Converse Environmental Consultants California

REPORT OF ACTIVITIES

SHELL OIL COMPANY FACILITY
285 Hegenberger
Oakland, California

For Quarter 1, 1989
Submitted: April 10, 1989

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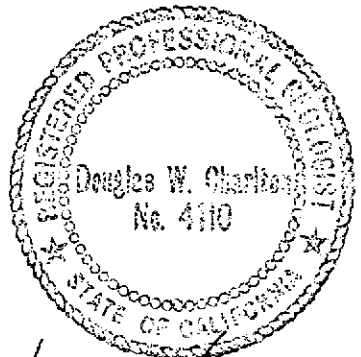
Site Owner:	Shell Oil Company



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1. SITE DESCRIPTION

1.1 Maps

Vicinity Map: See Drawing 1
Plot Plan: See Drawing 2

1.2 Neighborhood Topography

Relatively flat. Most of neighborhood appears to be comprised of reclaimed marshlands.

1.3 Primary Surface Waters Nearby

San Leandro Creek, approximately 500 feet northwest, and San Francisco Bay, approximately one mile northwest of site.

1.4 Water Table Information

Current water table elevation ranges between 2.80 and 2.34 feet MSL, with a gradient of 0.007 ft/ft^{-1}.

2. INVESTIGATION HISTORY

2.1 Investigative History Summary

TABLE 1: Chronological Summary

Date	Description of Activity
1984	Underground storage tanks replaced with single-wall fiberglass tanks

2.2 Soil Borings Drilled to Period Start

None.

2.3 Soil Borings Abandoned to Period Start

None.

2.4 Groundwater Wells Drilled to Period Start

None.

2.5 Groundwater Wells Abandoned to Period Start

None.

3. WORK COMPLETED THIS PERIOD

3.1 Introduction

Work initiated and completed during the quarter followed the task descriptions and modifications of the site Work Plan dated February 10, 1989. The relative timing and schedule of these activities is shown in summary in the Critical Path for the project (Drawing 3).

3.2 Soil Boring Drilling/Sampling

A total of 2 soil borings were drilled, sampled, and abandoned following the protocols described in Appendices A and F. Soil cuttings were handled by CECC and Shell Oil Company, following task procedures described in Appendix J. Boring logs are enclosed as Attachment 1. A summary of soil boring activities is presented in Table 2.

TABLE 2: Summary of Soil Borings Drilled

Boring No.	Diameter (inches)	T.D. (ft. bgs)	Unsaturated Soil Samples	Saturated Soil Samples
SB-1	8	6.5	4 ft.	None
SB-2	8	6.0	5 ft.	None

3.3 Well Installations

Three groundwater monitoring wells were installed, developed and sampled following the protocols in Appendices A through F. All wells were installed as 4-inch diameter filter-packed PVC wells through hollow-stem auger drilling equipment. Boring logs and

as-built well construction diagrams are included as Attachment 2. A summary of well installation is provided in Table 3.

TABLE 3: Summary of Groundwater Monitoring Well Installations

Well No.	Diameter Bore (in.)	Diameter Well (in.)	Initial Water Table (ft. bgs)	Static Water Table (ft. bgs)	T.D. (ft. bgs)	Screen (ft. bgs)	Bentonite Seal (ft. bgs)	Grout Seal (ft. bgs)
MW-1	12	4	~6.0	3.83	16.5	10-5.5	4.0-3.0	3.0-0
MW-2	12	4	~5.0	5.33	16.5	10-5.0	4.0-3.0	3.0-0
MW-3	12	4	~5.0	5.17	16.5	10-5.0	3.91-3.0	3.0-0

3.4 Soil Analysis/Results

Soil samples were properly packaged and transferred to a California State-certified analytical laboratory under proper chain-of-custody and preservation (see Appendix E). The samples were analyzed for TPH (as gasoline and diesel) and BTEX using EPA Method 8015 (modified) or 8020, and for Pb using EPA Method 7421. Analytical results are summarized in Table 4, and certified sheets from all analyses are enclosed as Attachment 3.

TABLE 4: Soil Analytical Results (ppm)

Boring No.	Sample Depth (ft. bgs)	Moisture	TPH-g	TPH-d	Total Oil & Grease	Benzene	Toluene	Ethyl-benzene	Xylene	Total Lead
SB-1	4.0	2	140	NA	NA	0.3	0.8	1.4	0.6	14.7
SB-2	5.0	3	3700	NA	NA	<8	120	110	530	9.17
MW-1	5.5	4	1100	NA	NA	12	36	27	120	12.7
MW-2	6.0	5	2	NA	NA	0.1	<0.1	<0.1	<0.1	3.31
MW-3	5.0	1	3	NA	<30	<0.1	<0.1	<0.1	<0.1	1.42

3.5 Groundwater Analysis and Results

Groundwater samples were properly packaged and transferred to a California State-certified analytical laboratory under proper chain-of-custody and preservation (see Appendix E). The samples were analyzed for TPH (as gasoline and diesel) and BTEX using EPA Method 602, 8020, or 5030. Selected analytical results are summarized in Table 5, and certified sheets from all analyses are enclosed as Attachment 4.

TABLE 5: Groundwater Analytical Results Exceeding 1 ppm TPH

Well No.	Date Sampled	TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylene
MW-1	02/16/89	99	NA	20	23	5.7	23
MW-2	02/16/89	20	NA	0.2	0.9	2.7	9.6
MW-3	02/16/89	60	NA	5.5	0.2	3.2	5.2

3.6 Physical Monitoring Results

A total of 3 wells were physically monitored for depth to water table, and measurement of floating product, if any, a total of 1 time during the quarter. A summary of these results is presented in Table 6.

TABLE 6: Physical Monitoring Results: Evidence of Contamination[1]

Well No.	Date	Depth to Water (ft.)	Water Odor	Thickness Floating Product (inches)	Notes
MW-1	02/16/89	3.83	Slight	0	None
MW-2	02/16/89	5.33	Petroleum	0	None
MW-3	02/16/89	5.17	No odor	0	None

3.7 Hydrologic Tests and Research

Certain public files and records were researched, and conversations were held with authorities on local water conditions to provide background on the location and thickness of saturated zone, soil stratigraphy, groundwater flow patterns, seasonal variation of water tables, beneficial uses, etc. This information is included in the interpretive diagrams presented in Section 4 of this report.

3.8 Neighborhood Assessment

An environmental assessment of Pacific Bell, a neighborhood business (at 295 Hegenberger Road) was conducted to identify possible discharge of MVF[2] to the environmental upgradient or near the subject property. Alameda County Health Care Services (ACHCS) agency records were reviewed to identify underground storage tanks

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[1] Sheen; odor; FID; color; PID (opened/odor trapped in casing)

[2] Motor vehicle fuel

and hazardous materials at the PacBell facility. ACHCS records show that there was one tank tested for tightness on June 6, 1988 and found to be tight.

4. REVIEW OF DATA AND INTERPRETATIONS

4.1 Distribution of MVF Contamination in Soil

(See Drawings 5a and 5b)

- At -5 feet bgs, contaminated soil adjacent to current tank backfill exceeds 1,000 ppm TPH-g. Therefore, further investigation is needed to assess lateral extent of contamination.

4.2 Distribution of Dissolved MVF Contamination in Groundwater

(See Drawings 7a and 7b)

- Significant TPH-g and BTEX exist in groundwater at the downgradient site boundary.
- Upgradient water quality and lateral water quality have not been established. Further onsite investigation is needed to define onsite water quality.

4.3 Distribution of Floating Product on Groundwater

None.

4.4 Groundwater Elevation and Gradient

See Drawing 6.

4.5 Geologic Cross Section, Showing Groundwater

(See Drawing 4)

- The site appears to be constructed on fill overlying Bay Mud.

5. STATUS OF SCHEDULE

Task time lines established on the Critical Path were met (see Drawing 3).

6. WORK PLANNED FOR NEXT QUARTER

Tasks 2 and 3 (second iteration) - Addition of five onsite wells (MW-4 through MW-8) at locations shown on Drawing 8.

Task 4 (see Critical Path) will be started next quarter, and a Task Modification will be submitted.

Task 4	Research Records
Task 5	Research Hydrology
Task GM	Quarterly groundwater monitoring will be performed on all existing and new wells

In addition, groundwater monitoring will be conducted as field measurements quarterly on a total of 8 wells, and as groundwater sampling for TPH-g, TPH-d and BTEX, analysis on 3 wells.

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.

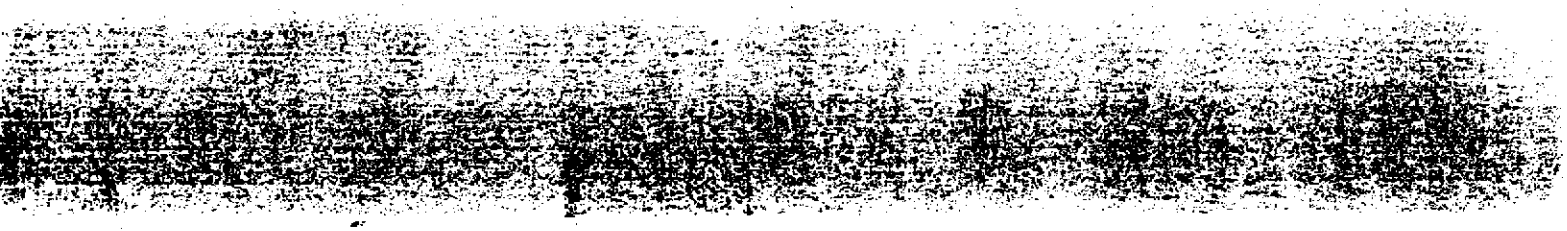
If the well is emptied before four to ten well volumes are removed, the sample shall be taken when the water level in the well recovers to 80% of its initial water level or better.

