File No. 10-93-570-ST

Approve WP. After over excavation, send site plan showing proposed MW and soil location.

PROPOSED WORK PLAN FOR CONTAMINATED SOIL EXCAVATION & PRELIMINARY SITE ASSESSMENT AT THE PROPERTY LOCATED AT 525 98TH AVENUE OAKLAND, CALIFORNIA

APRIL 27, 1994

PREPARED FOR:
MR. NISSAN SAIDIAN
5733 MEDALLION COURT
CASTRO VALLEY, CALIFORNIA 94552

BY:
SOIL TECH ENGINEERING, INC.
298 BROKAW ROAD
SANTA CLARA, CALIFORNIA 95050

SOIL TECH ENGINEERING, INC.

File No. 10-93-570-ST

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SOIL TECH ENGINEERING
Soil, Foundation and Geological Engineers
298 BROKAW ROAD, SANTA CLARA, CA 95050 ■ (408) 496-0265 OR (408) 496-0266

April 27, 1994

File No. 10-93-570-ST

Mr. Nissan Sadian
5733 Medallion Court
Castro Valley, California 94552

SUBJECT: PROPOSED WORK PLAN FOR CONTAMINATED SOIL EXCAVATION AND PRELIMINARY SITE ASSESSMENT AT THE PROPERTY Located at 525 98th Avenue, in Oakland, California

Dear Mr. Sadian:

Attached is the proposed work plan for the excavation of contaminated soil from the former fuel tank area located at 525 98th Avenue, in Oakland, California. This proposal has been prepared to comply with Alameda County Health Care Services Agency--UST Oversight Program (ACHCSA--USTOP) and the California Regional Water Quality Control Board (CRWQCB) requirements to determine the extent of subsurface petroleum contamination at the subject site.

Please submit this proposed work plan to Alameda County Health Care Services Agency for approval and comments.

File No. 10-93-570-ST

If you have any questions or require additional information, please feel free to contact our office at your convenience.

Sincerely,

SOIL TECH ENGINEERING, INC

FRANK HAMEDI-FARD
GENERAL MANAGER

LAWRENCE KOO, P. E.
C. E. #34928

File No. 10-93-570-ST

**PROPOSED WORK PLAN FOR
CONTAMINATED SOIL EXCAVATION
AND PRELIMINARY SITE ASSESSMENT
AT THE PROPERTY
LOCATED AT 525 98TH AVENUE
OAKLAND, CALIFORNIA
APRIL 27, 1994**

INTRODUCTION:

PURPOSE OF INVESTIGATION:

This work plan outlines the immediate corrective action and the site assessment for the property located at 525 98th Avenue, in Oakland, California (Figure 1).

The investigation of this site is prompted by inadvertent release of fuel product from the former tank area at the subject site. The proposed assessment is being undertaken at the request of ACHCSA--UST Oversight Program to determine the vertical and lateral extent of petroleum constituents in the soil and the potential impact on the groundwater in the vicinity of the former fuel tank area. The proposed work plan has been prepared in accordance with the California Regional Water Quality Control Board (CRWQCB) "Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tanks Guidelines", dated August 10, 1990.

SCOPE OF WORK:

The proposed work plan is presented in two separate phases: Immediate corrective action plan (Phase I) and the follow up preliminary site assessment (Phase II).

PHASE I. CONTAMINATE SOIL EXCAVATION:

The immediate corrective action plan will consist of excavation of elevated levels of contaminated soil from the former underground storage tank nest. The corrective action will minimize the impact of groundwater contamination. The following are the necessary tasks:

Task 1. Prepare a site Health and Safety Plan.

Task 2. Excavate petroleum impacted soil to the depth feasible. The goal of soil excavation is to remove heavily contaminated soil from the former fuel tank area to the extent feasible where elevated levels of dissolved petroleum hydrocarbons were detected.

Task 3. Conduct a confirmatory soil sampling.

Task 4. Characterize the excavated stockpiled soil for proper disposal and/or on-site bio-remediation.

