet deep shall also be inspected for indications of potentially hazardous ground movement.

When employees are working in trenches ***4 feet or more*** in depth, a safe means of access/egress shall be provided and located so that no more than 25 feet of lateral travel is necessary to reach the access/egress point.

No equipment will be allowed and no materials will be piled within ***2 feet*** of the edge of any trench or excavation. Adequate barrier protection shall be provided to keep mobile equipment and personnel from inadvertently falling into a trench or an excavation.

No excavation work shall take place below the level of the base of an adjacent foundation, retaining wall, or other structure until (1) a qualified person has characterized the situation as one that will not create a hazard to workers; or (2) adequate safety measures have been taken for the protection of workers.

Workers shall not be permitted underneath loads handled by excavation or loading equipment. Soil excavation, handling, stockpiling, and backfilling will not be conducted under high-wind conditions. Under these conditions, the work area, excavated material, and unpaved roadways will be watered down until the surface is moist, and maintained in a moist condition to minimize dust.

## 6.2 CHEMICAL HAZARDS AND CONTROLS

Chemical Characteristics

Hazardous chemicals that may be encountered at this site include diesel and gasoline hydrocarbons. These chemicals are volatile, flammable, and moderately to extremely toxic when inhaled, ingested, or absorbed above certain concentrations. See **ATTACHMENT B** for specific exposure limits and basic toxicology information.

Personnel will use engineering controls and PPE (based on hazard assessment) to prevent chemical exposure.

Sample Collection

Workers who must come in direct contact with known or suspected contaminated soil or groundwater to collect samples are required to wear protective gloves and other PPE, as needed, to reduce the potential for exposure. Safety glasses will be worn to avoid potential splashing of chemicals into the eyes.

Soil Cuttings, Decontamination Water, and Dust

As with sample collection, precautions are to be followed for handling materials such as soil cuttings and cleaning/decontamination water. Exposure and potential inhalation of dust (nuisance, silica) will be minimized by wearing dust masks or other appropriate PPE/respiratory protection.

Disposition of Materials

Excavated soil will be stockpiled and covered, or stored in closed drums or roll-off bins. Purged water will be stored in closed drums or tanks. Drums, tanks, and/or roll-off bins containing soil or water will be labeled in accordance with the hazard communication standard and removed from the site in accordance with client-approved protocol.

Hygiene

**Eating, smoking, and drinking are NOT ALLOWED in the work area. Site personnel will wash their hands, arms, and faces thoroughly prior to eating or drinking, and at the end of their shift. Food should never be stored where it may come into contact with, or be contaminated by, petroleum products or other toxic materials.**

## 6.3 ENVIRONMENTAL HAZARDS AND CONTROLS

Noise Exposure

Hearing protection (ear plugs or ear muffs) will be worn when project personnel enter high-noise areas. The SSO should see that extra earplugs are available onsite.

Heat Stress

Heat stress may be caused by the combination of ambient factors such as high air temperature, high relative humidity, and low air movement. This condition can result in heat rash, heat cramps, heat exhaustion, and/or heat stroke. It can impair worker coordination and judgment and directly impact health and safety. Heat stress is more likely when PPE is worn. Personnel are to drink plenty of water and take breaks (in shaded rest areas) as needed to help prevent heat stress. As part of the Buddy System, personnel should watch for signs and symptoms of heat stress in coworkers as well as themselves.

Cold Exposure

To guard against cold injury (frostbite and hypothermia), which is a danger when the temperature and wind-chill factor are low, employees will wear appropriate clothing, have warm shelter readily available, and maintain carefully scheduled work and rest periods.

Biological Hazards

Personnel will assess their surroundings for potential biological hazards, which may be posed by poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory equipment can help reduce the chances of exposure. Thorough washing of any exposed body parts and equipment will help protect against infection from biological hazards. ***"Universal Precautions"*** (e.g., wearing latex gloves) must be taken any time there is potential for exposure to human blood, such as when an employee renders first aid to a coworker.

### 6.4 CONFINED SPACE HAZARDS

Confined space entry is NOT ANTICIPATED during the course of these operations. However, if such a situation is encountered, workers are prohibited from entering confined spaces until the company plan dealing with confined spaces has been implemented.

