REVISED WORK PLAN

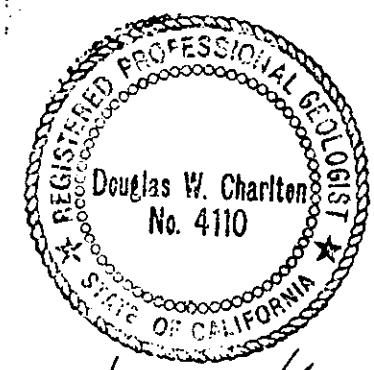
SHELL OIL COMPANY FACILITY
630 High Street
Oakland, California

Prepared for:

Shell Oil Company
1390 Willow Pass Road
Concord, California 94520

March 20, 1989

CECC Project No. 88-44-369-01



DOUGLAS W. CHARLTON
Principal Geologist

REVISED WORK PLAN

SHELL OIL COMPANY FACILITY
630 High Street
Oakland, California

March 20, 1989

CECC Project No. 88-44-369-01

This report has been prepared by the staff of **Converse Environmental Consultants California** under the professional supervision of the Engineer and/or Geologist whose seal(s) and signature(s) appear hereon.

The findings, recommendations, specifications or professional opinions are presented, within the limits prescribed by the Client, after being prepared in accordance with generally accepted professional engineering and geologic practice. We make no other warranty, either express or implied.

REVISED WORK PLAN

March 20, 1989

SHELL OIL COMPANY FACILITY
630 High Street
Oakland, California

PROJECT BACKGROUND

The following description is the summary of files supplied to Converse Environmental Consultants California (CECC) by Shell Oil Company (Shell). These files consisted of consulting reports by Blaine Tech Services, Inc. (February 10, 1989, February 13, 1989 and February 16, 1989); a citation letter from the Alameda County Health Care Services Agency (February 24, 1989); and a Plot Plan (Shell, March 1986).

The subject property is currently owned by Shell Oil Company. The property has been operated as a retail motor vehicle fuel (MVF) sales facility since 1969. Although currently under remodeling, the facility has been recently active in this capacity.

The site is located at the corner of High and Jensen Streets in West Oakland, California (Drawing 1). The site is approximately 400 feet long and 250 feet

wide, bordered on the north by High Street and on the east by Oakport Street. According to plot plans of earlier operations, the site is broadly divisible into several areas of former operations (Drawing 2):

- Carwash (currently inoperative)
- Underground storage tank bed (4 underground storage tanks in one backfill)
- Former pump islands (former islands demolished, new pump islands in construction)
- Former waste oil tank (approximate location)
- Former Underground storage tank bed (approximate location)

TABLE 1

CHRONOLOGICAL SUMMARY

The following chronological summary is based on information available to CECC for preparation of this Work Plan.

Date	Description of Activity
01/85	Re-modernization of gas station. Armer/Norman dismantled and removed all fuel dispensing facilities and excavated certain areas near former pump islands, product lines and areas which smelled of gasoline.
01/26/89	Blaine Tech Services collected and analyzed (10) excavation soil samples. The inspector from the Alameda County Health Department specified sampling locations. Soils were analyzed for TPH-g, BTEX and organic lead.
02/03/89	Blaine Tech Services collected and analyzed soil samples in areas of product dispensing pump islands after additional excavation in these areas and in areas of former waste oil and gasoline tank pits (sample No. 10 - 75 ppm and No. 12 - 600 ppm TPH-g).
02/03/89	Further excavation in former waste oil tank pit. Soil and groundwater samples were collected and analyzed in the area around sample no. 12 of February 3, 1989 sampling event. These soil samples contained less than 50 ppm TPH-d. Groundwater sample no. 3 from that area contained 1,800 ppb TPH-g and 200 ppb TPH-d.
02/24/89	Alameda County Environmental Health Department notified Shell that site conditions indicated a confirmed release, which required an investigation Work Plan within 25 days of the letter date.

According to the results of Blaine Tech testing (January and February 1989), shallow soil contamination (TPH-gasoline, TPH-diesel, BTEX) and groundwater contamination (one sample) (TPH-gasoline, TPH-diesel, and BTEX) exist at the site (Drawings 4, 5 and 6). The soil samples were all taken as sidewall and floor samples of excavations; the groundwater sample was collected from groundwater which flowed into the excavation near the former tank bed. Methods of sampling and analysis are described in an example report from Blaine Tech (Appendix A). Most of the soil samples were taken from shallow

(<5 feet deep) excavations along product dispensing lines and near former pump islands. No information is available on the methods for disposing of soil, or if any soil has been removed from the site.

No soil borings have been drilled or sampled on the site. No information is available on site soil stratigraphy. The 1989 water table at the former tank area is approximately 12 feet below grade based on excavation into the saturated zone.

The facility is currently out of operation and under renovation construction. The property is surrounded by a 6-foot high fence, which is further protected by a 24-hour security guard. The only building onsite is the car wash, which presently lacks operation equipment.

All the pavement has been removed and the site graded to several feet below recent pavement elevation. Foundations for the new pump islands and market have been constructed. The underground storage tanks are installed with earthen covers; piping runs to future pump islands are exposed. No excavations, pits or trenches are present. Two soil piles, totaling several hundred cubic yards in volume, exist in the northern part of the site. These soil piles are mostly covered with plastic and the soil is undergoing controlled aeration.

PROPOSED INVESTIGATION

This Work Plan describes tasks Shell will undertake to achieve environmental closure for the subject facility. The work presumes that groundwater contamination at the site is actionable at this time. It further presumes that this groundwater contamination, at least in part, has originated from discharges at the former Shell pump islands or former Shell underground gasoline storage tanks. Actionable soil contamination may exist in limited parts of the site.

Investigations to date have not eliminated the possibility of an offsite discharge migrating onto the Shell property. Therefore, future investigations may include upgradient groundwater studies to establish the quality of water migrating onto this site.

SCOPE

Shell will conduct a field program consisting of 15 tasks and groundwater monitoring to: (1) assess the potential for residual soil contamination from onsite discharges; (2) resolve the extent of groundwater contamination onsite and, if needed, offsite; (3) assess hydrologic conditions which may be factors in groundwater remediation; and (4) plan for and proceed with cost-effective groundwater and soil remediation (if needed). The Shell investigations and remediation will comprise four programs:

- Program I - Soil Investigations and Remediation (Tasks 1-4)
- Program II - Onsite Groundwater Investigations (Tasks 5-7)

- Program III - Offsite Groundwater Investigations (if needed) (Tasks 8-12)
- Program IV - Groundwater Remediation (if needed) (Tasks 13-15)

Drawing 7 shows the critical path for tasks to be undertaken under these programs. This drawing shows the approximate duration for initial tasks. Completion of these four programs, including possible tasks to be specified later, ultimately will lead to confirmation of clean soil, clean groundwater, and environmental closure of the facility.

PROGRAM I: SOIL INVESTIGATIONS

Soil results by Blaine Tech (1989) indicated localized TPH-g and possible TPH-d soil contamination near the former pump islands on the property. Soil investigations will be conducted to assess contamination in the following areas (Drawing 3);

- Pump Island East: Five soil borings will be drilled to assess the lateral and vertical extent of TPH-g and Pb beyond the excavation and confirm that TPH-d is not an actionable contaminant in soil in this area.

- Former Tank Bed: Two soil borings will be drilled and sampled to assess whether former pipes or tanks leaked;

- Pump Island West: Three soil borings will be drilled and sampled to assess the lateral and vertical extent of TPH-g and Pb beyond the excavations, and confirm that TPH-d is not a contaminant in this area.

Soil contamination will be investigated laterally until the 100 ppm TPH as gasoline or diesel isopleth is approximated.

Prefield Activities

Prefield activities will include preparation of: (1) site-specific/task-specific Health and Safety Plan(s), (2) this Work Plan, (3) task-specific plans, (4) bid specifications, and (5) program budgets. In addition, necessary permits will be obtained.

Task 1 - Drill and Sample Soil Borings

Ten soil borings (B-1 through B-6 and MW-1 through MW-4) will be drilled at the locations shown on Drawing 8 to assess the potential for contamination beyond that already defined by prior work. Four soil borings will be drilled around the excavation in the pump island east area, where analysis by Blaine Tech (1989) was for TPH-d and not TPH-g (the principal soil contaminant discovered by Blaine Tech, 1989). Two of these borings will be converted to groundwater monitoring wells (MW-1 and MW-2) in Task 5. In addition, two soil borings (B-1 and B-2) will be drilled in the former tank bed to complete assessment of this as a possible area of soil contamination (Drawing 8). Thirdly, three borings (B-5, B-6 and MW-4) will be drilled near the former

western pump islands to investigate previously reported actionable TPH-g soil contamination. One of these borings will be converted to a groundwater monitoring well (MW-4) in Task 5.

The borings will be drilled to 13 feet below ground surface (bgs) and drive-sampled using a California split-spoon sampler at depths of approximately 3-4 feet bgs and 8-9 feet bgs. Soil samples will be analyzed for TPH (as gasoline and diesel) using EPA Method 8015 (modified) and Pb by EPA Method 7421. Results of soil borings and analysis will be reported to regulatory agencies in the Quarter 2, 1989 Report of Activities.

At the end of Task 1, the extent of soil contamination onsite will be known for the areas investigated. If the initial borings near the pump islands do not quantify the extent of soil contamination, additional borings will be installed in an iterative, step-out pattern until such contamination is blocked out to approximately the 100 ppm TPH isopleth.

At the conclusion of sampling, all soil borings will either be abandoned using proper protocols (see Appendix F) or converted to groundwater monitoring wells by over-drilling and well construction according to the practices described in Appendices A and B.

Task 2 - Prepare Soil Remedial Action Plan

The options for cost-effective soil remediation will be identified and relatively evaluated based on the volume of contaminated soil, the hydrologic conditions of contamination, and the concentrations of contaminants involved. Using this information, a Soil Remedial Action Plan will be prepared identifying the options and preferred alternative for soil cleanup at the Shell property.

Task 3 - Remediate Soil

Soil will be remediated according to the protocols, schedule and cleanup objectives specified in the Soil Remedial Plan, as approved by regulatory agencies of jurisdiction (Task 2).

At the completion of Task 3, soil will be established as clean to levels acceptable to regulatory agencies. When combined with clean groundwater from Program IV, environmental closure of the property will be complete.

Task 4 - Confirm Remediated Soil

Upon completion of Task 3, soil samples will be collected and analyzed to confirm the effectiveness of soil remediation measures. Sample analyses that fail to pass the agency-established concentrations will be cause for further remediation and resampling. Confirming sample results will be presented in a Quarterly Report and submitted to the agencies.

PROGRAM II: ONSITE GROUNDWATER INVESTIGATIONS

Investigation of groundwater conditions onsite (Tasks 5-9) and investigation of soil conditions (Tasks 1-4) will be conducted simultaneously. Program I investigations will provide data which define the lateral extent of MVF contamination in groundwater within the bounds of the property, and provide a basis for starting cost-effective remediation of that contamination.

Task 5 - Install New Groundwater Monitoring Wells

Four new groundwater monitoring wells will be installed onsite to initiate investigation of water quality in the upper water-bearing zone. These wells will be installed, developed and sampled according to CECC standard protocols (see Appendices A through D). All monitoring wells will be installed through hollow-stem augers in the soil borings drilled in Task 1.

Two monitoring wells (MW-1 and MW-2) will be installed near the former underground storage tank area where contamination has been indicated in soil and groundwater. One well (MW-3) will be installed downgradient of this excavation, near the shallow soil sample location which yielded 620 ppm TPH-g. Lastly, one well (MW-4) will be installed to the west, near soil samples which yielded 690-2400 ppm TPH-g and 600 ppm TPH-d (see Drawings 4 and 8).

Well installation will consist of constructing 4-inch diameter, filter-packed PVC wells to at least 27 feet bgs into the upper saturated zone, per CECC standard

procedures (see Drawings 9 and 10 for construction details, and Appendices A through C for protocols). Soil will be sampled at 5 feet intervals downhole, and thoroughly described using the Unified Soil Classification System (USCS) (see Appendix A). Soil samples from the unsaturated zone will be collected, transported to a State-certified analytical laboratory and analyzed for lead (EPA Method 7421), and TPH as gasoline and diesel (EPA Method modified 8015) (see Appendices A and E).

Task 6 - Collect And Analyze Groundwater Samples

The wells will be fully developed by surge-purge, with at least four casing volumes of water removed and contained in 55-gallon drums onsite. This water will be profiled by sampling and analysis for TPH and Pb prior to disposal or authorized treatment under proper permit or manifest.

Groundwater samples will be collected from each well for analysis for TPH (as gasoline and diesel) and BTEX (see Appendices D and H).

The field data, as-built well construction diagrams, boring logs, analytical results, and the results of initial sampling will be compiled and presented in the Quarter 2, 1989 Report of Activities for the site.

Task 7 - Conduct Hydrology Tests and Research

Slug tests will be conducted on each well after development. In addition, local hydrologic conditions will be researched in public records, including libraries,

water districts, and other well record depositories. Groundwater well completions will be surveyed and a detailed site plan showing wellhead elevations will be prepared. The depth to groundwater will be measured in each well to establish groundwater gradient onsite.

The results of this work and water quality data from Task 6 will be compiled onto maps presented in Quarter 2, 1989 Report of Activities to regulatory agencies. If needed, additional wells will be installed onsite to characterize groundwater conditions to the extent that receiving and discharging groundwater quality and groundwater MVF contamination plume geometry are known.

At the conclusion of Program II, the extent of groundwater MVF contamination onsite will be established and the potential for offsite extensions of these conditions will be known.

PROGRAM III: OFFSITE GROUNDWATER INVESTIGATION

If groundwater plume conditions extend offsite, investigations may continue upgradient and/or downgradient under Program III. If site conditions indicate groundwater MVF contamination is confined to the site, Shell may proceed directly with groundwater remediation under Program IV.

Task 8 - Perform a Neighborhood Environmental Assessment

An environmental assessment of neighborhood businesses, ownerships, and prior operational practices may identify nearby dischargers of MVF to the environment upgradient of the subject property. These parties could, in part, be responsible for site conditions observed at Shell.

Agency records will be reviewed to identify nearby owners of underground storage tanks and hazardous materials handlers and generators. In addition, regional hydrologic conditions, including present and historical gradients, and groundwater withdrawal and subsurface injection patterns and gradients, will be researched. The results of these studies will be reported directly to Shell.

Task 9 - Refer to Legal Counsel

If other Principal Responsible Parties (PRPs) are possible or confirmed, Shell may elect to work through its legal counsel to establish fiscal and legal responsibility for environmental cleanup by negotiation with PRPs involved.

Task 10 - Inform The Regional Water Quality control Board

If PRPs are confirmed, Shell will inform the Regional Water Quality Control Board (RWQCB) of its findings so that environmental investigations and cleanup are conducted by PRPs in proportion to their responsibility.

Task 11 - Prepare Offsite Groundwater Investigation Plan

An amended to this Work Plan will be prepared to address the potential for offsite groundwater MVF contamination. Step-out wells will be proposed for key projected upgradient and downgradient extensions of groundwater MVF contamination. Subsequent activities may include prefield organization, obtaining rights-of-entry and well installation permits, specifying well design criteria, and specifying monitoring arrangements.

Task 12 - Install Offsite Groundwater Wells

Offsite groundwater monitoring wells will be installed in an iterative process until one of the following conditions is met: (1) offsite groundwater MVF contamination is characterized and is established to be the result of Shell activities or (2) the investigation has proceeded to a point that other cross-gradient or downgradient PRPs are identified, if any.

