Pacific Gas and Electric Company

Repair Facility
4525 Hollis Street
Emeryville, CA 94608-2999
510/649-3350

January 18, 1994

Ms. Susan Hugo
Alameda County Department of Health Services
80 Swan Way
Oakland, CA 94621

Dear Ms. Hugo:

Enclosed is a written report detailing a Subsurface Investigation at the Emeryville Materials Facility former above ground oil storage tank area. The report represents a description of soil samples and the results of the study done in October of 1993.

The soil beneath the former tanks consist of sand, clayey sand, silt and clay. Groundwater was not encountered to a depth of 9 feet. PCB's are Aroclor 1260 up to concentrations of 385 mg/kg. Total extractable petroleum hydrocarbons are present at concentrations ranging from 640 to 16,000 mg/kg. A water sample collected from well MW4 did not contain detectable levels of PCB's, TEPH or BTEX.

It is our recommendation that this investigation be expanded to include groundwater in the near vicinity. A work plan has been prepared for the next investigative phase, and is being submitted to you under a separate cover. Should you have any questions please contact Frederick F.Flint, Project Manager, at (510)866-5808 or Melvin G. Byrd at (510)649-3340.

Sincerely,

Melvin G. Byrd
Environmental Coordinator

cc: Michelle Boscoe
Fred Flint

TES

Work Plan for the
Groundwater Investigation
of Emeryville Materials Facility
Emeryville, California

Prepared by
Land and Water Quality Unit

Prepared for
Central Repair and Recovery Services
Pacific Gas and Electric Company

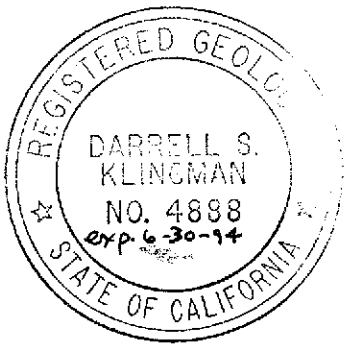
January 11, 1994

Pacific Gas and Electric Company
Technical and Ecological Services
3400 Crow Canyon Road, San Ramon, California 94583

Prepared by:

Frederick F. Flint
Contract Hydrogeologist

Approved by:



Darrell S. Klingman
Registered Geologist

David A. Gilbert
Senior Engineer

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INTRODUCTION

This work plan presents a proposal to conduct a groundwater investigation in the vicinity of four former transformer oil storage tanks located within PG&E's Emeryville Materials Facility. The facility is located at 4525 Hollis Street in the city of Emeryville (Figure 1).

The purpose of this investigation is to assess the possible presence of materials associated with transformer oil storage in the subsurface soils and groundwater in the vicinity of the tanks at the facility.

The primary activities addressed in this work plan include the collection of subsurface soil and groundwater samples and the submittal of selected samples for chemical analyses. This information should identify the impact to groundwater by past transformer oil storage operations and will determine the need for further corrective action activities. This work plan presents a description of all activities proposed in this site investigation including the procedures which will be followed during the field activities. Plans addressing health and safety, waste disposal and quality assurance are also included.

BACKGROUND

The Emeryville Materials Facility was constructed in the early 1920's and has served as a warehouse, repair shop and storage yard. Transformers, capacitors, oil circuit breakers and other miscellaneous equipment used in the electrical transmission and distribution system are brought to the facility for repair and storage.

A tank farm used to store transformer oil was located along the western edge of the property adjacent to 53rd Street. This corner of the property contains a lowered concrete pad (40' x 40') which supported four above-ground storage tanks and a pump which was used for oil transfer. Three of the tanks had a capacity of 10,000 gallons each while the fourth had a capacity of 11,000 gallons. The tanks, pump, and concrete pad have been removed.

A preliminary investigation was performed in October 1993 to determine if polychlorinated biphenyls (PCBs) and total extractable petroleum hydrocarbons (TEPH) are present in subsurface soils within the former above-ground tank containment area. PCBs were detected at concentrations up to 385 mg/kg at a depth of 3.0–4.5 feet, and TEPH were detected at concentrations up to 16,000 mg/kg at a depth of 7.5 to 9.0 feet. Groundwater was not encountered in any of the soil borings to a depth of 9 feet. A nearby groundwater well was sampled and analyzed for PCBs, TEPH and BTEX; none of these compounds were detected. Results of the preliminary investigation are presented in TES report No. 402.331-93.41, entitled, "Investigation of Subsurface Soils at Emeryville Materials Facility, Emeryville, California." An

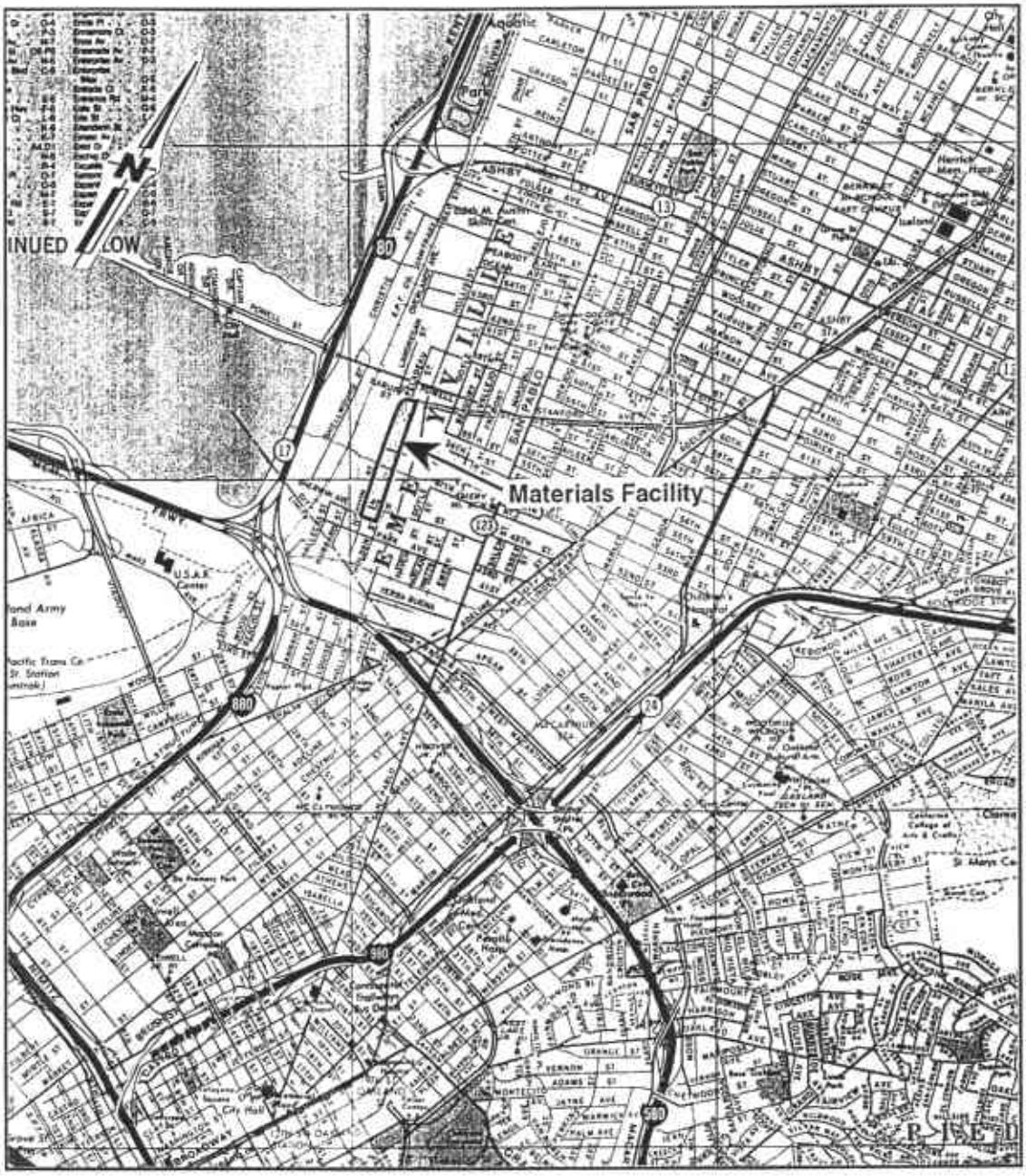

Figure 1. Location map of Emeryville Materials Facility.

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assessment of the facility was conducted in 1984 by Ecology and Environment. Soil borings and monitoring wells were installed throughout the site (E&E 1984).

SITE DESCRIPTION

Location and Land Use

The Emeryville Materials Facility is located between Hollis and Holden streets and extends from an area south of 45th Street to the railroad right-of-way property located north of 53rd Street (Figure 2). The property occupies approximately 16.5 acres and is used as materials storage and supply yard for PG&E. Land use in the near vicinity is industrial.

The site was constructed on artificial fill about three to four feet above the natural ground surface at an elevation of approximately 20 feet above mean sea level (USGS 1980). The nearest drainage is Temescal Creek, an intermittent creek which flows west through the property toward San Francisco Bay. In the vicinity of the site, Temescal Creek flows through an underground culvert. San Francisco Bay is located approximately one-half mile west of the site (Figure 3).

Geologic Setting

The facility is located in lowland area along the eastern shore of San Francisco Bay. The Bay is a flooded river valley in a northwest trending structural trough formed in Franciscan bedrock. Tectonic forces in place during the Pleistocene epoch (approximately 2 million years ago) created the San Francisco Bay depression as the Oakland/Berkeley hills were undergoing uplift. Erosion and deposition of material from the Oakland/Berkeley hills created coalescing alluvial fan deposits along the east shore of the bay.