## 7.0 PERSONAL PROTECTIVE EQUIPMENT

### 7.1 LEVEL OF PROTECTION

Personnel are required to wear PPE appropriate for the task and anticipated exposure to known contaminants. Selection of PPE will be based on hazard assessment, task performance, and air monitoring. Based on the history of this site, the initial level of protection will be Level D. At a minimum, Level D PPE will consist of the following:

- Hardhat
  *at all times in work area*
- Boots: chemical-resistant, steel toe and shank
  *at all times in work area*
- Safety glasses, splash goggles, or hardhat with face shield
  *when there is risk of hazardous substances (sampling) or flying particles (drilling, excavation, etc.) getting into eyes*

- Ear plugs / hearing protection
  *when high-noise equipment/drill rig is in operation*

- Gloves: chemical-resistant
  *when handling soil cuttings or soil/water samples*

Site personnel also are required to *be prepared* with the following items:

- Respirators: half-face, air purifying with appropriate cartridges
- Dust masks
- Tyvek coveralls and other suitable protective clothing
- Traffic safety vest
- Leather work gloves and back brace/lifting belt

Air monitoring information will dictate when and if a site will be upgraded to Modified Level D (Level D plus respirator).

## 7.2 RESPIRATOR SELECTION

For operations that require the use of a respirator, the SSO must verify that Field Personnel are medically approved to use respiratory equipment, fit tested, and trained in the proper use of air-purifying respirators. Site personnel are required have their respirator available and ready to use onsite. Only respirators that are NIOSH/MSHA approved are to be used.

Air monitoring will be performed to assess airborne contaminant levels onsite, and to evaluate suitable respiratory protection. Workers will be required to wear half-face, air-purifying respirators with organic vapor cartridges under the following circumstances, as indicated by onsite air monitoring:

- If volatile organic compound (VOC) vapors in the work area continuously exceed the threshold limit value- time-weighted average (TLV-TWA) for gasoline (300 parts per million [ppm]).

- If, at any time, VOC vapors in the work area exceed the threshold limit value - short-term exposure limit (TLV-STEL) for gasoline (500 ppm).

TLV values for gasoline are derived from American Conference of Governmental Industrial Hygienists (ACGIH) standards. Similar precautions will be taken with regard to other toxic chemicals, such as BTEX components. See **ATTACHMENT B** for additional information and regulatory exposure limits.

### 7.3 REASSESSMENT OF PPE

The levels of protection listed above will be upgraded (or downgraded) based on changes in activities, changes in site conditions, measurements of direct-reading instruments (compared to action levels for contaminants), or other findings. Changes in the level of protection require the approval of the SSO.

## 8.0 AIR MONITORING

Monitoring will be conducted as needed to characterize airborne contaminant levels. The potential hazards associated with the presence of hydrocarbons include (1) personnel exposure to chemicals, and (2) possible formation of flammable atmospheres in and around the work area.

Air sampling will be conducted in accordance with NIOSH, OSHA, or EPA methods. The SSO will check to see that air-monitoring equipment brought onsite is properly calibrated prior to operation and recalibrated during the course of the day, as necessary.

### 8.1 PHOTOIONIZATION DETECTOR

A photoionization detector (PID) will be used for the monitoring of VOCs in the work area in accordance with the requirements outlined in Title 8 CCR 5192. Air monitoring will be conducted in the breathing zone of workers, and the data collected will be used to evaluate suitable respiratory protection against chemicals encountered. Refer to the Respirator Selection guidelines in **Section 7.2** for personal protection measures. Measurements will also be obtained periodically at the top of boreholes or excavation cavities, and during any construction activities in which hydrocarbon-affected soil is encountered; however, only breathing zone measurements will be used to determine whether PPE should be used or discontinued.

## 8.2 COMBUSTIBLE GAS INDICATOR

A direct-reading, portable CGI that measures VOC concentrations in ppm, or as a percentage of the lower explosive limit (LEL), will be used to monitor airborne concentrations of VOCs and evaluate the possible formation of flammable atmospheres in and around the work area. Data will be used to monitor and evaluate vapor concentrations within or emanating from well bores, excavations, and contaminated soil that is stockpiled, moved, or loaded on or about the site. Measurements will be obtained periodically at the top of boreholes or excavation cavities throughout drilling or excavation operations, and during any construction activities in which hydrocarbon-affected soil is encountered. Periodic measurements also will be taken in areas that may contain an accumulation of combustible vapors.

