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To: City of Emeryville Date: May 9, 1994
Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, CA 94608

Attention: Mr. Ignacio Dayrit
 Project: 4300 San Pablo Avenue Number: 15,681.004.04
 Subject: Quarterly Groundwater Monitoring

| Quantity | Date | Description |
|----------|--------|-------------|
| 3 | 5/9/94 | Work Plan |
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| | | |
| | | |

For Your:

Distribution Use Records Review Approval Information

Remarks: _____

From: John B. Adams Via: First Class Mail
 c.c. Ms. Susan Hugo, Alameda Co. Health Care Services Agency
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A Work Plan Prepared For

City of Emeryville
Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, California 94608

QUARTERLY GROUNDWATER MONITORING
4300 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA

AGI Project No. 15,681.004.04

by



John B. Adams
Environmental Scientist



William K. Wikander, P.E., G.E.
Associate Engineer

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May 9, 1994

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1.0 INTRODUCTION

1.1 GENERAL

This Work Plan describes the actions to be conducted during quarterly groundwater monitoring to be performed by AGI Technologies (AGI), on behalf of the City of Emeryville Redevelopment Agency (Agency), at 4300 San Pablo Avenue in Emeryville, California. Our scope of services consists of purging and sampling monitoring wells; analyzing groundwater samples for petroleum hydrocarbons; determining the direction of groundwater flow; and reporting the results.

This Work Plan is based upon information from the following sources:

- ▶ Correspondence from Subsurface Consultants Inc. (SCI) dated March 1, May 24, June 23, and September 22, 1993
- ▶ A letter from the Alameda County Health Care Services Agency (ACHCSA) dated August 6, 1993.
- ▶ Data gathered during installation of the upgradient well we installed on March 3, 1994 (no soil nor groundwater contamination was encountered at the well location).
- ▶ Our understanding of local, state, and federal laws and regulations.

This Work Plan also includes a Health and Safety Plan (HASP) which is presented in Appendix A. The results of installation of the upgradient monitoring well will be presented in the first groundwater monitoring report.

1.2 BACKGROUND

The site is located at the northeast corner of the intersection of San Pablo Avenue and 43rd Street in Emeryville, California, as shown on Figure 1, Vicinity Map, and Figure 2, Site Plan. The site is bounded by residential property to the east, a U. S. Post Office to the north, San Pablo Avenue to the west, and 43rd Street to the south. The site is currently used by the U. S. Postal Service for mail delivery vehicle parking.

The site was formerly occupied by service stations from about 1926 to 1966, and a car wash from about 1969 to 1990. Records show that after 1936, the service station had three 550-gallon gasoline underground storage tanks (USTs). The USTs were located beneath the sidewalks along San Pablo Avenue (2) and 43rd Street (1). Soil samples were obtained from the native soil/tank backfill interface at the former UST locations and analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and diesel (TPH-D); and benzene, ethylbenzene, toluene, and xylenes (BETX). TPH-G and TPH-D concentrations in soil samples from the former UST locations along San Pablo Avenue ranged up to 57 mg/kg. TPH-G and TPH-D concentrations in soil samples from the 43rd Street UST location ranged up to 490 mg/kg. As part of remediation efforts, about 250 cubic yards (cy) of contaminated soil were removed from the 43rd Street location. The presence of backfill and underground pipes still in-place indicated that two USTs formerly existed along 43rd Street. Soil was excavated to a clean-up level of 300 mg/kg. The contaminated excavated soil was remediated by solid phase treatment to TPH-G and TPH-D concentrations less than 1 mg/kg. About one-third of the remediated soil was reused as backfill on-site. The rest was disposed of at a Class III landfill. Prior to backfilling, about 2,500 gallons of contaminated water were removed from the excavation and disposed of off-site.



AGI
TECHNOLOGIES

Vicinity Map
Emeryville Redevelopment Agency
4300 San Pablo Avenue
Emeryville, California

FIGURE
1

| JOB NUMBER | DRAWN | APPROVED | DATE | REVISED | DATE |
|---------------|-------|----------|------|---------|------|
| 15,681.004.04 | DH | | | | |

MW7

EMERYVILLE POST OFFICE
4310 SAN PABLO AVENUE

PARKING LOT

MW1

MW4

MW3

MW2

SIDEWALK

MW5

43rd STREET

SAN PABLO AVENUE

MW6

SIDEWALK

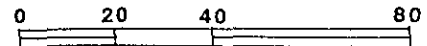
RETAIL BUILDING

EMERYVILLE
FIRE STATION #1

LEGEND

⊕ MW2 MONITORING WELL DESIGNATION AND APPROXIMATE LOCATION

□ APPROXIMATE FORMER UST LOCATION



Scale in Feet

Reference: SCI Site Plan, Emeryville Senior Housing, May '93.

AGI
TECHNOLOGIES

Site Plan
Emeryville Redevelopment Agency
4300 San Pablo Avenue
Emeryville, California

FIGURE

2

| JOB NUMBER | DRAWN | APPROVED | DATE | REVISED | DATE |
|---------------|-------|----------|------|---------|------|
| 15,681.004.04 | DH | | | | |

5/9/94

As part of site assessment efforts, SCI installed 6 groundwater monitoring wells at the site (MW-1 through MW-6) at the locations shown on Figure 2. Contaminant concentrations in water samples from the wells have ranged as follows: TPH-G, <0.05 to 1.2 mg/L; TPH-D, <0.05 to 1.9 mg/L; benzene, <0.5 to 3.0 ug/L; ethylbenzene, <0.5 to 2.1 ug/L; toluene, <0.5 to 3.9 ug/L; and xylenes, <0.5 to 6.9 ug/L. AGI recently installed an additional up gradient well (MW-7). No TPH-G, TPH-D or BETX were detected in soil samples obtained as part of well installation, nor in the water sample from MW-7.