Alluvial deposits along the East Bay margin include:

- Pleistocene alluvial fan deposits consisting of silty and sandy clays with gravely lenses which grade laterally into margin sediments.
- Upper Pleistocene Merrit sand consisting of fine grained lenticular sands and silty sands that occur irregularly and vary in thickness from a few inches to 65 feet.
- Late Pleistocene to Holocene alluvial deposits consisting of interbedded clayey gravels, sand and silty clays, and sand-silt-clay mixtures that grade laterally into Merrit sand.
- Holocene stream deposits.

Generally, Pleistocene alluvial fan material is termed Alameda formation and the Late Pleistocene sands and alluvium are termed the Temescal formation (Radbruch 1957). Classification of these alluvial units into stratigraphic formations are subject to interpretation.

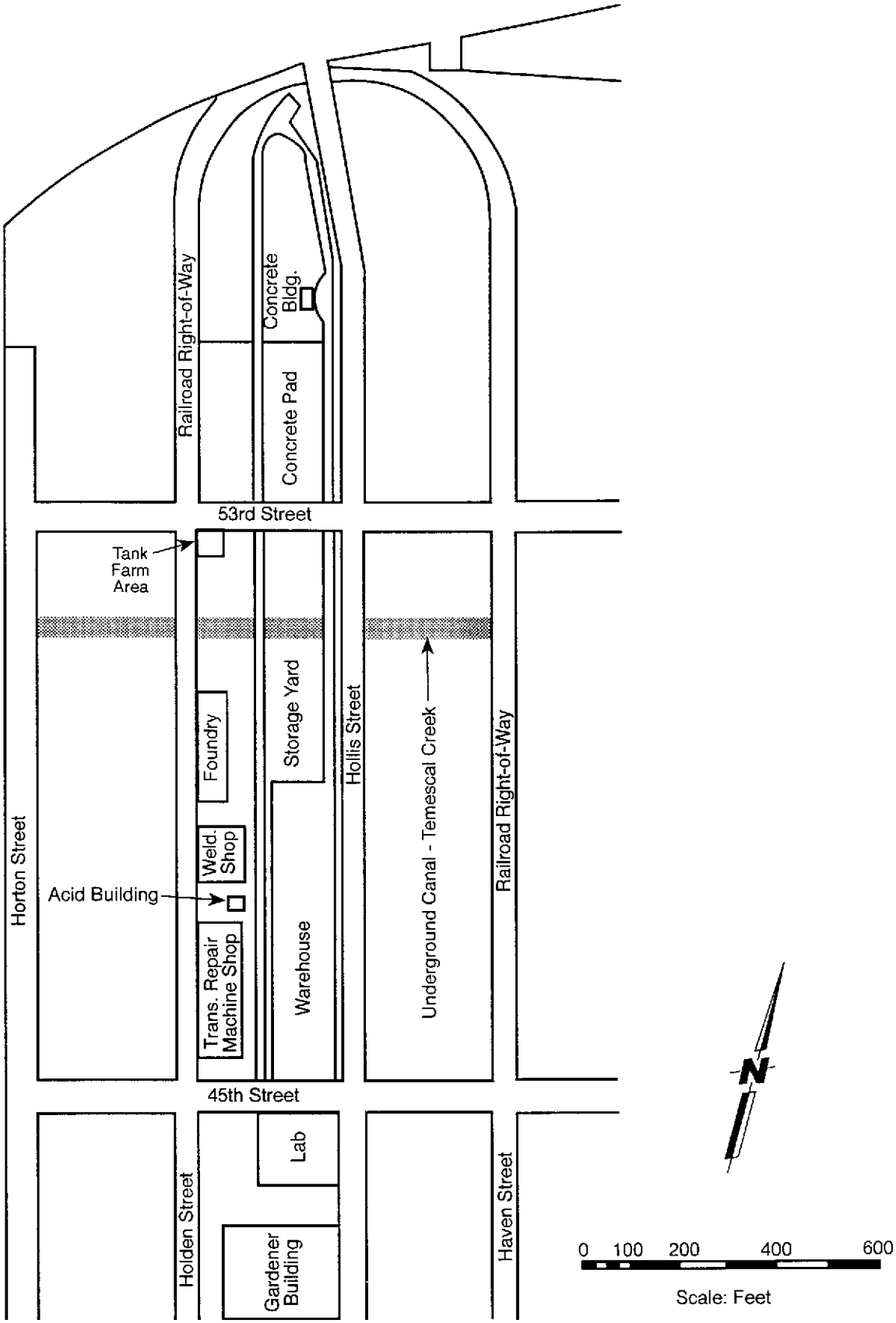

Figure 2. Site plot plan, Emeryville Materials Facility.

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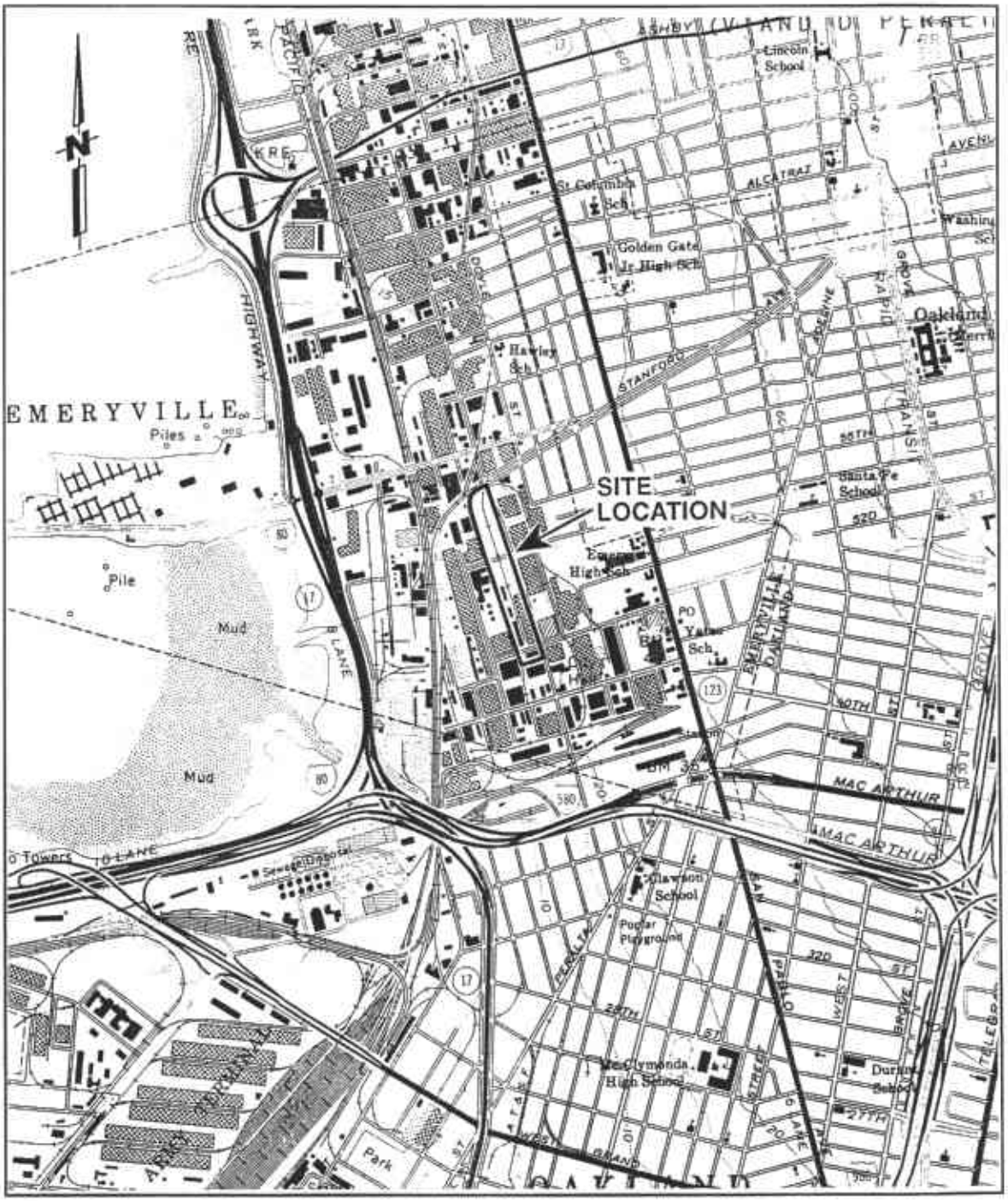

USGS Quadrangle Oakland West

Figure 3. Topographic map of Emeryville Materials Facility.

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Previous investigations indicate that the facility is underlain by approximately 3–4 feet of fill. This fill is underlain by Pleistocene alluvial fan deposits consisting of thick sequences of silty and sandy clay with thinly interbedded and discontinuous gravel lenses.

Shallow groundwater occurs at an elevation of about 6 to 8 feet above sea level, 12.5 to 14.5 feet below ground surface. General groundwater flow direction is anticipated to be westerly toward the bay shoreline.

PROPOSED SITE INVESTIGATION

OVERVIEW

The purpose of the proposed site investigation is to assess the subsurface soils and groundwater in the vicinity of the former tank containment area for the presence (or absence), and distribution of chemicals historically stored in the above-ground tanks. The objective of this investigation will be to collect and analyze soil and groundwater samples from four soil borings for monitoring wells located adjacent to the above-ground tank farm and to determine if further corrective actions are warranted at the site.

Personnel And Procedures

All work described in this work plan will be performed under the supervision of a California Registered Geologist. An experienced geologist will log the borings, collect subsurface samples, oversee installation and development of the monitoring wells, and coordinate delivery of the soil and groundwater samples to a State of California-certified analytical laboratory.

Exploratory Soil Borings

The presence of PCBs and TEPH in the subsurface soils near the tank site will be assessed by sampling and analyzing soil samples from four boreholes. Proposed boring locations are shown in Figure 4. All borings will terminate 10 feet past the first indication of water. A detailed description of borehole advancement and soil sampling procedures is presented in Appendix A.