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 Number: _____ AFE: _____ CT/DL: _____

DRUMMED MATERIAL DESCRIPTION

Soil: Description of Soil: _____
_____
Date(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: Date(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: Date:
Location WIC Number: City:

Pick Up yes/ no	Drum No.	Date 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:

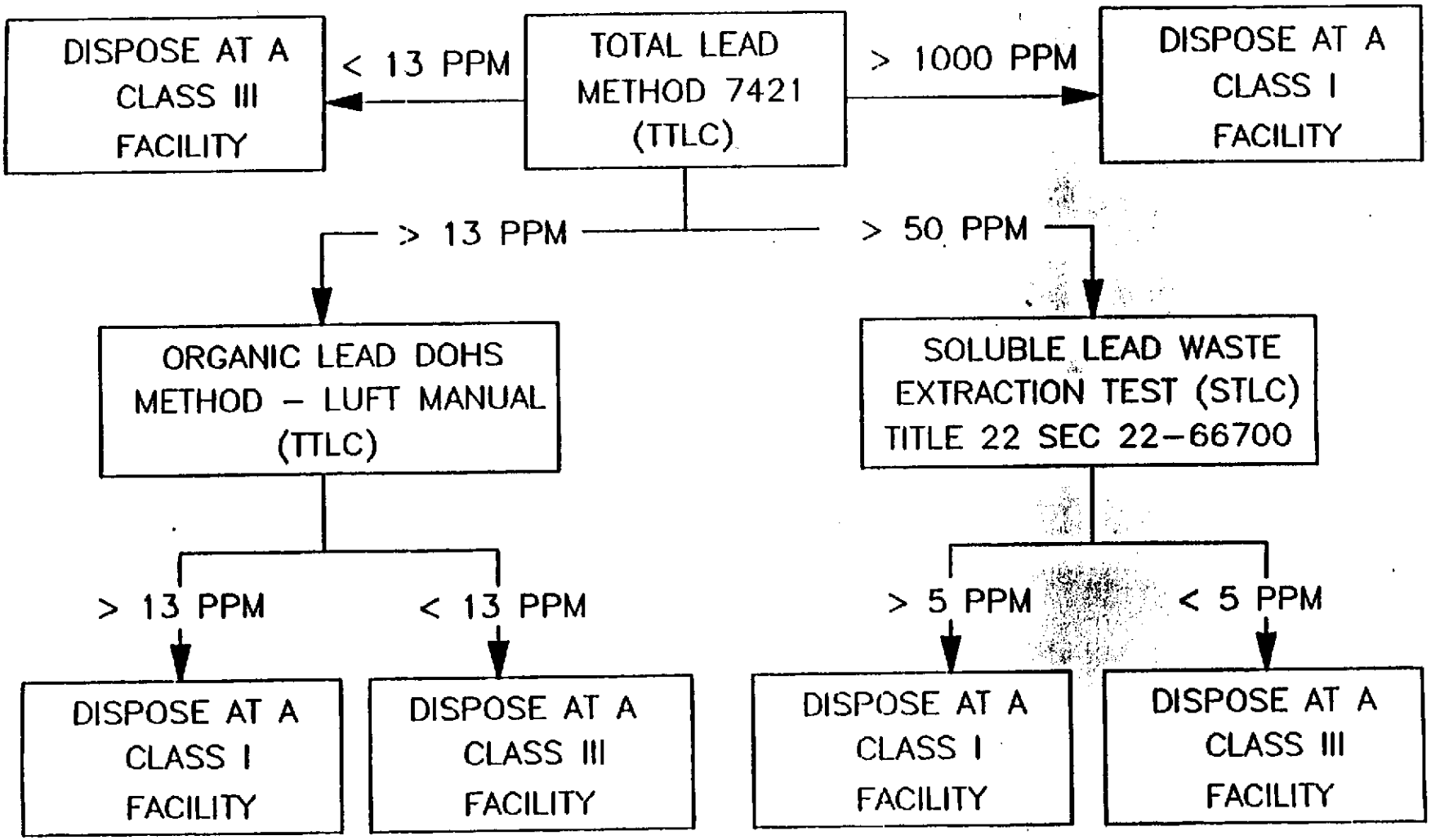
Location WIC Number: City:

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

LOG OF BORING NO. 1

DATE DRILLED: *2/13/89*	ELEVATION:	WL TAKEN: *None*	EQUIPMENT: *Hand Auger*

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION	BLOWS/FT.	DRY WEIGHT %	DRY DENSITY lb/ft³	TESTS
							0-2" ASPHALT, 2-6" BASE ROCK SP				
				damp moist	firm	brown	CLAY (Fill) CL Some sand and gravel				
				damp	firm to soft	black dark gray	SILTY CLAY CL/GP Some gravel				
	D						SILTY SAND AND GRAVEL SP/	23			
				damp							
5	D			wet			Fine SAND SW/GW	8			
							Bottom of Boring at 6.5 FT. Water seeping into hole				
10											
15											
20											

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
258 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Converse Environmental Consultants California

Drawing No.
A-1

LOG OF BORING NO.2

DATE DRILLED: *2/13/89*	ELEVATION:	WL TAKEN: *None*	EQUIPMENT: *Hand Auger*

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION	BLOWS/FT.	DRY WEIGHT %	DRY DENSITY lb/ft³	TESTS
					hard		0-2" ASPHALT, 2-12" BASE ROCK				
				slightly damp	firm	gray	SILTY AND SANDY CLAY (Fill) CL/CH Some gravel				
				moist	firm	gray	CLAYEY SAND SP/GP Some gravel. Odor of gasoline				
5	D							27			
							Bottom of Boring at 6 ft. Water in hole at 6 ft.				
10											
15											
20											

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
258 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Drawing No.
A-2

Converse Environmental Consultants California

ATTACHMENT 2

LOG OF BORING NO.MW-1

DATE DRILLED: 2/14/89	ELEVATION:	WL TAKEN: 2-14-89	EQUIPMENT: Hollow Stem Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION		WELL CONSTRUCTION	TOTAL PETROLEUM HYDROCARBONS Mg/Kg	TESTS
					hard		0-2" ASPHALT, 2"-12" BASE ROCK				
				dry	firm	brown to black	SANDY SILT	ML			
							CLAYEY SAND and GRAVEL (Fill)	SP/GP			
5	D			wet	loose	gray-black	CLAYEY fine SAND (Bay Mud) Some gasoline odor	SW			
								SP			
10	D			moist	soft to medium	gray-black	CLAY (Bay Mud) No gasoline odor	CH			
15	D			slightly damp	medium dense	gray-black	SANDY CLAY Trace of gravel	CH/CL			
20							Bottom of Hole at 16.5 ft.				

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
258 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Drawing No.
A-3

Converse Environmental Consultants California

LOG OF BORING NO. MW-2

DATE DRILLED: 2/15/89	ELEVATION:	WL TAKEN: 2-15-89	EQUIPMENT: Hollow Stem Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION	WELL CONSTRUCTION	TOTAL PETROLEUM HYDROCARBONS Mg/Kg	TESTS
					hard		0-2" ASPHALT; 2-6" BASEROCK			
				dry	medium dense	brown	SILTY SAND and GRAVEL (Fill) SM/GM			
				slightly damp	soft to medium	gray	SANDY CLAY (Fill) CL			
5	D			wet	soft	dark gray	CLAYEY SAND (Bay Mud) Trace of gravel SP/CL			
							SANDY CLAY (Bay Mud) CL			
10	D			moist	soft, firmer with depth	gray	CLAY (Bay Mud) CH			
15	D						SANDY CLAY			
20							Bottom of Hole at 16.5 ft.			

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
258 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Drawing No.
A-4

Converse Environmental Consultants California

LOG OF BORING NO. MW-3

DATE DRILLED: 2/14/89	ELEVATION:	WL TAKEN: 2-14-89	EQUIPMENT: Hollow Stem Auger

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION		WELL CONSTRUCTION	TOTAL PETROLEUM HYDROCARBONS Mg/Kg	TESTS
					hard		0-2" ASPHALT; 2-12" BASE ROCK				
				moist	medium dense	brown to black	CLAYEY SAND and GRAVEL (Fill)	SP/GP			
								CH			
5	D			moist	soft	brown	SILTY SAND and GRAVEL (Fill)	SW/GP			
				wet	soft	black	CLAYEY SAND (Fill)	CL			
							SILTY CLAY (Bay Mud) Some fine sand				
10	D			sat.	soft, firmer with depth		CLAY (Bay Mud)	CH			
15	D			moist	medium [illegible]	gray-black					
20							Bottom of Hole at 16.5 ft.				

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
258 Hegenberger Road
Oakland, California

Project No.
88-44-359-01

Drawing No.
A-5

Converse Environmental Consultants California

ATTACHMENT 3

ANAMETRIX INC
Environmental & Analytical Chemistry
1961 Concourse Drive, Suite E, San Jose, CA 95131
(408) 432-8192 • Fax (408) 432-8198

REPORT

Robin Brewer
Converse Consultants
55 Hawthorne St. Ste. 500
San Francisco, CA 94105

March 10, 1989
Anametrix W.O.#: 8902128
Date Received : 02/17/89
Purchase Order#: N/A
Site: Shell Oil
285 Hegenberger
Oakland, CA

Dear Mr. Brewer:

Your samples have been received for analysis. The REPORT SUMMARY lists your sample identifications and the analytical methods you requested. The following sections are included in this report: RESULTS and QUALITY ASSURANCE.