2.0 PURPOSE AND SCOPE

2.1 PURPOSE

Our purpose is to monitor the groundwater depths in the 7 existing wells, and monitor groundwater quality in three representative wells for one year.

2.2 SCOPE OF SERVICES

2.2.1 Site Health and Safety Plan

A site Health and Safety Plan (HASP) has been prepared for this project and is included in this Work Plan as Appendix A. The HASP addresses specific hazards which may be encountered during our work, and delineates appropriate actions to be taken based upon the hazards. A Hospital Route Map is included in the HASP for emergency reference, and a copy of the HASP will be available at the site during our field operations. Our work at the site will be performed with strict conformance to the requirements of the HASP.

2.2.2 Elevation Survey

We will perform a level survey to determine the top of well casing elevations (using an assumed elevation datum) of the new and existing wells. We will measure the depth to groundwater in each well using an electronic interface probe, to an accuracy of 0.01 foot. If free product is encountered we will measure its thickness to the nearest 0.01 foot. Based on the data we will evaluate the direction and gradient of groundwater flow.

2.2.3 Well Monitoring

We will monitor wells on a quarterly basis for a period of one year. During each event, we will measure the depth to groundwater beneath the top of casing of the 7 existing wells using an electronic water level meter. The 3 wells to be sampled are MW4, MW5, and MW7. These wells are located immediately down gradient from the former tank locations (MW4 and MW5) and up gradient from the site (MW7). We will purge these wells using a centrifugal suction pump until the pH, temperature, and specific conductance of the purged water have stabilized. At least 4 well volumes of water will be removed. After purging, we will obtain groundwater samples from each of the 3 wells using new, clean disposable polyethylene bailers.

2.2.4 Sample Handling and Analytical Testing

Groundwater samples will be placed in the appropriate containers for the analytical tests to be performed. All samples will be placed on "blue ice" in a cooler, and kept cool until delivery to the analytical laboratory. Sample handling will be documented using Chain-of-Custody records.

The samples will be submitted to Curtis & Tompkins, Ltd., a California Department of Health Services certified analytical laboratory. The samples will be analyzed for TPH-G and TPH-D (EPA 8015 modified), and BETX (EPA 8020).

2.2.5 Reports

Upon completion of each monitoring event, we will report the depth to groundwater, the groundwater gradient direction, and the analytical test results. The reports will describe sampling procedures, and include a site

plan showing groundwater contours, analytical test data, and chain-of-custody records. Quarterly monitoring reports will be completed approximately 4 weeks following each field event. In the first report, we will present the results of the upgradient well installation (MW7). In the final report, we will provide recommendations for future services, based upon the monitoring results.

3.0 SCHEDULE

AGI is prepared to commence groundwater monitoring at the site immediately upon ACHCSA approval of this Work Plan. Our planned schedule for monitoring events and reporting is as follows:

| | | |
|------------------|-----------|------|
| Event 1 | May | 1994 |
| Quarterly Report | June | 1994 |
| Event 2 | August | 1994 |
| Quarterly Report | September | 1994 |
| Event 3 | November | 1994 |
| Quarterly Report | December | 1994 |
| Event 4 | February | 1995 |
| Final Report | March | 1995 |

This schedule will be followed throughout the monitoring period, and will be updated if delays occur in the Work Plan approval process or if additional requirements are made by the ACHCSA.

DISTRIBUTION

3 Copies City of Emeryville
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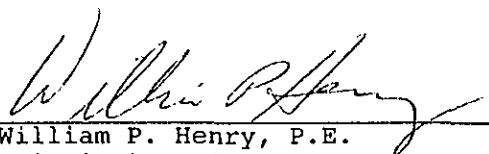
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 Attention: Ms. Susan Hugo

Quality Assurance/Technical Review

by:



William P. Henry, P.E.
Principal Engineer

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APPENDIX A

Health and Safety Plan

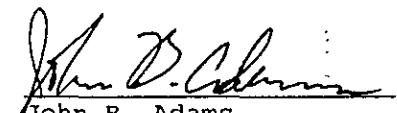
A Plan Prepared For

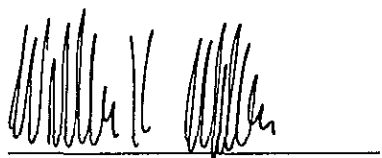
City of Emeryville
Redevelopment Agency
2200 Powell Street, 12th Floor
Emeryville, California 94608-1806

APPENDIX A
PROJECT HEALTH AND SAFETY PLAN
QUARTERLY GROUNDWATER MONITORING
4300 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA

AGI Project No. 15,681.004.04

Prepared by:


John B. Adams
Environmental Scientist


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May 9, 1994

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- Attachment 2: Field Team Review Form
- Attachment 3: Supplementary Record of Occupational Injuries and Illnesses Form

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PURPOSE

The purpose of this project Health and Safety Plan (HASP) is to provide guidance and procedures to AGI Technologies (AGI) personnel involved in field activities at 4300 San Pablo Avenue in Emeryville, California. This HASP applies to AGI personnel working within the scope outlined in Section 2.0.

If, during the course of work, information is obtained indicating additional hazards or a change in scope, field work will be temporarily halted, information regarding potential hazards reevaluated, and this HASP updated or modified as necessary. Project work will resume after field personnel are notified of modifications to the HASP.