In the event that CGI readings on the site exceed 10 percent of the LEL, work will be suspended, monitoring will be continued as needed to isolate the area of concern, and the following applicable environmental controls will be implemented:

1. Vapors from pooled petroleum product will be suppressed (if necessary) by spraying with foam, appropriate chemical suppressant, or carbon dioxide in gas form or dry ice.

2. Air movers will be used to ventilate the areas of concentration to below 10 percent LEL.

3. Contaminated soil will be covered with clean soil and/or sprayed with water or deodorizing chemicals in order to reduce vaporization of VOCs.

# 9.0 DECONTAMINATION

Due to the expected low levels and types of contaminants at the site, it is anticipated that personnel will not perform routine decontamination procedures when leaving the Exclusion Zone. Project activities will be initially conducted in Level D PPE. When decontamination is necessary, it will consist of the following:

- Removal of contaminated garments in an "inside out" manner at a designated decontamination station located at the step-off location where personnel routinely enter/exit the Exclusion Zone.

- Placement of contaminated garments in designated plastic bags or drums prior to disposal or transfer offsite. Labels in compliance with the hazard communication standard will be affixed to containers of contaminated debris and clothing.

## 10.0 PERSONNEL TRAINING

Personnel who will perform field activities shall meet the training requirements specified in the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard [29 CFR 1910.120 (e)]. Prior to commencement of work, the SSO will discuss the potential physical and chemical hazards associated with site operations, and review safe work practices with personnel.

Personnel are required to acknowledge their understanding and willingness to comply with this SHSP before admission to the site by signing the Compliance Log at the end of the SHSP.

Other job-specific training required to perform tasks within this operation will be verified by the SSO. This training may include, but is not be limited to respirator fit testing, safe lifting techniques, confined spaces, hearing conservation, and proper fire fighting procedures.

## 11.0 MEDICAL PROGRAM

The site medical program has two main components: a baseline medical surveillance program, and emergency medical assistance procedures.

### 11.1 BASELINE MEDICAL SURVEILLANCE

TRC has established a medical surveillance program to assess, monitor, and help protect the health of employees, in particular, employees who may be exposed to potentially hazardous substances during site work. Personnel will undergo medical examinations as follows:

**Initial:** Pre-employment / prior to any assignment involving work in a hazardous or potentially hazardous environment. The initial examination is used to establish a baseline picture of health against which future changes can be measured, and to identify any underlying illnesses or conditions that might be aggravated by chemical exposures or job activities.

**Periodic:** At least once every 12 months to measure changes in health status.

**Upon notification:** As soon as possible upon notification by an employee that they have developed signs or symptoms indicating possible overexposure to hazardous substances, or in response to an injury or exposure during an emergency situation.

**Exit:** At termination of employment.

11.2 EMERGENCY MEDICAL ASSISTANCE

An emergency medical assistance network will be established prior to work start-up. The nearest fire department, police, ambulance service, and hospital with an *emergency room* will be identified. **See ATTACHMENT C** for Emergency Services contact information. A vehicle shall be available onsite during work activities to transport injured personnel to the identified emergency medical facilities, if necessary. Company vehicles are to be equipped with a fire extinguisher and first aid kit.

## 12.0 EMERGENCY RESPONSE PLAN

The SSO will have controlling authority during an emergency. In the SSO's absence, the Alternate SSO will be in charge. See ATTACHMENT C for the name, location, and telephone number of emergency response organizations in the vicinity of the project site, and a map to the nearest hospital(s).

12.1 EMERGENCY PROCEDURES

In the event of an accident, injury, or other emergency, remember to:

**1) Stop work and REMAIN CALM.**

**2) Move personnel to a safe location (evacuation plan).**

**3) Call 911 or notify other emergency facilities.**

**4) Address medical emergencies and apply first aid, if necessary.**

**5) Contain physical hazards.**

(NOTE: Act only if hazard is minimal and you are trained to deal with the situation. Otherwise evacuate and wait for emergency services to arrive.)

**Notify offsite supervisor and client, and initiate accident-reporting procedures.**

## 12.2 ACCIDENT REPORTING

In case of an accident, the SSO (or Alternate) will immediately notify the Supervisor/Offsite Coordinator at the nearest TRC office and later provide a report to the PM describing the following:

1. A description of the event (including date and time) that required notification of offsite personnel (i.e., medical facilities, fire department, police department) and the basis for that decision.
2. Date, time, and names of persons/agencies notified, and their response.
3. Details regarding personal injury and property damage, if any.
4. Resolution of incident and the corrective action involved.