NOTE: Amounts reported are net values, i.e. corrected for method blank contamination.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

ANAMETRIX, INC.

Sarah Schoen, Ph.D.
GC Manager

SRS/lm

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client : Converse Consultants
Address : 55 Hawthorne St. Ste. 500
City : San Francisco, CA 94105
Attn. : Robin Brewer

Anametrix W.O.#: 8902128
Date Received : 02/17/89
Purchase Order#: N/A
Project No. : 88-44-359-01
Date Released : 03/10/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8902128-01	88-44-359-01 B-1	SOIL	02/13/89	TPH		02/23/89	N/A
8902128-02	88-44-359-01 B-2	SOIL	02/13/89	TPH		02/23/89	N/A
8902128-03	88-44-359-01 MW-1	SOIL	02/14/89	TPH		02/23/89	N/A
8902128-04	88-44-259-01 MW-3	SOIL	02/14/89	TPH	03/01/89	03/01/89	N/A
8902128-05	88-44-359-01 MW-2	SOIL	02/15/89	TPH		02/23/89	N/A
8902128-01	88-44-359-01 B-1	SOIL	02/13/89	TTLPb		02/22/89	AA1
8902128-02	88-44-359-01 B-2	SOIL	02/13/89	TTLPb		02/22/89	AA1
8902128-03	88-44-359-01 MW-1	SOIL	02/14/89	TTLPb		02/22/89	AA1
8902128-04	88-44-359-01 MW-3	SOIL	02/14/89	TTLPb		02/22/89	AA1
8902128-05	88-44-359-01 MW-2	SOIL	02/15/89	TTLPb		02/22/89	AA1
QUALITY ASSURANCE (QA)							
MB021389	METHOD BLANK	SOIL	N/A	TTLPb		02/22/89	AA1

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 88-44-359-01 B-1 @ 4'	Anametrix I.D.	: 8902128-01
Matrix	: SOIL	Analyst	: TC
Date sampled	: 02/13/89	Supervisor	: [illegible]
Date anl.TPHg	: 02/23/89	Date released	: 03/10/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	0.2	0.3
108-88-3	Toluene	0.2	0.8
100-41-4	Ethylbenzene	0.2	1.4
1330-20-7	Total Xylenes	0.2	0.6
	TPH as Gasoline	2	140

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 88-44-359-01 B-2 @ 5'	Anametrix I.D.	: 8902128-02
Matrix	: SOIL	Analyst	: JC
Date sampled	: 02/13/89	Supervisor	: DHS
Date anl.TPHg	: 02/23/89	Date released	: 03/10/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	8	ND
108-88-3	Toluene	8	120
100-41-4	Ethylbenzene	8	110
1330-20-7	Total Xylenes	8	530
	TPH as Gasoline	80	3700

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 88-44-359-01 MW-1 @ 5.5'	Anametrix I.D.	: 8902128-03
Matrix	: SOIL	Analyst	: TC
Date sampled	: 02/14/89	Supervisor	: [illegible]
Date anl.TPHg	: 02/23/89	Date released	: 03/10/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	2	12
108-88-3	Toluene	2	36
100-41-4	Ethylbenzene	2	27
1330-20-7	Total Xylenes	2	120
	TPH as Gasoline	20	1100

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 88-44-259-01 MW-3 @ 5'	Anametrix I.D.	: 8902128-04
Matrix	: SOIL	Analyst	: JC
Date sampled	: 02/14/89	Supervisor	: [illegible]
Date anl.TPHg	: 03/23/89	Date released	: 03/10/89
Date ext.TPHd	: N/A	Date ext. TOG	: 03/01/89
Date anl.TPHd	: N/A	Date anl. TOG	: 03/01/89

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	0.1	ND
108-88-3	Toluene	0.1	ND
100-41-4	Ethylbenzene	0.1	ND
1330-20-7	Total Xylenes	0.1	ND
	TPH as Gasoline	1	3
	Total Oil & Grease	30	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 88-44-359-01 MW-2 @ 6'	Anametrix I.D.	: 8902128-05
Matrix	: SOIL	Analyst	: IC
Date sampled	: 02/15/89	Supervisor	: DMJ
Date anl.TPHg	: 02/23/89	Date released	: 03/10/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	0.1	ND
108-88-3	Toluene	0.1	0.1
100-41-4	Ethylbenzene	0.1	ND
1330-20-7	Total Xylenes	0.1	ND
	TPH as Gasoline	1	2

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 88-44-359-01 B-1 @ 4'
Matrix : SOIL
Date Sampled : 02/13/89
Date Prepared: 02/22/89
Date Analyzed: 02/22/89

Anametrix ID : 8902128-01
Analyst : MN
Supervisor : RA
Date released: 03/10/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (ppm)	Amount Found (ppm)
7421	Total Lead (Pb)	0.1	14.7

ND : Not detected at or above the practical quantitation limit for the limit.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 88-44-359-01 B-2 @ 5'
Matrix : SOIL
Date Sampled : 02/13/89
Date Prepared: 02/22/89
Date Analyzed: 02/22/89

Anametrix ID : 8902128-02
Analyst : MN
Supervisor : RA
Date released: 03/10/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (ppm)	Amount Found (ppm)
7421	Total Lead (Pb)	0.1	9.17

ND : Not detected at or above the practical quantitation limit for the limit.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 88-44-359-01 MW-1 @ 5.5'
Matrix : SOIL
Date Sampled : 02/14/89
Date Prepared: 02/22/89
Date Analyzed: 02/22/89

Anametrix ID : 8902128-03
Analyst : MN RA
Supervisor :
Date released: 03/10/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (ppm)	Amount Found (ppm)
7421	Total Lead (Pb)	0.1	12.7

ND : Not detected at or above the practical quantitation limit for the limit.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 88-44-359-01 MW-3 @ 5'
Matrix : SOIL
Date Sampled : 02/14/89
Date Prepared: 02/22/89
Date Analyzed: 02/22/89

Anametrix ID : 8902128-04
Analyst : MN
Supervisor : RA
Date released: 03/10/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (ppm)	Amount Found (ppm)
7421	Total Lead (Pb)	0.1	1.42

ND : Not detected at or above the practical quantitation limit for the limit.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 88-44-359-01 MW-2 @ 6'
Matrix : SOIL
Date Sampled : 02/15/89
Date Prepared: 02/22/89
Date Analyzed: 02/22/89

Anametrix ID : 8902128-05
Analyst : MN
Supervisor : RM
Date released: 03/10/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (ppm)	Amount Found (ppm)
7421	Total Lead (Pb)	0.1	3.31

ND : Not detected at or above the practical quantitation limit for the limit.

Shell Oil
285 Hegenberger
Oakland, CA

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : METHOD BLANK
Matrix : SOIL
Date Sampled : N/A
Date Prepared: 02/13/89
Date Analyzed: 02/22/89

Anametrix ID : MB021389
Analyst : MN
Supervisor : RW
Date released: 03/10/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (ppm)	Amount Found (ppm)
7421	Total Lead (Pb)	0.002	0.002

ND : Not detected at or above the practical quantitation limit for the limit.

Shell Oil
285 Hegenberger
Oakland, CA

ANAMETRIX INC
Environmental & Analytical Chemistry
1961 Concourse Drive, Suite E, San Jose, CA 95131
(408) 432-8192 • Fax (408) 432-8198

REPORT

Ren Hodgson
Converse Consultants
55 Hawthorne Street
Suite 500
San Francisco, CA 94105

March 23, 1989
Anametrix W.O.#: 8903113
Date Received : 03/20/89
Purchase Order#: N/A

Dear Mr. Hodgson:

Your samples have been received for analysis. The REPORT SUMMARY lists your sample identifications and the analytical methods you requested. The following sections are included in this report: RESULTS and QUALITY ASSURANCE.

NOTE: Amounts reported are net values, i.e. corrected for method blank contamination.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

ANAMETRIX, INC.

Refaat Mankarious
Refaat Mankarious
Inorganics Supervisor

RM/dg

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client : Converse Consultants
Address : 55 Hawthorne Street
Suite 500
City : San Francisco, CA 94105
Attn. : Ren Hodgson

Anametrix W.O.#: 8903113
Date Received : 03/20/89
Purchase Order#: N/A
Project No. : 88-44-359-01
Date Released : 03/23/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8903113-01	88-44-359-01 B-1	SOIL	02/13/89	ORG Pb		03/20/89	AA1
QUALITY ASSURANCE (QA)							
OMB032089	METHOD BLANK	SOIL	N/A	ORG Pb		03/20/89	AA1

ANALYSIS DATA SHEET - ORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 88-44-359-01 B-1
Matrix : SOIL
Date Sampled : 02/13/89
Date Prepared: 03/20/89
Date Analyzed: 03/20/89

Anametrix ID : 8903113-01
Analyst : MN
Supervisor : RA
Date released: 03/23/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
LUFT	Organic Lead (Pb)	0.2	ND

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - ORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : METHOD BLANK
Matrix : SOIL
Date Sampled : N/A
Date Prepared: 03/20/89
Date Analyzed: 03/20/89

Anametrix ID : OMB032089
Analyst : MN
Supervisor : RV
Date released: 03/23/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
LUFT	Organic Lead (Pb)	0.2	ND

ND : Not detected at or above the practical quantitation limit for the limit.