Task 5. Prepare a technical report.

PHASE II. PRELIMINARY SITE ASSESSMENT:

This phase will consist of assessing the extent of contamination (lateral and vertical) in the soil and groundwater. This phase of work will be conducted in accordance with the requirements of CRWQCB and ACHCSA--USTOP. The followings are Phase II tasks:

Task A. Acquire the necessary drilling permits.

Task B. Conduct an exploratory soil borings by drilling 6 to 7 soil borings in the vicinity of the former fuel tank area.

Task C. Install three groundwater monitoring wells.

Task D. Develop, sample and survey monitoring wells.

Task E. Analyze the soil and groundwater samples for Total Petroleum Hydrocarbons as gasoline (TPHg), Benzene, Toluene, Ethylbenzene and Total Xylenes (TEX).

Task F. Analyze the data and laboratory results and prepare a technical report.

Details of the two phases of the work plan are described in the following sections.

PHASE I. SOIL EXCAVATION:

TASK 1. SITE HEALTH AND SAFETY PLAN:

Per OSHA requirements, a site Health and Safety Plan has been prepared. The main purpose of the plan is to protect the staff including uninvolved personnel against potential physical and chemical hazards associated with drilling, sampling and field activities. All employee and subcontractor will be required to read and comply with the plan. The site Health and Safety Plan is developed for the project and attached in Appendix "D".

TASK 2. EXCAVATE IMPACTED SOIL:

Notification of Excavation and Remediation:

The ACHCSA--USTOP will be notified two weeks before excavation of soil is initiated. Additionally, according to the requirements for soil excavation, the Bay Area Air Quality Management District (BAAQMD) will be notified by letter not less than five days before the excavation is to take place. This notification will be directed to the appropriate Air Pollution Control Inspector (APCI) and will include the names and addresses of persons performing the excavation, the location of the proposed excavation, the scheduled starting date and the procedures to be followed.

Following additional BAAQMD requirements, the APCI will also be notified by telephone at least 24 hours before soil treatment is

to take place. This notification will include the estimated total quantity of soil to be treated, the average concentrations for the Total Organic Content (TOC) of the soil, the TOC composition and a description of the basis on which these estimates were derived (soil analysis test results).

Preparation of Excavation Site:

The area is flat and completely covered with asphalt paving material.

The anticipated approximate boundaries of the excavation will be marked and the presence or absence of underground utilities will be surveyed and documented within the marked area. If necessary utilities will be disconnected prior to excavation.

A cyclone fence, cones, barriers and signs will be installed to demarcate field work areas and to minimize the public entering the work area.

TASK 3. SAMPLING AND ADDITIONAL EXCAVATION:

Following excavation of contaminated soil, discrete confirming soil samples will be taken from the base and sidewalls of the excavation. The number of soil samples will be based on regulatory agencies' requirements. The samples will be taken in brass tubes using a hand held sampling device or from a backhoe bucket. The

end of the brass sampler will be covered tightly with aluminum foil and plastic cap, sealed with tape, logged and stored in a cooled ice chest for transport to a state certified analytical laboratory. The soil samples will be analyzed for TPH as gasoline 5030 and 3550 (EPA Methods 8015 and 8020) and BTEX.

To document the level of contaminants in the excavation and in the stockpiles, field screening and verification sampling will be performed. All excavated soil will be screened with photoionization organic vapor analyzer (OVA). The OVC readings will be made continuously from soil grab samples collected from the backhoe bucket during excavation. Soil with concentrations of less than 10 parts per million (ppm) will be stockpiled as "clean", while soil with concentrations of greater than 10 ppm will be separately stockpiled on plastic sheeting.

TASK 4. CHARACTERIZATION OF EXCAVATED STOCKPILED SOIL:

At least one composite sample will be collected from each 50 cubic yards of stockpiled soil. The composite sample will consist of four separate soil samples, which will remain separate until they are combined in the laboratory just prior to analysis. The samples will be collected from at least 6 to 24 inches below the surface of the pile by driving a clean brass tube at least three inches into the soil. The ends of the tube will be sealed and stored as described previously.