:

1.0 GENERAL SITE INFORMATION

1.1 CONTACT PERSONNEL

| | | |
|----------------------------------------------|-------------------|---------------|
| AGI Project Manager | John B. Adams | (510)238-4590 |
| AGI Health and Safety Manager | Monica P. Beckman | (206)453-8383 |
| AGI Site Safety Officer | John B. Adams | (510)238-4593 |
| East Bay Occupational Medicine Associates | | (510)351-3553 |

1.2 PROJECT RESPONSIBILITIES

The AGI Health and Safety Manager (HSM) and AGI Project Manager (PM) are responsible for ensuring this HASP is implemented during project operations. The AGI Site Safety Officer (SSO) is responsible for the day-to-day safety requirements while field work is progressing. AGI personnel are responsible for following the procedures set forth in this HASP. Project-related safety responsibilities include the following:

▶ Project Manager:

- Ensure that subcontractors have submitted a completed Subcontractor Safety Agreement Form, included as Attachment 1.
- Ensure that site personnel and visitors comply with the requirements of the project HASP.
- Ensure that site personnel meet the required qualifications.

▶ Health and Safety Manager:

- Write and amend the project HASP.
- Ensure that site personnel comply with the requirements of the HASP and have submitted a completed Field Team Review Form, included as Attachment 2.
- Conduct specialized and site-specific training as required.
- Address questions raised by the PM or site personnel.

▶ Site Safety Officer:

- Ensure that site personnel comply with the requirements of the HASP and have submitted a completed Field Team Review Form to the HSM.
- Monitor the site and work areas for health and safety hazards and address any unusual situations that are encountered; consult the HSM if necessary.
- Investigate accidents, injuries, and illnesses; contact the HSM.

- Oversee the proper use, maintenance, and care of safety equipment and ensure proper decontamination procedures are followed.
 - Conduct daily site safety meetings.
 - Stop work if necessary (i.e., an imminent danger or health hazard exists) and contact the HSM.
- ▶ Site Personnel:
- Read and follow the HASP.
 - Report accidents, illnesses, or unsafe conditions to the SSO or HSM.
 - Properly clean and maintain safety equipment.

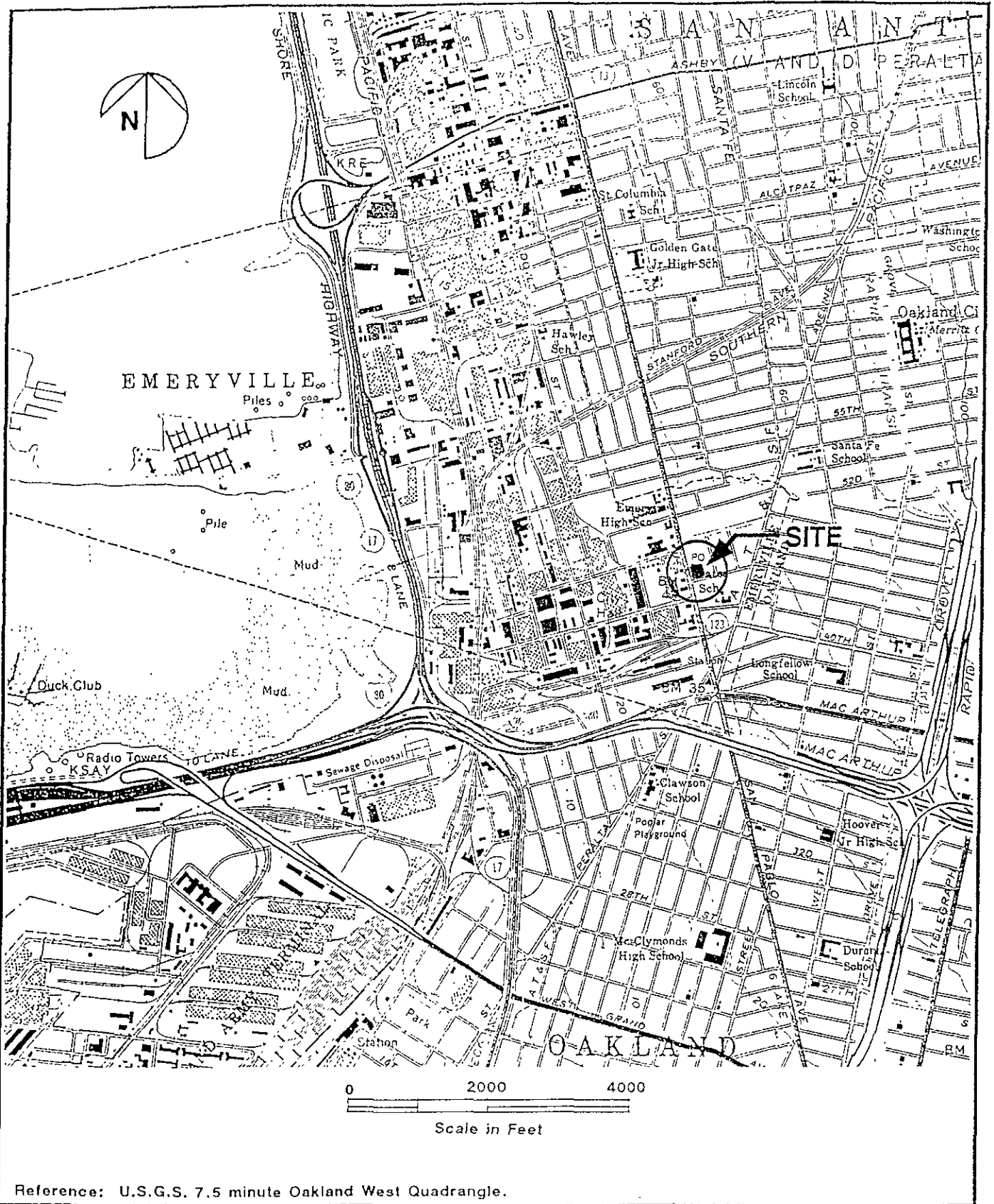
Prior to working at the site, each employee will receive a copy of this HASP from the PM or HSM. Employees are required to read the HASP and forward a completed copy of the Field Team Review Form (Attachment 2) to the HSM. Employees are expected to conduct site work in a safe manner and comply with this HASP and federal, state, and local regulations.