357 D-2

ANAMETRIX, INC.
LABORATORY SERVICES
ENVIRONMENTAL • ANALYTICAL CHEMISTRY
1961 CONCOURSE DR., SUITE E • SAN JOSE, CA 95131
TEL: (408) 432-8192 • FAX: (408) 432-8198

SUBCONTRACTED WORK REFERENCE GUIDE

Client: Converse Consultants
55 Hawthorne Street Suite 500
San Francisco, Ca 94105

Attn: Ben Hodgson

Date recvd from Subcontractor: 3-29-89
Anametrix Project #: 8903113
Client Project #: 88-44-359-01
Subcontractor: Sequoia
Date project recvd : 3-20-89

ANAMETRIX SAMPLE I.D.	CLIENT SAMPLE I.D.	METHOD
02	B-2	Flashpoint
03	mw-1	Flashpoint

\1317

SEQUOIA ANALYTICAL

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

Anametrix Laboratory	Client Project ID:	890-3113	Sampled:	3/13 - 14/89
1961 Concourse Drive, Suite F	Sample Descript:	Soil	Received:	Mar 21, 1989
San Jose, CA 95131	Analysis for:	Flashpoint (Closed cup)	Extracted:	N/A
Attention: Narine Sylvia	First Sample #:	903-2132	Analyzed:	N/A
			Reported:	Mar 23, 1989

LABORATORY ANALYSIS FOR: Flashpoint (Closed cup)

Sample Number	Sample Description	Detection Limit Centigrade	Sample Result Centigrade
903-2132	02 (B-2)	N.A.	71
903-2133	03 (MW-1)	N.A.	64

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

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

ATTACHMENT 4

ANAMETRIX INC
Environmental & Analytical Chemistry
1961 Concourse Drive, Suite E, San Jose, CA 95131
(408) 432-8192 • Fax (408) 432-8198

REPORT

Robin Brewer
Converse Consultants
55 Hawthorne Street
Suite 500
San Francisco, CA 94105

March 13, 1989
Anametrix W.O.#: 8902146
Date Received : 02/22/89
Purchase Order#: N/A
Site: Shell Oil Company
285 Hegenberger Road
Oakland, CA
Converse Proj.# 88-44-359-01

Dear Ms. Brewer:

Your samples have been received for analysis. The REPORT SUMMARY lists your sample identifications and the analytical methods you requested. The following sections are included in this report: RESULTS.

NOTE: Amounts reported are net values, i.e. corrected for method blank contamination.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

ANAMETRIX, INC.

Sarah Schoen

Sarah Schoen, Ph.D.
GC Manager

SRS/dg

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client	: Converse Consultants	Anametrix W.O.#:	8902146
Address	: 55 Hawthorne Street	Date Received :	02/22/89
	Suite 500	Purchase Order#:	N/A
City	: San Francisco, CA 94105	Project No. :	88-44-359-01
Attn.	: Robin Brewer	Date Released :	03/13/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8902146-01	88-44-359-01 MW-3	WATER	02/16/89	TPHg		03/01/89	N/A
8902146-02	88-44-359-01 MW-1	WATER	02/16/89	TPHg		02/24/89	N/A
8902146-03	88-44-359-01 RINS	WATER	02/17/89	TPHg		03/01/89	N/A
8902146-04	88-44-359-01 MW-2	WATER	02/17/89	TPHg		02/24/89	N/A

Shell Oil Company
285 Hegenberger Road
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 88-44-359-01 MW-3	Anametrix I.D.	: 8902146-01
Matrix	: WATER	Analyst	: TC
Date sampled	: 02/16/89	Supervisor	: RJ
Date anl.TPHg	: 03/01/89	Date released	: 03/13/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	0.1	5.5
108-88-3	Toluene	0.1	0.2
100-41-4	Ethylbenzene	0.1	3.2
1330-20-7	Total Xylenes	0.2	5.2
	TPH as Gasoline	5	60

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil Company
285 Hegenberger Road
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 88-44-359-01 MW-1	Anametrix I.D.	: 8902146-02
Matrix	: WATER	Analyst	: TC
Date sampled	: 02/16/89	Supervisor	: [illegible]
Date anl.TPHg	: 02/24/89	Date released	: 03/13/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	0.5	20
108-88-3	Toluene	0.5	23
100-41-4	Ethylbenzene	0.5	5.7
1330-20-7	Total Xylenes	1	23
	TPH as Gasoline	25	99

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil Company
285 Hegenberger Road
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 88-44-359-01 RINSATES	Anametrix I.D.	: 8902146-03
Matrix	: WATER	Analyst	: TC
Date sampled	: 02/17/89	Supervisor	: [illegible]
Date anl.TPHg	: 03/01/89	Date released	: 03/13/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	0.005	0.12
108-88-3	Toluene	0.005	0.20
100-41-4	Ethylbenzene	0.005	1.2
1330-20-7	Total Xylenes	0.01	4.9
	TPH as Gasoline	0.5	12

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil Company
285 Hegenberger Road
Oakland, CA

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

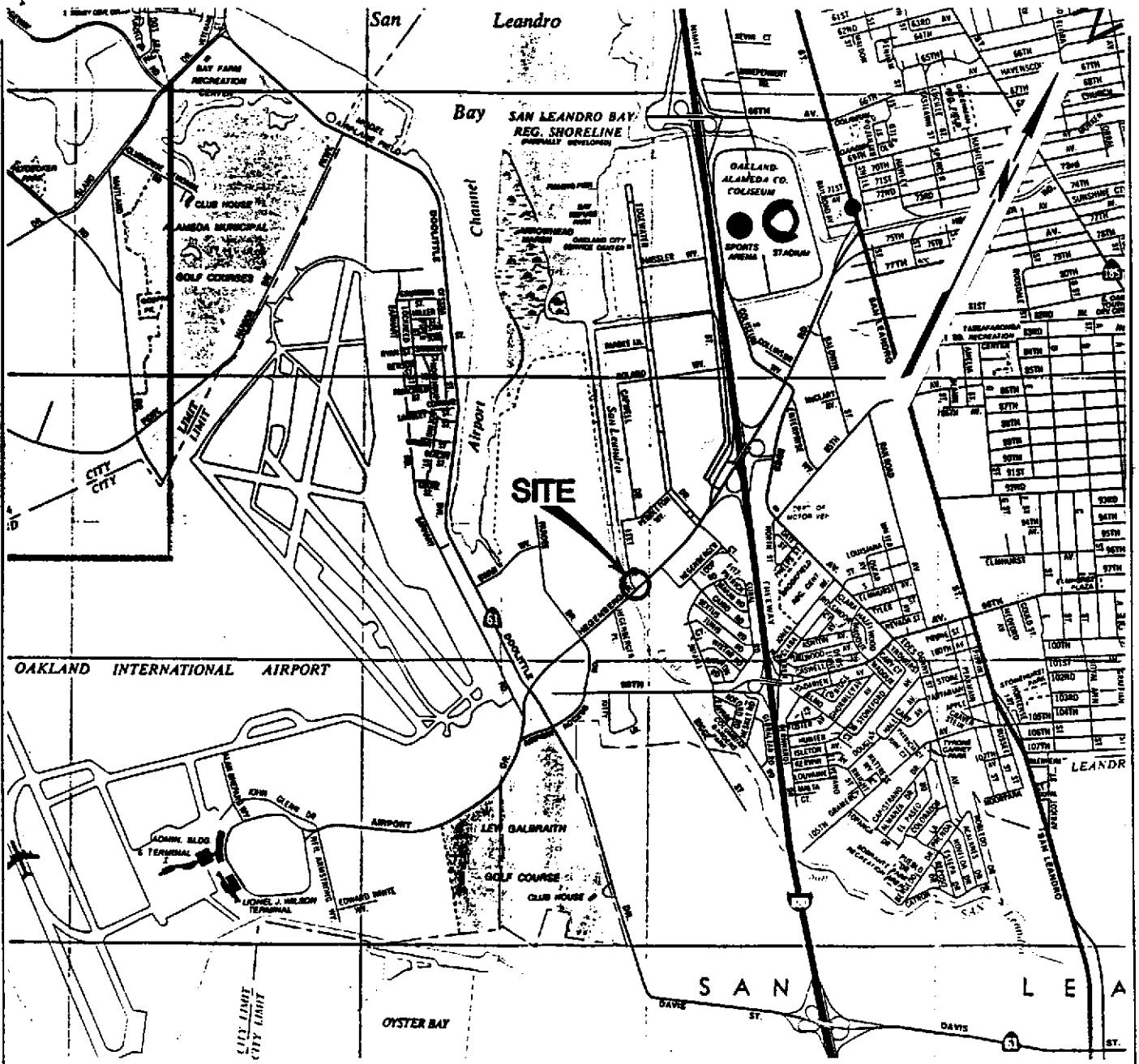
Sample I.D.	: 88-44-359-01 MW-2	Anametrix I.D.	: 8902146-04
Matrix	: WATER	Analyst	: TC
Date sampled	: 02/17/89	Supervisor	: MJ
Date anl.TPHg	: 02/24/89	Date released	: 03/13/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ppm)	Amount Found (ppm)
71-43-2	Benzene	0.2	0.2
108-88-3	Toluene	0.2	0.9
100-41-4	Ethylbenzene	0.2	2.7
1330-20-7	Total Xylenes	0.4	9.6
	TPH as Gasoline	10	20

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Shell Oil Company
285 Hegenberger Road
Oakland, CA