Monitoring Wells

Monitoring wells will be installed in each soil boring described above and shown in Figure 4. The proposed monitoring wells will be utilized to characterize groundwater elevation and flow direction and determine if PCBs or TEPH is present in the uppermost water-bearing zone. At least two downgradient and one upgradient monitoring wells will be installed to characterize groundwater quality. A previous study has determined that depth to groundwater is approximately 14 feet below the ground surface and that the groundwater gradient is to the west (E&E 1984). All borings will be drilled to 10 feet below groundwater, however, if a laterally extensive clay layer exists below the water table, which is at least 5 feet in thickness and does not appear to contain petroleum hydrocarbons, the wells will be terminated 1 to 2 feet into the clay. Monitoring well installation procedures are outlined in Appendix B. Appendix C presents procedures which will be followed for groundwater level measurements and groundwater sample collection.

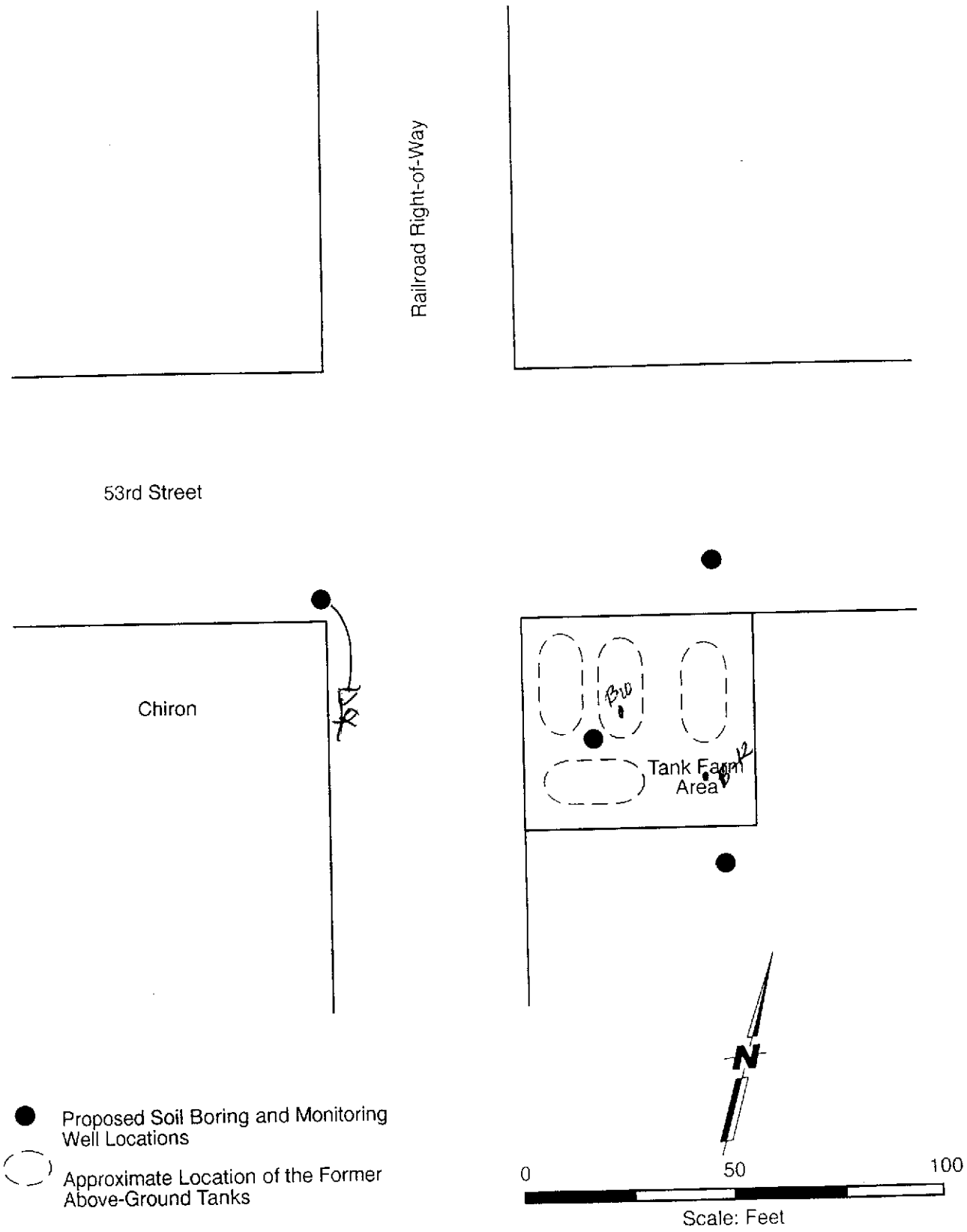

Figure 4. Proposed soil boring and monitoring well locations, Emeryville Materials Facility.

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Analytical Procedures

Selected soil samples, including a sample taken near the top of the saturated zone in each borehole, will be tested for PCBs using EPA Method 8080, BTEX using EPA Method 8020, and TEPH using EPA Method 3510/8015. Groundwater samples will be collected from each monitoring well and analyzed for PCBs, BTEX and TEPH using EPA Methods 8080, 602, and 3510/8015, respectively. Soil and groundwater samples will be submitted under proper chain-of-custody to Sherwood Labs (a state of California-certified laboratory located in Hilmar) for chemical analyses.

QUALITY ASSURANCE/QUALITY CONTROL AND CHAIN-OF-CUSTODY PROCEDURES

Quality control and quality assurance procedures will be carefully followed to ensure a successful sampling program and valid test results.

Quality Assurance/Quality Control

Quality assurance samples will be used to evaluate the quality and accuracy of data obtained from the field program. Established QA/QC procedures for the laboratory will include sample custody procedures, analyses of matrix spikes and method blanks, data reduction, verification of raw analytical data, and maintenance of control charts to monitor analytical performance. These procedures are outlined in the laboratory's Quality Assurance/Quality Control Plan and Standard Operating Procedures which are available upon request. Organic chemical analyses will be performed in conformance with the standard procedures established by the EPA in "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" (40 CFR Part 136, October 1984).

Chain-of-Custody

Chain-of-custody procedures will be used to identify and ensure the traceability and integrity of the samples collected. These procedures also will be used to document the handling and shipping procedures of the samples. The procedures will trace the samples from collection, through all custody transfers, and finally to the storage facility or the analytical laboratory, where the laboratory's internal procedures will govern until final disposition of the samples. This information will be recorded on the chain-of-custody form, which will remain with the samples at all times. The chain-of-custody forms will be used for a packaged lot of samples (i.e., information on more than one sample will be recorded on a single form). If all the samples in a given lot cannot be recorded on a single chain-of-custody form, additional forms will be used and sequentially numbered indicating the total number of pages (e.g., page 2 of 4).

Health and Safety Plan

Guidelines and procedures for field operations have been prepared to protect the work crew and the public. Details of the Health and Safety Plan are included in Appendix D. In event of emergency, directions are provided for contacts in Appendix E.

WASTE DISPOSAL PLAN

This section provides guidelines for handling potentially contaminated materials generated during the field portion of this investigation.

All soils generated during soil boring and well installation will be stored in approved 55-gallon Department of Transportation (DOT) drums. All drums will remain on site until analytical results are returned from the laboratory. Soils will be appropriately disposed of based on the analytical results.

All drilling equipment will be steam cleaned between boreholes. The water collected during steam cleaning, as well as water removed from the wells during development and sampling, will be stored on site in sealed DOT 55-gallon drums. All drummed liquids will be sampled and properly disposed of based on analytical results.

California Uniform Hazardous Waste manifests will be completed by PG&E as required for the transport and disposal of any hazardous waste that may be generated during the investigation. Disposal of all wastes will be conducted in accordance with federal, state, and local regulations.

PRELIMINARY EVALUATION AND INVESTIGATION REPORT

Upon completion of the investigation, a report will be prepared to document all test methods, procedures, and results, as well as present geologic logs generated from soil boring and sampling. The hydrogeology and chemical characteristics at the uppermost water bearing zone in the vicinity of the former above-ground tank containment area will be described. Formal laboratory reports will be appended to the report.

SCHEDULE

The proposed investigation will be initiated upon management and regulatory approval of this work plan and receipt of necessary permits and encroachment agreements. Field work will be scheduled based on drill rig availability and weather conditions. Soil boring and well installation is estimated to take four working days and will be initiated after underground utilities are properly identified in all proposed drilling locations. Laboratory results should be available within three-to-four weeks of sample collection. The preliminary evaluation and investigation report will be submitted approximately 10 weeks following the commencement of field activities.

REFERENCES

Radbruch, Dorothy H., 1957, Areal and Engineering Geology of the Oakland West Quadrangle, California, United States Geological Survey Miscellaneous Geologic Investigation Map I–239, USGS, Washington D.C.

United States Geological Survey. 1980 7.5 minute Quadrangle. Oakland West, California.

Ecology & Environment, 1984, Site Investigation of the Pacific Gas & Electric Company Materials Distribution Center in Emeryville, California, San Francisco.

Appendix A

BOREHOLE ADVANCE AND SAMPLING PROCEDURES

BOREHOLE ADVANCE AND SAMPLING PROCEDURES

Boreholes for exploratory soil sampling and monitoring well installation will be drilled using a truck-mounted drill rig equipped with 8-inch hollow-stem augers. No fluids will be added to the boreholes during the drilling operations. Borehole logging and sampling will be conducted by a PG&E, Technical and Ecological Services contract hydrogeologist, under the supervision of a State of California Registered Geologist.