If AGI hires subcontractors to perform field operations in support of the elevation survey, well sampling, and groundwater level monitoring, an individual authorized to commit the company will read the HASP and forward a completed copy of the Subcontractor Safety Agreement Form to the PM. Work performed on the site by subcontractors may include elevation surveying.

1.3 SITE INFORMATION

The site is located at the northeast corner of the intersection of San Pablo Avenue and 43rd Street in Emeryville, California (Figure A1). The site is bounded by residential property to the east, a U. S. Post Office to the north, San Pablo Avenue to the west, and 43rd Street to the south (Figure A2). The site is currently used by the U. S. Postal Service for mail delivery vehicle parking.

The site was formerly occupied by service stations from about 1926 to 1966, and a car wash from about 1969 to 1990. Records show that after 1936, the service station had three 550-gallon gasoline underground storage tanks (USTs). The USTs were located beneath the sidewalks along San Pablo Avenue (2) and 43rd Street (1). Soil samples were obtained from the native soil/tank backfill interface at the former UST locations and analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and diesel (TPH-D); and benzene, ethylbenzene, toluene, and xylenes (BETX). TPH-G and TPH-D concentrations in soil samples from the former UST locations along San Pablo Avenue ranged up to 57 mg/kg. TPH-G and TPH-D concentrations in soil samples from the 43rd Street UST location ranged up to 490 mg/kg. As part of remediation efforts, about 250 cubic yards (cy) of contaminated soil were removed from the 43rd Street location. The presence of backfill and underground pipes still in-place indicated that two USTs formerly existed along 43rd Street. Soil was excavated to a clean-up level of 300 mg/kg. The contaminated excavated soil was remediated by solid phase treatment to TPH-G and TPH-D concentrations less than 1 mg/kg. Approximately one-third of the



Reference: U.S.G.S. 7.5 minute Oakland West Quadrangle.

AGI
TECHNOLOGIES

Vicinity Map
Emeryville Redevelopment Agency
4300 San Pablo Avenue
Emeryville, California

FIGURE

A1

JOB NUMBER
15,681,004.04

DRAWN
DH

APPROVED

DATE

REVISED

DATE

MW7

EMERYVILLE POST OFFICE
4310 SAN PABLO AVENUE

PARKING LOT

43rd STREET

MW1

MW4

MW3

MW2

SIDEWALK

MW5

SAN PABLO AVENUE


MW6

SIDEWALK

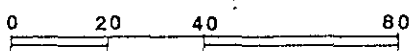
RETAIL BUILDING

EMERYVILLE
FIRE STATION #1

LEGEND

 MW2 MONITORING WELL DESIGNATION AND APPROXIMATE LOCATION

 APPROXIMATE FORMER UST LOCATION



Scale in Feet

Reference: SCI Site Plan, Emeryville Senior Housing, May '93.

AGI
TECHNOLOGIES

Site Plan
Emeryville Redevelopment Agency
4300 San Pablo Avenue
Emeryville, California

FIGURE
A2

| JOB NUMBER | DRAWN | APPROVED | DATE | REVISED | DATE |
|---------------|-------|----------|------|---------|------|
| 15,681.004.04 | DH | | | | |

remediated soil was reused as backfill on-site. The rest was disposed of at a Class III landfill. Prior to backfilling, about 2,500 gallons of contaminated water were removed from the excavation and disposed of off-site.

As part of site assessment efforts, Subsurface Consultants, Inc. (SCI) installed 6 groundwater monitoring wells at the site (MW-1 through MW-6). Contaminant concentrations in water samples from the wells have ranged as follow: TPH-G, <0.05 to 1.2 mg/L; TPH-D, <0.05 to 1.9 mg/L; benzene, <0.5 to 3.0 ug/L; ethylbenzene, <0.5 to 2.1 ug/L; toluene, <0.5 to 3.9 ug/L; and xylenes, <0.5 to 6.9 ug/L. AGI recently installed an additional up gradient well (MW-7). No TPH-G, TPH-D or BETX were detected in soil samples obtained as part of well installation, nor in the water sample from MW-7.

2.0 SCOPE OF SERVICES

AGI will perform groundwater monitoring at the site. This HASP describes procedures to be followed and personal protective equipment (PPE) to be used by AGI personnel while performing the following field tasks:

- ▶ Perform an elevation survey of all site monitoring wells (Event 1 only).
- ▶ Collect groundwater samples from three existing monitoring wells.
- ▶ Collect groundwater level data from all site monitoring wells.

:
:
:

3.0 CHEMICAL HAZARD ASSESSMENT

3.1 GENERAL

AGI employees may be exposed to hazardous chemicals during field operations at the site. Exposure could be the result of physical contact, inhalation of dust and/or vapors, or inadvertent ingestion. The anticipated hazardous chemicals at the site include gasoline, diesel, and BETX.

In general, acute short-term exposure to potential site contaminants may result in eye, nose, skin, and upper respiratory tract irritation. Mild narcosis, chest pain, difficulty breathing, nausea, vomiting, and diarrhea are indications of severe exposure. Some potential site contaminants are considered carcinogenic; therefore, exposure should be minimized. Observable symptoms in site personnel may indicate a chemical's permissible exposure level (PEL) is being exceeded. If such symptoms are observed, AGI personnel should leave the site and inform the AGI HSM, who will reevaluate conditions at the site and implement engineering controls before allowing AGI personnel to reenter.

3.2 DIESEL FUELS

Constituents of diesel fuels usually include kerosene and light- to middle-weight distillates; some also contain naphthalene. The most common routes of exposure for diesel fuels include inhalation and skin contact or absorption. Prolonged inhalation of these compounds may cause central nervous system effects, including headache, dizziness, loss of appetite, weakness, and loss of coordination. Prolonged skin contact may result in pain or a feeling of heat, discoloration, swelling, and blistering. Overexposure to naphthalene may result in fever, sweating, nausea, abdominal pain, diarrhea, lethargy, tremors, and convulsions. Toxicology tests reportedly indicate middle-weight distillates can cause skin cancer and mutagenic effects.