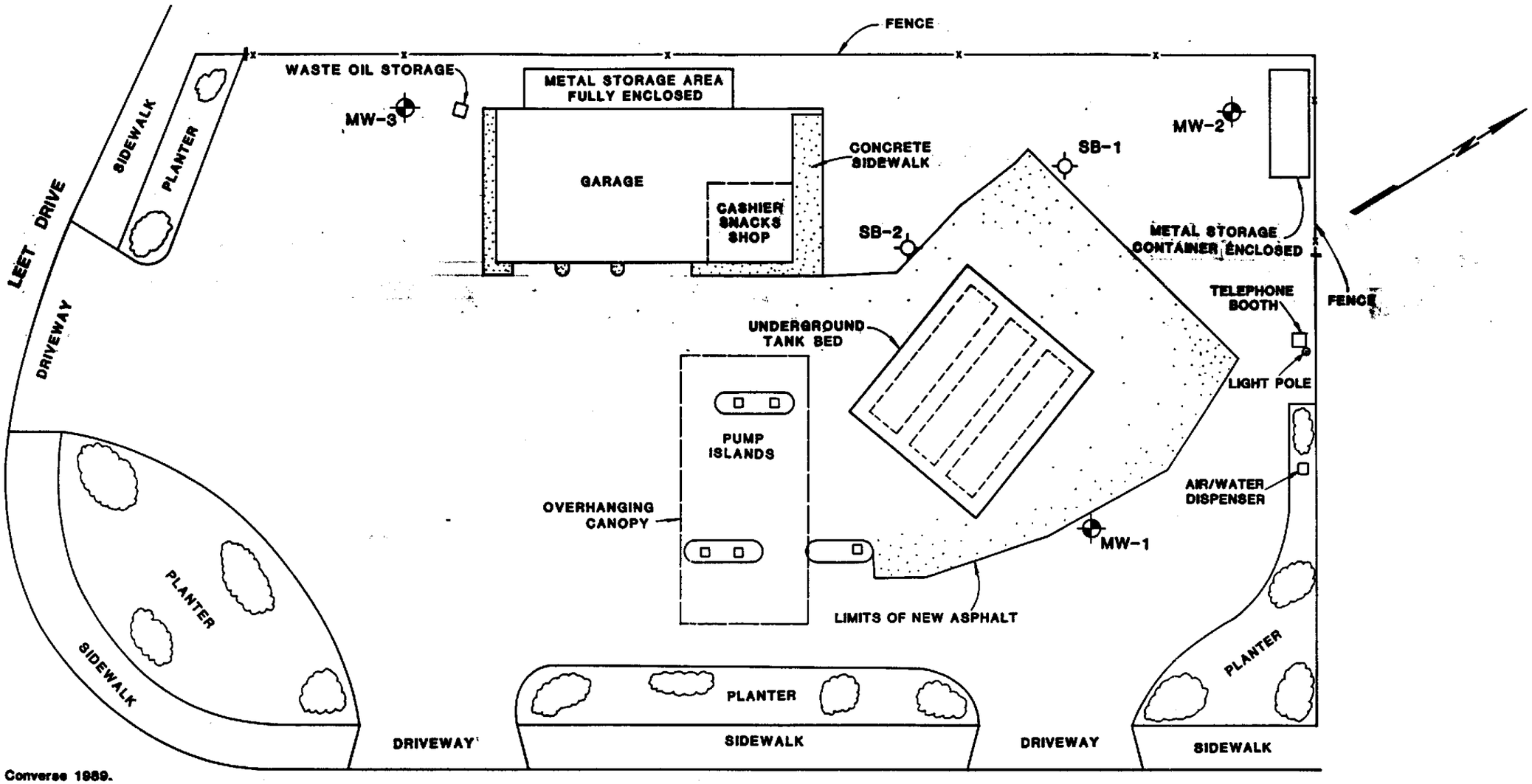
SOURCE: California State Automobile Association

SITE LOCATION

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale: 1"=2000'	Project No.: 88-44-359-01
Prepared by: KGC	Date: 3/21/89
Checked by: RMB	Drawing No.: 1
Approved by: DWC	



Surveyed with EDM . Converse 1989.

LEGEND

- SOIL BORING LOCATIONS
- GROUNDWATER MONITORING LOCATIONS

SCALE 0 20 40 FEET

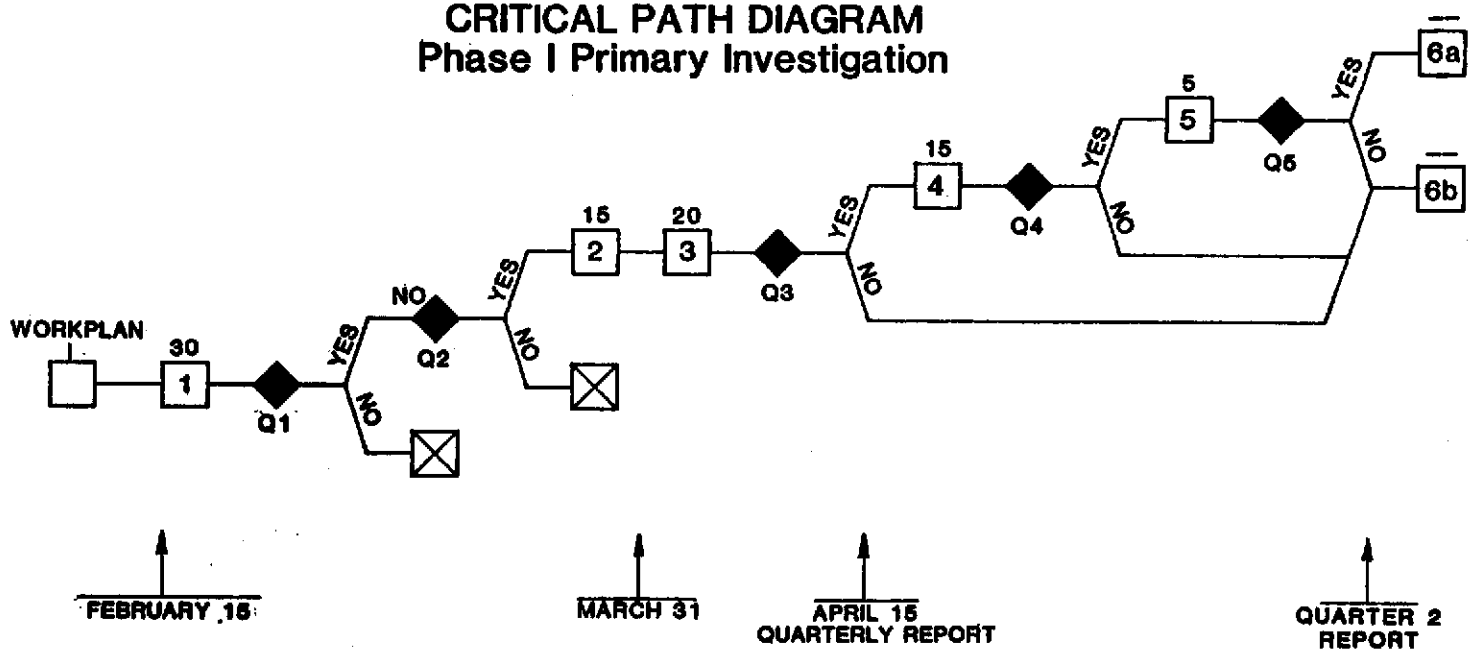
PLOT PLAN

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	1"=20'
Date	3-20-89
Prepared By	LQL
Checked By	RMB
Approved By	DWC
Project No.	88-44-359-02
Drawing No.	2

CRITICAL PATH DIAGRAM
Phase I Primary Investigation



TASKS

- 1 Sample Soil Borings
- 2 Install Wells/Establish Gradient
- 3 Collect/Groundwater Samples
- 4 Research Records
- 5 Research Hydrology
- 6 Investigate/Remediate
  - 6a With others
  - 6b Alone

QUESTION I: Did Shell leak/discharge?

Q1: Is unsaturated zone near tanks polluted?

QUESTION II: Could a Shell discharge at the tanks migrate to the PacBell property boundary?

Q2: Does soil pollution extend to water table?

QUESTION III: Could other neighbors be responsible?

Q3: Are chemicals other than petroleum hydrocarbons and Pb present at more than background?
If yes, non-petroleum user neighbors probably implicated.

Q4: Are reported discharges, old tanks, or TSDF within ¼ mile?
If yes and other discharges are cited nearby, other discharger probably co-responsible.

Q5: Are above possible polluters upgradient?
If no, but discharges are cited nearby and/or gradient (or tidal influence) is very shallow, discharger probably partly responsible.

CRITICAL PATH DIAGRAM

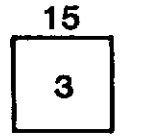
SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

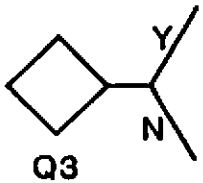
Scale	
Date	2/9/89
Prepared By	LQL
Checked By	RMB
Approved By	DWC
Project No.	88-44-359-01
Drawing No.	3

KEY TO CRITICAL PATH DIAGRAMS

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

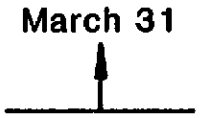


Task, showing Task number (inside) and anticipated number of days to completion (above), including preparatory activities, report preparation and review, and other related actions.



Question to be answered based on information from prior tasks.