The soil samples will be visually described and logged by the on-site geologist. Soil descriptions will include Unified Soil Classification System (ASTM D-2487-83), color, moisture content and density (in relative terms), and the results of any field tests (e.g., photoionization meter readings). Soil samples from all of the borings will be obtained at intervals of five feet or less and from the bottom of the hole. Soil samples will be taken from the boring with a 2.0 or 2.5-inch I.D. split spoon sampler containing three 6-inch brass tube liners. The sampler will be driven 18 inches into the undisturbed soil beyond the tip of the lead auger using a 140-pound safety hammer with a 30-inch drop. Prior to the drilling of each borehole, the hollow-stem augers, drill bit, and drill rods will be steam cleaned.

The split spoon sampler and brass tube liners will be thoroughly washed with a trisodium phosphate (TSP) solution and rinsed with distilled water between each sampling to avoid cross contamination of samples. The drive samples will be retained in the brass liners, capped with polyethylene lids, sealed with adhesive tape, and placed on ice. Each soil sample will be labeled with at least the site locations, borehole I.D. number, depth, date and time, and initials of the field geologist.

Appendix B

MONITORING WELL INSTALLATION PROCEDURES

MONITORING WELL INSTALLATION PROCEDURES

Once the hollow-stem augers have been advanced to the desired depth for monitoring well installation, the depth to the bottom of the hole will be measured inside the augers to ensure that it is free of slough or heaving sand. The monitoring well casing will then be lowered into the hollow-stem augers and the annular space between the borehole and screened portion of the well will be backfilled with sand as the augers are withdrawn. Factory-perforated, threaded, PVC screen (2-inch diameter, 0.020-inch slot, Schedule 40) will be installed from the bottom of the borehole just above the highest anticipated groundwater level. Blank, threaded, PVC casing will be installed from the top of the screen to the ground surface. The bottoms of the casing in each well will be fitted with threaded end plugs and the tops will be sealed with lockable, water-tight caps. The annular space between the borehole and the casing will be filled with filter pack of clean sand of an appropriate grain size (e.g., Lonestar No. 3 sand). Due to the anticipated shallow depth to groundwater (14 feet in a nearby on-site well), well completion depth will be determined in the field. The placement of the filter pack above the well screen, bentonite plug, and cement seal will be designed to provide maximum protection to the groundwater from surface infiltration. The top of each well will be completed and secured with a watertight security traffic box. A tag with the well number, well type, depth of well, perforated intervals, and well diameters will be attached to the interior of the well cover. The well cover will be set flush with, or slightly higher than, the adjacent surface in paved areas. Figure B-1 shows a typical monitoring well installation.

The monitoring wells will be developed by mechanical means using a vented surge block. Development will occur at least 72 hours after installation of the well. Development will continue until the well discharged water is relatively free of sand and silt. It is estimated that each well will produce 10 well volumes of water during development.

CARBON DIOXIDE, DRY CHEMICAL OR FOAM. DO NOT USE A SOLID STREAM OF WATER SINCE THE STREAM WILL SCATTER AND SPREAD THE FIRE. USE WATER SPRAY TO COOL FIRE-EXPOSED TANKS/CONTAINERS.
--------- SPECIAL FIRE FIGHTING INSTRUCTIONS ----------
FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING WHEN FIGHTING FIRES INVOLVING MINERAL OIL.**FLASH POINT VARIES WITH GRADE. VALUES RANGING FROM 270DEG.F-444DEG.F HAVE BEEN INDICATED.
---------- OTHER TEXT ----------

*** SECTION 5 HEALTH HAZARD INFORMATION ***

---------- EXPOSURE LIMITS ----------

8 HR 5.0000 MG/M3

---------- COMMENTS ----------
TLV 5.0 MG/M(3)
FUMES OR MISTS OF MINERAL OIL ARE IRRITATING TO THE EYES, MUCOUS MEMBRANES, AND UPPER RESPIRATORY TRACT AND CAN CAUSE HEADACHE, DIZZINESS AND/OR DROWSINESS IF EXPOSURE IS EXCESSIVE. PROLONGED INHALATION OF FUMES CAN RESULT IN LIPOID PNEUMONIA. IF SPLASHED IN THE EYES, MINERAL OIL MAY CAUSE IRRITATION. REPEATED AND/OR PROLONGED CONTACT WITH THE SKIN MAY CAUSE IRRITATION AND/OR DERMATITIS. INGESTION OF MINERAL OIL MAY PRODUCE A CATHARTIC EFFECT (NAUSEA, VOMITING, AND DIARRHEA). ASPIRATION OF MINERAL OIL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONIA. MINERAL OILS ARE SUSPECTED CARCINOGENS OF THE SKIN AND SCROTUM, LARYNX, LUNG AND ALIMENTARY TRACTS. "MINERAL OIL" IS A NAME APPLIED TO MANY MATERIALS. CAS #8002-05-9 COVERS SEVERAL DIFFERENT TYPES WHICH ARE LISTED AS ANIMAL CARCINOGENS BY IARC. CHECK WITH YOUR SUPPLIERS.

---------- ROUTES OF ENTRY ----------

---------- SYMPTOMS OF EXPOSURE ----------

---------- TOXICITY DATA ----------

---------- HEALTH HAZARDS ----------

---------- EMERGENCY FIRST AID ----------
EYE CONTACT: PROMPTLY FLUSH EYES INCLUDING UNDER EYELIDS WITH RUNNING WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.*
SKIN CONTACT: WASH EXPOSED AREA WITH SOAP AND WATER.
INHALATION: REMOVE VICTIM TO FRESH AIR. RESTORE AND/OR SUPPORT BREATHING AS NEEDED. GET MEDICAL HELP.*
INGESTION: CONTACT A PHYSICIAN OR POISON CONTROL CENTER. DO NOT INDUCE VOMITING. IF VOMITING OCCURS, ASPIRATION OF MINERAL OIL MAY RESULT.
---------- MEDICAL AGGRAVATIONS ----------

---------- NOTES TO PHYSICIAN ----------

*** SECTION 6 REACTIVITY ***

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
COND. TO AVOID (STAB.):
AS A COMBUSTIBLE HYDROCARBON, MINERAL OIL MAY REACT VIOLENTLY WITH STRONG OXIDIZING AGENTS.

COND. TO AVOID (POLY.):
INCOMPATIBLE MATERIALS:

HAZARDOUS DECOMPOSITION:
THERMAL DECOMPOSITION OR BURNING MAY PRODUCE CARBON MONOXIDE.

*** SECTION 7 SPILL OR LEAK PROCEDURES ***
- STEPS TO BE TAKEN IN CASE OF SPILL, LEAK OR RELEASE -
NOTIFY SAFETY PERSONNEL OF LARGE SPILLS OR LEAKS. REMOVE ALL SOURCES OF HEAT AND IGNITION. PROVIDE MAXIMUM EXPLOSION-PROOF VENTILATION. EVACUATE ALL NONESSENTIAL PERSONNEL FROM THE AREA. THOSE INVOLVED IN CLEANUP NEED PROTECTION AGAINST INHALATION OF FUMES OR MIST AND CONTACT WITH THE LIQUID. ABSORB SMALL SPILLS ON PAPER TOWEL OR VERMICULITE AND PLACE IN A CLOSED CONTAINER FOR DISPOSAL. DIKE LARGE SPILLS AND COLLECT FOR RECLAMATION OR DISPOSAL. MOP UP RESIDUE WITH SOAP AND WATER. USE CAUTION WHEN PICKING UP SPILLS SINCE FLOOR MAY BE SLIPPERY. DO NOT FLUSH TO SEWER. KEEP OUT OF WATERSHEDS AND WATERWAYS.
---------- WASTE DISPOSAL METHOD ----------
PLACE IN A SUITABLE CONTAINER FOR LICENSED CONTRACTOR, BURN IN AN APPROVED INCINERATOR OR LANDFILL FOLLOW ALL FEDERAL, STATE AND LOCAL REGULATIONS.

*** SECTION 8 SPECIAL PROTECTION INFORMATION ***
---------- VENTILATION ----------
GENERAL VENTILATION IS ADEQUATE FOR THIS HIGH-BOILING MATERIAL, EXCEPT WHEN IT IS HEATED OR MISTED. WHEN FUMES OR MISTS ARE PRESENT, LOCAL EXHAUST VENTILATION IS NEEDED TO MEET THE ACGIH TLV OF 5 MG/M(3). FOR EMERGENCY OR NONROUTINE EXPOSURES WHERE THE TLV MAY BE EXCEEDED, USE AN APPROPRIATE NIOSH-APPROVED RESPIRATOR. ALL ELECTRICAL SERVICE IN USE OR STORAGE AREAS SHOULD HAVE AN EXPLOSION-PROOF DESIGN.
---------- OTHER TEXT ----------
VISCOSITY @ 100DEG.F 39.2 SSU*
VISCOSITY @ 100DEG.F 39.2 SSU*
TO PREVENT SKIN CONTACT, WEAR IMPERVIOUS GLOVES AND, IF NECESSARY, OIL-IMPERVIOUS CLOTHING. WEAR SAFETY GLOVES WITH SIDE SHIELD, SPLASH GOGGLES, OR FACE SHIELD TO PREVENT CONTACT WITH THE EYES. REMOVE CONTAMINATED CLOTHING PROMPTLY AND DO NOT REUSE UNTIL IT HAS BEEN PROPERLY LAUNDERED.
EYEWASH STATIONS AND SAFETY SHOWERS SHOULD BE AVAILABLE IN USE AND HANDLING AREAS.
CONTACT LENSES POSE A SPECIAL HAZARD; SOFT LENSES MAY ABSORB AND ALL LENSES CONCENTRATE IRRITANTS.