3.3 GASOLINE, BENZENE, ETHYLBENZENE, TOLUENE AND XYLENES

The most common exposure routes for gasoline, benzene, ethylbenzene, toluene, and xylenes (BETX) include inhalation and skin contact or absorption. Acute short-term inhalation of petroleum hydrocarbon concentrations up to 1,000 parts per million (ppm) may result in headache, dizziness, loss of appetite, weakness, loss of coordination, and upper respiratory tract irritation. Inhalation of vapor concentrations in excess of 5,000 ppm may result in loss of consciousness, coma, and death. Dermal contact may result in eye and skin irritation. Benzene is considered carcinogenic; therefore, exposure should be minimized.

Symptoms indicating acute exposure to benzene compounds include irritated eyes, nose, and respiratory system; giddiness; headache; nausea; staggered gait; fatigue; and dermatitis. Chronic exposure to benzene may result in damage to the blood, central nervous system, skin, bone marrow, eyes, and respiratory system. The American Council of Governmental Industrial Hygienists (ACGIH) recommends an 8-hour time weighted average-threshold limit value (TWA-TLV) of 10.0 ppm for occupational exposure to benzene.

4.0 PHYSICAL HAZARD ASSESSMENT

4.1 TEMPERATURE-RELATED HAZARDS

The development of temperature-related illnesses is considered the most common hazard. Ambient work site temperatures and the amount of physical activity may contribute to temperature-related illnesses in employees ranging from heat stress to hypothermia. Personnel performing physical labor while wearing protective clothing at temperatures above 70°F are subject to developing heat-related disorders. Monitoring employee temperatures and radial pulse rates should be performed to ensure an adequate work/rest regimen is followed to prevent heat-related illnesses. Appropriate clothing should be worn if outside temperatures fall below 40°F for more than 2 hours.

4.2 FIRE AND EXPLOSION HAZARDS

The risk of fire or explosion is moderate during field activities. A combustible gas meter (CGM) should be utilized during purging operations. If the CGM indicates combustible gas levels in the general work area at 20 percent of the lower explosive level (LEL), work shall cease and the tasks will be reevaluated. Work involving welding or cutting shall not be performed if the CGM indicates concentrations have reached 10 percent of the LEL in the general work area. Engineering controls, such as ventilation, will be implemented to control combustible gas levels. If combustible gas levels reach 50 percent of the LEL at the wellhead, a packing device and water will be utilized prior to conducting hot work near the wellhead. As a precautionary measure, smoking will not be permitted on site at any time.

4.3 OXYGEN DEFICIENCY HAZARDS

Site personnel are not expected to encounter an oxygen-depleted atmosphere during site activities. Confined space entries are considered a last resort and require an addendum to this HASP. Confined spaces are defined as any space having a limited means of egress, and which is subject to the accumulation of toxic or flammable contaminants or an oxygen-deficient atmosphere. This definition includes but is not limited to tanks, silos, utility vaults, trenches over 4 feet deep, and open-topped vessels with walls greater than 4 feet high.

4.4 CONSTRUCTION HAZARDS

The principal construction safety hazards will be associated with sampling activities. When equipment is being loaded and unloaded, AGI personnel should stand clear to prevent injuries in case the load falls. AGI personnel should be aware of vehicle traffic at sites and stay out of its way; particular attention should be paid when working near the traffic lane because driver visibility in the direction of travel may be decreased. Cones, flagging, bright-orange vests, and flashing lights should be used to identify work areas and limit traffic hazards to working personnel. Traffic control personnel should be on-site when encroachment into the traffic lanes is necessary to complete work.

4.5 NOISE HAZARDS

Purging pumps may be a source of high levels of noise. Since noise levels vary for each piece of equipment, hearing protection will be provided. It is recommended that personnel utilize hearing protection while working within 15 feet of operating equipment.

5.0 SITE WORK ZONES

Three work zones, described in the following paragraphs, will be established during site activities as a contamination control measure.

5.1 EXCLUSION ZONE

The exclusion zone is the area that contains or is suspected of containing contamination. Because the site work is limited to sampling and monitoring at well locations, the exclusion zone will include only the space necessary to perform work at the site. An area having an approximate 5-foot radius should be established around each sampling location to serve as the exclusion zone during work activities. These areas will cease being exclusion zones when the well caps are replaced and the purge water is contained and sealed. No one should be allowed to enter an exclusion zone unless they have been given permission by the SSO and otherwise follow all portions of this HASP.

5.2 CONTAMINATION REDUCTION ZONE

A contamination reduction zone will be established adjacent to each exclusion zone to act as a transition area for decontamination of personnel and equipment. The contamination reduction zone is also considered a restricted area; therefore, personnel must meet training and medical surveillance qualifications.

5.3 SUPPORT ZONE

The support zone is the area considered to be uncontaminated. This area is used to stage clean equipment and other support facilities. Visitors must stay in the support zone unless proof of training and medical clearance is shown to the SSO.