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



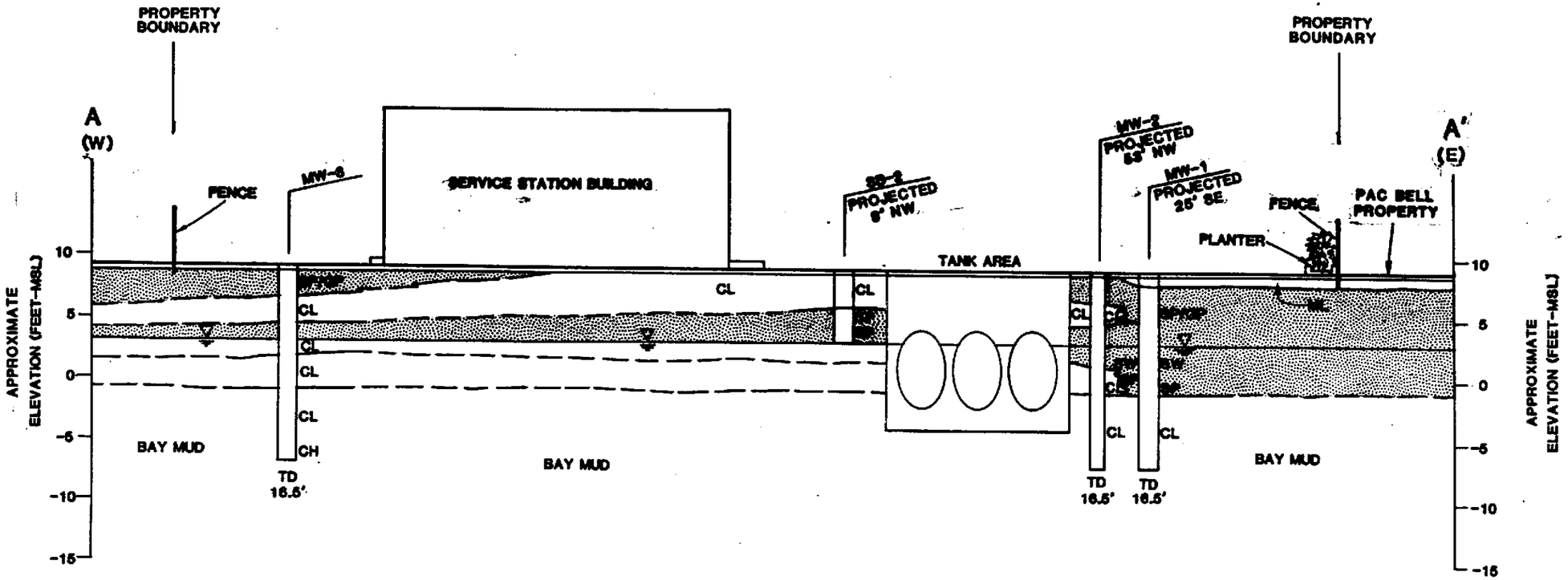
Relative calendar dates and dates of quarterly program reports to regulatory agencies.

KEY TO CRITICAL PATH DIAGRAM

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale: N/A
Date: 2/9/89
Prepared By: LQL
Checked By: RMB
Approved By: DWC
Project No: 88-44-359-01
Drawing No: 3a



LEGEND

RELATIVELY IMPERMEABLE SEDIMENTS

RELATIVELY PERMEABLE SEDIMENTS

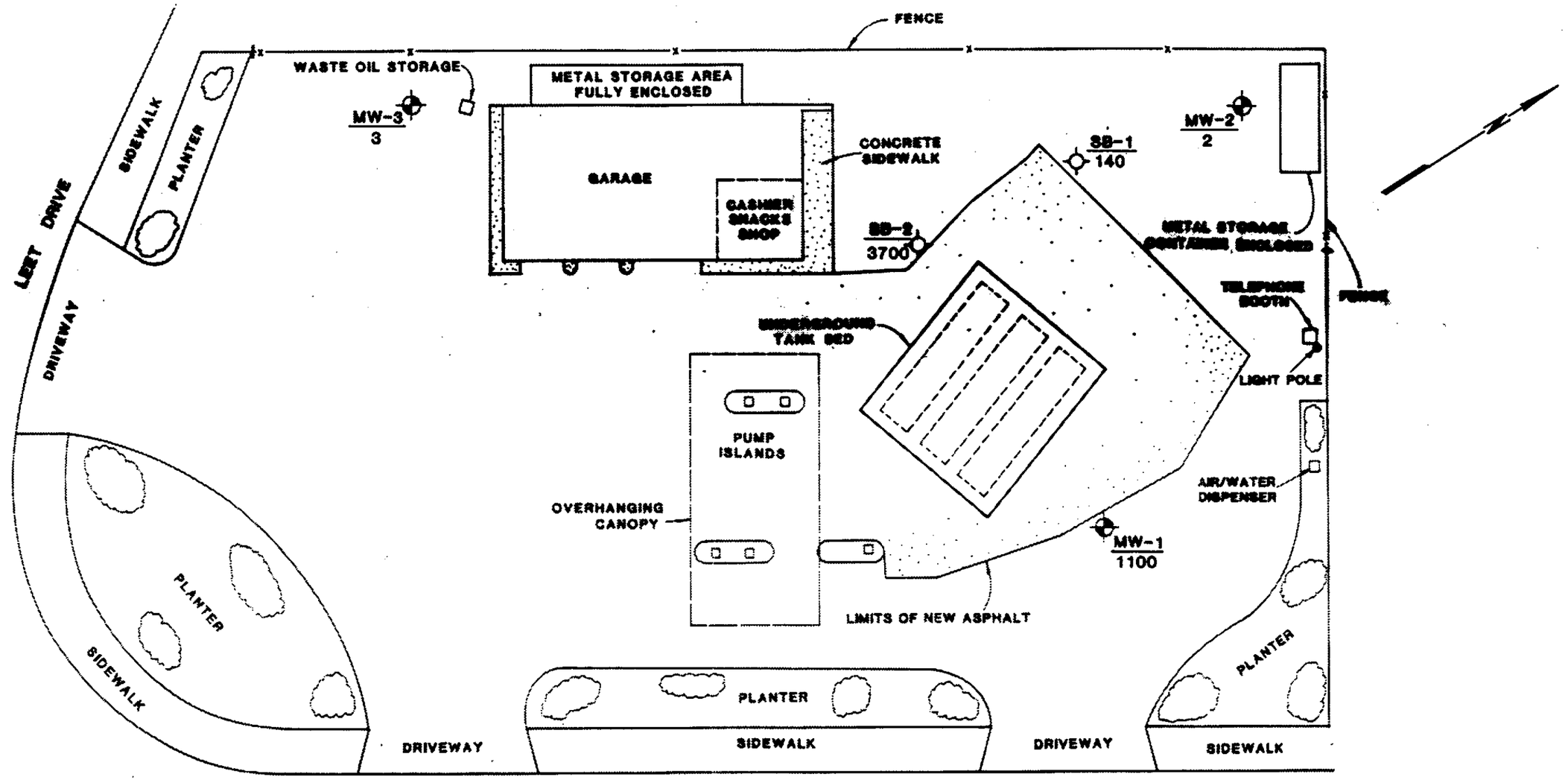
0 20 40
SCALE FEET

CROSS SECTION A – A'

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	3/22/89
Prepared By	KGC
Checked By	REH
Approved By	
Project No.	88-44-359-01
Drawing No.	4



Surveyed with EDM . Converse 1989.

LEGEND

SB-1 — SOIL BORING LOCATIONS

MW-1 — GROUNDWATER MONITORING WELL LOCATIONS

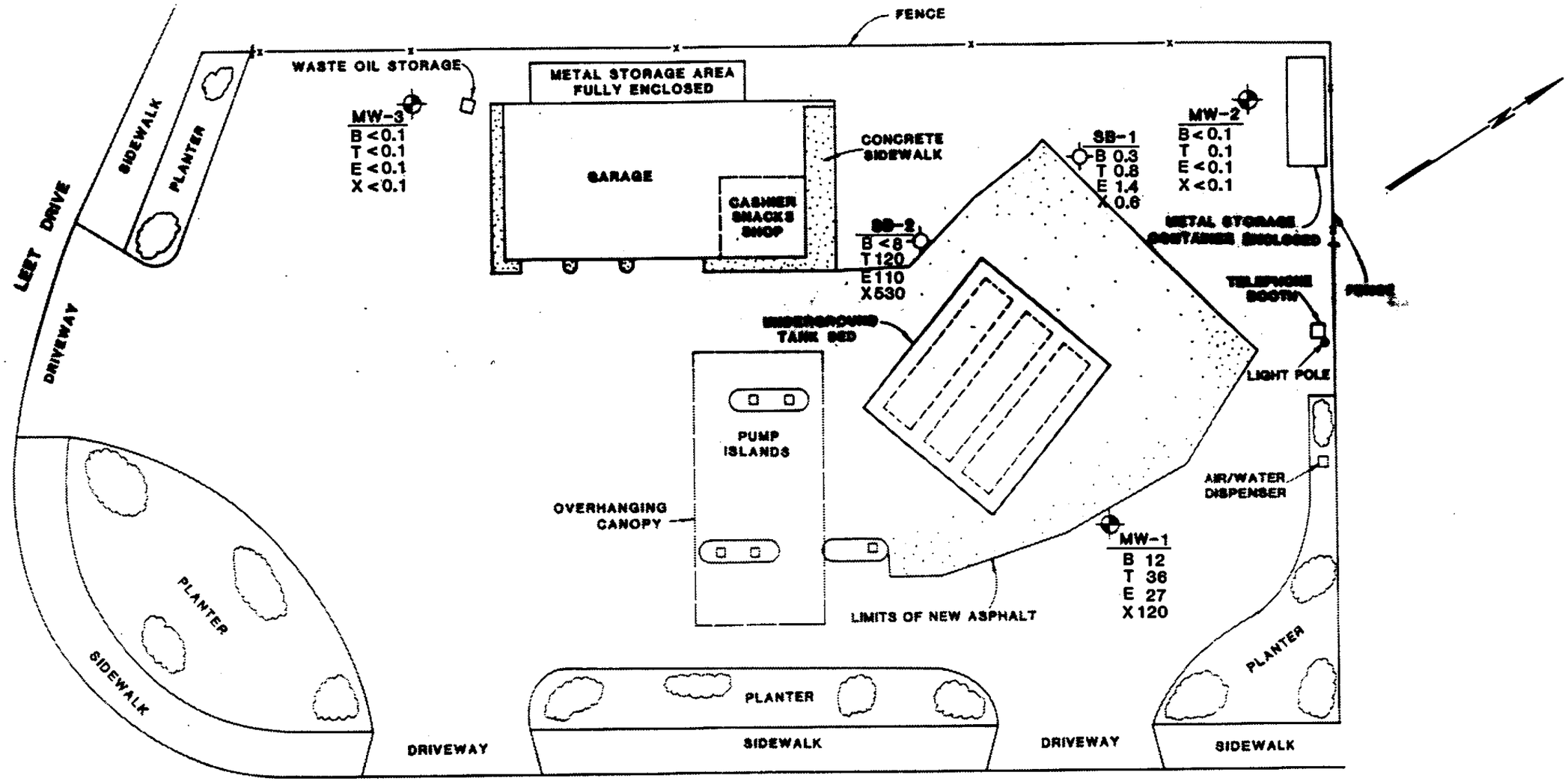
g = TPH-GASOLINE (ppm)

LEVEL PLAN AT (-5') SOIL RESULTS SHOWING TPH-g

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Scale	1"=20'
Date	3/29/89
Prepared By	SHN
Checked By	RMB
Approved By	
Project No.	88-44-359-01
Drawing No.	5a

Converse Environmental Consultants California



Surveyed with EDM . Converse 1989.