PROGRAM IV: GROUNDWATER REMEDIATION

Program IV will comprise the permitting, planning, design, installation, operation, and monitoring of a groundwater remediation system which will cost-effectively clean up MVF contamination in groundwater at the site.

Task 13 - Groundwater Remedial Action Plan

Once groundwater conditions are characterized and offsite groundwater conditions are known, a Groundwater Remedial Action Plan will be prepared.

This plan will address the means, duration, and cost to remediate groundwater MVF contamination at and around the Shell facility. The technical approach recommended will also consider the distribution and composition of contaminants, the beneficial uses of the groundwater, regulatory limits for extraction, treatment and discharge, best available technologies, and other relevant issues. Based on the outcome of neighborhood and offsite investigations, Shell will prepare this plan alone, or in conjunction with other PRPs.

The Plan will be presented to regulatory agencies of jurisdiction, and implemented upon agency approval to proceed.

If appropriate, an NPDES permit will be prepared for treatment system discharge. This permit will be submitted to the RWQCB for review and forwarding to EPA for further review at the earliest reasonable moment, so that groundwater remediation will not be delayed by the permitting process.

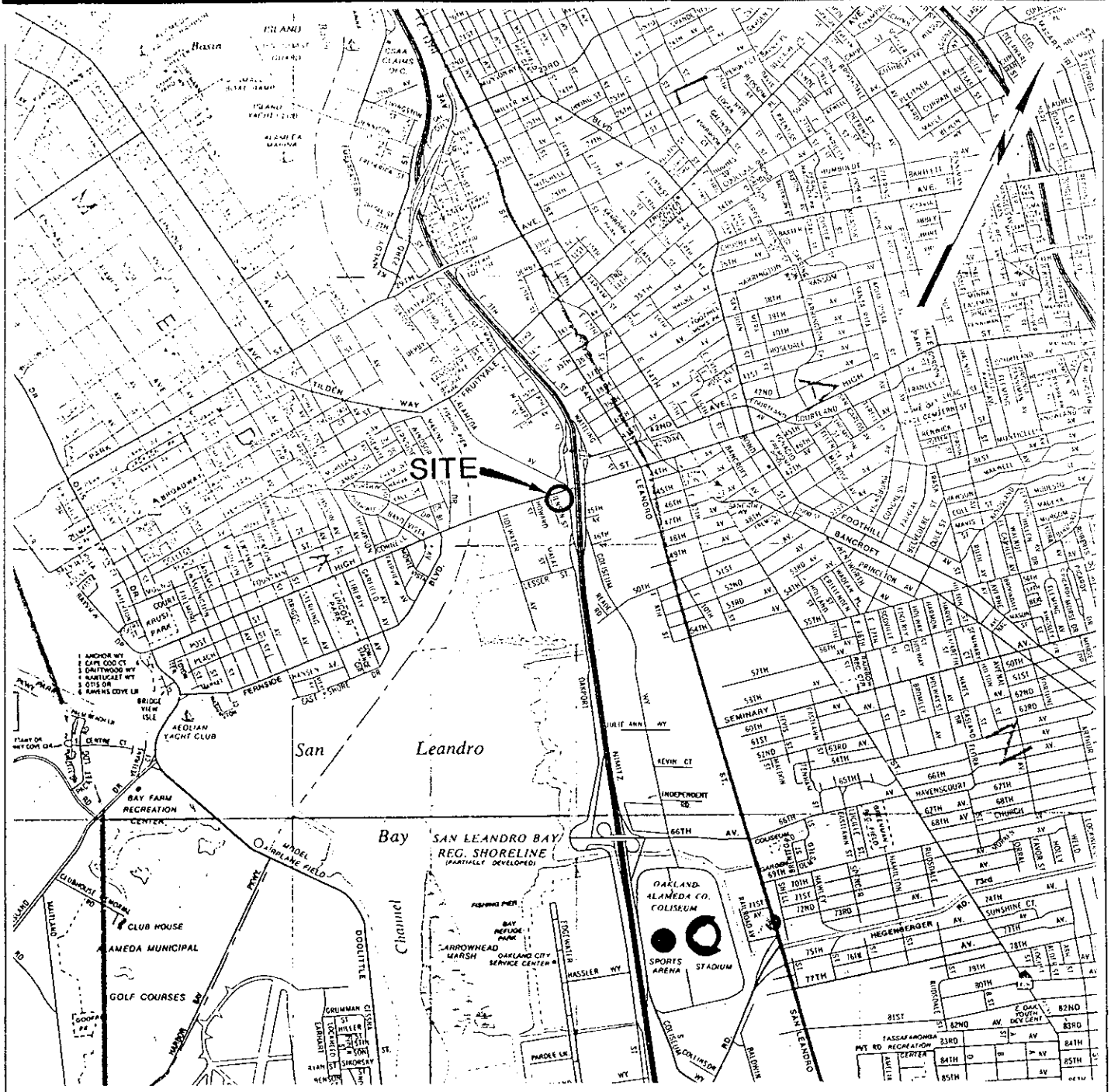
Task 14 - Implement Groundwater Remediation

Upon approval of final design by regulatory agencies and acquisition of all necessary permits, remediation will be undertaken in accordance with the parameters specified in the groundwater Remedial Action Plan.

Lastly, a formal report of startup activities and progress reports of remediation (including monitoring data) will be prepared and submitted to regulatory agencies at proper intervals.

Task 15 - Confirm Remediated Groundwater

At the conclusion of groundwater mitigation, monitoring samples will be collected over a brief period of time to confirm completion of groundwater remediation. Reports with certifications by registered professionals will be supplied to regulatory agencies as required.



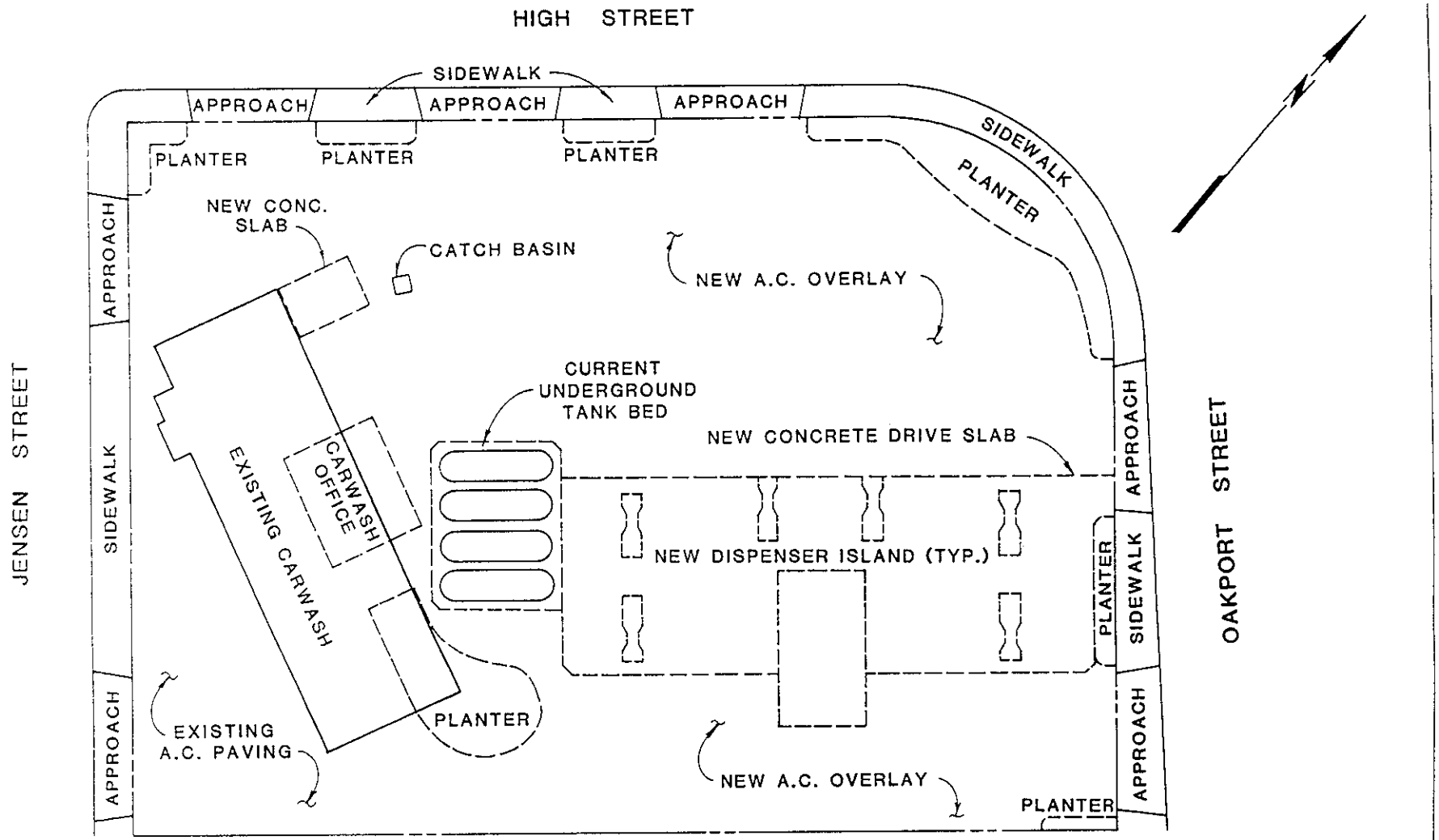
SOURCE: California State Automobile Association

SITE LOCATION MAP

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale: AS SHOWN	Project No.: 88-44-369-01
Prepared by: KGC	Date: 3/16/89
Checked by: RMB	Drawing No.: 1
Approved by: DWC	



LEGEND

PLANNED CONSTRUCTION
(Some foundation constructed as of 3/15/89)

SOURCE: Robert H. Lee & Associates, Inc., 3/24/86

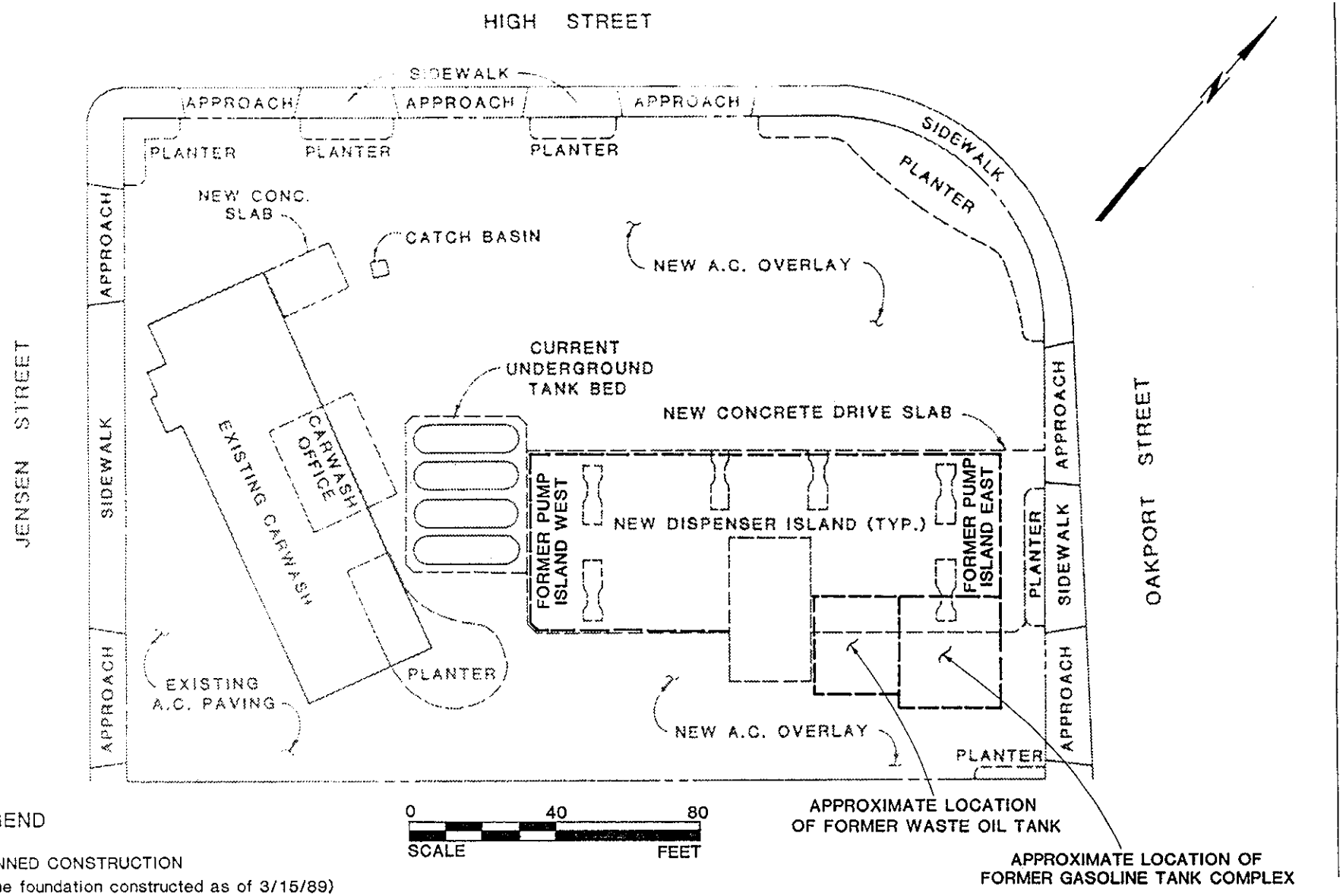
0 40 80
SCALE FEET

PLOT PLAN

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale	1" = 40'
Date	3-16-89
Prepared By	LQL
Checked By	RMB
Approved By	DWC
Project No.	88-44-369-01
Drawing No.	2



LEGEND

PLANNED CONSTRUCTION
(Some foundation constructed as of 3/15/89)