6.0 PERSONNEL PROTECTION

6.1 EXCLUSION ZONES AND CONTAMINATION REDUCTION ZONES

This section describes the PPE to be worn by personnel performing field operations within site exclusion zones and contamination reduction zones. Appropriate PPE was determined using information in Sections 3.0 and 4.0. The following PPE should be worn by personnel working in a site exclusion zone or contamination reduction zone:

- ▶ Head protection - American National Standards Institute (ANSI) hard hats should be worn around heavy equipment and drill rigs, and when there is an overhead hazard.
- ▶ Eye and face protection - Safety glasses should be worn during sampling activities. When there is a high splash potential (i.e., sampling of groundwater monitoring wells), face shields should also be worn.
- ▶ Foot protection - Steel-toe and shank work boots should be worn. Work boots should be made of rubber or covers may be worn over leather workboots.
- ▶ Skin protection - Coveralls should be worn. If direct contact with contaminated material is expected, Tyvek coveralls should also be worn. If the probability of being splashed or coming in contact with wet contaminants is high, personnel should wear PVC rainsuits or Saranax-coated Tyvek coveralls.
- ▶ Hand protection - Personnel should wear two pair of chemically protective gloves during sampling activities. An inner, surgical-type glove should be worn to lessen the chance of cross contamination during decontamination activities. Outer gloves should be made of Nitrile. If necessary, heavy duty work gloves may also be worn. If work gloves are worn over chemically protective gloves, they should be considered disposable. An alternative is to wear the work gloves under the chemically protective gloves.
- ▶ Respiratory protection - If organic vapor concentrations (measured in the breathing zone) exceed sustained readings (i.e., 5 minutes) of 5 parts per million (ppm), personnel should wear National Institute of Occupational Safety and Health (NIOSH) approved, properly fitted half-face respirators. Respirators should be equipped with combination organic vapor/high efficiency particulate and aerosol (OV/HEPA) cartridges. Cartridges should be changed a minimum of once per day or more often if breakthrough is suspected. At organic vapor levels between 10 and 50 ppm measured in the breathing zone, personnel should wear full-face respirators equipped with OV/HEPA cartridge. At sustained concentrations above 50 ppm, work shall cease. Additional information concerning air monitoring is included in Section 10.0.

6.2 SUPPORT ZONES

Personnel working in the support zone, or in an exclusion zone or contamination reduction zone before or after contaminated material is present, are not required to wear protective clothing or respirators. Regular work clothing should provide adequate protection during operations in these areas. Hard hats, safety glasses, and steel-toe boots must be worn while working in the traffic lane.

6.3 SUMMARY

Levels of protective clothing have been assigned to each field task. Level D is considered general work clothing; Level C is considered general work clothing with the addition of chemically protective clothing and respirators. In some cases, personnel may wear respirators and no chemically protective clothing; this is referred to as Modified Level C protection. The levels of protection listed below may be altered based on additional information and field conditions. Final determinations concerning levels of protection will be made by the SSO and are subject to approval of the HSM. The following is a list of field tasks, and the levels of protective clothing assigned to them:

- ▶ Elevation survey - Level C or D (as determined on site).
- ▶ Collection of groundwater samples and water level data from the existing monitoring wells - Level C or D (as determined on site).
- ▶ Contain purge and decontamination water - Level C or D (as determined on site).

7.0 DECONTAMINATION PROCEDURES

To ensure contamination is controlled and not spread from the site, decontamination procedures should be employed for equipment and personnel. In addition, contact to contaminated material should be limited. Methods to achieve minimization of contamination include using plastic covers over field equipment, and limiting personnel contact rates and areas.

7.1 PERSONNEL

Personnel should don protective equipment before entering an exclusion zone and decontaminate before reentering the support zone. Decontamination should consist of the following steps:

- ▶ Wash and rinse outer clothing, boots, and gloves. A soap and water solution should be used for the wash.
- ▶ Remove outer gloves and protective clothing (if worn).
- ▶ Remove respirator and cartridge assembly; clean respirator (if worn).
- ▶ Remove inner gloves.
- ▶ Wash hands and face.
- ▶ Shower as soon as possible after leaving the site.

7.2 SAMPLING EQUIPMENT

Sampling equipment should be brought through the decontamination line with personnel and cleaned before returning it to AGI. Samples and sample coolers should be wiped down to prevent contaminating laboratory personnel. Used disposable protective equipment and decontamination water will be packaged for off-site disposal.

8.0 GENERAL SAFE WORK PRACTICES

If respiratory protection is required, a buddy system will be used. No person will be allowed to work out of sight of other personnel. This precaution will be followed to readily detect when emergency aid is required.

A first aid kit and fire extinguisher will be available when work is performed. Fire extinguishers should be within 50 feet of the work operation.

Personnel shall not eat, drink, chew gum or tobacco, smoke, or perform any other practice that increases the probability of hand-to-mouth contact in site exclusion zones or contamination reduction zones.

The use of controlled substances or alcohol is forbidden at the site. In addition, personnel shall not work at the site while under the influence of such substances.

9.0 EMERGENCY PROCEDURES

Emergency response procedures have been developed for extraordinary events that could occur during field operations. These events include injuries, chemical exposures, fires, and spills.

In general, the following actions should be implemented in the event of an emergency:

- ▶ First aid or other appropriate initial action should be administered by those closest to the accident or emergency situation. This assistance should be conducted so those giving aid are not placed in a situation of unacceptable risk.
- ▶ The AGI PM and HSM should be contacted immediately.
- ▶ A Supplementary Record of Occupational Injuries and Illnesses Form (Attachment 3) should be completed by the injured individual or witness and forwarded to the PM. The PM will review the form prior to forwarding it to the HSM. Changes to the operation should be made to prevent the same event from occurring in the future.

9.1 PHYSICAL INJURIES

If a person is physically injured or suffers a medical emergency, Red Cross first aid procedures should be followed. Depending on the severity of the injury or medical condition, emergency medical response may be sought. Contaminated clothing may need to be decontaminated and removed prior to transport to an emergency medical facility.

9.2 CHEMICAL EXPOSURES

If the injury to the worker is chemical in nature, the following first aid procedures should be followed:

9.2.1 Eye Exposures

If contaminated solid or liquid enters the eyes, they should be flushed immediately with large amounts of clean water while lifting the upper and lower eye lids occasionally. Medical attention should be obtained immediately.