The excavated stockpiled soil will be sampled and analyzed in accordance with Bay Area Air Quality Management District guidelines (BAAQMD) Regulation 8, Rule 40 as approved on February 15, 1989 for on-site bio-remediation.

Based on the review of the analytical results and the hydrocarbons present, a decision will be made regarding proper disposal or on-site treatment.

The excavation will be backfilled with clean imported soil.

TASK 5. PREPARE REPORT:

Upon completion of Phase I activities, STE will prepare a written report that includes a description of (1) the scope of work; (2) volume of impacted oil removed and analytical results; (3) excavation activities and soil stockpile setup; (4) results of soil sampling and analysis program; (5) volumes of soil removed; and (6) overall conclusions.

PHASE II. PRELIMINARY SITE ASSESSMENT:

The Phase II scope of work will be conducted in accordance with the requirements of the California Regional Water Quality Control Board--San Francisco Bay Region (CRWQCB--SFBR) and ACHCSA--USTOP. The proposed scope of work to complete the preliminary site assessment includes the following tasks:

TASK A. ACQUIRE PERMITS:

Following work plan approval by the state and local agencies, STE will acquire drilling permits, schedule field activities and locate underground utility lines prior to beginning field work.

TASK B. CONDUCT EXPLORATORY SOIL BORINGS:

In order to assess the vertical and lateral extent of hydrocarbons at the site, six to seven soil borings will be drilled to the depth of first saturation zone. The approximate locations of the borings will be determined upon completion of Phase I. The drilling procedures will be in accordance with ACHCSA--USTOP guidelines as described in the attached Standard Operation Procedures (SOP) (Appendix "B"). Soil samples will be collected from each boring at 5-foot intervals and at significant lithologic changes, using a split spoon sampler lined with stainless steel or brass sample sleeves. The samples recovered for chemical analysis will be retained in the sleeve, covered with aluminum foil and plastic caps, wrapped with tape, labeled and placed immediately into an iced cooler.

TASK C. INSTALL GROUNDWATER MONITORING WELLS:

If groundwater is encountered within 45 feet below grade, three of the soil borings will be converted into groundwater monitoring wells to depths of approximately 10 feet below the top of the saturated zone. The borings will be drilled using 8-inch

diameter hollow-stem augers. Each monitoring well will be constructed of 2-inch diameter, clean flush-threaded, Schedule 40 PVC blank and screened (.020-inch slot size) casing, and the required filter pack. Well installation will be follow the standard procedures and requirements of the CRWQCB and ACHCSA--USTOP.

The top of each monitoring well will be secured with a watertight locking cap and utility box finished flush with the ground surface.

TASK D. DEVELOP, SAMPLE AND SURVEY MONITORING WELLS:

The monitoring wells will be properly developed, purged and sampled in accordance with applicable regulations and guidelines of the CRWQCB and ACHCSA--USTOP. Then the samples will be placed in clean containers for transport to a California-certified laboratory for analysis following proper chain-of-custody procedures.

All wells will be surveyed as to location and elevation in reference to an established benchmark to within 0.01 foot. Depth to water in each well will be measured from the top of the casing using an electronic sounder. Wells will be monitored prior to sampling for presence or absence of any petroleum product.

TASK E. ANALYZE SOIL AND GROUNDWATER SAMPLES:

Selected samples soil and groundwater samples will be transported to a California-certified laboratory for analysis following