All incidents and near misses are to be investigated in accordance with TRC's IIPP. The Supervisor's Report of Accident is to be completed and submitted to the Human Resources department within 24 hours following any accident or injury.

## SITE HEALTH AND SAFETY PLAN
## COMPLIANCE LOG

I have reviewed this Site Health and Safety Plan and understand the contents of the plan. I hereby agree to comply with all safety requirements outlined herein.

Signature: _____ Date: _____
Safety Officer, TRC.

Signature: _____ Date: _____
Safety Officer, TRC.

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

## SITE HEALTH AND SAFETY PLAN
## COMPLIANCE LOG
(Continued)

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

Signature: _____ Date: _____
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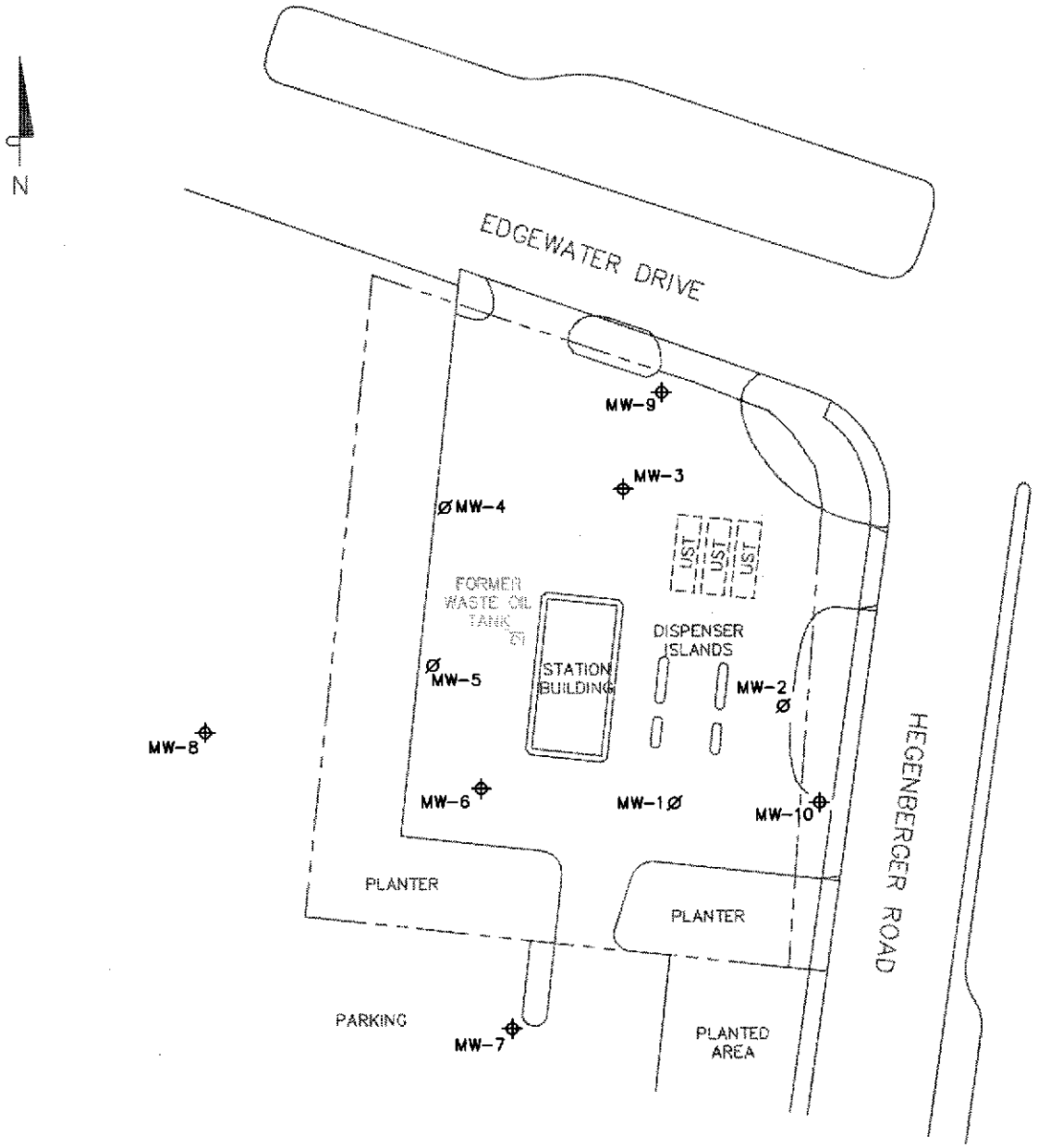
Print Name: _____ Company: _____