LEGEND

SB-1 — SOIL BORING LOCATIONS

MW-1 — GROUNDWATER MONITORING WELL LOCATIONS

B = BENZENE (ppm)

T = TOLUENE (ppm)

E = ETHYLBENZENE (ppm)

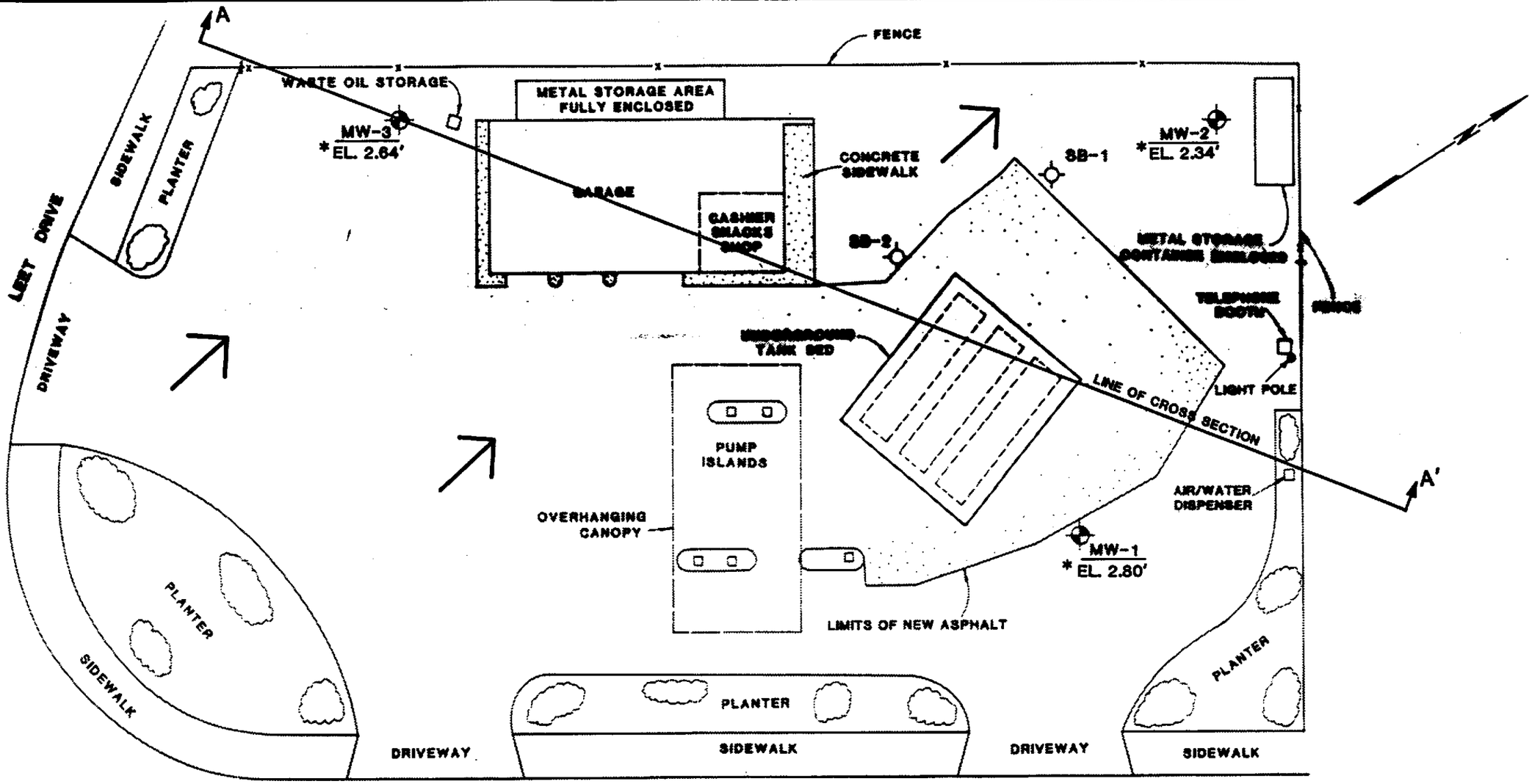
X = XYLENE (ppm)

LEVEL PLAN AT (-5') SOIL RESULTS SHOWING BTEX

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Scale	1"=20'
Date	3/29/89
Prepared By	SHN
Checked By	RMB
Approved By	
Project No.	88-44-359-01
Drawing No.	5b

Converse Environmental Consultants California



Surveyed with EDM . Converse 1989.

HEGENBERGER ROAD

0 20 40
SCALE FEET

LEGEND

SB-1 — SOIL BORING LOCATIONS

MW-1 — GROUNDWATER MONITORING WELL LOCATIONS

GROUNDWATER FLOW DIRECTION

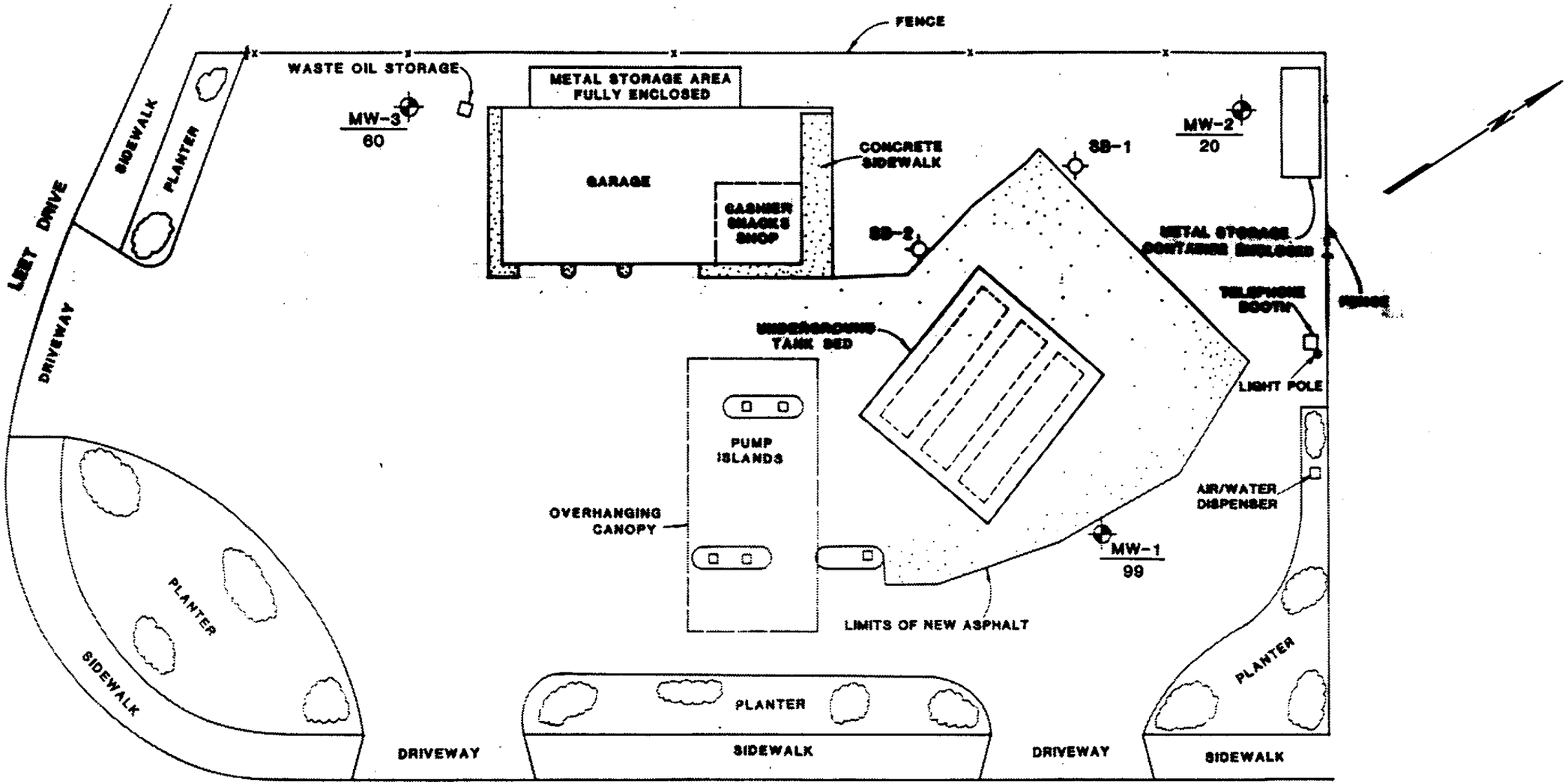
* ELEVATION OF WATER TABLE IN FEET ABOVE MEAN SEA LEVEL (3/89)

GROUNDWATER GRADIENT

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	1"=20'
Date	3/29/89
Prepared By	SHN
Checked By	RMB
Approved By	
Project No.	88-44-359-01
Drawing No.	6



Surveyed with EDM . Converse 1989.