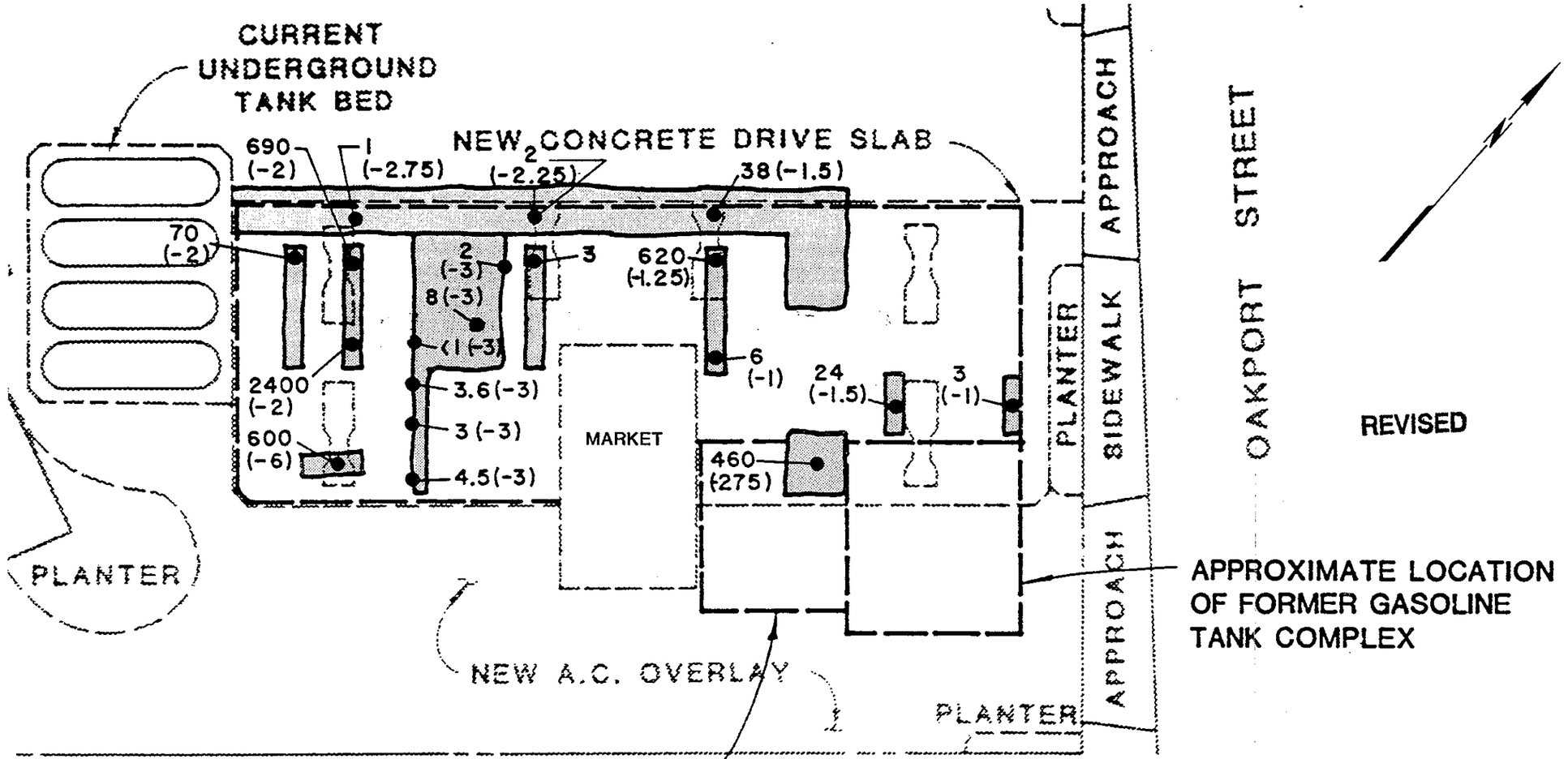
SOURCE: Robert H. Lee & Associates, Inc., 3/24/86

FORMER OPERATION AREAS

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale	1"=40'
Date	3/16/89
Prepared By	KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-369-01
Drawing No.	3



LEGEND

- — — — PLANNED CONSTRUCTION (Some foundation constructed as of 3/15/89)
- ● GASOLINE SOIL SAMPLE LOCATIONS
- 3.6 CONCENTRATION IN PPM
- (-3) DEPTH IN FEET
- EXCAVATIONS, (JANUARY-FEBRUARY 1989

NOTE: NEW STRUCTURES ARE IN CONSTRUCTION AS OF MARCH 1989.

SOURCE: Robert H. Lee & Associates Inc., 3/24/86.

0 40 80

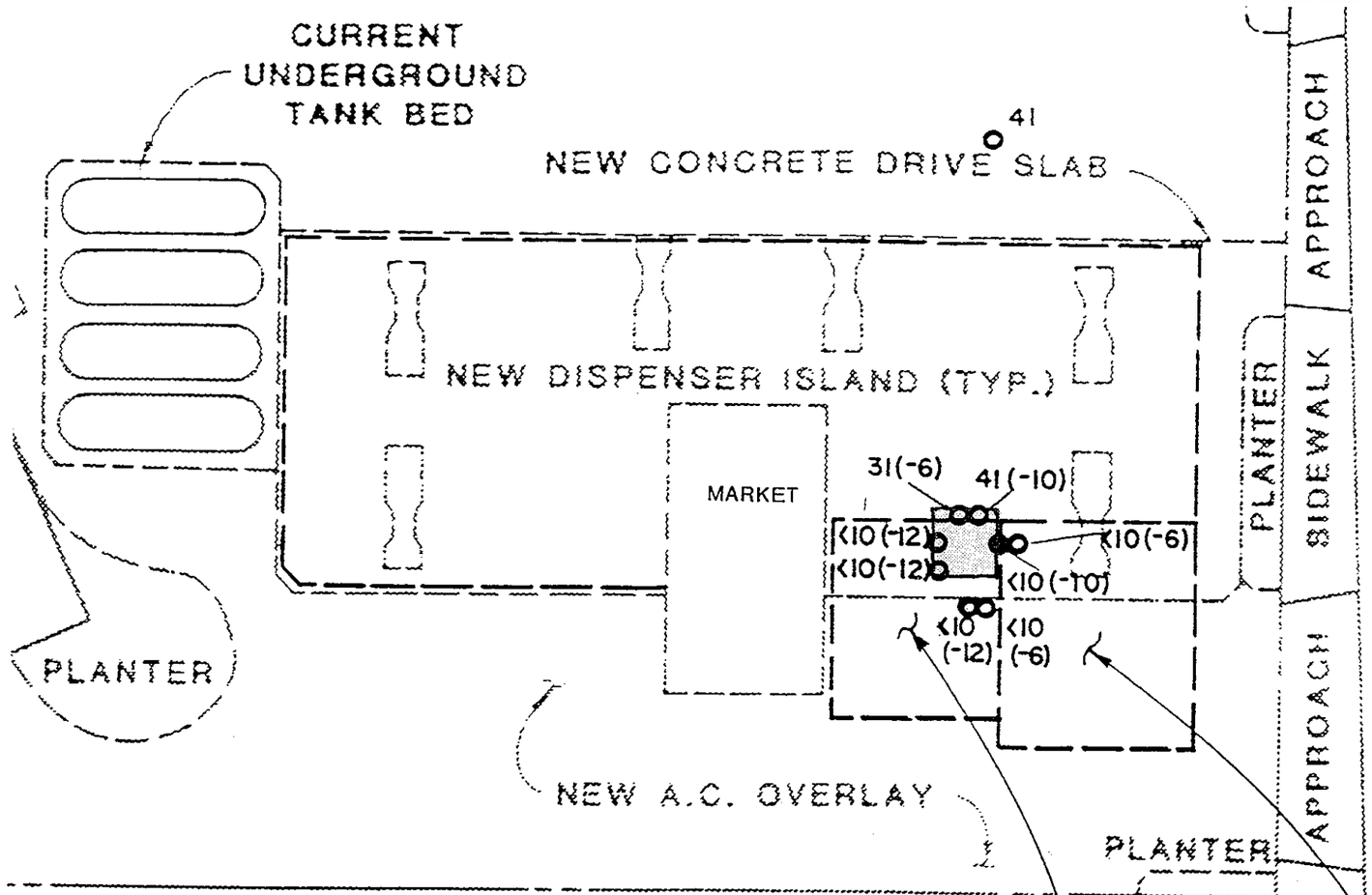
SCALE FEET

GASOLINE SOIL SAMPLE LOCATIONS

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	3/17/89
Prepared By	KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-369-01
Drawing No.	4



LEGEND

PLANNED CONSTRUCTION
(Some foundation constructed as of 3/15/89)

o DIESEL SOIL SAMPLE LOCATIONS
<10 CONCENTRATIONS IN PPM
(-12) DEPTH IN FEET

EXCAVATIONS, (JANUARY–FEBRUARY 1989)

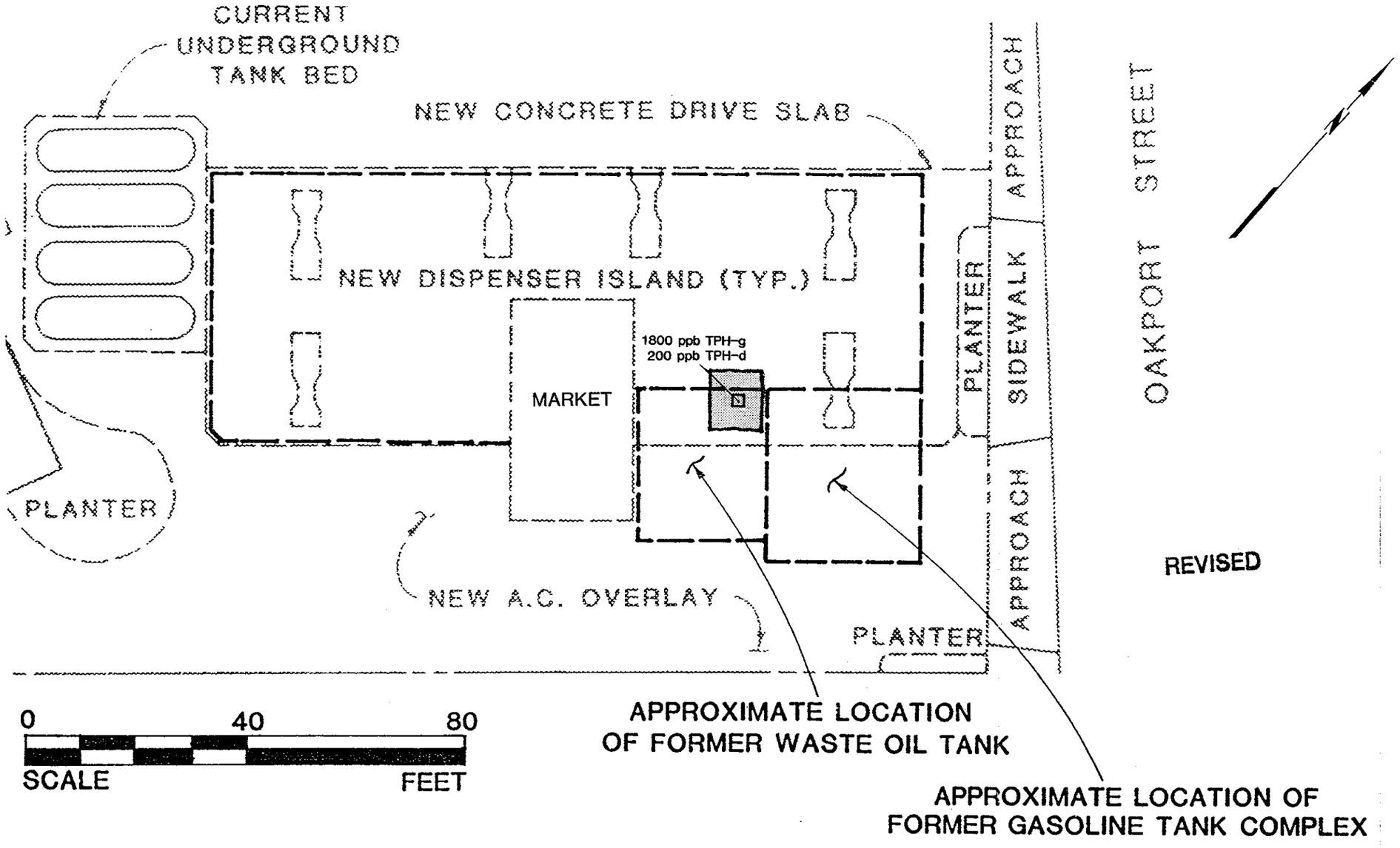
NOTE: NEW STRUCTURES ARE IN CONSTRUCTION AS OF MARCH 1989.
SOURCE: Robert H. Lee & Associates Inc., 3/24/86.

DIESEL SOIL SAMPLE LOCATIONS

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	3/17/89
Prepared By	KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-369-01
Drawing No.	5



LEGEND

PLANNED CONSTRUCTION
(Some foundation constructed as of 3/15/89)

EXCAVATIONS, (JANUARY-FEBRUARY 1989)

GROUNDWATER SAMPLE

NOTE: NEW STRUCTURES ARE IN CONSTRUCTION AS OF MARCH 1989.

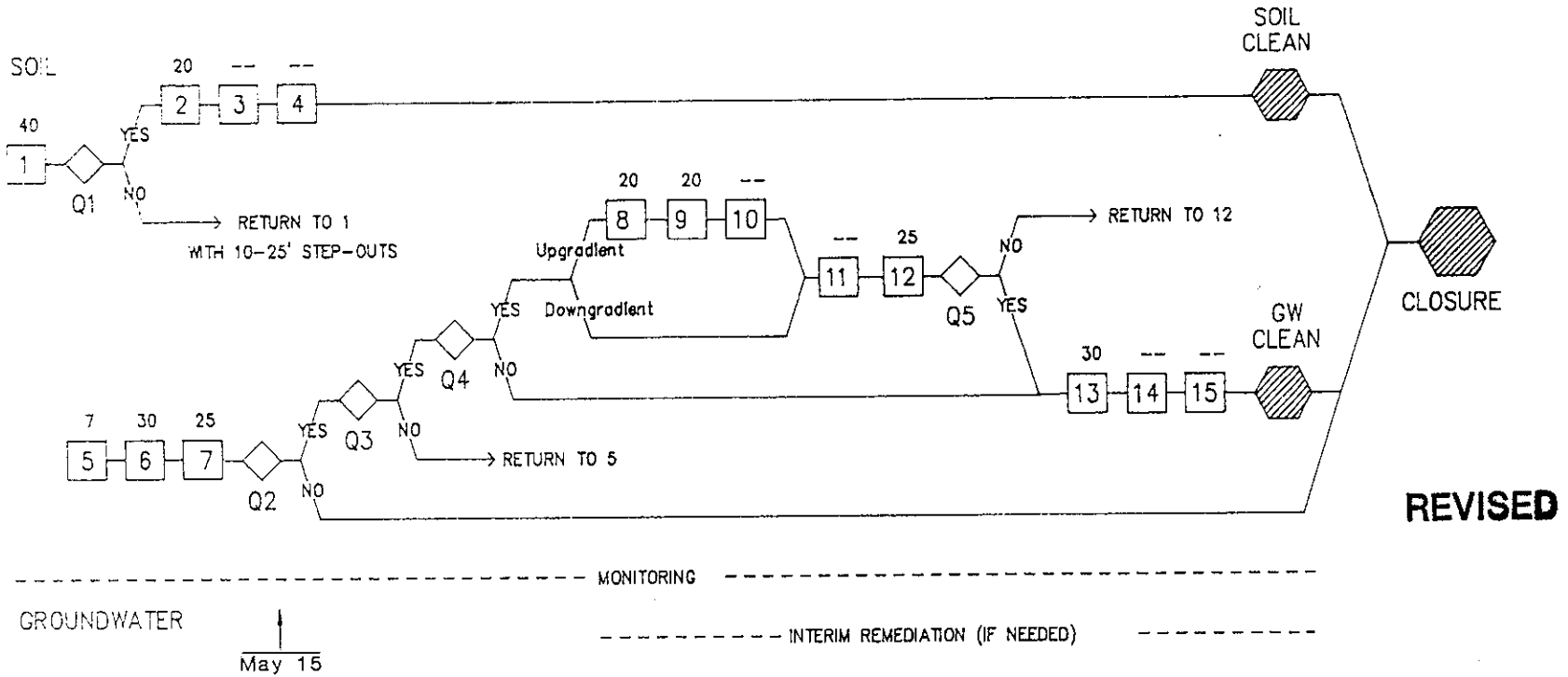
SOURCE: Robert H. Lee & Associates, Inc., 3/24/86

GROUNDWATER SAMPLE LOCATION

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	3/17/89
Prepared By	KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-369-01
Drawing No.	6



TASK

Program I: Onsite Soil Investigation

Task 1	Drill Soil Borings/Analyze Soil
Task 2	Prepare Soil Remedial Action Plan
Task 3	Remediate Soil (if needed)
Task 4	Confirm Remediated Soil

Program II: Onsite Groundwater Investigation

Task 5	Install/Develop New Groundwater Monitoring Wells
Task 6	Sample/Analyze Groundwater
Task 7	Hydrology Tests and Research

Program III: Offsite Groundwater Investigation

Task 8	Neighborhood Assessment
Task 9	Refer to Legal Counsel
Task 10	Inform RWQCB
Task 11	Offsite Groundwater Investigation Plan
Task 12	Install Offsite Wells; Sample/Analyze

Program IV: Groundwater Remediation

Task 13	Prepare Groundwater Remediation Action Plan
Task 14	Implement Remedial Action Plan
Task 15	Confirm Remediated Groundwater

QUESTIONS

Q1:	Is soil fully characterized?
Q2:	Is groundwater actionable?
Q3:	Is groundwater characterized onsite?
Q4:	Does groundwater pollution extend offsite?
Q5:	Is groundwater characterized offsite?