---------- PERSONAL PROTECTIVE EQUIPMENT - EYE -------

--------- PERSONAL PROTECTIVE EQUIPMENT - GLOVES ------

------- PERSONAL PROTECTIVE EQUIPMENT - RESPIRATOR ----

-------- PERSONAL PROTECTIVE EQUIPMENT - FACE ---------

--------- PERSONAL PROTECTIVE EQUIPMENT - SKIN --------

--------- PERSONAL PROTECTIVE EQUIPMENT - OTHERS ------

------------------ HYGIENIC PRACTICES -----------------

*** SECTION 9 SPECIAL PRECAUTIONS ***
------------ STORAGE AND HANDLING CONDITIONS ----------
STORE IN CLOSED CONTAINERS IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM STRONG OXIDIZING AGENTS. PROTECT CONTAINERS FROM PHYSICAL DAMAGE.
------------------ OTHER PRECAUTIONS -----------------
USE ONLY WITH ADEQUATE VENTILATION. AVOID INHALATION OF FUMES OR MISTS AND REPEATED OR PROLONGED CONTACT WITH THE SKIN. DO NOT EAT OR SMOKE IN USE OR HANDLING AREAS.
FOLLOW GOOD HOUSEKEEPING AND PERSONAL HYGIENE PRACTICES WHEN HANDLING THIS MATERIAL.
---------------------- OTHER TEXT ----------------------

*** SECTION 10 PRECAUTIONARY L

Appendix E

EMERGENCY CONTACTS AND PROCEDURES

EMERGENCY CONTACTS AND PROCEDURES

Contacts: Should any situation or unplanned occurrence require outside or support services, the appropriate agency shall be contacted.

Agency	Person to Contact	Telephone
Police	Dispatcher	911
Fire	Dispatcher	911
Ambulance	Dispatcher	911
Hospital* Summit Hospital 350 Hawthorne Avenue, Oakland	Dispatcher	(510) 655-4000
PG&E Project Coordinator Emeryville Materials Facility	Mel Byrd	(Work) (510) 649-3340
PG&E Project Manager and On-site Safety Officer	Fred Flint	(Work) 510-866-5808 (Home) 510-680-4394
PG&E Supervising Geologist	Darrell Klingman	(Work) 510-866-5883 (Home) 209-835-0818

* Direction to the hospital: See Map, Figure E-1.

Procedures: In the event that an emergency develops on-site, the procedures described below are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on-site; or,
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following emergency procedures should be followed:

1. The on-site Safety Officer will establish emergency evacuation routes and will make all project personnel aware of these routes prior to the first on-site activities. In the event of an emergency, selection of the emergency route will be based on the nature of the emergency and wind direction.
2. In the event that any member of the field crew experiences any adverse effects or symptoms of exposure while on-site, the entire field crew shall immediately halt work and act according to the instructions provided by the on-site Safety Officer.
3. The discovery of any condition that would suggest the existence of a situation more hazardous that anticipated shall result in the shut down of activities and evacuation of the field team and re-evaluation of the hazard and the level of protection required.

One of two designated routes to Summit Hospital in Oakland will be used in the case of an emergency or the need for immediate medical treatment. The on-site Safety Officer will determine if an ambulance is required or if the person(s) requiring medical aid can be transported by PG&E personnel. Professional medical transport will be used in cases of unknown or obvious immediate medical attention. Figure E-1 shows the preferred and alternate emergency routes to the hospital.

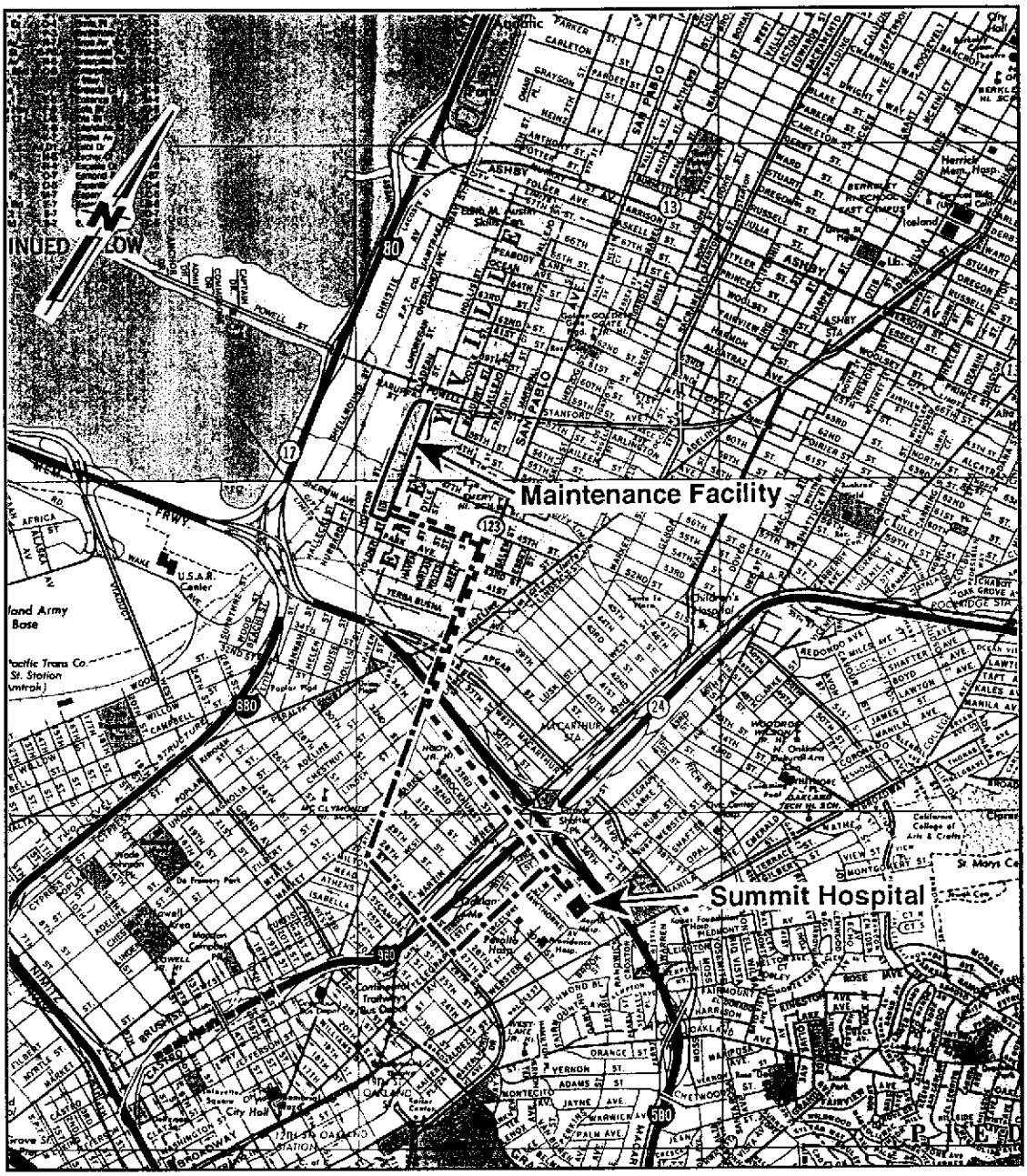

Figure E-1. Emergency route to Summit Hospital (primary & secondary route).

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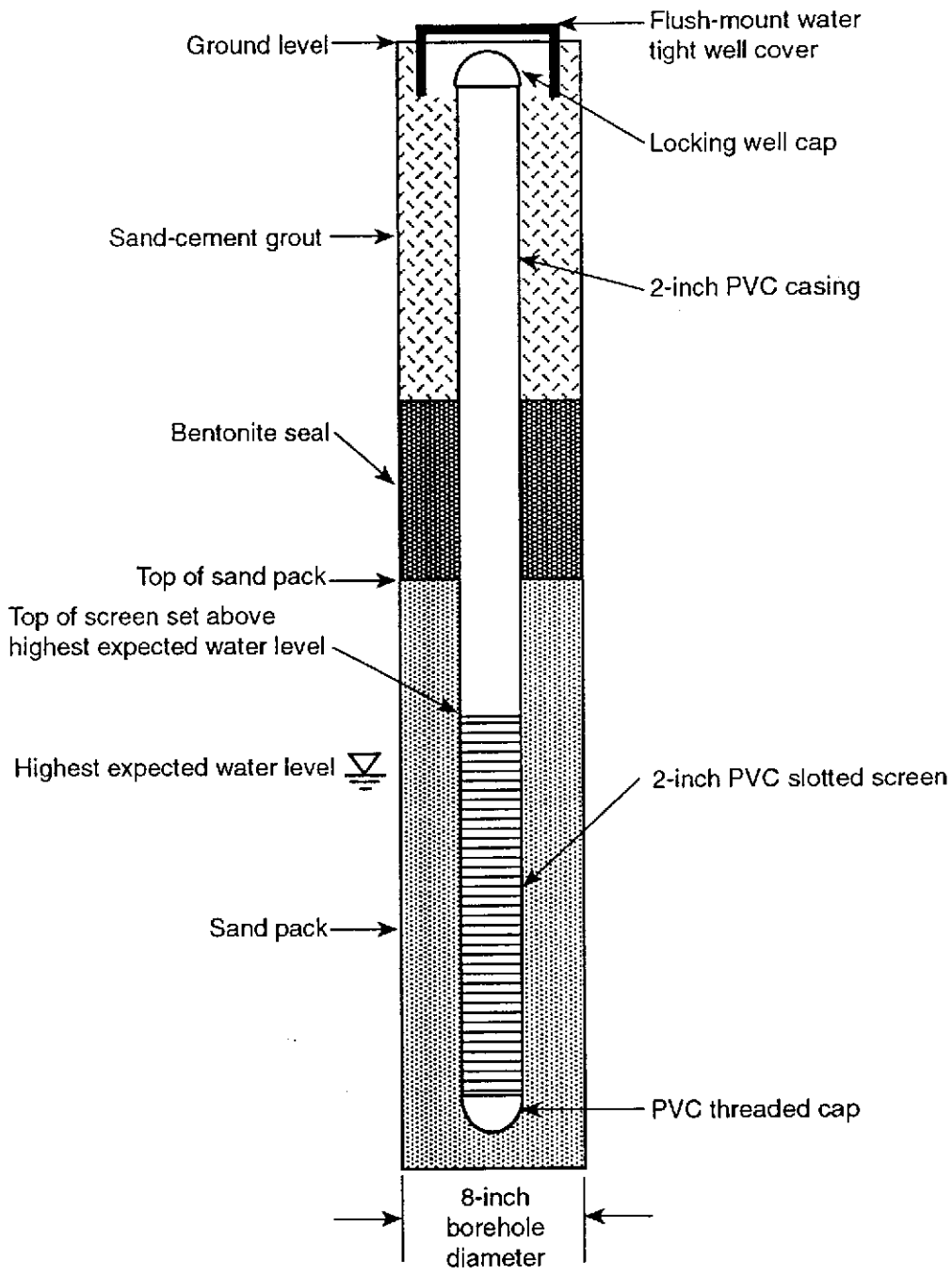

Figure B-1. Diagram of typical monitoring well construction.