LEGEND

SB-1 — SOIL BORING LOCATIONS

MW-1 — GROUNDWATER MONITORING WELL LOCATIONS

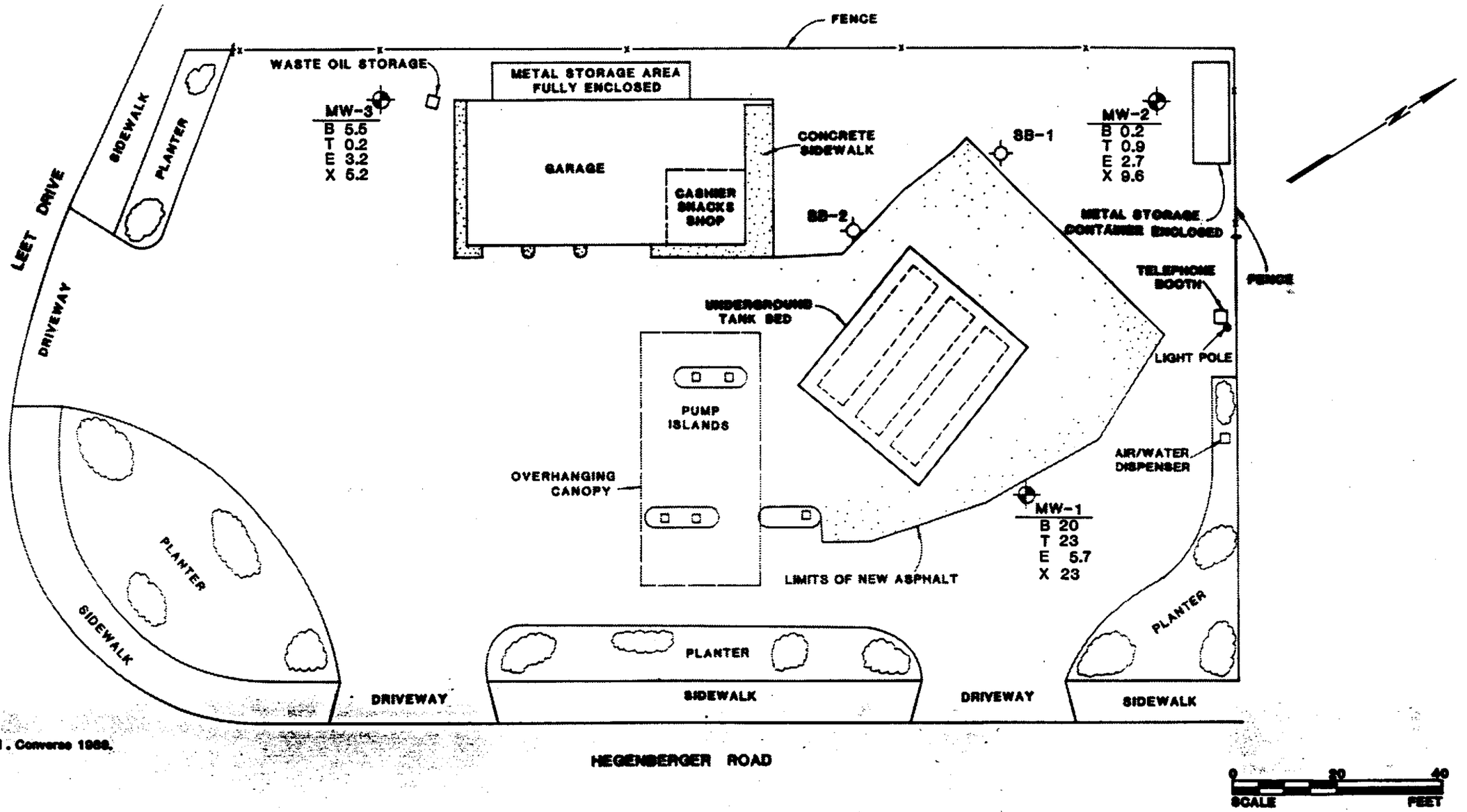
g = TPH-GASOLINE (ppm)

GROUNDWATER RESULTS SHOWING TPH-g

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Scale	1"=20'
Date	3/29/89
Prepared By	SHN
Checked By	RMB
Approved By	
Project No.	88-44-359-01
Drawing No.	7a

Converse Environmental Consultants California



Surveyed with EDM . Converse 1988.

LEGEND

SB-1 — SOIL BORING LOCATIONS

MW-1 — GROUNDWATER MONITORING WELL LOCATIONS

B = BENZENE (ppm)

T = TOLUENE (ppm)

E = ETHYLBENZENE (ppm)

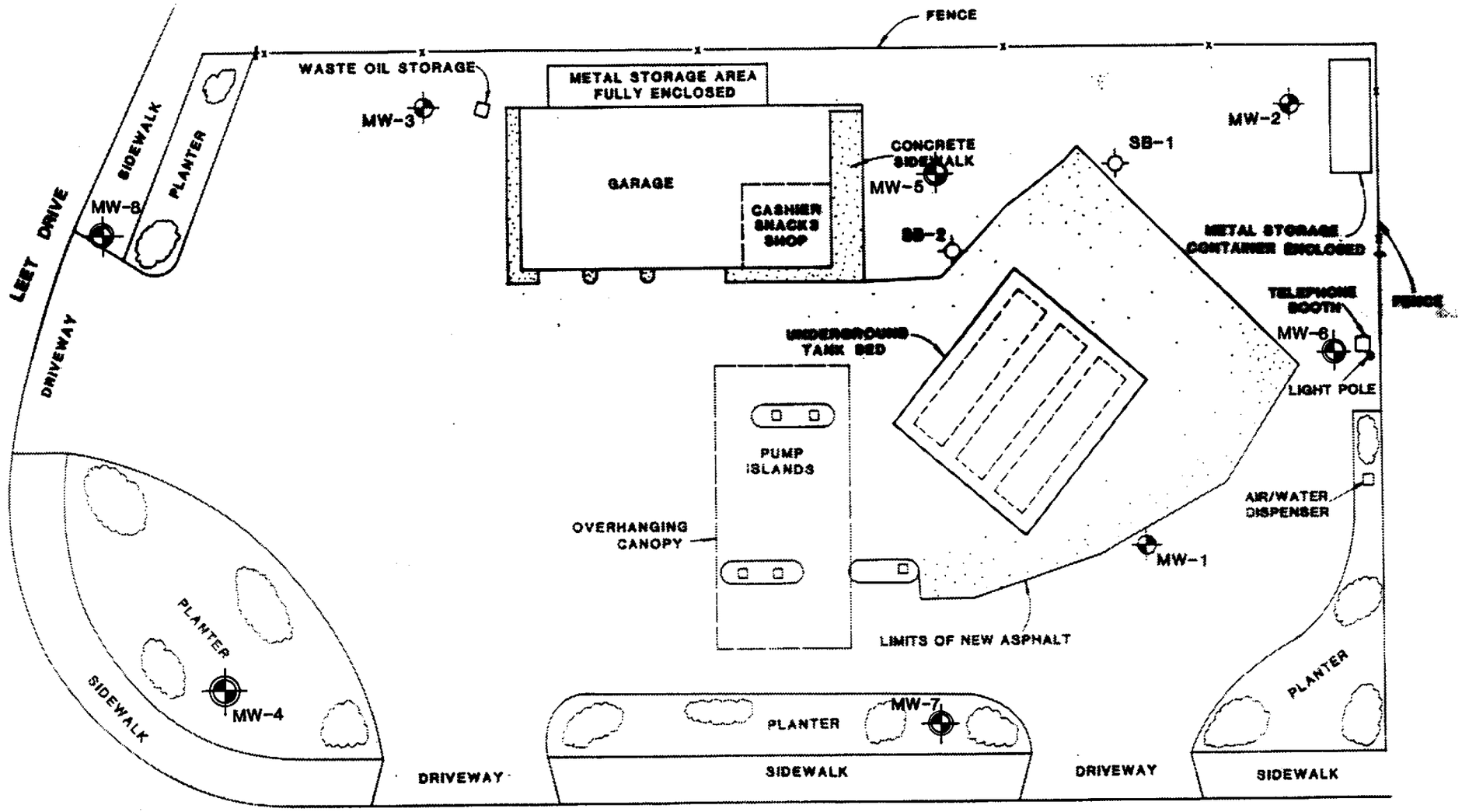
X = XYLENE (ppm)

GROUNDWATER RESULTS SHOWING BTEX

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Scale	1"=20'
Date	3/29/89
Prepared By	SHN
Checked By	RMB
Approved By	
Project No.	88-44-359-01
Drawing No.	7b

Converse Environmental Consultants California



LEGEND

SB-1 — SOIL BORING LOCATIONS

MW-1 — GROUNDWATER MONITORING WELL LOCATIONS

PROPOSED GROUNDWATER MONITORING WELLS

0 20 40
SCALE FEET

Base Map: Surveyed with EDM, Converse 1989.

PROPOSED GROUNDWATER MONITORING WELLS

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental Consultants California

Scale	1"=20'
Date	3/31/89
Prepared By	KGC
Checked By	REH
Approved By	
Project No.	88-44-359-01
Drawing No.	8