9.2.2 Skin Exposures

If contaminated material contacts the skin, the affected area should be washed promptly with soap and water. If contaminated materials penetrate clothing or protective equipment, the items should be removed and affected skin areas washed. Medical attention should be obtained if symptoms warrant.

9.2.3 Inhalation

If a person breathes a large volume of potentially toxic vapors, the individual should be moved to fresh air at once. If breathing has stopped, artificial respiration should be performed. Medical attention should be obtained immediately.

9.2.4 Ingestion

If contaminated material is swallowed, medical attention should be obtained immediately and the poison control center contacted for further directions.

9.3 FIRES

Fire extinguishers should be available on site and in vehicle cabs. In case of fire at the site, the following actions should be taken:

- ▶ Evacuate personnel from the site to an upwind location.
- ▶ Notify the fire department and emergency response agencies.
- ▶ Attempt to extinguish the fire using portable fire extinguishers or by smothering (only if the fire is small).

9.4 UNCONTROLLED RELEASE OF HAZARDOUS MATERIALS

The primary considerations during a hazardous materials spill are to prevent additional personnel from entering the area, contain existing spillage, and prevent further spillage. In the event of a hazardous materials spill at the site, the following actions should be taken:

- ▶ Evacuate personnel from the area.
- ▶ Summon emergency medical or fire services if the spill involves extremely toxic or flammable materials.
- ▶ Contain the spill with absorbent booms and block off the area. Drains, sewers, etc. should be blocked to prevent material from migrating.
- ▶ Attempt to stop the flow of material from its point of origin.

9.5 EMERGENCY SERVICES

The telephone closest to the site should be located by the SSO prior to starting site work. If outside services (i.e., ambulance, fire, etc.) are required, field personnel should immediately telephone the local emergency number (911). The SSO should notify AGI at (510)238-4590 after the emergency situation has been stabilized. If medical attention is needed but the situation is not an emergency, the injured employee may be transported to the hospital by other field personnel.

9.5.1 Hospital Route

Figure A3, Hospital Route Map, shows the location of Alta Bates Medical Center with respect to the site. Driving directions are as follows:

Exit the site and drive north on San Pablo Avenue, then turn right (east) onto Ashby Avenue. Follow Ashby Avenue to the east for about 2-1/2 miles to Alta Bates Medical Center. Alta Bates Medical Center is located at 2540 Ashby Avenue (at the intersection of Ashby Avenue and Colby Street).

In cases involving severe emergencies, personnel should await emergency medical transport.

9.5.2 Emergency Telephone Numbers

The following emergency telephone numbers should be available at the site:

| | |
|----------------------------------------------------------|---------------|
| Fire | 911 |
| Ambulance | 911 |
| Paramedics | 911 |
| Police | 911 |
| Poison Control Center | 911 |
| Alta Bates Medical Center | (510)204-1303 |
| East Bay Occupational Medicine Associates | (510)351-3553 |
| AGI Health and Safety Manager (Monica Beckman, Home) . . | (206)760-1013 |



Reference: U.S.G.S. 7.5 minute Oakland West Quadrangle.

AGI
TECHNOLOGIES

Hospital Route Map
Emeryville Redevelopment Agency
4300 San Pablo Avenue
Emeryville, California

FIGURE
A3

| JOB NUMBER | DRAWN | APPROVED | DATE | REVISED | DATE |
|---------------|-------|----------|------|---------|------|
| 15,681.004.04 | DH | | | | |

10.0 AIR MONITORING AND SAMPLING

Air monitoring will be conducted during site operations having a high potential to release contaminants. Monitoring will be used to document exposure levels and confirm necessary precautions are taken to protect on-site personnel and the general public. In addition, air sampling may be performed if personnel exposures to organic vapors are suspected of exceeding established exposure limits.

Monitoring and sampling equipment will be calibrated daily in accordance with the manufacturers' requirements. Calibration data, background readings, predominant wind direction, air monitoring readings, and air sampling information will be recorded as part of the daily field logs. If instrument readings are questionable or abnormal, the HSM should be notified.

10.1 AIR MONITORING

Action levels for various instruments have been established for work at the site. The organic vapor action level is based on readings obtained with an organic vapor monitor equipped with a photoionization detector (OVM-PID). Measurements are taken in the breathing zone, which is considered to include a 1-foot radius circle from a worker's nose during normal work operations.

Since the OVM-PID measures total organic vapors and cannot readily distinguish between compounds, a conservative organic vapor action level has been established. The organic vapor action level will be a sustained (5 minutes) reading on the PID of 5 ppm above background, measured in the breathing zone. If organic vapor levels exceed 5 ppm above background, half-face respirators should be worn. If levels exceed 10 ppm above background, full-face respirators should be worn. If organic vapor concentrations exceed 50 ppm above background, work should cease and personnel will evacuate the site.

The action levels discussed above were determined to be sufficient based on a comparison of air sampling analytical results to air monitoring readings obtained using an OVM-PID or OVM equipped with a flame ionization detector (OVM-FID) during sampling. Action levels may be adjusted as additional information is obtained. AGI employees are instructed to stay outside or upwind of the exclusion zone as much as possible. Such work practices will minimize the potential for exposures above established PELs.

10.2 AIR SAMPLING

Air samples have been collected for AGI employees observing, directing, and documenting operations at hazardous waste sites to document exposure of AGI personnel to benzene and TPH. These air samples have been collected at various project locations during different phases of site operations. Analytical results received from these samples indicate no exposures to benzene above the PEL of 1 ppm measured as an 8-hour TWA at any site.

Additional air sampling may be conducted at the discretion of the AGI HSM, PM, or SSO. Air sampling should be conducted at sites potentially contaminated with substances for which air sampling has not previously been conducted. In addition, air sampling will be conducted if an overexposure situation is suspected.