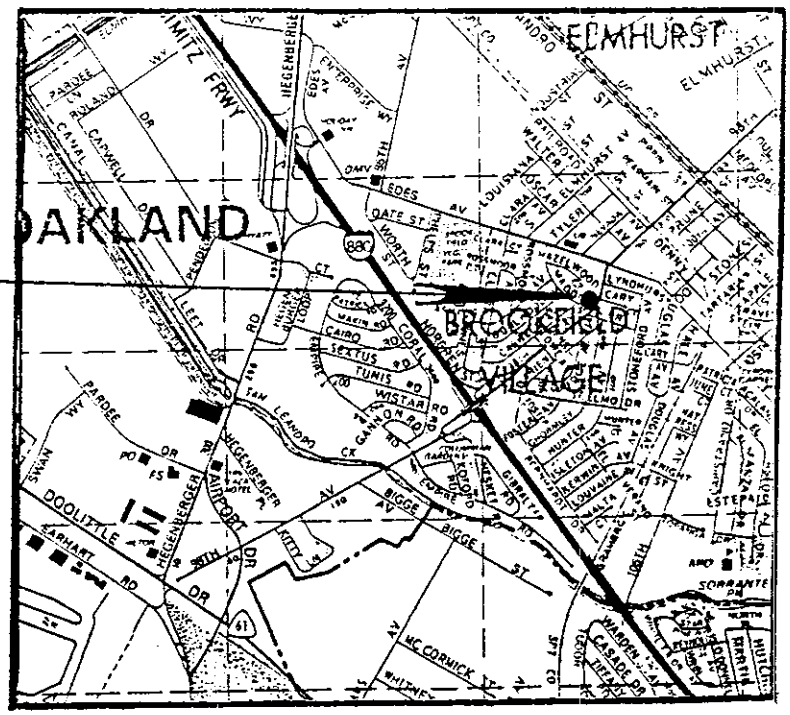
proper chain-of-custody procedures. At lease one soil and groundwater samples will be analyzed for TPH as gasoline with BTEX distinction. All samples will be analyzed using a standard 2-weeks reporting time.

TASK F. ANALYZE THE DATA, LABORATORY RESULTS AND PREPARE A TECHNICAL REPORT:

Upon completion of the soil and groundwater samples analysis and background research, a detailed analysis of the results and available information will be conducted to define the extent and nature of hydrocarbons in the soil and/or groundwater, if any, at the site. This analysis will include interpretation of geologic and hydrogeologic information and assessment of the potential impacts of contamination, if nay, on beneficial uses of local ground and surface water.

A report presenting the results and findings of the Phase II exploratory soil borings and monitoring well installation, including the boring logs and laboratory reports, will be prepared the report should be submitted to CRWQCB and ACHCSA--USTOP. The format of the report will be in accordance with the technical specifications of the CRWQCB and ACHCSA--USTOP.

File No. 10-93-570-ST



Thomas Brothers Map 1993 Edition
San Francisco, Alameda
and Contra Costa Counties

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Figure 1

SOIL TECH ENGINEERING, INC.