CRITICAL PATH DIAGRAM

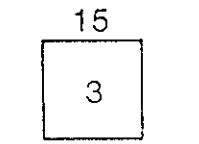
SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

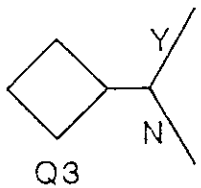
Scale	N/A
Date	3/16/89
Prepared By	KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-369-01
Drawing No.	7

KEY TO CRITICAL PATH DIAGRAMS

Time proceeds from left to right, with Tasks shown in relative order of succession.

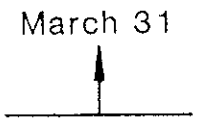


Task, showing Task number (inside) and anticipated number of days to completion (above), including preparatory activities, report preparation and review, and other related actions.



Question to be answered based on information from prior tasks.

Solid symbols indicate Letter Reports or formal Completion Reports coincident with question response.



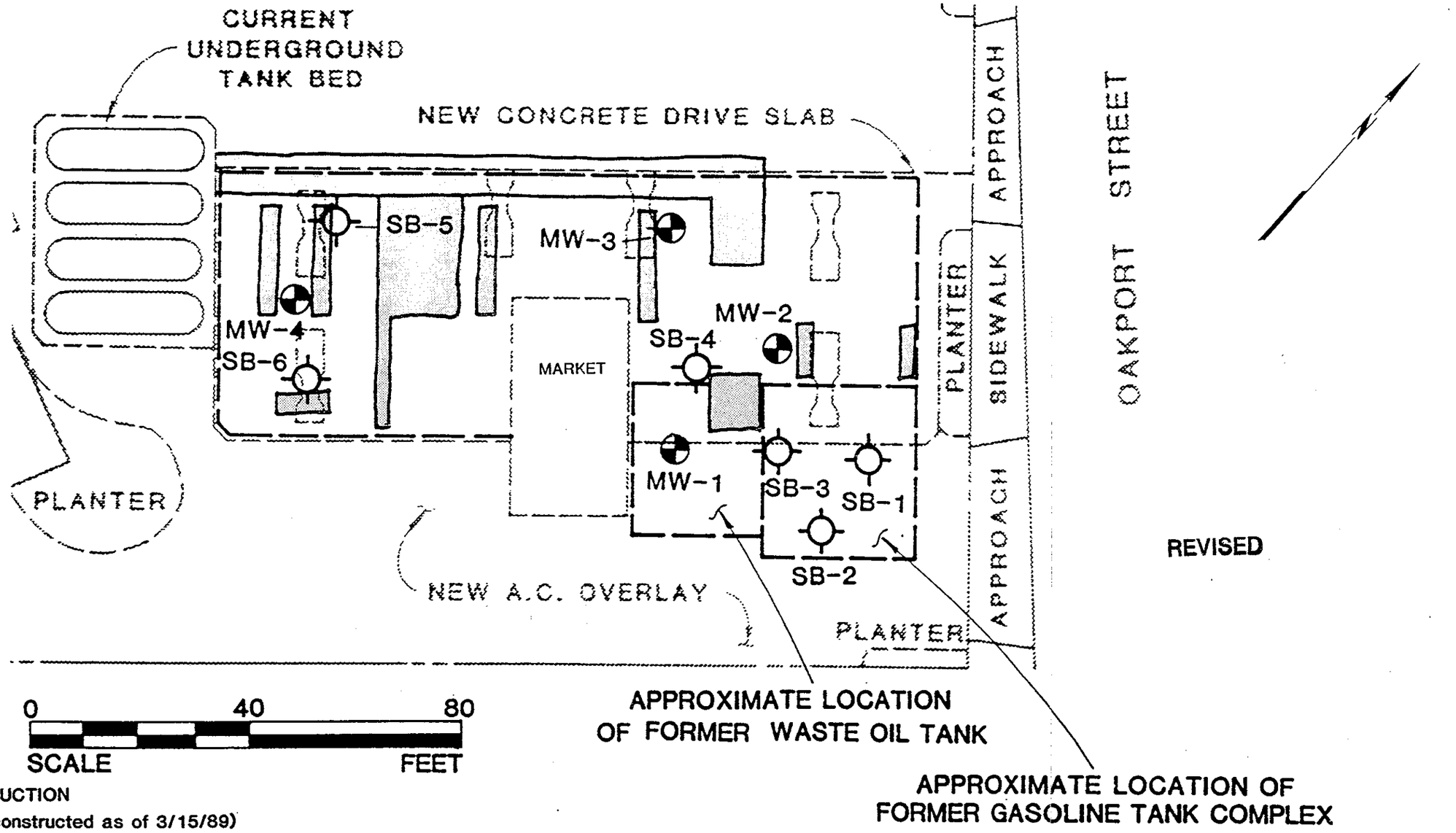
Relative calendar dates and dates of quarterly program reports to regulatory agencies.

KEY TO CRITICAL PATH DIAGRAM

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale	N/A
Date	3/16/89
Prepared By	LQL
Checked By	RMB
Approved By	DWC
Project No.	88-44-369-01
Drawing No	7a



0 40 80

SCALE FEET

LEGEND

PLANNED CONSTRUCTION
(Some foundation constructed as of 3/15/89)

PROPOSED SOIL BORING LOCATIONS

PROPOSED MONITORING WELL LOCATIONS

EXCAVATIONS, (JANUARY-FEBRUARY 1989)

NOTE: NEW STRUCTURES ARE IN CONSTRUCTION AS OF MARCH 1989.

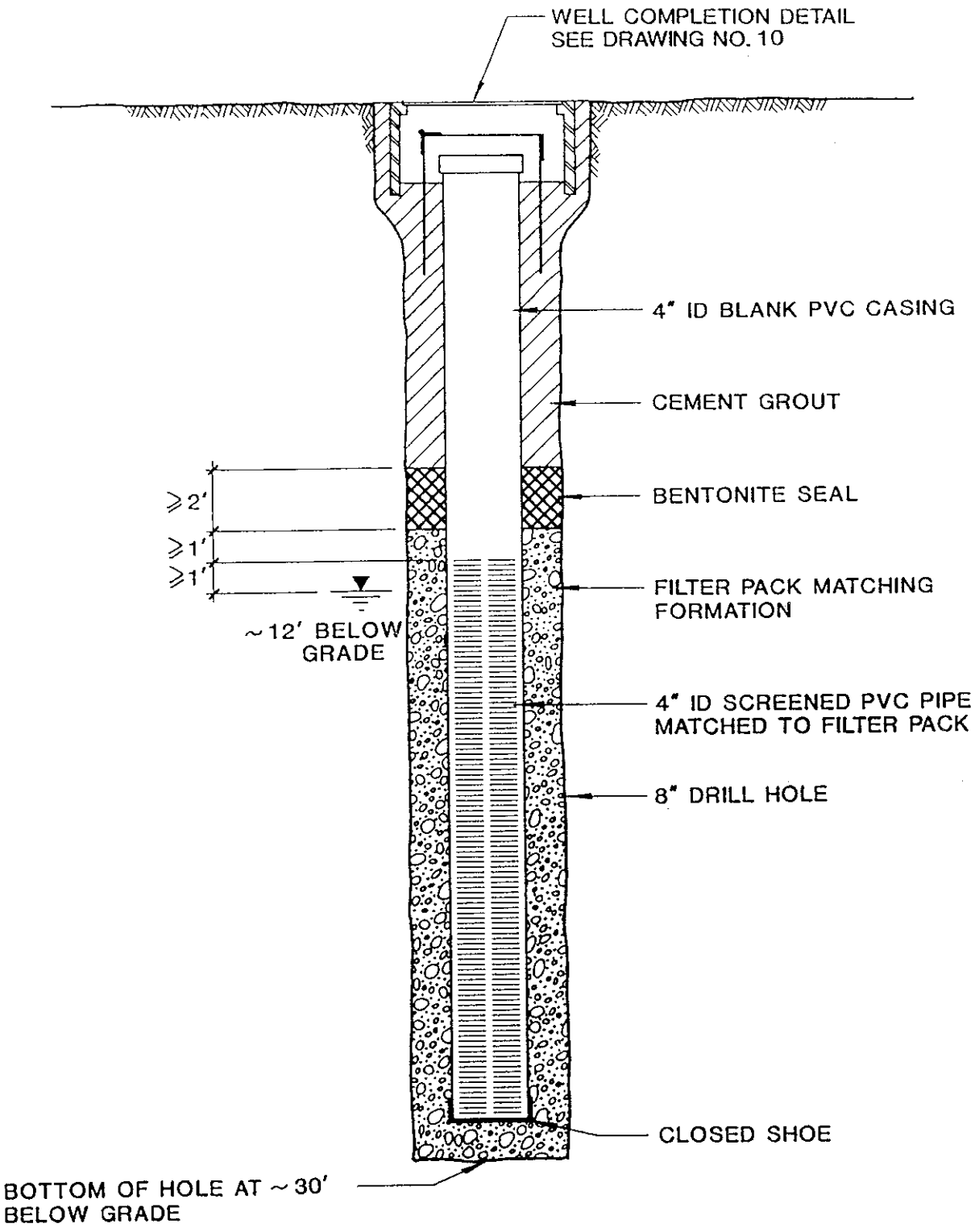
SOURCE: Robert H. Lee & Associates Inc., 3/24/86.

PROPOSED SOIL BORING AND MONITORING WELL LOCATIONS

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	3/17/89
Prepared By	KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-369-01
Drawing No.	8

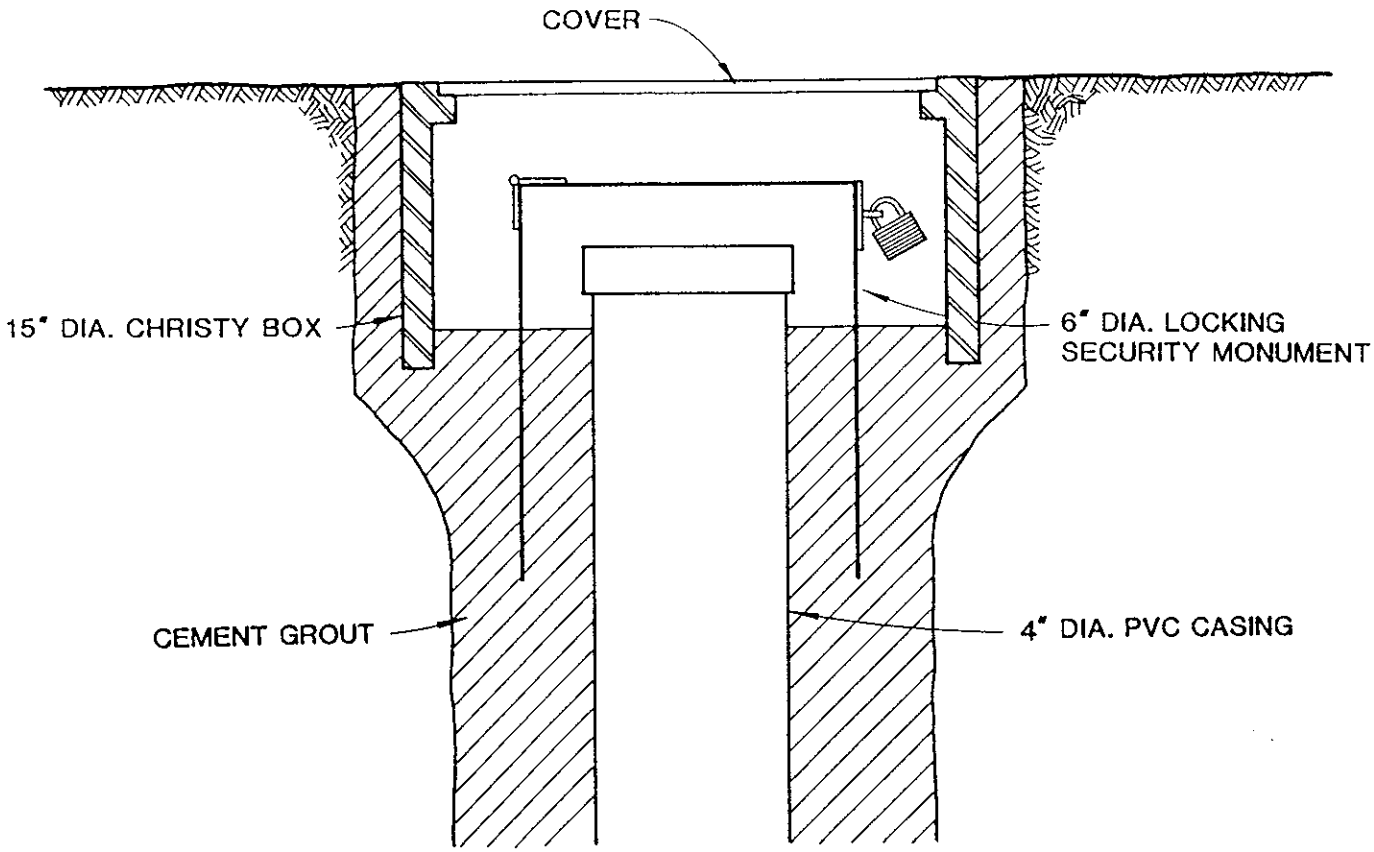


MONITORING WELL DIAGRAM

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental Consultants California

Scale	NOT TO SCALE
Project No.	88-44-369-01
Prepared by	LQL
Date	3/16/89
Checked by	RMB
Drawing No.	9
Approved by	DWC



WELL COMPLETION DETAIL

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental
Consultants California

Scale	NOT TO SCALE
Project No.	88-44-369-01
Prepared by	LQL
Date	3/16/89
Checked by	RMB
Drawing No.	10
Approved by	DWC

APPENDICES

APPENDIX A

HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING

Undisturbed (intact) soil samples shall be recovered from soil borings without introducing liquids into the borings. Soil samples as core or cuttings shall be taken continuously from ground surface to termination depth (TD), or through the aquifer zone of interest for lithologic logging.

Borings shall be drilled hand-driven with a hollow-stem auger and sampled with a modified California-type split-spoon sampler. Soil samples shall be of sufficient volume to perform the analyses which may be required, including replicate analyses.

Soils from all borings shall be described in detail using the Unified Soil Classification System and shall be logged by a professional geologist, civil engineer, or engineering geologist who is registered or certified by the State of California and who is experienced in the use of the Unified Soil Classification System. A technician trained and experienced in the use of the Unified Soil Classification System who is working under the direct supervision of one of the aforementioned professionals shall be qualified to log borings, provided the aforementioned professional reviews the logs and assumes responsibility for the accuracy and completeness of the logs.

All wet zones above the free water zone shall be noted and accurately logged.

If evidence of contamination is detected by sight, smell, or other field analytical methods, drilling shall be halted until the responsible professional determines if drilling deeper is advisable.

All drilling tools shall be thoroughly decontaminated with trisodium phosphate (TSP) or steam cleaner immediately before starting each boring.

Soil samples shall be taken in decontaminated brass sampling tubes in the split-spoon. The brass sleeves will be cut apart using a clean knife. The ends of the tubes will be covered tightly with teflon wrap, capped with tight-fitting plastic caps, wrapped with plastic electricians' tape, and properly labeled.