Signature: _____ Date: _____
Print Name: _____ Company: _____

## ATTACHMENT A

## SITE PLAN




APPROXIMATE SCALE (FEET)

0 60 120

LEGEND

- Approximate property line
- MW-10 ⊕ Groundwater monitoring well
- MW-5 Ø Abandoned well

SOURCE: Site plan by Gettler-Ryan, May 2001.

**SITE PLAN**

76 Service Station #5043
449 Hegenberger Road
Oakland, California

TRC

**FIGURE 2**

# ATTACHMENT B

# OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

**Table B-1**

**OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION**
**Gasoline Constituents**

| Contaminant | ACGIH TLV-TWA (ppm) | NIOSH REL (ppm) | OSHA PEL (ppm) | STEL (ppm) | IDLH (ppm) | Routes of Exposure | Known or Suspected Carcinogen | Symptoms |
|---|---|---|---|---|---|---|---|---|
| Diesel (as Stoddard solvent) | for Diesel fuel/ Kerosene 14.4 (skin only) | Approx. 60-98 | 500 | 250-500 (NIOSH ceiling) | Approx. 3000-5600 | Inhalation, Ingestion, Contact | No | Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration, weakness, restlessness, incoordination |
| Gasoline | 300 | n/a | n/a | 500 (ACGIH) | n/a | Inhalation, Absorption, Ingestion, Contact | Yes | Irritation to eyes, skin, mucous membrane; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, aspiration |
| Benzene | 0.5 | 0.1 | 1 | 1 (NIOSH) | 500 | Inhalation, Absorption, Ingestion, Contact | Yes | Irritation to eyes, skin, nose, resp system, giddiness, headache, nausea, staggered gait, fatigue, anorexia, weakness/exhaustion, dermatitis |
| Toluene | 50 | 100 | 200 | 150 (NIOSH) | 500 | Inhalation, Absorption, Ingestion, Contact | No | Irritation to eyes, nose; fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, tears, nervousness, muscle fatigue, insomnia, dermatitis |
| Ethylbenzene | 100 | 100 | 100 | 125 (NIOSH& ACGIH) | 800 | Inhalation, Ingestion, Contact | No | Irritation to eyes, skin, mucous membranes; headache, dermatitis, narcosis, coma |
| Xylenes (o,m,p) | 100 | 100 | 100 | 150 (NIOSH & ACGIH) | 900 | Inhalation, Absorption, Ingestion, Contact | No | Irritation to eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait, nausea, vomiting, abdominal pain, dermatitis |
| Methyl tert butyl ether (MTBE) | 40 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

## TABLE KEY

| | |
|---|---|
| ACGIH TLV-TWA | American Conference of Governmental Industrial Hygienists, Threshold Limit Value-Time Weighted Average |
| NIOSH REL | National Institute of Occupational Safety & Health, Recommended Exposure Limit |
| STEL | Short Term Exposure Limit (Gasoline STEL is by ACGIH; BTEX STELs are by NIOSH) |
| OSHA PEL | Occupational Safety and Health Administration, Permissible Exposure Limit |
| IDLH | Immediately Dangerous to Life and Health |
| ppm | parts per million |
| CNS | Central Nervous System |
| n/a | not available (i.e., no value has been established) |

## DEFINITIONS

**Threshold Limit Value:** Threshold limit values (TLVs) refer to airborne concentrations of substances and represent conditions under which it is believed nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

**Threshold Limit Value - Time Weighted Average:** The time weighted average (TWA) is a concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. TLV-TWAs are established by the ACGIH.

**Recommended Exposure Limit:** Unless otherwise noted, the recommended exposure limit (REL) is a TWA concentration for up to a 10-hour workday during a 40-hour workweek. RELs are established by NIOSH to reduce or eliminate adverse occupational health effects.