M1

File No. 10-93-570-ST

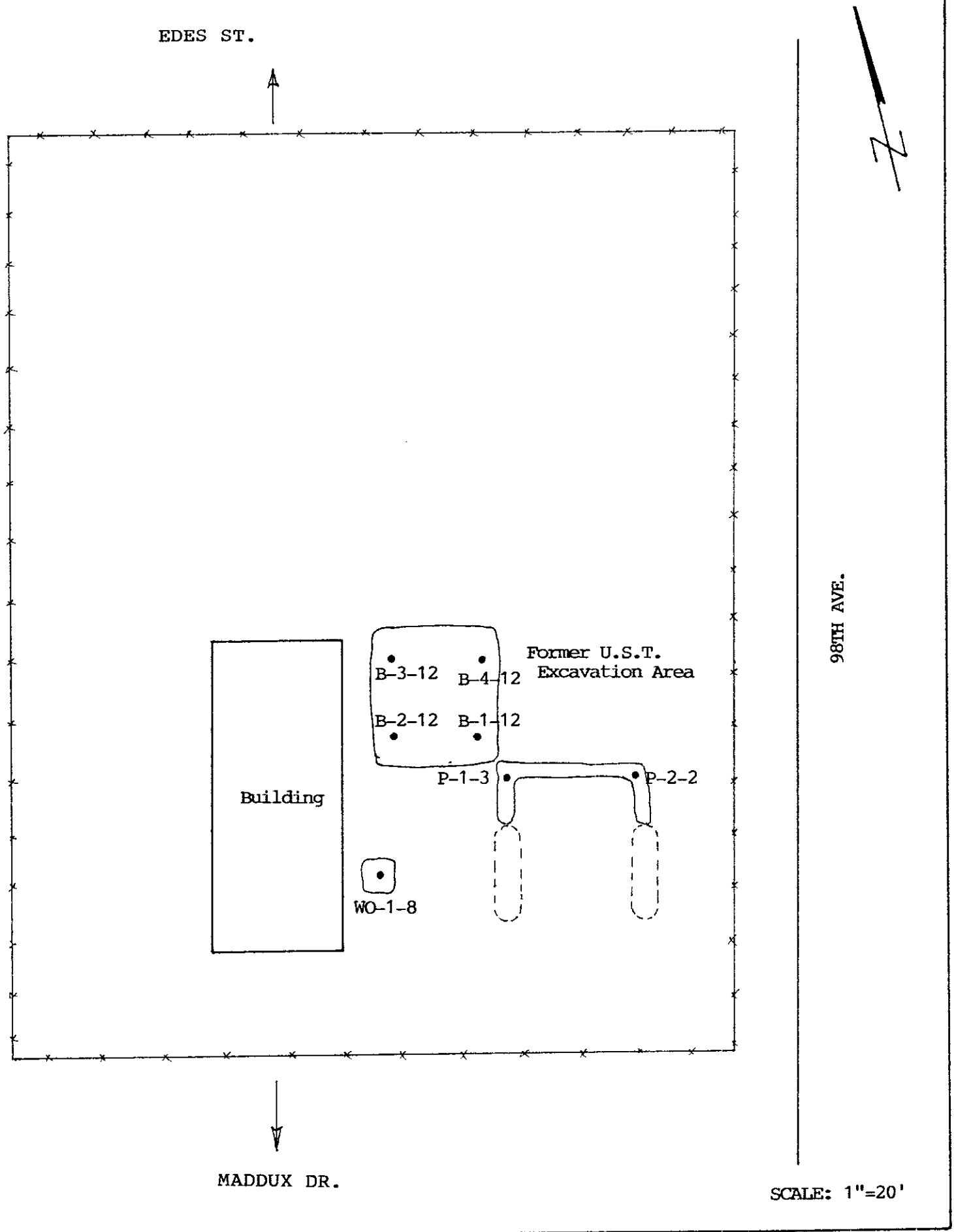

Figure 2

SOIL TECH ENGINEERING, INC.

M2

File No. 10-93-570-ST

SITE GRADING AND BACKFILLING
FOR THE PROPERTY
LOCATED AT 525 98TH AVENUE
OAKLAND, CALIFORNIA

Site clearing, placement of fill and the control of grading operations at the site must be conducted in accordance with the following recommendations and under a supervision of a Project Engineer.

1) The depression left by the removal of contaminated soil should be cleaned of all debris and backfilled with clean soil. This backfill must be engineering fill. This operation must be conducted under the supervision of the Project Engineer.

2) All engineering fill, whether native or imported soil, should be placed in uniform horizontal lifts not more than 6 to 8 inches in uncompacted thickness and compacted to not less than 90% relative compaction according to ASTM D1557-83 procedure.

3) Before compaction begins, the fill material whether native or imported soil shall be brought to water content that will permit compaction by either:

   A) Aerating the material if it is too wet, or
   B) Spraying the material with water if it is too dry.

Each lift shall be thoroughly mixed before compaction. No rocks larger than 4 inches in diameter should be used.

4) No soil shall be placed or compacted during periods of rain nor on ground which is not drained of all free water. Soil which has been soaked and wetted by rain or any other cause, shall not be compacted until completely drained and the moisture content is within the limits herein described or approved by the Project Engineer. Prior approval by the Project Engineer shall be obtained before continuing the grading operations.