APPENDIX B

GROUNDWATER MONITORING WELL CONSTRUCTION

Groundwater monitoring wells shall be constructed according to the general specifications shown on the attached well construction diagram.

Groundwater monitoring wells shall extend to the base of the upper aquifer, as defined by the first consistent (>5-foot thick) clay layer below the upper aquifer, or at least 15 feet below the top of the upper aquifer, whichever is shallower. The wells shall not extend through the laterally extensive clay layer below the upper aquifer. The wells shall be terminated 1 to 2 feet into such a clay layer.

For single-cased wells, groundwater monitoring well casing shall extend to the bottom of the boring or into a bentonite plug, if one is used at the bottom of the boring as a hydraulic seal. These casings shall be factory-perforated from a point 1 foot above the bottom of the casing to at least 5 feet above the top of the upper aquifer, as defined by boring lithology and/or geophysics.

Groundwater monitoring wells shall be constructed as filter-packed wells that will prevent the migration of the surrounding formation into the well. Wells shall have 4-inch diameter factory-perforated casing with slots of 0.010 inch for shallow zone wells and 0.0168 inch (nominal) for Schedule 80 intermediate zone wells. Well casings shall have a threaded bottom cap or plug.

Filter packs shall extend at least 2 feet above the top of the perforated interval. A layer of bentonite pellets 1 to 2 feet thick shall be placed on top of the filter pack. Approximately 2 gallons of water shall be added to hydrate the bentonite pellets. The wells shall then be sealed from the top of the bentonite seal to the surface with neat cement. All sand, bentonite and cement below groundwater shall be placed using a tremie pipe.

Any monitoring well to be screened below the upper aquifer shall be installed as double-cased wells, with a steel conductor casing through the upper water-bearing zones to preclude aquifer cross-contamination.

The conductor casing shall be installed in the following manner: a large diameter borehole (typically 18 inches) shall be drilled until it is determined that the first aquifer has been completely penetrated. At this time, a steel conductor casing shall be placed in the hole with centralizers to the depth drilled, and the annulus between the conductor casing and the surrounding formation shall be cement-grouted to the surface using a tremie pipe. The grout shall be allowed to set for a minimum of 72 hours. Drilling shall then continue inside the conductor casing, with a drill bit smaller than the inside diameter of the conductor casing, to the desired completion depth. If additional known aquifers are to be fully penetrated, the procedure can be repeated with successively small diameter conductor casings. If multiple casings are necessary, the width of each casing interval shall be sufficiently large to allow use of a tremie pipe for installing the filter pack without bridging.

Wellheads shall be installed in a watertight structure and provided with a watertight cap. Wellheads shall be enclosed in a locked well covering device that protects the well from the entry of surface water, accidental damage, unauthorized access, and vandalism.

Soil and water sampling equipment and materials used to construct the wells shall not donate, capture, mask, nor alter the chemical composition of the soils and ground water.

All well casings, casing fittings, screens, and all other components that are installed in the well shall be thoroughly decontaminated immediately before starting each well installation.

APPENDIX C

WELL DEVELOPMENT

For all newly installed groundwater monitoring wells, the well casing, filter pack and adjacent formation shall be cleared of disturbed sediment and water before representative water samples are collected. A field geologist shall supervise such development work.

Before well development begins, the grout and bentonite seals shall set at least 24 hours and one pre-development water sample will be taken for each well. These water samples will be collected and analyzed for possible contaminants present according to CECC groundwater sampling protocol and QA/QC. These samples will be stored in the laboratory pending a decision to analyze, if required. If analyzed, standard laboratory procedures will be used. Samples not analyzed will be discarded.

All well development tools shall be thoroughly cleaned immediately before each well development. Well development shall begin with bailing using either a stainless steel or teflon bailer. This procedure will remove heavy sediments from within each well casing, reducing the possibility of the well screen abrasion and pump damage during subsequent pumping. Wells shall be bailed until water samples contain only trace amounts of fine to coarse sand, as measured in sampling jars after 15 minutes of settling.

The wells will be mechanically surged with a surge or flapper block for 15 strokes or 30 minutes, whichever is less. The block will be lowered to the well plug and then carefully drawn up to the top of the well screen or until it emerges from the water. For wells in moderate soils, the rate of surging will be progressively increased with each stroke. When working in areas of loose sediments, surging will be at a constant, slow stroke rate. Areas of dense or over-compacted sediments may require more vigorous surging. Between surging episodes, the wells will be bailed and/or pumped to remove the sediment-rich water generated.

After surging, wells under development will be pumped using stainless steel 3-inch positive displacement development pumps, 2-inch bladder pumps or other appropriate equipment. In this procedure, the pumps will operate at maximum rate which is less than the recharge rate of the pumped well. For complete development, the wells will be pumped until: (1) the discharge is clear or nearly clear; and (2) the turbidity has not noticeably changed with one-half hour.

All water and sediment generated by well development shall be collected in clean, 55-gallon steel drums unless only a small volume (less than 100 gallons) is produced. Drums of this development water will be temporarily contained onsite, pending sampling and laboratory analysis. Non-hazardous development waters shall be disposed of by surface dumping (small volumes) or sewerage. Potentially hazardous development water shall be properly disposed of at a suitable hazardous waste disposal site or properly treated for non-hazardous discharge. Small volumes of development water may be disposed of by surface dumping if, in the opinion of the onsite geologist, potential contamination to the environment is minimal.

APPENDIX D

GROUNDWATER SAMPLING

Groundwater samples shall be collected for laboratory analysis by the following procedures:

1. Before sampling or purging begins, all bailers, pumps, cables and lines will be steam-cleaned. An established and designated cleaning area will be kept clean by lining with visqueen or using a cleaning rack.

2. A pre-purge sample shall first be obtained with a bailer from as deep in the well as possible. Standard "Water Sampling Field Survey Forms" will be filled out for this and all future samples, to include the following information:

   - Depth to water and total depth of water column, measured and recorded before purging begins;
   - Conductivity, checked and recorded for every 5 gallons of purged water (for small volumes); and
   - Purged volume (as appropriate), with stabilized readings for pH, conductivity and temperature.

The well shall then be bailed or pumped to remove four to ten well volumes prior to sampling. The well will be purged until conductivity has been stabilized. "Stabilized" is defined as three consecutive readings within 15% of one another. A casing volume will be based on actual measurements made on the day of sampling, i.e., the total depth minus depth to water on day of sampling, time the cross-sectioned area of the casing.

If the well is emptied before four to ten well volumes are removed, the sample shall be taken when the water level in the well recovers to 80% of its initial water level or better.

Whenever possible, samples will be collected within 24 hours after purging; ideally, samples will be collected immediately after purging.

Following the required volume of evacuation from the well, the sample shall be obtained with a teflon or stainless steel bailer on a 60-pound monofilament or polypropylene (washed) line. Care will be taken to properly clean cables with braided stainless steel cable or plastic coverings, if used. Air lift sampling and bladder pumps shall not be used.

Unless specifically waived or changed by the local, prevailing regulatory agency, water samples shall be handled and preserved according to the latest EPA methods as described in the Federal Register (Volume 44, No. 233, Monday, December 3, 1979, Page 69544, Table II) for the type of analysis to be performed.

Purge water will be properly disposed of or temporarily contained in steel barrels pending chemical analysis to designate proper disposal procedure.

APPENDIX E

CHAIN-OF-CUSTODY

SAMPLE COLLECTION, HANDLING AND IDENTIFICATION

Sample collection, handling, and identification will follow the guidelines set by the California Department of Health Services. Field records will be completed when the sample is collected and will be signed or initialed, including the date and time, by the sample collector(s). Field records will contain the following information:

1. Unique sample or log number;
2. Date and time;
3. Source of sample (including name, location and sample type);
4. Preservative used;
5. Analyses required;
6. Name of collector(s);
7. Pertinent field data (pH, DO, C1, residual, etc.); and
8. Serial number on seals and transportation cases.

Each sample will be identified by affixing a pressure sensitive, gummed label, or standardized tag on the container(s). This label will contain the sample identification number, date and time of sample collection, source of sample preservative used, and the collector(s) initial(s). Analysis required will be identified. Where a label is not available, the same information will be affixed to the sample contained with an indelible, waterproof, marking pen.

The sample container will be placed in a transportation case along with the chain-of-custody record form, pertinent field records, and analyses request form. The transportation case will then be sealed and labeled. Records will be filled out legibly in pen.

TRANSFER OF CUSTODY AND SHIPMENT

When transferring the possession of the samples, the transferee will sign and record the date and time on the chain-of-custody record. Custody transfer, if made to a sample custodian in the field, will account for each individual sample, although samples may be transferred as a group.

The field custodian or field inspector will be responsible for properly packaging and dispatching samples to the appropriate laboratory for analysis. This responsibility includes filling out, dating, and signing the appropriate portion of the chain-of-custody record.

All packages sent to the laboratory will be accompanied by the chain-of-custody record and other pertinent forms. A copy of these forms will be retained by the originating office.

Mailed packages can be registered with return receipt requested. If packages are sent by common carrier, receipts should be retained as part of the permanent chain-of-custody documentation.

Samples to be shipped will be sealed locked so evidence of tampering may be readily detected.

LABORATORY CUSTODY PROCEDURES

Chain-of-custody procedures will be followed in the laboratory from the time of sample receipt to the time the sample is discarded.

The sample control officer (SCO) will be the designated custodian, and an alternate is designated to act as custodian in the custodian's absence. All incoming samples are received by the SCO, who shall indicate receipt by signing the accompanying custody forms and who shall retain the signed forms as permanent records.

The SCO will maintain a permanent log book to record, for each sample, the person delivering the sample, the person receiving the sample, date and time received, source of sample, sample identification or log number, how transmitted to the laboratory, and condition received (sealed, unsealed, broken container, or other pertinent remarks). A standardized format will be established for log book entries.

A clean, dry, isolated room, building, and/or refrigerated space that can be securely locked from the outside, will be designated as a "sample storage security area."

The SCO will ensure that heat-sensitive, light-sensitive samples, radioactive, or other sample materials having unusual physical characteristics, or requiring special handling, are properly stored and maintained prior to analysis.

Only the custodian will distribute samples to the section leaders who are responsible for the laboratory performing the analysis.

The laboratory area will be maintained as a secured area, restricted to authorized personnel only.

Laboratory personnel will be responsible for the care and custody of the sample once it is received by them. These personnel shall be prepared to testify that the sample was in their possession and view, or secured in the laboratory at all times, from the moment it was received from the SCO, until the time that the analyses are completed.

Once the sample analyses are completed, the unused portion of the sample, together with all identifying labels, will be returned to the SCO. The returned tagged sample will be retained in the custody room until permission to destroy the sample is received by the SCO.

Samples will be destroyed only upon the order of the Laboratory Director, in consultation with previously-designated Project Manager, and/or client, or when it is certain that the

information is no longer required or the samples have deteriorated. The same procedure will apply to tags and laboratory records.

APPENDIX F

STANDARDS FOR BACKFILLING BORINGS AND SEALING WELLS

INTRODUCTION

As standard practice, all borings and observation and monitoring wells shall be backfilled or sealed with "relatively impervious" grout to prevent surface contamination or cross-contamination between aquifers. Borings will be sealed from termination depth to the surface and observation and monitoring wells shall be backfilled and sealed above the water table. This practice will reduce liability if it is determined and proven that groundwater contamination occurred along a "vertical pathway" in an improperly sealed or filled boring or well.

In hazardous and potentially hazardous waste sites where deep borings or wells are installed, appropriate geologic information will be reviewed to determine if multiple aquifer system(s) exist(s). If such system(s) exist(s), drilling and sealing techniques will be used to prevent contamination of a lower aquifer by upper, potentially contaminated aquifer(s). Grout seals will be installed according to the following techniques through all thicknesses of impermeable zones which separate aquifer.

Borehole grouting shall consist of backfilling with bentonite pellets, cement/bentonite grout, or a thick bentonite slurry, depending upon the depth of the boring, depth to ground water, and type of drilling equipment used. Details of currently acceptable sealing methods are outlined below.

GENERAL SPECIFICATIONS

- All grouting and well construction and sealing and abandonment of borings shall be consistent with local ordinances.

- Cement/bentonite grout used to seal wells will be of a hard consistency that can resist traffic loads, but not installed to create a "concrete pile" that will obstruct further earthwork. Bentonite slurry, which does not support surface loads, will not be used for sealing wells.

GROUTING/SEALING TECHNIQUES

Dry Holes and Borings Containing Less Than 5 Feet of Water

Option 1: Backfill boring with bentonite pellets or granules in about 2-foot lifts. Add a gallon of water to hole after each lift.

Option 2: Pour in a mixture of cement/bentonite group (9 parts cement, 1 part bentonite powder plus water as needed to make mixture consistency of pancake batter).

Option 3: Pour in a thick mixture of bentonite and water. Soil cuttings can be used to bulk this mixture is soil is not contaminated and chunks are small and well-mixed in slurry.

Borings Containing More Than 5 Feet of Water

Option 1: Pump out water and use criteria for "dry hole."

Option 2: Pump cement/bentonite grout to bottom of hole or use tremie. Do not pour grout through water.

Option 3: Pump or tremie bentonite slurry. This alternative is particularly efficient if you are using rotary wash equipment since all you have to do is thicken the drilling mud and pump it through the drill rod.

Monitoring/Observation Well Sealing (Single Aquifer)

A. Place sand pack around well casing to about 2 feet above slotted interval. Anticipate fluctuation of water level so screened interval covers maximum water elevation.

B. Place 2-foot thick bentonite pellet seal above sand pack. Add a bucket of clean water to swell pellets.

C. Pour cement/bentonite grout or bentonite slurry above pellet seal to ground surface.

APPENDIX G

MUD ROTARY DRILLING PROCEDURES

Mud rotary will be drilled according to the following procedures:

All drilling equipment (rig, drill bits, drill pipe, mud tub) shall be thoroughly cleaned before drilling begins.

A mud tub shall be set in place and a drilling fluid of bentonite mud or some similar material shall be circulated.

Drilling shall proceed with constant monitoring of drilling speeds (how hard the engine must work in order to turn the bit) and rate of drilling (how quickly the bit cuts through the material) in order to determine subsurface lithology. "Rig chatter" shall be used to determine size or quantity of gravel. Loss of drilling fluid shall be used to determine permeability, e.g., in a gravel layer, large loss of drilling fluid implies clean gravels.

Drilling mud shall be kept thick to minimize "trip time" of cuttings to the surface and allow coarser, representative material to be carried to the surface quickly.

In the event large losses of drilling fluid are encountered, the mud shall be thickened to facilitate building of mud cake on the borehole walls and reduce loss of drilling fluid into the formation.

Sampling may be accomplished by pulling up all drill pipe, removing the drill bit from the borehole and running a sampler (exactly like hollow-steam auger) down the hole.

Mud rotary drilling shall be used in environmental investigations with minimal cross-contamination of aquifers for at least two reasons: (1) the bend produced by the column of mud in the borehole shall cause flow of fluids in the borehole into the formation and not contaminants in the surrounding formation into the borehole; and (2) the mud cake on the borehole walls will reduce communication between the borehole and the surrounding formation.

Mud rotary has the advantage over hollow-steam auger drilling of: (1) being able to drill deeper; and (2) being able to drill larger diameter holes to allow setting of conductor casing.

APPENDIX H

SAMPLING FOR VOLATILE ORGANICS

In this sampling, it is especially important that the sample represent conditions existing in the aquifer, not in the well. Differences in water quality characteristics often exist between the water in the well and the surrounding aquifer, particularly in wells used intermittently or infrequently such as monitoring wells. To obtain a representative sample of the aquifer, the well is purged until selected water quality parameters stabilize. The parameters should include pH, electrical conductivity and temperature. Once consistent readings are obtained for the three parameters, the discharge should represent formation waters rather than potentially stagnant water in the well. The purge volume should amount to between three and five well volumes.