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Appendix C

WATER SAMPLING PROCEDURES

WATER SAMPLING PROCEDURES

Before purging or sampling, the depth to water (using a well sounder) and floating product thickness, if present, (using an interface probe or clean bailer) in the monitoring wells will be measured and recorded. Groundwater in the monitoring wells will be sampled according to the following methodology:

1. Prior to sampling, each well will be purged until at least three well volumes have been removed or until conductivity, pH, and temperature have stabilized. If the well is evacuated during purging, the water level will be allowed to recover to 80 percent of the initial static level before samples of the groundwater are collected.

2. Groundwater samples will be collected using a clean disposable bailer. The bailer will be cleaned between wells to avoid cross contamination of the samples. The bailer line will be replaced between well samplings.

3. Samples will be transferred from the bailer to appropriately prepared 40-ml VOA vials and 1-liter bottles with caps that have Teflon septums. Care will be taken when transferring the water from the bailer to the containers to avoid turbulence and bubbling as much as possible. The containers will be filled and capped so that no air bubbles are trapped. Each sample container will be labeled with the following information: Sample Identification (i.e., well number), Site Location, Date, Time, and Initials of the person collecting the sample. Samples will then be placed on ice and chilled to less than 4°C.

Appendix D

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

PG&E is dedicated to ensuring that its employees and contractors work within a safe and healthy environment at potentially hazardous sites. All field personnel working on the project will be SARA-trained in a Hazardous Waste Site Operations 40-hour training class and 8-hour annual refresher. This Health and Safety Plan is prepared in accordance with OSHA regulations contained in 29 CFR 1910.120 and will be implemented during the soil sampling portion of the subsurface investigation described in this work plan. The requirements, specifications, and procedures presented in this plan will apply to all personnel working in the exclusion zone, including employees, contractors, subcontractors, site visitors, and regulatory agency personnel.

Key Personnel

The Site Safety Coordinator/Project Manager will train site personnel in the use of safety and personal protection equipment and will manage the on-site monitoring program. The Site Safety Coordinator/Project Manager will have the authority to deny access to any individual without the proper training or protective equipment required for the site conditions or individuals disregarding site safety procedures. All site personnel will be under the direction of the Site Safety Coordinator/Project Manager. The Site Safety Coordinator/Project Manager for this project at PG&E's Emeryville Materials Facility is Fred Flint (work telephone number 510-866-5808).

Hazard Analysis

The activities addressed by this health and safety plan include subsurface soil collection to depths of approximately 25 feet below the existing ground surface. Although exposure at hazardous levels are unlikely, these activities could expose workers to potentially hazardous materials via dermal contact and inhalation.

The most significant risks associated with polychlorinated biphenyls are dermal absorption and ingestion with inhalation risk minimized due to low volatility of the compounds. Skin contact will be eliminated by use of clothing and gloves. The inhalation hazard will be minimized by use of appropriate respiratory protective devices as determined by on-site air monitoring using a photoionization detector (PID) calibrated with isobutylene gas (100 ppm).

Site Security

The Site Safety Coordinator/Project Manager will establish an exclusion zone around the work area. Restricted activities inside the exclusion zone may be allowed depending on the results of field measurements taken during the course of the activities. Access within this zone will be limited to authorized personnel. All personnel and authorized visitors must contact the Site Safety Coordinator/Project Manager prior to entering and exiting the exclusion zone.

Current enforceable and recommended exposure limits for potential site contaminants are presented in Table A-1. The attached Material Safety Data Sheets present additional hazard information on these compounds.

Table A-1

Hazard Exposure Guidelines
Emeryville Materials Facility
Emeryville, California

Compound	CAL OSHA PEL	1992-93 ACGIH TLV
Mineral oil	none	none
Benzene	1 ppm (TWA) 5 ppm (STEL)	10 ppm (TWA)
Toluene	100 ppm (TWA) 150 ppm (STEL)	100 ppm (TWA) 150 ppm (STEL)
Ethylbenzene	100 ppm (TWA) 125 ppm (STEL)	100 ppm (TWA) 125 ppm (STEL)
Xylenes	100 ppm (TWA) 150 ppm (STEL)	100 ppm (TWA) 150 ppm (STEL)
Polychlorinated biphenyls	1 mg/m^3 (TWA)	1 mg/m^3 (TWA)

Notes: 1. Table includes possible contaminants which may be encountered based on available information.

2. CAL OSHA = California Occupational Safety and Health Administration.

ACGIH = American Conference of Governmental Industrial Hygienists.

PEL = Permissible Exposure Limit.

TLV = Threshold Limit Values.

TWA = Time Weighted Average (8-hour).

Personal Protective Equipment

A minimum of U.S. EPA Level D protection will be required within the exclusion zone for any workers engaged in sample collection or other similar activities. Level D protection will include:

1. Hardhat
2. Boots with steel toe
3. Chemical-resistant inner and outer gloves (when workers handle soil samples or sampling equipment).
4. Disposable Tyvek coverall (when workers handle soil samples or sampling equipment).

Level C protection will be required if organic vapor measurements (OVMs) exceed 50 ppm in the worker's breathing zone. Level C protection will consist of:

1. Hardhat
2. Boots with steel toe
3. Disposable Tyvek coverall
4. Safety glasses, splash goggles, or face shield
5. Chemical-resistant inner and outer gloves
6. MSHA/NIOSH-approved half-face or full face dust respirator with organic vapor cartridges.

If the OVMs exceed 200 ppm in the worker's breathing zone, all work shall stop and the exclusion zone shall be evacuated.

Site Security

Access to the work zone during all on-site activities will be restricted to authorized personnel. All personnel and authorized visitors must contact the Site Safety Officer/Project Manager prior to entering and exiting the exclusion zone.

Record Keeping

All site safety records pertaining to this site investigation will be maintained by the Site Safety Officer/Project Manager throughout the project.

Air Monitoring

The site Safety Officer/Project Manager (or another qualified person designated by the Site Safety Officer) will conduct periodic air monitoring, using direct-reading, real-time sampling equipment.

The direct-reading photoionization organic vapor meter (Thermo-Environmental Model 580A or equivalent) will be used to monitor the concentrations of organic vapors in the work area. Organic vapors will be monitored periodically during the collection of soil and/or groundwater samples. The meter will be calibrated at the start of each work period with isobutylene gas. Total organic vapor measurements will be used to determine the appropriate levels of respiratory protection, and identify conditions that would require site evacuation. Total organic concentrations in the worker's breathing zone in excess of 50 PPM will require Level C personal protective equipment. Total organic concentrations in the worker's breathing zone in excess of 200 PPM will require evacuation of the work area until the organic concentrations subside to below 200 PPM.

Additional Training and Information

Prior to any on-site activities, the Site Safety Officer/Project Manager will conduct training on any health and safety related items which are unique or specifically germane to the project. This will at least include the following:

1. Summarize the physical and chemical health and safety hazards which can be expected at the site.
2. Personal protective equipment rationale, use, and maintenance.
3. Exclusion zone entry, exit, and decontamination procedures.
4. Emergency response procedures (i.e., emergency phone numbers, hospital route, procedures to be followed in the event of a chemical spill, fire, or explosion, evacuation routes, mustering areas, etc.).

MATERIAL SAFETY DATA SHEET

POLYCHLORINATED BIPHENYLS (PCBS) REV.DATE 11/01/88

*** SECTION 1 IDENTIFICATION ***

GENIUM PUBLISHING CORPORATION
1145 CATALYN STREET
SCHENECTADY, NY 12303
CAS REGISTRY NO:
PROD CODE:
--- SYNONYMS (ALIASES):
P01562
07534
CHLORODIPHENYLS

INFORMATION SUPPLIED BY:
PJ IGOE, BS
PHONE: 518-377-8855
U.N.NUMBER: UN2315
CHEM.FAM:

*** SECTION 2 INGREDIENTS *** A=ACGIH O=OSHA N=NIOSH S=STATE OSHA M=MSHA R=NRC C=CORPORATE 9=OTHER

MATERIAL	PERCENT RANGE		EXP. LIMIT	UNITS
ALL PCBS/AROCLORS	42.00	54.00		

*** SECTION 3 PHYSICAL DATA ***

BOILING PT: 527-725 F, 275-385 C
MELTING PT: -31- 87.8 F, -35- 31 C
PH INFO: PH AT G/L H2O
SPECIFIC GRAVITY (H2O=1):
PACKING DENSITY: (KG/M3)
EVAPORATION RATE:
APPEARANCE:
CLEAR TO LIGHT YELLOW MOBILE OIL TO A STICKY RESIN
ODOR:
A SWEET "AROMATIC" ODOR.