**Short Term Exposure Limit:** A short-term exposure limit (STEL) is defined as a 15-minute TWA exposure that should not be exceeded at any time during a workday. When compared to the REL (or TLV-TWA for ACGIH standards), the STEL allows the worker to be exposed to a higher concentration, BUT for a shorter period of time. Exposures above the REL up to the STEL should not be longer than 15 minutes and should not occur more than four times per day.

**Permissible Exposure Limit:** Permissible exposure limits (PELs) are TWA concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek. PELs are established by OSHA (29 CFR 1910.1000).

**Immediately Dangerous to Life and Health:** Immediately dangerous to life and health (IDLH) values are established as concentrations from which a worker can escape within 30 minutes without suffering loss of life, irreversible health effects, or other deleterious effects that could prevent him/her from escaping the hazardous environment. The purpose of establishing an IDLH exposure concentration is to ensure that workers can escape from a given contaminated environment in the event of failure of respiratory protection equipment.

## ATTACHMENT C

## EMERGENCY SERVICES
## PHONE NUMBERS, DIRECTIONS, AND LOCAL AREA MAP

## EMERGENCY SERVICES

| FACILITY / LOCATION | TELEPHONE |
|---|---|
| **Emergency Situation** | **911** |

**Medical Facility**:
San Leandro Hospital (510) 357-6500
13855 E 14th St
San Leandro, Ca

**Directions to Emergency Facility**

**Directions**

1. Starting at on **EDGEWATER DR** - go < **0.1** mi
2. Turn (L) on **HEGENBERGER RD** - go < **0.1** mi
3. Take **I-880 SOUTH** towards **SAN JOSE** - go **2.6** mi
4. Take the **MARINA BLVD EAST** exit - go **0.2** mi
5. Bear (R) on **MARINA BLVD** - go **0.9** mi
6. Turn (R) on **SAN LEANDRO BLVD** - go **0.7** mi
7. Turn (R) on **E 14TH ST** - go **0.1** mi
8. Arrive at San Leandro Hospital

**California Poison Control System:**
24-hour hotline (800) 876-4766

**Police Department:** 911

Fire Department: 911

## AREA MAP WITH ROUTE TO HOSPITAL

## TAILGATE SAFETY MEETING CHECKLIST

**Topics Covered**
(Check off as discussed)

____ **Personnel training/qualifications:** Check cards for OSHA HAZWOPER 40-hour certification/8-hour-refresher training (others, if appropriate).

____ **Supplies:** Indicate location of first aid kit, fire extinguisher, clean water supply (drinking, eye wash), and Site Health and Safety Plan (SHSP).

____ **Emergency services:** Discuss location of nearest telephone and directions to hospital. Map, directions, phone numbers provided at end of SHSP (Attachment C).

____ **Site background:** Discuss types, locations, and concentrations of chemicals found onsite, presence of free product, depth to groundwater, etc.

____ **Work activities:** Discuss scope of work for the day and activities to be performed.

____ **Potential hazards:** Discuss physical hazards (lifting, pinch points, traffic, working around machinery, etc.); chemical hazards (exposure limits, symptoms, air monitoring); and environmental hazards (heat stress, etc.).

____ **Air monitoring:** Necessary equipment is onsite and calibrated. Circle: CGI PID

____ **Personal protective equipment (PPE):** Discuss required level of protection. See that workers have appropriate PPE onsite; includes, but is not limited to, hardhat, steel-toe boots, safety glasses, ear plugs / hearing protection, respirator (with cartridges), gloves, traffic safety vest (other _____).

____ **Utilities:** Utilities have been cleared/marked by appropriate divisions.

____ **Traffic control** (vehicular and pedestrian): Work area is properly delineated and cordoned off from traffic.

____ **Compliance log:** SHSP has been reviewed and signed by site personnel.

# SITE SAFETY INSPECTION FORM

| Date: | Inspected by: | Branch/Department: |
|---|---|---|
| Site Name and Location: | | |
| Work Activities: | Site Safety Officer: | |

**Type of Inspection / Check Appropriate Boxes**

| | | |
|---|---|---|
| ☐ Safe Performance / Self Assessment | ☐ Project / Site Inspection | ☐ Equipment Inspection |
| ☐ Field Activities | ☐ TRC Office / Inspection | ☐ IIPP Coordinator Inspection |