After the well is purged, the discharge shall be decreased to the slowest rate obtainable. The sampler shall be careful to not contaminate the sample. The following practices shall be followed:

1. Do not touch the lip of the bottles or insides of the septum.

2. Avoid touching the mouth of the discharge tap.

3. Do not splash or agitate the water while the bottle is being filled.

4. Do not smoke, eat or handle any objects not necessary for sampling.

5. Do not sample downwind of any potential volatile organic sources such as car exhausts, open fuel tanks, etc. Note any potential sources in the area if the are unavoidable.

6. Avoid handling the septum. If handling is necessary, use specially prepared and protected forceps or tweezers.

When taking the sample, first rinse the bottle two to three volumes with the well water. The bottle is then filled slowly to prevent entrapment of any air bubbles. The bottle is filled completely such that a meniscus form, essentially "piling up" the water into the bottle. Immediately place the cap on, turn the bottle upside down, tap it a few times and note whether there are any bubbles in the sample. If a bubble exists, discard the sample and repeat sampling including the triple rinse. If a bubble is found on the second attempt, do not repeat the procedure again, but note the bubbles existence on the sample label and also notify the laboratory when it is submitted.

Place the sample in a sealable plastic bag and then into a cooler/ refrigerator. The sample should be protected from any light sources as much as possible.

Deliver the sample to the laboratory as soon as possible. If it cannot be delivered to the lab the same day, store the sample in a refrigerator which maintains a constant

temperature of 4°C. It is important that the sample be delivered as soon as possible since the samples must be analyzed within two weeks for the results to be valid. Therefore, the sooner the sample is given to the lab, the more time the lab has to analyze it.

APPENDIX I

OUTLINE OF DRUM HANDLING PROCEDURES

1. Complete drummed worksheets on site, forward a copy to Shell.

2. Test material per Shell's site-specific test requirements (Appendix J).

3. Classify Material as: Clean/Non-Hazardous/Hazardous

4. Labeling of Drums

   - Pending Label: Used to describe material pending final analytical testing. Labels must be immediately affixed to drum during field work.

   - Non-Hazardous Label: Required within 48 hours after analytical results are received.

   - Hazardous Label: Required within 48 hours after analytical results are received.

   - For Pick-Up Label: Must be affixed to drum prior to Shell Hazardous Waste Coordinator arranged pick-up date.

5. Remove within 14 days of date of generation. Empty drums, where material was disposed in bulk, must be removed the same day they are emptied.

6. Dispose of Material:

   - Clean: Any local landfill
   - Non-Hazardous: Class III landfill. If a Class III landfill will not accept, contact Shell Hazardous Waste Coordinator for assistance
   - Hazardous: Class I landfill arranged by Shell Hazardous Waste Coordinator.

   Mail or FAX completed Hazardous Waste Pick-Up Forms to the Shell Hazardous Waste Coordinator with a copy of the analytical results and worksheets.

7. If required, contact the Shell Hazardous Waste Coordinator:

   Shell Oil Company
   Hazardous Waste Coordinator
   Anna Sampson
   P.O. Box 6249
   Carson, California 90749
   Phone: (213) 816-2037
   FAX: (213) 816-2114

8. Manifests may be signed by the onsite contractor or consultant, station dealer, or other authorized Shell Oil representatives. The transporter CAN NOT sign the manifest.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR/CONSULTANT TO ARRANGE FOR A PERSON TO SIGN THE MANIFEST ON THE DAY OF PICK-UP.

9. Reporting

   All reports must be received by the Shell Hazardous Waste Coordinator within 7 working days of disposal. Reports shall include the following:

   - Completed drummed soil and water worksheets.
   - Attach a copy of the analytical results.
   - State how and where material was disposed.
   - If drums are emptied and material was disposed in bulk, state how empty drums were handled.
   - The signed blue and yellow copies of the hazardous waste manifest.

APPENDIX J

DRUM HANDLING PROCEDURES

SOIL:

1. Test requirements and methods: Per Shell's site-specific test requirements

   - TPH: EPA Method 8015
   - BTEX: EPA Method 8020
   - Lead:

     -One composite sample from each boring
     -See attached decision tree
     -Total Lead - EPA Method 7421
     -Inorganic (soluble) Lead - DOS Title 22, Waste Extraction Test, §22-66700

   - Ignitable:

     -One composite sample from each boring
     -Bunsen Burner Test Flame Test

2. Classification

   - Clean: TPH, BTEX, and Lead non-detectable
   - Non-Hazardous if any are true:

     -TPH less than 1000 ppm

     -Lead -Inorganic (soluble) Lead less than 5 ppm (STLC)
     or less than 100 ppm (TTLC)
     -Organic Lead less than 13 ppm (TTLC)

     -Ignitable - If TPH < 1000 ppm do not conduct test

   - Hazardous if any are true:

     -TPH greater than 1000 ppm

     -Lead -Inorganic (soluble) Lead greater than 5 ppm (STLC)
     or greater than 1000 ppm (TTLC)
     -Organic Lead greater than 13 PPM (TTLC)

-Ignitable -If TPH >1000 ppm, then conduct Bunsen Burner Test
-If soil burns vigorously and persistently, soils are RCRA D001

3. Responsibility For Disposal

   - Clean: Consultant/Contractor
   - Non-Hazardous: Consultant/Contractor or Shell Hazardous Waste Coordinator
   - Hazardous: Shell Hazardous Waste Coordinator

4. Types of Drums: DOT-17H for a solid, solidified, or sludge material.

5. Disposal Facility

   - Clean: Any local landfill
   - Non-Hazardous: Class III landfill. If a Class III landfill will not accept, contact Shell Hazardous Waste Coordinator for assistance
   - Hazardous: Class I landfill arranged by Shell Hazardous Waste Coordinator

WATER:

1. Test requirements and methods: Per Shell's site-specific test requirements.

   - TPH: EPA Method 8015
   - BTEX: EPA Method 602

2. Classification

   - Clean Water: TPH and BTEX non-detectable
   - Non-Hazardous:

     -Water with dissolved product and detectable TPH and BTEX
     -Water with free product
     -Free product only

3. Responsibility For Disposal

   - Clean: Consultant/Contractor
   - Non-Hazardous: Consultant/Contractor or Shell Hazardous Waste Coordinator

4. Types of Drums: DOT-17C or DOT-17E for liquid or slurry

5. Disposal Facility

- Clean Water: Into dealer's sanitary sewer or with proper approval from Water Board to storm sewer

- Non-Hazardous:

  Water with TPH and BTEX only -

  -Into dealer's sanitary sewer with approval from the POTW
  -Contact Shell Hazardous Waste Coordinator to arrange disposal

  Water with free product -

  -Contact Shell Hazardous Waste Coordinator to arrange disposal

- Hazardous:

  Free product only -

  -Contact Shell Hazardous Waste Coordinator to arrange disposal

HAZARDOUS WASTE PICK-UP FORM

TO: Hazardous Waste Coordinator
Anna Sampson
Shell Oil Company

P. O. Box 6249
Carson, CA 90749
Phone: (213) 816-2037 FAX: (213) 816-2114

Date: _____ Pick-up Date and Time: _____

CONSULTANT/CONTRACTOR INFORMATION

Company Name: _____
Address: _____
City: _____ State: _____ Zip: _____
Contact: _____ Phone: _____

SHELL INFORMATION

District/Environmental Engineer: _____
District: _____ Phone: _____

SHELL FACILITY INFORMATION

Facility Address: _____
City: _____
County: _____ State: _____ Zip: _____
Location WIC Numcer: _____ AFE: _____ CT/DL: _____

DRUMMED MATERIAL DESCRIPTION

Soil: Description of Soil: _____

Data(s) accumulated: _____
Type of Drum: DOT17C___ Other: _____
Number of Drums containing Clean Soil ..... _____
Number of Drums containing Non-Hazardous Soil ..... _____
Number of Drums containing Hazardous Soil ..... _____
* Total Number of Soil Drums for pick-up ..... _____

Water: Description of Water: _____

Date(s) accumulated: _____
Type of Drum: DOT17E___ DOT17H___ Other: _____
Number of Drums containing clean water only ..... _____
Number of Drums containing dissolved product & water_____
Number of Drums containing free product & water ... _____
Number of Drums containing free product ..... _____
* Total Number of Water Drums for pick-up ..... _____

BULK MATERIAL DESCRIPTION

Bulk Material: Data(s) accumulated: _____
Type of Material: _____

Estimated Quantity: _____
Type of service required to move material: _____

NOTE: Attach a copy of all Analytical Results. All information must be completed, any questions call Shell Engineer.

DRUMMED SOIL WORKSHEET

Page of

Facility address:
Location WIC Number:
City:
Date:

Pick Up yes/ no	Drum No.	Data Acumul	Description of Soil	TPH-ppm			Lead-ppm		
				<100	100 to 1000	>1000	Total	Organ	Inor

Consultant:
Geologist:

DRUMMED WATER WORKSHEET

Page of

Facility address: Date:

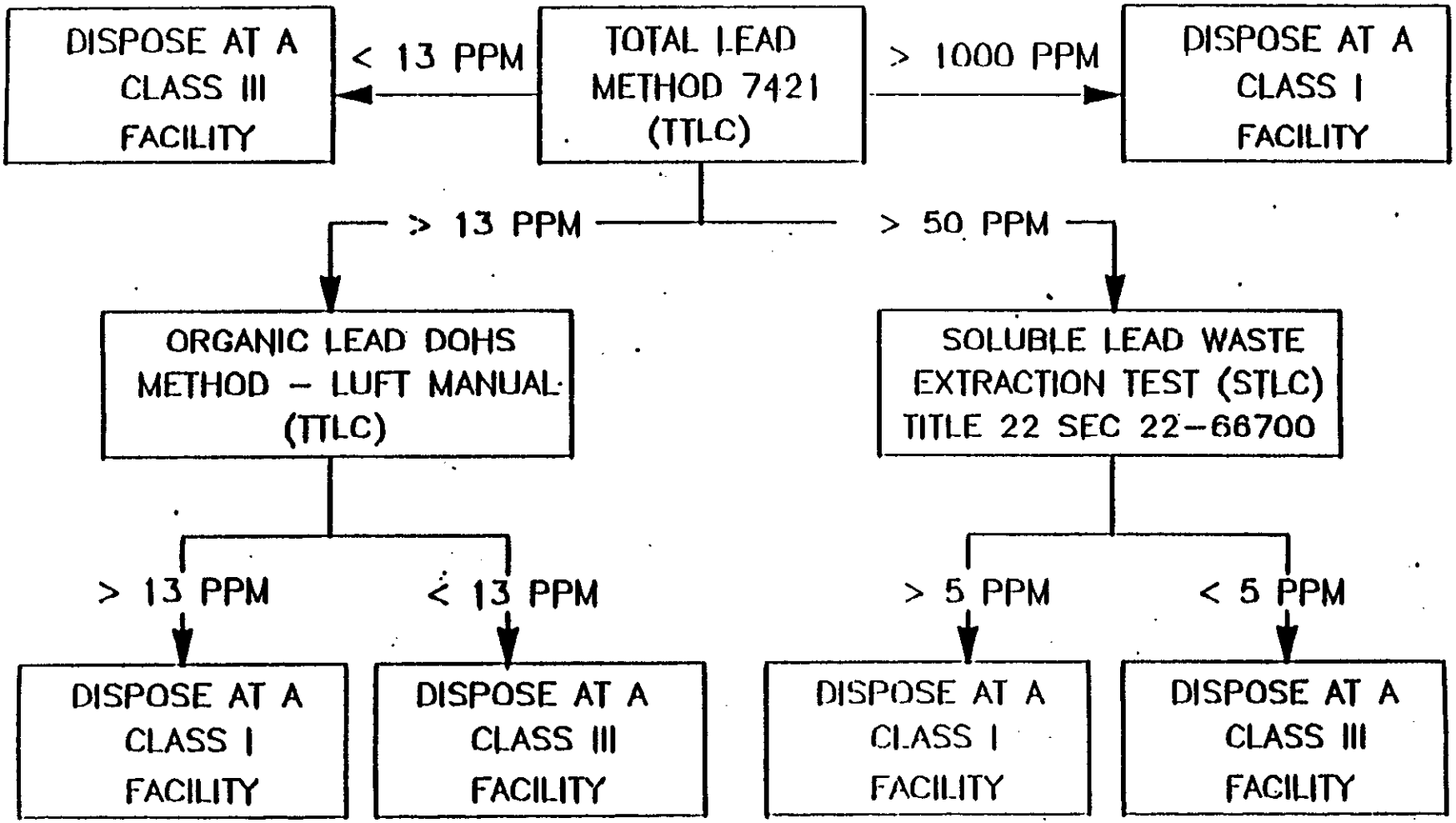
Location WIC Number: City:

Pick Up yes/ no	Drum No.	Date Acumul	Description of Water	Clean Water Only		Disolvd Product & Water		Free Product & Water	Product Only
				TPH	B	TPH	B		

Consultant:

Geologist:

DECISION TREE FOR LEAD TESTING CONTAMINATED SOILS



ATTACHMENT 1

BLAINE
TECH SERVICES INC.

1370 TULLY RD., SUITE 505
SAN JOSE, CA 95122
(408) 995-5535

February 16, 1989

Shell Oil Company
P.O. Box 4023
Concord, CA 94524

Attention: Ray Newsome

SITE:
Shell Oil
630 High Street
Oakland, California

PROJECT:
Confirmation samples following additional excavation in the waste oil tank pit

SAMPLED ON:
February 8, 1989

SAMPLING REPORT 89039-C-1

OBJECTIVE SERVICES

Blaine Tech Services, Inc. performs specialized environmental sampling and documentation as an independent third party. In order to avoid compromising the objectivity necessary for the proper and disinterested performance of this work, Blaine Tech Services, Inc. does not participate in the interpretation of analytical results or become involved with the marketing or installation of remedial systems. The interpretation of results should be performed by representatives of interested regulatory agencies and/or those professionals who are engaged as paid consultants in the business of providing opinions and proposals for further investigation or clean-up activities.

This report describes the environmental sampling and documentation performed by our firm on this project. In addition to the text of the Sampling Report, supporting documents are provided as attachments. These include the chain of custody and the certified analytical laboratory report. All of these documents should be kept together and preserved as a file of interrelated records which, together, comprise the documentation of the work performed at the site.

Background

Our field personnel first visited the subject site on Thursday, January 26, 1989, to obtain soil samples from beneath the product lines and the product dispensing pump islands. A total of nine sample were collected from the product line trench and the three western dispenser pump islands. Two soil samples were collected from the eastern island area, where two dispenser pump islands had been located at some point in the past. Finally, a soil sample was collected from an area that smelled of gasoline, but was not closely associated with either the product dispensing pump islands or the product line trench. Discussion of this sampling activity can be found in Blaine Tech Services, Inc. Sampling Report No. 89026-C-1.

We returned to the site on Thursday, February 3, 1989 to obtain samples from the product dispensing pump islands after additional excavation in these areas. In addition, samples were obtained from the areas of the former waste oil and gasoline tank pits. These tank pits were associated with a service station that occupied the site prior to the present fuel dispensing facility. A detailed discussion of this particular sampling activity can be found in Blaine Tech Services, Inc. Sampling Report No. 89034-C-1.

Scope of Requested Services

In accordance with your request, field personnel would be dispatched to the site to obtain additional soil samples from the waste oil tank pit after this pit had been excavated to a depth of thirteen feet (13') below grade. In addition, our personnel would arrange for the proper analyses of the samples, and maintain adequate documentation resulting in the issuance of a formal Sampling Report. The collection of environmental samples was to be performed in accordance with the requirements of the State Water Resources Control Board.