VAPOR PRESSURE:
VAPOR DEN.:
SOLUBILITY IN WATER: INSOLUBLE
% VOLATILES BY VOL: 1.4
ODOR THRESHOLD (PPM):

*** SECTION 4 FIRE AND EXPLOSION HAZARD DATA ***

FLASH PT: 284 -392 F, 140-200 C
AUTOIGNITION TEMP: NOT FOUND F, C
LOWER EXPLOSIVE LIMIT (LEL): NOT FOUND % VOL.
UPPER EXPLOSIVE LIMIT (UEL): NOT FOUND % VOL.
SPEC. HAZARD:

---NFPA CLASS---
HEALTH: 1
FIRE: 1
REACTIVITY: 0
OTHER:

---------- FIRE AND EXPLOSION HAZARDS ----------
IF A TRANSFORMER CONTAINING PCBS IS INVOLVED IN A FIRE, ITS OWNER MAY BE REQUIRED TO REPORT THE INCIDENT TO APPROPRIATE AUTHORITIES. CONSULT AND FOLLOW ALL PERTINENT FEDERAL, STATE, AND LOCAL REGULATIONS.

---------- EXTINGUISHING MEDIA ----------
USE WATER SPRAY/FOG, CARBON DIOXIDE (CO{2}), DRY CHEMICAL, OR "ALCOHOL" FOAM TO EXTINGUISH FIRES THAT INVOLVE POLYCHLORINATED BIPHENYLS. ALTHOUGH IT IS VERY DIFFICULT TO IGNITE PCBS, THEY ARE OFTEN MIXED WITH MORE FLAMMABLE MATERIALS (OILS, SOLVENTS, ETC.)

---------- SPECIAL FIRE FIGHTING INSTRUCTIONS ----------
WEAR A SELF-CONTAINED BREATHING APPARATUS (SCBA) WITH A FULL FACEPIECE OPERATED IN THE PRESSURE-DEMAND OR POSITIVE-PRESSURE

MODE; FIRE FIGHTERS MUST ALSO WEAR A COMPLETE SET OF PROTECTIVE CLOTHING.

---------- OTHER TEXT ----------

COMMENTS: THE HAZARDS OF PCB FIRES ARE ASSOCIATED WITH THE POSSIBILITY OF THEIR BEING RELEASED INTO THE ENVIRONMENT WHERE THEY AND THEIR PRODUCTS OF DEGENERATION CAN POSE SERIOUS LONG-TERM HEALTH RISKS. THESE POTENTIAL PROBLEMS ARE HEIGHTENED BY THE PCBS' RESISTANCE TO BIOLOGICAL AND CHEMICAL DEGRADATION AND BY THE POSSIBILITY THAT THEY WILL CONTAMINATE UNDERGROUND WATER SYSTEMS (SEE SECT. 5)
*RANGES FROM 284DEG.F (140DEG.C) TO 392DEG.F (200DEG.C)

*** SECTION 5 HEALTH HAZARD INFORMATION ***

---------- EXPOSURE LIMITS ----------

REFER TO INGREDIENTS SECTION FOR EXPOSURE INFORMATION.

---------- COMMENTS ----------

TARGET ORGANS: SKIN, EYES, EYELIDS, BLOOD, LIVER.

---------- ROUTES OF ENTRY ----------

INHALATION, SKIN CONTACT/ABSORPTION.

---------- SYMPTOMS OF EXPOSURE ----------

ACUTE EFFECTS: SKIN AND EYE IRRITATION, ACNEFORM DERMATITIS, NAUSEA, VOMITING, ABDOMINAL PAIN, JAUNDICE, LIVER DAMAGE.
CHRONIC EFFECTS: POSSIBLE CANCER (EVIDENCE OF THIS IS INCONCLUSIVE); REPRODUCTIVE EFFECTS (JAUNDICE, EXCESSIVE SECRETION OF TEARS, DERMAL CHROMOPEXY); AND HEPATITIS.

---------- TOXICITY DATA ----------

ORAL{50}: 1900 MG/KG
CARCINOGENICITY:
THE EPA LISTS PCBS AS CARCINOGENS, AND THE IARC CLASSIFIES THEM AS PROBABLE HUMAN CARCINOGENS (GROUP 2B).

---------- HEALTH HAZARDS ----------

SUMMARY OF RISKS: EFFECTS OF ACCIDENTAL EXPOSURE TO PCBS INCLUDE ACNE FORM ERUPTIONS; EYE DISCHARGE; SWELLING OF THE UPPER EYELIDS AND HYPEREMIA OF THE CONJUNCTIVA; HYPERPIGMENTATION OF SKIN, NAILS, AND MUCOUS MEMBRANE; CHLOROACNE; DISTINCTIVE HAIR FOLLICLES; FEVER; HEARING DIFFICULTIES; LIMB SPASMS; HEADACHE; VOMITING; AND DIARRHEA. PCBS ARE POTENT LIVER TOXINS THAT CAN BE ABSORBED THROUGH UNBROKEN SKIN IN HAZARDOUS AMOUNTS WITHOUT IMMEDIATELY DISCERNIBLE PAIN OR DISCOMFORT. SEVERE HEALTH EFFECTS CAN DEVELOP LATER. IN EXPERIMENTAL ANIMALS, PROLONGED OR REPEATED EXPOSURE TO PCBS BY ANY ROUTE RESULTS IN LIVER DAMAGE AT LEVELS THAT ARE LESS THAN THOSE REPORTED TO HAVE CAUSED CANCER IN RODENTS.

---------- EMERGENCY FIRST AID ----------

EYES. IMMEDIATELY FLUSH EYES, INCLUDING UNDER THE EYELIDS, GENTLY BUT THOROUGHLY WITH FLOODING AMOUNTS OF RUNNING WATER FOR 15 MINUTES.
SKIN. RINSE EXPOSED SKIN WITH FLOODING AMOUNTS OF WATER; WASH WITH SOAP AND WATER.
INHALATION. REMOVE THE EXPOSED PERSON TO FRESH AIR; RESTORE

AND/OR SUPPORT BREATHING AS NEEDED. HAVE QUALIFIED MEDICAL PERSONNEL ADMINISTER OXYGEN AS REQUIRED.
INGESTION. INDUCE VOMITING BY STICKING YOUR FINGER TO THE BACK OF THE EXPOSED PERSON'S THROAT. HAVE HIM OR HER DRINK 1 TO 2 GLASSES OF MILK OR WATER. GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. SEEK PROMPT MEDICAL ASSISTANCE FOR FURTHER TREATMENT, OBSERVATION, AND SUPPORT AFTER FIRST AID.

---------- MEDICAL AGGRAVATIONS ----------

NONE REPORTED.

---------- NOTES TO PHYSICIAN ----------

PCBS ARE POORLY METABOLIZED, SOLUBLE IN LIPIDS, AND THEY ACCUMULATE IN TISSUES OR ORGANS RICH IN LIPIDS. LIVER FUNCTION TESTS CAN HELP TO DETERMINE THE EXTENT OF BODY DAMAGE IN EXPOSED PERSONS. IF ELECTRICAL EQUIPMENT CONTAINING PCBS ARCS OVER, THE PCBS OR OTHER HYDROCARBON DIELECTRIC FLUIDS MAY DECOMPOSE AND GIVE OFF HYDROCHLORIC ACID (HCl), A POTENT RESPIRATORY IRRITANT.

*** SECTION 6 REACTIVITY ***

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
COND. TO AVOID (STAB.):
LIMIT HUMAN EXPOSURE TO PCBS TO THE LOWEST POSSIBLE LEVEL; ESPECIALLY AVOID CONTACT WITH SKIN.

COND. TO AVOID (POLY.):
INCOMPATIBLE MATERIALS:
PCBS CAN REACT DANGEROUSLY WITH SODIUM OR POTASSIUM. THESE REACTIONS ARE PART OF AN INDUSTRIAL PROCESS USED TO DESTROY PCBS; HOWEVER, PEOPLE HAVE BEEN KILLED BY EXPLOSIONS AT PCB TREATMENT, STORAGE, AND DISPOSAL SITES.
HAZARDOUS DECOMPOSITION:
THERMAL-OXIDATIVE DEGRADATION CAN PRODUCE TOXIC GASES SUCH AS CO, CHLORINE, CHLORINATED AROMATIC FRAGMENTS, PHENOLICS, ALDEHYDES, AND HYDROGEN CHLORIDE. INCOMPLETE COMBUSTION YIELDS: TOXINS SUCH AS POLYUCHLORINATED DIBENZOFURAN & POLYCHLORINATED BIBENZO-P-DIOXIN.

*** SECTION 7 SPILL OR LEAK PROCEDURES ***
- STEPS TO BE TAKEN IN CASE OF SPILL, LEAK OR RELEASE -
TREAT ANY ACCIDENTAL RELEASE OF PCBS AS AN EMERGENCY. AN SPCCP (SPILL-PREVENTION CONTROL AND COUNTERMEASURE PLAN) MUST BE FORMULATED BEFORE SPILLS OR LEAKS OCCUR. PCBS ARE RESISTANT TO BIODEGRADATION, SOLUBLE IN LIPIDS, AND CHEMICALLY STABLE; AS SUCH THEY HAVE BECOME SIGNIFICANT CONTAMINANTS OF GLOBAL ECOSYSTEMS. RELEASES OF PCBS REQUIRE IMMEDIATE, COMPETENT, PROFESSIONAL RESPONSE FROM TRAINED PERSONNEL. EACH RELEASE SITUATION IS UNIQUE AND REQUIRES A SPECIFICALLY DESIGNED CLEANUP RESPONSE. GENERAL RECOMMENDATIONS INCLUDE ADHERING TO FEDERAL REGULATIONS (40 CFR PART 761). NOTIFY SAFETY PERSONNEL, EVACUATE NONESSENTIAL PERSONNEL, VENTILATE THE SPILL AREA, AND CONTAIN THE PCBS. ALL WASTES, RESIDUES, AND CONTAMINATED CLEANUP EQUIPMENT FROM THE INCIDENT ARE SUBJECT TO EPA REQUIREMENTS (40 CFR 761). CONSULT YOUR ATTORNEY OR APPROPRIATE REGULATORY OFFICIALS FOR INFORMATION ABOUT

REPORTING REQUIREMENTS AND DISPOSAL PROCEDURES.