Personnel air sampling of organic vapors may be conducted using 3M brand organic vapor diffusion (OVD) badges or a charcoal tube and pump assembly. For personnel sampling, the OVD badge or charcoal tube should be placed within the breathing zone of the individual with the greatest potential exposure for 8 to 10 hours. OVD badges and charcoal tubes may be exposed for shorter durations if personnel leave the exclusion zone. Upon sampling completion, the OVD badges or charcoal tubes are collected and sealed, exposure times recorded, and the badges are sent to an independent laboratory accredited by the American Board of Industrial Hygiene (ABIH) to perform industrial hygiene analysis. Personnel air samples are analyzed for benzene by National Institute for Occupational Safety and Health (NIOSH) Reference Method 1501 and for TPH by NIOSH Reference Method 1500.

11.0 TRAINING

Personnel working at the site will have received the required 40-hour training for work at hazardous waste sites in accordance with Occupational Safety and Health Administration (OSHA) regulations. Site personnel will also be up to date with respect to 8-hour annual refresher training requirements. At least one individual working at the site will be currently certified in American Red Cross First Aid and Cardiopulmonary Resuscitation (CPR) procedures. The PM will have completed 8 hours of specialized training for supervising workers at hazardous waste sites in accordance with OSHA requirements. Training records are maintained at the AGI Bellevue office by the HSM.

12.0 MEDICAL SURVEILLANCE

Employees working at the site will participate in a Medical Surveillance Program. Medical surveillance documentation is maintained at the AGI Bellevue office by the HSM; actual medical examination results are maintained by the examining physician.

Employees are given a baseline physical and annual examinations thereafter. The examining physician verifies in writing whether each individual is fit to work at hazardous waste sites and utilize protective equipment, including respirators. Additional medical examinations may be required during the course of a project if overexposure to site contaminants or an injury occurs.

The content of the medical examinations has been determined by the AGI Corporate Occupational Medical Consultant, Dr. Susan Forrest of Virginia Mason Occupational Medicine Clinic. The following are the minimum requirements of the medical surveillance examinations:

- ▶ Baseline head-to-toe examination.
- ▶ Medical history including work history, past exposures, hobbies, and family history.
- ▶ Complete blood count and blood chemistries (including liver function, kidney function, heart function, and thyroid function screening).
- ▶ Urinalysis.
- ▶ Spirometry.
- ▶ EKG (every 2 years).
- ▶ Chest X-ray (every 2 years).
- ▶ Audiogram.
- ▶ Vision acuity test.

Additional tests may be conducted at the discretion of the examining physician.

13.0 HASP MODIFICATIONS

This project HASP should be reviewed and amended when:

- ▶ Applicable regulations are revised.
- ▶ Additional information concerning site contaminants, operations, personnel, emergency services, etc. is obtained.
- ▶ Site operations are revised.

When the HASP is revised or an addenda prepared, personnel shall review the changes or addenda and file a new Field Team Review Form with the HASP.

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ATTACHMENT 1

SUBCONTRACTOR SAFETY AGREEMENT FORM

_____ (hereafter called Subcontractor) has been retained by AGI Technologies (AGI) to assist AGI with field work at 4300 San Pablo Avenue in Emeryville, California. Subcontractor has read and understands the project Health and Safety Plan (HASP). Subcontractor is aware that its employees may be exposed to potentially hazardous materials and physical hazards during the performance of work at the above-referenced site.

Subcontractor shall ensure its employees, agents, subcontractors, and other invitees to the project site comply with all applicable health and safety laws and regulations, and the most recent version their project HASP. Subcontractor is responsible for examining regulatory requirements and determining whether additional or more stringent health and safety provisions are required for their portion of work.

Authorized Signature

Printed Name

Title

Date

Completed copies of this form should be forwarded to the AGI Project Manager.

ATTACHMENT 2

...

FIELD TEAM REVIEW FORM

I have read and reviewed the most recent revision dated May 9, 1994 of the Project Health and Safety Plan (HASP) for 4300 San Pablo Avenue in Emeryville, California. I have been given a chance to ask questions regarding the Project HASP and understand the information contained therein. I agree to comply with all aspects of the Project HASP.

Name: _____

Signature: _____

Date: _____

Completed copies of this form should be forwarded to the AGI Health and Safety Manager.

:
:
:

ATTACHMENT 3

**SUPPLEMENTARY RECORD OF OCCUPATIONAL
INJURIES AND ILLNESSES FORM**

CASE NO: _____

THIS IS AN OFFICIAL DOCUMENT, BE THOROUGH AND ACCURATE.

This section to be completed by injured employee or witness:

Employer Name: AGI Technologies

Employer Address: 827 Broadway, Suite 210, Oakland, California 94607

Project Name/Location: _____

Date of Accident/Incident: _____ Time: _____

Was place of accident/incident on employer's premises? Yes(), No()

Employee Name: _____

Employee Home Address: _____

Social Security Number: _____ Age: _____ Sex: M(), F()

Occupation/Department: _____

What was being done at time of accident/incident? _____

How did the accident/incident occur? _____

Employee Signature: _____ Date: _____

This section to be completed by the Project Manager/Supervisor:

Time reported: _____ Did employee leave work? _____ When: _____

Date & time returned: _____

Nature of injury: _____ Exact body part affected: _____

Check one: Near Miss(), First Aid(), Doctor(), Hospitalized()

Doctor/Hospital Name: _____ Address: _____

Why did accident/incident occur? _____

What corrective action has been initiated to prevent recurrence? _____

Project Manager/Supervisor Signature: _____ Date: _____

**SUPPLEMENTARY RECORD OF OCCUPATIONAL
INJURIES AND ILLNESSES FORM (CONTINUED)**

CASE NO: _____

THIS IS AN OFFICIAL DOCUMENT, BE THOROUGH AND ACCURATE.

This section to be completed by Health and Safety Manager:

Concur with action taken? Yes(), No();Remarks: _____

Health and Safety Manager Signature: _____ Date: _____