Execution of the Work

Field personnel from our office arrived at the subject site on Wednesday, February 8, 1989 to perform the requested sampling. Our personnel observed the further excavation in the area of the former waste oil tank pit. The pit was enlarged in a westerly direction from ten feet (10') to approximately fifteen feet (15') in length. The depth of the pit was increased from six feet (6') to approximately ten feet (10') below grade. The soil being removed from the floor of the excavation at this point smelled as though it might still contain some waste oil, so excavation was begun in the southwest corner of the pit to extend the depth of the excavation. At approximately twelve feet (12') below grade level, water began to enter this area of new excavation activity.

Mr. Ariu Levi of the Alameda County Department of Health, who was not present to observe the sampling, was contacted by telephone. In response to questioning by our field personnel, Mr. Levi stated that since water was available to sample, his office was going to request that a water sample be obtained. Mr. Levi further stated that it was preferable that the water standing in the excavation be evacuated prior to sampling, but if this was not possible, that a sample of the water was still desirable.

The southwest corner of the waste oil pit was extended to a total depth of approximately fourteen feet (14') below grade, forming a small sump in this corner of the excavation. Approximately two feet of water was allowed to collect in this sump, and one sample of the water was obtained (Sample #3) with a subsurface water sampler. At the time the sample was collected, the water was standing in the sump at a depth of twelve feet (12') below grade level.

Mr. Ray Newsome, the Shell Oil Engineer in charge of this project, requested during a visit to the site earlier in the day that samples should be taken of each of the pit walls at a depth of six feet (6') below grade, and at the bottom of the wall where the wall and the floor intersect. Four soil samples were collected at a depth of six feet (6') below grade from each of the walls of the excavation: Sample #1 from the north wall, Sample #6 from the east wall, Sample #4 from the south wall, and Sample #8 from the west wall. Samples #2 and #7 were collected at a depth of ten feet (10') below grade from the north and east walls, respectively, where the wall and the floor intersect. Samples #5 and #9 were collected at a depth of twelve feet (12') below grade level from the south and west walls, respectively, approximately six inches (6") above the water standing in the sump. All of these soil samples were obtained with a hand driven soil core sampler.

The material removed during this and previous excavation activity in the waste oil tank pit was stockpiled near the northern edge of the property. Four sample containers of soil (Samples #10A - 10D) from this stockpile were collected and submitted to the laboratory to be composited into one sample prior to analysis.

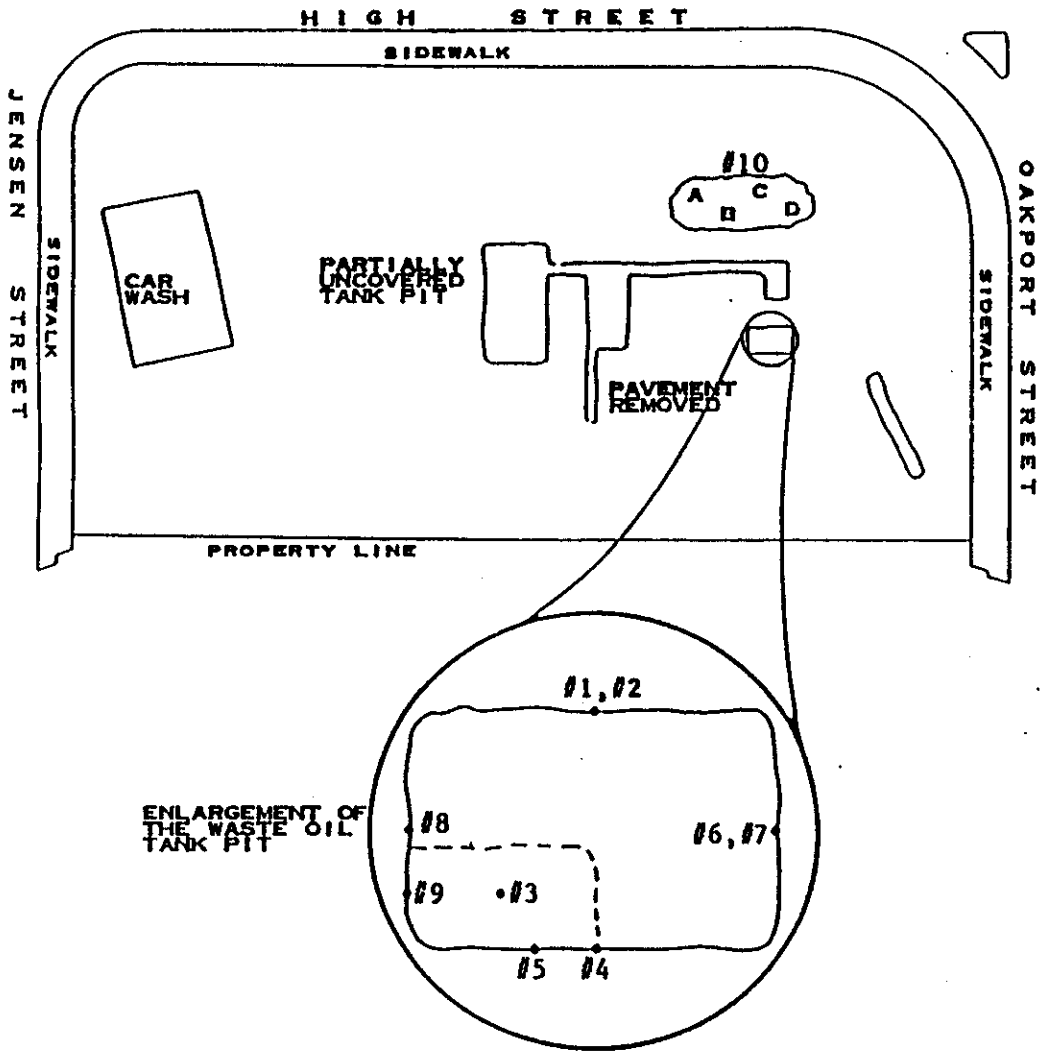
The location of individual sampling points is shown on the diagram on page four. Additional information on the exact method of sample collection will be found in the **Sampling Methodology** section of this report.

Following the completion of the sampling activity, the samples were submitted to the offices of Mobile Chem Labs, Inc., of San Carlos, California. Mobile Chem Labs, Inc. is a California Department of Health Services certified Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #198.

It was requested that the analytical procedures used for these analyses be those specified by the Regional Water Quality Control Board -- San Francisco Bay Region. The methods are defined in attachments to the San Francisco RWQCB (Region 2) publication, Guidelines For Addressing Fuel Leaks and in documents issued to clarify the Board's interpretation of the California LUFT Manual.

SCALE: 0 50'

MAP REF: THOMAS BROS, ALAMEDA CO. P.12 A-4



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#1 SOIL SAMPLE FROM WALL AT 6' ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS(TPH) AS DIESEL AT MOBIL CHEM LAB

#2 SOIL SAMPLE FROM WALL AT 10' ANALYSIS FOR TPH AS DIESEL

#3 SUBSURFACE WATER SAMPLE ANALYSIS FOR TPH AS GASOLINE, TPH AS DIESEL AND BENZENE, TOLUENE, XYLENES AND ETHYL BENZENE(BTXE)

#4 SOIL SAMPLE FROM WALL AT 6' ANALYSIS FOR TPH AS DIESEL

#5 SOIL SAMPLE FROM WALL AT 12' ANALYSIS FOR TPH AS DIESEL

#6 SOIL SAMPLE FROM 6' ANALYSIS FOR TPH AS DIESEL

#7 SOIL SAMPLE FROM 10' ANALYSIS FOR TPH AS DIESEL

#8 SOIL SAMPLE FROM 6' ANALYSIS FOR TPH AS DIESEL

#9 SOIL SAMPLE FROM 12' ANALYSIS FOR TPH AS DIESEL

#10 STOCKPILE SOIL COMPOSITE ANALYSIS FOR TPH AS DIESEL

SAMPLING PERFORMED BY STEPHEN CARTER

DIAGRAM PREPARED BY BRENT ADAMS

SAMPLING METHODOLOGIES USED ON THIS PROJECT

Hand Driven Core Sampling: This is another term for the sampling methodology that is often called undisturbed soil sampling. This is the generally preferred sampling method for both geotechnical and environmental investigations because the method captures a relatively undisturbed cylinder of soil which can be retained in its sealed brass liner during transport to a laboratory for very precise examination. Whether driven by a drill rig or a much smaller hand operated slide hammer, the principle attributes of the methodology remain the same.

Because of the tons of force which can be exerted by a drill rig, the samplers, drill rod and hammers are, necessarily, quite massive. Apparatus used in hand augered borings is usually much lighter and more subject to wear and breakage. Specialized hand tools that enable a person to drive samples consist of a sampling shoe (which contains the brass liners), light weight drill rod, and a small slide hammer. These hand operated drive samplers collect samples in the same two inch diameter brass liners used in many drill rig samplers, but collect only a four or six inch long core rather than twelve to twenty four inches of soil commonly obtained by drilling apparatus.

Common uses for hand operated drive samplers include all those applications where an undisturbed soil sample is desired. Typical applications include the collection of soil samples from the bottom of a hand augered boring, capillary zone sampling where a drill rod is used to extend the sampler across an open pit to a selected location on the wall of the excavation, and when sampling soil from the backhoe bucket that is too hard to allow a brass sample liner to be pushed into the soil by hand.

In practice, the sampler is usually overdriven and then retracted. Then the sampler is removed from the drill rods and hammer, opened, and the sample contained in the brass sample liners removed. Samples to be analyzed for environmental hazards are treated according to the same sample handling protocol as all other environmental samples.

Subsurface Water Sample: Subsurface water samples are obtained with a proprietary device which duplicates the functioning of several EPA, commercial, and industrial sampling devices. The device goes beyond the EPA weighted bottle device to include both the ability to position the sample at an exact depth (via an extendible pole) and to securely reseal the sample bottle prior to bringing the sample container up through the surface of the liquid being sampled. Though the device can be used to skim the surface, or obtain aggregate samples of all the water in the pit, the most common application for the device is the collection of samples of that water which is below the surface and petroleum fuel contaminants that may be floating on the surface.

Requests for subsurface samples are usually made by regulatory agency inspectors seeking information to determine if there are large amounts of dissolved constituents in the main body of water (indicating that lost fuel has been in contact with the water for a sufficient length of time to allow a significant discharge of benzene and other soluble compounds into the water) or if a petroleum film on the water may be only the the result of fuel contaminated soil falling into the pit in the course of the present tank excavation work. The frequency of requests for sampling of this sort in several San Francisco Bay area

counties lead to the development of the current version of the device and its issue to all our field personnel.

The "subsurface" designation indicates that the device was used in the following manner: The device was lowered into the body of water with the sample container closed against the intrusion of liquid; the sample container was not opened until it was below the surface of the liquid and any free petroleum that might be floating on the surface; the sample container was opened below the surface and allowed to fill with subsurface liquid; the device was closed before being brought back up through the surface of the body of water.

The ordinary "water sample" designation indicates that the device was used without any attempt to collect subsurface water. In this application the device is lowered into the water with the seal open so as to include both the surface and subsurface water in an aggregate sample. In this application the device duplicates the functioning of another EPA device which consists of a simple bottle or open jar attached to a pole. Ordinary "water samples" may also be collected in bailers which are made of either acrylic plastic, Teflon, or stainless steel. These, however, are usually designated "bailer" samples.

SAMPLE CONTAINERS

Our firm uses new sample containers of the type specified by either EPA or the RWQCB for the collection of samples at sites where underground storage tanks are involved. Water samples are contained in 40 ml volatile organic analysis vials (VOAs) when analysis for gasoline and similar light volatile compounds is intended. These containers are prepared according to EPA SW 846 and will contain a small amount of preservative when the analysis is for TPH as gasoline or EPA 602. Vials intended for EPA 601 analysis and EPA 624 GCMS procedures are not preserved. Closure is accomplished with an open headed (syringe accessible) plastic screw cap brought down on top of a Teflon faced septum which is used to seal the sample without headspace.

Water samples intended for semivolatile and nonvolatile analysis such as total oil and grease (TOG) and diesel (TPH HBF) are collected and transported in properly prepared new glass liter bottles. Dark amber glass is used in the manufacture of these bottles to reduce any adverse effect on the sample by sunlight. Antimicrobial preservative may be added to the sample liquid if a prolonged holding time is expected prior to analysis. Closure is accomplished with a heavy plastic screw cap.

Soil samples for volatile, semivolatile and nonvolatile analyses are all collected in properly prepared new brass liners which are 2 inches in diameter by 4 inches in length. Closure is accomplished with press fit plastic end caps which are fitted to the open ends of brass tube liners after a sheet of aluminum foil is wrapped over the exposed sample material. A non-contributing/nonsubtractive tape is wrapped completely around the joint areas where the plastic caps meet the outer wall of the brass tube. No preservative other than cold storage is used on samples captured in sample containers of this type.

SAMPLE HANDLING PROCEDURES

Solid sample material is captured by advancing the liner into the soil. This may be done by pushing the liner into soft soils or by containing the liner in a drive shoe which can be advanced and then retracted by means of a slide hammer. The open ends of the sample

liner are covered with aluminum foil and plastic end caps. Excess aluminum foil is removed and the edge of the plastic end caps is tightly sealed against the outer surface of the brass liner with an unbroken wrap made with a tape which has been tested to confirm that it does not contribute compounds that would be detected in the type of analyses intended for the sample contained inside of the brass liner. The brass liner is then labeled with the appropriate identification numbers which specify the sampling activity designation number, sample collection area, depth etc. that apply to that particular sample. The sample liner is then placed in an ice chest which contains pre-frozen blocks of an inert ice substitute such a Blue Ice or Super Ice.

Water samples are collected in any of several appropriate devices such as bailers, Coliwasas, Middleburg sampling pumps etc. which are described in detail only as warranted by their employment at a given site. Sample liquid is decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA procedures for handling volatile organic and semi-volatile compounds. Only two variations from the EPA methods are generally employed. First, preservative is added to the sample container prior to addition of the sample liquid. This method was pioneered by Stoner Laboratories in 1982 and subsequently adopted by laboratories and environmental consulting firms as a practical means of reducing the time that a liquid is allowed to aerate prior to closure of the sampling container. Second, because tests have shown that the preservative readily mixes with sample liquid, glass stirring rods are not used to agitate the sample/preservative mixture.

SAMPLE DESIGNATIONS

All sample containers are identified with both an activity number and a discrete sample identification number. Please note that the activity number is the number that appears on our chain of custody. It is roughly equivalent to a job number, but applies only to work done on a particular day of the year rather than spanning several days as an actual activity often does. This is followed by the sample I.D. number which is usually a simple number such as #1, #2, #3.

CHAIN OF CUSTODY

Samples are continuously maintained in either a chilled ice chest, refrigerator, or freezer from the time of collection until acceptance by the State certified Hazardous Materials Testing Laboratory selected to perform the analytical procedures. If the samples are taken charge of by a different party (such as another person from our office, a courier, etc.) prior to being delivered to the laboratory, appropriate release and acceptance records are made on the chain of custody (time, date, and signature of person releasing the samples followed by the time, date and signature of the person accepting custody of the samples).

LABORATORY IDENTIFICATION NUMBERS

Following receipt of the samples and completion of the Chain of Custody form, the laboratory then assigns their own identification numbers to the samples. Different laboratories use different numbering systems and, according to their own internal conventions, may or may not assign sequential numbers to samples which are placed on temporary "hold", pending the results of other analyses. Laboratory identification numbers (if assigned and

available) are included on the DIAGRAM, and will be found on the certified analytical report by the analytical laboratory.