---------- WASTE DISPOSAL METHOD ----------

CONTACT YOUR HAZARDOUS WASTE DISPOSAL FIRM OR A LICENSED CONTRACTOR FOR DETAILED RECOMMENDATIONS, ESPECIALLY WHEN PCBS ARE UNEXPECTEDLY DISCOVERED. FOLLOW FEDERAL, STATE, AND LOCAL REGULATIONS. PCBS ARE BIOMAGNIFIED IN THE FOOD CHAIN; I.E., THEIR CONCENTRATION INCREASES AT EACH LINK. THE DISPOSAL OR OF PCBS OR PCB-CONTAMINATED MATERIALS IS STRICTLY REGULATED; VIOLATIONS OF APPLICABLE LAWS CAN RESULT IN FINES, LAWSUITS, AND NEGATIVE PUBLICITY.

*** SECTION 8 SPECIAL PROTECTION INFORMATION ***

---------- VENTILATION ----------

INSTALL AND OPERATE GENERAL AND LOCAL MAXIMUM, EXPLOSION-PROOF VENTILATION SYSTEMS POWERFUL ENOUGH TO MAINTAIN AIRBORNE LEVELS OF THIS MATERIAL BELOW THE OSHA PEL STANDARDS CITED IN SECTION 2. LOCAL EXHAUST VENTILATION IS PREFERRED BECAUSE IT PREVENTS DISPERSION OF THE CONTAMINATION INTO THE GENERAL WORK AREA BY ELIMINATING IT AT ITS SOURCE. CONSULT THE LATEST EDITION OF GENIUM REFERENCE 103 FOR DETAILED RECOMMENDATIONS.

---------- OTHER TEXT ----------

WARNING: AIR PURIFYING RESPIRATORS WILL NOT PROTECT WORKERS IN OXYGEN-DEFICIENT ATMOSPHERES.
OTHER: WEAR IMPERVIOUS GLOVES, BOOTS, APRONS, AND GAUNTLETS, ETC., TO PREVENT ANY CONTACT OF PCBS WITH YOUR SKIN.
SAFETY STATIONS: MAKE EMERGENCY EYEWASH STATIONS, SAFETY/QUICK-DRENCH SHOWERS, AND WASHING FACILITIES AVAILABLE IN WORK AREAS.
CONTAMINATED EQUIPMENT: CONTACT LENSES POSE A SPECIAL HAZARD; SOFT LENSES MAY ABSORB IRRITANTS, AND ALL LENSES CONCENTRATE THEM. DO NOT WEAR CONTACT LENSES IN ANY WORK AREA. REMOVE CONTAMINATED CLOTHING AND LAUNDER IT BEFORE WEARING IT AGAIN; CLEAN THIS MATERIAL FROM YOUR SHOES AND EQUIPMENT. HEAVILY SOILED CLOTHING MUST BE PROPERLY DISCARDED IN A MANNER CONSISTENT WITH APPLICABLE REGULATIONS.
COMMENTS: PRACTICE GOOD PERSONAL HYGIENE; ALWAYS WASH THOROUGHLY AFTER USING THIS MATERIAL AND BEFORE EATING, DRINKING, SMOKING, USING THE TOILET, OR APPLYING COSMETICS. KEEP IT OFF YOUR CLOTHING AND EQUIPMENT. AVOID TRANSFERRING IT FROM YOUR HANDS TO YOUR MOUTH WHILE EATING, DRINKING, OR SMOKING. DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

---------- PERSONAL PROTECTIVE EQUIPMENT - EYE -------

ALWAYS WEAR PROTECTIVE EYEGLASSES OR CHEMICAL SAFETY GOGGLES. WHERE SPLASHING OF PCBS IS POSSIBLE, WEAR A FULL FACE SHIELD. FOLLOW OSHA EYE- AND FACE-PROTECTIONS REGULATIONS (29 CFR 1910.133).

--------- PERSONAL PROTECTIVE EQUIPMENT - GLOVES ------

-------- PERSONAL PROTECTIVE EQUIPMENT - RESPIRATOR ----

WEAR A NIOSH-APPROVED RESPIRATOR PER GENIUM REFERENCE 88 FOR THE MAXIMUM-USE CONCENTRATIONS AND/OR EXPOSURE LIMITS CITED IN SECTION 2. FOLLOW OSHA RESPIRATOR REGULATIONS (29 CFR
SECTION 2. FOLLOW OSHA RESPIRATOR REGULATIONS (29 CFR
1910.134). FOR EMERGENCY OR NONROUTINE OPERATIONS (LEAKS OR

CLEANING REACTOR VESSELS AND STORAGE TANKS), WEAR AN SCBA.
-------- PERSONAL PROTECTIVE EQUIPMENT - FACE ---------

--------- PERSONAL PROTECTIVE EQUIPMENT - SKIN --------

--------- PERSONAL PROTECTIVE EQUIPMENT - OTHERS ------

------------------ HYGIENIC PRACTICES -----------------

*** SECTION 9 SPECIAL PRECAUTIONS ***
------------ STORAGE AND HANDLING CONDITIONS ----------
ALL STORAGE FACILITIES MUST HAVE ADEQUATE CONTAINMENT SYSTEMS (DIKES; ELEVATED, NONPOROUS HOLDING PLATFORMS; RETAINING WALLS) TO PREVENT ANY MAJOR RELEASE OF PCBS INTO THE ENVIRONMENT. CAREFULLY DESIGN AND IMPLEMENT THESE EXTRA PRECAUTIONS NOW; DO NOT WAIT UNTIL YOU HAVE TO RESPOND TO AN ACCIDENTAL RELEASE OF THIS MATERIAL.
------------------ OTHER PRECAUTIONS ------------------

---------------------- OTHER TEXT ----------------------
WARNING: ACCIDENTAL SPILLS OF PCBS THAT MAY AFFECT WATER SUPPLIES MUST BE REPORTED TO COAST GUARD PERSONNEL AT THE NATIONAL RESPONSE CENTER, TELEPHONE (202) 426-2675.
OSHA DESIGNATIONS
LISTED AS AN AIR CONTAMINANT (29 CFR 1910.1000 SUBPART Z).
EPA DESIGNATIONS (40 CFR 302.4)
CERCLA HAZARDOUS SUBSTANCE, REPORTABLE QUANTITY: 10 LBS (4.54 KG), PER THE CLEAN WATER ACT (CWA), SEC. 31 (B) (4) AND 307(A).
STORAGE SEGREGATION: STORE PCBS IN CLOSED CONTAINERS IN A COOL, DRY, WELL-VENTILATED AREA. PROTECT CONTAINERS FROM PHYSICAL DAMAGE.

*** SECTION 10 PRECAUTIONARY LABEL ***

MATERIAL SAFETY DATA SHEET

MINERAL OIL

REV.DATE 11/01/85

*** SECTION 1 IDENTIFICATION ***

GENIUM PUBLISHING CORPORATION
1145 CATALYN STREET
SCHENECTADY, NY 12303
CAS REGISTRY NO:
PROD CODE:

INFORMATION SUPPLIED BY:
GENIUM PUBLISHING CORPORATION
PHONE: 518-377-8855
U.N.NUMBER:
CHEM.FAM:

--- SYNONYMS (ALIASES):
(MIDDLY SOLVENT-REFINED OR HYDROTREATED OILS)
WHITE MINERAL OIL
P01437
ALBOLINE
NUJOL
LIGNITE OIL
PARAFFIN OIL

*** SECTION 2 INGREDIENTS *** A=ACGIH O=OSHA N=NIOSH S=STATE OSHA
M=MSHA R=NRC C=CORPORATE 9=OTHER

---------- MATERIAL ----------	---PERCENT RANGE---	EXP. LIMIT	UNITS
PETROLEUM DISTILLATE (C{14) TO	100.00		
PARAFFINIC HYDROCARBONS	65.00		
NAPTHENIC HYDROCARBONS	29.00		
ALKYLATED AROMATIC HYDROCARBON	6.00		

***
* TYPICAL COMPOSITION

*** SECTION 3 PHYSICAL DATA ***

BOILING PT: 500-626 F, 260-330 C
MELTING PT: F, C
PH INFO: PH AT G/L H2O
SPECIFIC GRAVITY (H2O=1): 0.8222
PACKING DENSITY: (KG/M3)
EVAPORATION RATE: (ETHER = 1) NEGLIGIBLE
VAPOR PRESSURE: NEGLIGIBLE
VAPOR DEN.: N/A
SOLUBILITY IN WATER: NEGLIGIBLE
% VOLATILES BY VOL: 90
ODOR THRESHOLD (PPM):

APPEARANCE:
CLEAR, COLORLESS, OILY LIQUID.
ODOR:
PRATICALLY COLORLESS.

*** SECTION 4 FIRE AND EXPLOSION HAZARD DATA ***

FLASH PT: 270 - 444 F, C
AUTOIGNITION TEMP: NO DATA F, C
LOWER EXPLOSIVE LIMIT (LEL): % VOL.
UPPER EXPLOSIVE LIMIT (UEL): % VOL.
SPEC. HAZARD:

---NFPA CLASS---
HEALTH:
FIRE:
REACTIVITY:
OTHER:

---------- FIRE AND EXPLOSION HAZARDS ----------
MINERAL OIL IS A SLIGHT FIRE HAZARD WHEN EXPOSED TO HEAT, SPARKS, OR OPEN FLAME.
---------- EXTINGUISHING MEDIA ----------