***Check the following and circle appropriate response. Look for any unsafe acts or conditions and report them on the reverse side of this form. (Forward form to your immediate supervisor & copies to the IIPP Coordinator & HSO).***

| | | | |
|---|---|---|---|
| 1. Heavy equipment, motor vehicles and other machinery is in good/safe condition. (check machine guards in place; belts, pulleys, gears working; smooth operation; vehicle safety equipment & qualification of operators) | YES ☐ | NO ☐ | NA ☐ |
| 2. Tools needed are onsite and being used properly and in good condition. | YES ☐ | NO ☐ | NA ☐ |
| 3. Overhead obstructions including utility lines: operations and equipment maintain safe distance (at least 10 feet in all directions). | YES ☐ | NO ☐ | NA ☐ |
| 4. Underground utilities are marked. | YES ☐ | NO ☐ | NA ☐ |
| 5. Air monitoring equipment is onsite, calibrated, and used properly to include documentation maintained of monitored conditions | YES ☐ | NO ☐ | NA ☐ |
| 6. Current Site Health and Safety Plan is onsite, read, understood & signed by field personnel, and readily accessible. (check directions to medical facilities) | YES ☐ | NO ☐ | NA ☐ |
| 7. Site control measures are in place (work area cordoned off, traffic control set up, motor vehicles properly secured etc.) | YES ☐ | NO ☐ | NA ☐ |
| 8. Fire extinguisher is onsite, properly rated, approved and inspected & tagged. | YES ☐ | NO ☐ | NA ☐ |
| 9. First aid kit is onsite, approved, inspected & maintained. | YES ☐ | NO ☐ | NA ☐ |
| 10. Clean water supply is available for personnel, potable for drinking, and for eye and handwashing. | YES ☐ | NO ☐ | NA ☐ |
| 11. Housekeeping rules are being followed. (check waste disposal and stockpiling practices; possible trip, slip, and fall hazards) | YES ☐ | NO ☐ | NA ☐ |
| 12. Fall protection: safety harnesses, etc. are used for work 6 feet or more above surfaces with no handrails in place. (check also safety of ladders, scaffolds, etc.) | YES ☐ | NO ☐ | NA ☐ |
| 13. Trenching/excavation practices are safe and in compliance with OSHA/ TRC standards. Permit & Site Safety Officer is designated & readily accessible. | YES ☐ | NO ☐ | NA ☐ |
| 14. Personal Protective Equipment is onsite and properly used by personnel. **Circle items being used:** hardhats, steel-toe safety boots, safety glasses/face shields, hearing protection, gloves, respirators, traffic safety vests, chemical /protective clothing (tyvek, etc.) | YES ☐ | NO ☐ | NA ☐ |
| 15. Hazardous materials/chemicals are labeled and stored safely; MSDS information available, tanks labeled properly. Documentation on labeling visible and clear. | YES ☐ | NO ☐ | NA ☐ |
| 16. Material handling equipment and/or safe lifting techniques are used. | YES ☐ | NO ☐ | NA ☐ |
| 17. Pressure equipment is used safely (steam equipment, air compressors, gas cylinders, hoses, etc.). | YES | NO | NA |

## SITE SAFETY INSPECTION FORM

| | YES | NO | NA |
|---|---|---|---|
| 18. Electrical equipment is properly grounded, conditions intrinsically safe, lock out tag out utilized, proper PPE insulation. Utilized e.g. mats gloves, boots, temporary power structure in good working condition. | ☐ | ☐ | ☐ |
| 19. Decontamination and hygiene procedures are followed. (check disposal of contaminated gloves, etc.; no eating, drinking, or smoking in work area; hands are washed, etc.) | ☐ | ☐ | ☐ |
| 20. Personnel have HAZWOPER training (29 CFR 1910.120[e]); CPR & First Aid current registration cards are onsite. | ☐ | ☐ | ☐ |
| 21. Structures, enclosures, fences and power poles, overhead lines, well box leads and machinery in safe and good Physical condition. | ☐ | ☐ | ☐ |

## CORRECTIVE ACTION(S) NECESSARY AS RESULT OF INSPECTION PROCESS

| Unsafe Act or Condition Observed | Corrective Action Needed | Responsibility Assigned To: | Date Completed |
|---|---|---|---|
| | | | |