CERTIFIED ANALYTICAL REPORT

The certified analytical report (CAR) generated by the laboratory is the official document in which they issue their findings. The Results of Analyses section of the TABLE OF SAMPLING LOCATIONS AND ANALYTICAL RESULTS should correspond exactly with the laboratory's CAR. Any discrepancy between analytical values should be decided in favor of the CAR, for while it may, itself, be in error with regard to a particular number, the CAR remains the recognized document until such time as it is amended with a corrected report.

The certified analytical report should also be reviewed when samples are taken from below waste oil tanks as any detection of the EPA halogenated and purgeable aromatic compounds may be grounds for requiring further action. Also the TABLE OF SAMPLING LOCATIONS AND ANALYTICAL RESULTS is insufficiently spacious to allow anything more that a simple listing of the detected compounds. The TABLE does not include such information as the detection limits at which other compounds were not detected. The full text of the laboratory report will be found in Section Four of this report.

REPORTAGE

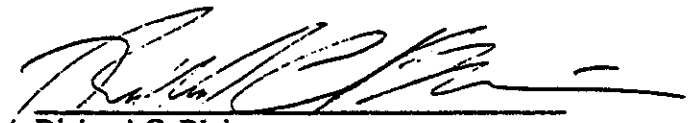
Submission to the Regional Water Quality Control Board and the local implementing agency should include copies of the sampling report, the chain of custody, and the certified analytical report issued by the Hazardous Materials Testing Laboratory. The property owner should attach a cover letter and submit all documents together in a package.

The following addresses have been listed here for your convenience:

Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street
Room 6040
Oakland, CA 94607
ATTN: Greg Zentner

Alameda County Health
Hazardous Materials Management
420 27th Street
Oakland, CA 94612
ATTN: Ariu Levi

Please call if we can be of any further assistance.



Richard C. Blaine

RCB/dmp

attachments: supporting documents

BLAINE
TECH SERVICES INC.

1370 TULLY ROAD, SUITE 505
SAN JOSE, CA 95122
(408) 995-5535

CHAIN OF CUSTODY # 990391

SITE SPECIFICATION Shell Station
630 High Street
Oakland, CA

( ) Bill BLAINE TECH SERVICES, Inc.
(X) Bill Shell Oil
Attn: Kay Newsome

SPECIAL INSTRUCTIONS

SAMPLE I.D.	QUANTITY	TYPE	OK	ANALYSIS TO DETECT	STATUS	RESULTS	LAB NUMBER
1	1	Soil		TPH (Diesel)		99 ppm	
2	1	"		"		"	
3	5	Liq		TPH (Gas, diesel), BTXE		"	
4	1	Soil		TPH (diesel)		"	
5	1	"		"		"	
6	1	"		"		"	
7	1	"		"		"	
8	1	"		"		"	
9	1	"		"		"	
C-4-10D	4	"		"			

Field sampling was performed by Stephen J. Carter — Sampling was completed at 14:45 AM/PM 2-8-1988

RELEASE OF SAMPLES FROM (name, time, date) ——>>>>> INTO THE CUSTODY OF (name, time, date)

from J. Carter 15:57 AM/PM 2/8-88 -> to Kinney @ 15:57 AM/PM 2/8-88

from _____ @ __:__ AM/PM ____-88 -> to _____ @ __:__ AM/PM ____-88

from _____ @ __:__ AM/PM ____-88 -> to _____ @ __:__ AM/PM ____-88

The laboratory designated to perform these analyses is McCalle Chem DHS #ML # 198
NOTE: Procedures and detection limits must confirm to RWQCB Region 2 specifications.
Please include chain of custody number and site specification on reports and invoices.

MOBILE CHEM LABS INC.

733 Dartmouth Avenue
San Carlos, CA 94070 • (415) 591-5820

Shell Oil Co.
P.O. BOX 4023
Concord, CA 94524
Attn: Ray Newsome

Date Sampled:02-08-89
Date Received:02-08-89
Date Reported:02-09-89

Sample Number	Sample Description	Detection Limit	Total Petroleum Hydrocarbons as Diesel
		ppm	ppm
	89039C1-Oakland 630 High St.		
029054	# 1	10	31
029055	# 2	10	41
029057	# 4	10	<10
029058	# 5	10	<10
029059	# 6	10	<10
029060	# 7	10	<10
029061	# 8	10	<10
029062	# 9	10	<10
029063	# 10A-10D	10	41

Note: Analysis was performed using EPA methods 3550 and 8015

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

733 Dartmouth Avenue
San Carlos, CA 94070 • (415) 591-5820

Shell Oil Co.
P.O. BOX 4023
Concord, CA 94524
Attn: Ray Newsome

Date Sampled:02-08-89
Date Received:02-08-89
Date Reported:02-09-89

Sample Number	Sample Description
029056	89039C1-Oakland 630 High Street # 3 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	1,800
Benzene	0.5	170
Toluene	0.5	240
Xylenes	0.5	170
Ethylbenzene	0.5	34

Note: Analysis was performed using EPA methods 5030 and 602.

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

733 Dartmouth Avenue
San Carlos, CA 94070 • (415) 591-5820

Shell Oil Co.
P.O. BOX 4023
Concord, CA 94524
Attn: Ray Newsome

Date Sampled:02-08-89
Date Received:02-08-89
Date Reported:02-09-89

Sample Number	Sample Description	Detection Limit	Total Petroleum Hydrocarbons as Diesel
		ppb	ppb
	89039C1-Oakland 630 High St.		
029056	# 3	50	200

Note: Analysis was performed using EPA methods 3510 and 8015

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Mobile Chem Labs, Inc.	Client Project ID:	89039-C-1	Sampled: Feb 3, 1989
733 Dartmouth Avenue	Sample Descript:	Soil, 10A - 10D, Composite	Received: Feb 14, 1989
San Carlos, CA 94070			
Attention: Ronald Evans	Lab Number:	902-1341	Analyzed: Feb 15, 1989
			Reported: Feb 17, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit	Sample Results Centigrade
Flashpoint (open up)	N.A.	>115

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Mobile Chem Labs, Inc.	Client Project ID:	89039-C-1	Sampled:	Feb 3, 1989
733 Dartmouth Avenue	Sample Descript:	Soil, 10A - 10D, composite	Received:	Feb 14, 1989
San Carlos, CA 94070			Extracted:	N/A
Attention: Ronald Evans	Lab Number:	902-1341	Analyzed:	Feb 15, 1989
			Reported:	Feb 17, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Soluble Lead	0.005	ND

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Mobile Chem Labs, Inc.	Client Project ID:	89039-C-1	Sampled:	Feb 3, 1989
733 Dartmouth Avenue	Sample Descript:	Soil, 10A - 10D composite	Received:	Feb 14, 1989
San Carlos, CA 94070			Extracted:	N/A
Attention: Ronald Evans	Lab Number:	902-1341	Analyzed:	Feb 15, 1989
			Reported:	Feb 17, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Lead	0.05	44

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

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SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Mobile Chem Labs, Inc.	Client Project ID:	89039-C-1	Sampled:	Feb 3, 1989
733 Dartmouth Avenue	Sample Descript:	Soil, Composite 10A - 10D	Received:	Feb 14, 1989
San Carlos, CA 94070	Analysis Method:	California LUFT Manual, 12/87	Analyzed:	N/A
Attention: Ronald Evans	First Sample #:	902-1341	Reported:	Feb 17, 1989

ORGANIC LEAD

Sample Number	Sample Description	Sample Results mg/kg (ppm)
902-1341	10A - 10D	2.2

Detection Limits:	**0.05**

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

ATTACHMENT 2

CONVERSE ENVIRONMENTAL CONSULTANTS CALIFORNIA
55 Hawthorne Street, Suite 500
San Francisco, California 94105
(415) 543-4200

HEALTH AND SAFETY PLAN

BACKGROUND INFORMATION

Project Name: Shell Oil Company - 630 High Street

Project Number: 88-44-369-01

Project Manager: Douglas W. Chalrton

Client: Shell Oil Company

Site Name: Shell Oil Gas Station & Car Wash

Site Address: 630 High Street

Client Contact: Ms. Diane Lundquist

Telephone Number: (415) 676-1414 (ext. 127)

Overall Objective of Site Visit: To install borings and wells and collect samples.

Proposed Date(s) of Site Visit: To be arranged

Source of Site Information: Shell Oil Company files

Will Site Officials Accompany Work Personnel: No

Work Time Limitations: Normal business hours

Warning for Site Evacuation: Verbal

SITE DESCRIPTION

Current Status

Current Use of Facility: Fuel Station (On-going remodernization)

Physical Description of Facility: See attached plot plan

Materials Handled, Disposed, or Stored: Gasoline, diesel fuel, waste oil

Hazardous Constituents: Benzene, toluene, xylene, n-hexane, polyaromatic hydrocarbons

Potential Degradation Products: Phenol, benzene

Industrial Processes/Procedures: Bulk handling of motor fuels

HAZARDS: DESCRIPTION, PROTECTION AND MONITORING

The following substances are known or suspected to be currently or historically onsite:

SUBSTANCE	PHYSICAL STATE	PEL/ TLV (PPM)	PRIMARY HEALTH HAZARD
Hydrocarbon Motor Fuels:			
Gasoline	Liquid or adsorbed	300	Irritant
Diesel fuel	Liquid or adsorbed	--	Irritant
Waste Oil	Liquid or adsorbed	--	Irritant

Potential Environmental Hazards: Spillage or leakage of motor fuels may cause soil and/or groundwater contamination.

Potential Worker Hazards: Contact with hydrocarbon-based fuels may result in dermal irritation due to desiccation. Respiration or air laden with hydrocarbon vapors may result in oxygen deficiency, central nervous system (CNS) depression, and/or mucous membrane irritation. Mixtures of air and hydrocarbon fuels exhibit an explosive range, thus presenting an explosion hazard. Gasoline contains benzene, a suspected human carcinogen. Many unleaded gasoline tanks previously contained leaded gasoline. Tetraethyl lead and ethylene dibromide (EDB) gasoline additives are both neurotoxic.

Potential Physical Hazards Onsite:

Overhead power lines

Buried power lines

Buried fuel lines

Trenches or excavations

Noisy operations

Auto/truck traffic

Overall Hazard Estimation: Low

Required Personal Protective Equipment (PPE)

The following levels of personal protection have been designated:
(**NOTE**: No eating, drinking or smoking is allowed in work areas)

Level of Protection: D

Location(s) to be used: Within work area (exclusion zone).

Equipment to be used consists of hard hat, eye protection, cloth coveralls, leather boots with steel toes and shanks, and work gloves. Use latex gloves when handling samples or drill cuttings.

When to use: During all onsite work operations.

Level of Protection: C

Location(s) to be used: Within work area (exclusion zone).

Equipment to be used consists of hard hat, full or half-face air purifying respirator (APR) with Scott 642-OA-H cartridge filters or equivalent, Tyvek suit, inner and outer chemical resistant gloves, over-boots with over-boots and outer gloves sealed to the Tyvek suit with duct tape, neoprene boots with steel toes and shanks, and eye protection.

When to use: When greater than 100 ppm of unknown gases or vapors are detected in the breathing zone by photoionizer (TIP meter).

Decontamination

See CECC standard Level C decontamination procedure; control boundaries, including exclusion, contamination reduction and support zones, and decontamination station(s), will be set up in the event Level C protection is required.

Required Decontamination Equipment: Steam cleaner.

Disposal of Contaminated Materials or Equipment: Treat contaminated soil or ultimately dispose in Class I disposal facility. Place contaminated disposable clothing in trash receptacles approved by Site Safety Officer. Contaminated soil and equipment shall not be disposed of in places where motor fuel chemicals may ultimately contact potable water resources.

Monitoring

1. **Direct Reading Monitoring Equipment (e.g., Draeger tubes, TIP meter)**:

   Equipment: Photoionizer (TIP meter), and Organic Vapor Analyzer OVA

   Location to be used: Immediate work area

   When to use: During work operations

2. **Action Levels for Monitoring Results**:

   Equipment: TIP meter

   Action Level: 100 ppm (TIP)

   Action (type and duration): Upgrade personal protection to Level C when TIP meter reading exceeds 100 ppm in breathing zone of site workers. Record all changes in PPE and monitoring equipment readings in site safety log.

ONSITE ORGANIZATION AND COORDINATION

General

The following personnel are designated to carry out the stated job functions onsite:

Project Team Leader: Ren Hodgson

Site Safety Officer: Charlie Brown

Site Safety Officer (Client): Diane Lundquist

Other Responsible Site Personnel (note job functions): None

Contractors onsite (state function): Driller to install borings and wells

Government Agency Reps: Alameda Co., Dept. Environmental Health

Site Access Control

Access to the site will be controlled such that no unauthorized person enters within the following boundaries: 20 ft.

EMERGENCY MEDICAL CARE AND PROCEDURES

Nearest emergency medical facility:
(see attached map)

Facility Name: Oakland Emergency Hospital

Address: 2648 E-14th Street

Telephone: (415) 532-6300

Emergency Telephone Numbers:

Fire: 911

Police: 911

Ambulance: 911

Hotline (Poison Control Center): (415) 476-6600

CECC-SF Health & Safety Supervisor or Designee: Corey T. Dare - 415/543-4200 (WORK); 415/758-3115 (HOME)

Emergency First Aid for Substances Present:

SUBSTANCE	EXPOSURE SYMPTOMS	FIRST AID
Gasoline or diesel fuel	Dizziness, headache, nausea, CNS depression	Evacuate to open, clear air area

First Aid Equipment Onsite:

EQUIPMENT	LOCATION
First Aid Kit	Onsite
Fire Extinguisher	Onsite
Emergency Eye Wash	Onsite

Onsite Emergency Procedures:

1. Personal Injury or Illness: Administer first aid; call ambulance if necessary; transport to Oakland Emergency Hospital.

2. Fire or Explosion: Turn off all motorized equipment; evacuate working area; meet at designated upwind location.

3. Earthquake: Turn off all motorized equipment; evacuate working area; meet at designated upwind location.

4. Hazardous Material Spill or Release: Turn off all motorized equipment; evacuate work area in an upwind direction of the spill or release; meet at designated upwind location.

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

6. Other Equipment Failure: If any other equipment onsite fails to operate properly, the project team leader and site safety officer shall be notified and then shall determine the effect of this failure on continuing operations onsite. If the failure affects the safety of personnel or prevents completion of the work plan tasks, all personnel shall leave the Exclusion Zone until the situation is evaluated and appropriate actions taken.

CTD/April 1988

HEALTH AND SAFETY PLAN FOR 88-44-369-01
630 HIGH STREET, OAKLAND

PREPARED BY:

ROBIN M. BREUER — DATE
SENIOR REGULATORY SPECIALIST

REVIEWED BY:

COREY T. DARE — DATE
CECC-SF Health and Safety Supervisor

APPROVED BY:

DOUGLAS W. CHARLTON — DATE
Manager, Environmental Practice

We, the undersigned, have read this Site Health and Safety Plan and will institute the provisions and abide by the regulations contained herein.

Name	Signature	Responsibility


ALAMEDA
HARBOR
ALAMEDA
ENCINAL TERMINAL
MAIN ST
CENTRAL AV
SAN ANTONIO AV
PARK ST
SOUTH SHORE
SOUTH SHORE SHOPPING CENTER
CROWN BEACH
SAN LEANDRO CHANNEL
BAY PARK
SAN LEANDRO BAY
NIMITZ FRWY
OAKLAND
ALAMEDA AV
HIGH ST
FOOTHILL BLVD
BANCROFT AV
SEMINARY AV
MACARTHUR BLVD
OAKLAND COLISEUM ARENA
SEE MAP 10