5) The contractor shall conduct all grading operations in such a manner as to preclude wind blow dirt, dust and related damage to neighboring properties. The means of dust control shall be left to the discretion of the contractor. the contractor shall assume liability for claims related to wind blow materials.

6) Any import soil for engineering fill shall be approved by the Project Engineer before the grading operation.

7) All grading shall be observed and approved by Project Engineer and shall prepare a final report upon completion of the back-filling operations.

File No. 10-93-570-SA

DRILLING AND SOIL SAMPLING PROCEDURE

A truck-mounted drill rig, using a continuous, solid-flight, hollow stem auger will be used in drilling soil borings to the desired depths.

Prior to drilling, all drilling equipment (i.e. auger, pin, and drilling head) will be thoroughly steam-cleaned to minimize the possibility of cross-contamination and/or vertical migration of possible contaminants.

In addition, prior to obtaining each individual soil sample, all sampling tools, including the split-spoon sampler and brass liners will be thoroughly washed in a Tri-Sodium Phosphate (TSP) solution followed by a rinse in distilled water.

During the drilling operation, relatively undisturbed soil samples will be taken from the required depth by forcing a 2-inch I.D., split-spoon sampler insert with a brass liner into the ground by means of a 140-lb. hammer, falling 30-inches or by hydraulic forces, at various depths.

The samplers will contain relatively undisturbed soil. In general, the first section of soil from the sampler (shoe) will be used in the field for lithologic inspection and evidence of contamination. The selected brass liner will be immediately trimmed, and the ends of the brass liner will be covered tightly

with aluminum foil and plastic caps, sealed with tape, labeled, placed in a plastic bag and store in an ice chest on blue ice in order to minimize the escape of any volatiles present in the samples. Soil samples for analysis are subsequently sent to a State Certified Hazardous Waste Laboratory accompanied by a chain-of-custody record.

Soil samples collected at each sampling interval will be inspected for possible contamination (odor or peculiar colors). Soil vapor concentrations are measured in the field by using Photoionization Detector (PID), PhotoVac-Tip Air Analyzer. The purpose of this field analysis is to qualitatively determine the presence or absence of hydrocarbons and to establish which soil samples will be analyzed at the laboratory. The soil sample is sealed in a zip-lock plastic bag and placed in the sun to enhance volatilization of the hydrocarbons from the sample. The data is recorded on the drilling log at the depth corresponding to the sampling point.

Other soil samples may be collected to document the stratigraphy and estimate relative permeability of the subsurface materials.

Soil tailings obtained during drilling will be stored on-site in steel drums, pending the analytical test results, for proper disposal.

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File No._____

Date_____

By_____

Job_____

Site Description_____ (continued on reverse side)

Type of Drill Rig_____ Hole Diameter_____

(NOTE WATER LEVEL, TIME, DATE AT END OF LOG, CAVING, ETC...)

Elevation_____ Datum_____

Sample Quality	Blows/6 inches	Sample Loc.	Sample Number	Depth		Soil Characterization	Penetrome
				1			
				2			
				3			
				4			
				5			
				6			
				7			
				8			
				9			
				0			
				1			
				2			
				3			
				4			
				5			
				6			
				7			
				8			SOP3

File No. 10-93-570-SA

MONITORING WELL INSTALLATION

Prior to well installation, all the necessary permits will be obtained from the local regulatory agencies.

The boreholes for monitor wells are drilled with the diameter at least two inches larger than the casing outside diameter (O.D.).

Monitor wells will be cased with threaded factory perforated and blank, schedule 40 P.V.C. The perforated interval consists of slotted casing, generally 0.010 to 0.040 inch wide by 1.5 inch long slots, with 42 slots per foot (slots which match formation grain size as determined by field grain-size distribution analysis), a P.V.C. cap is fastened to the bottom of the casing (no solvents, adhesive, or cements are used). The well casing is thoroughly washed and steam-cleaned.

After setting the casing inside the borehole, kiln dried sand or gravel filter-material is poured into the annular space from the bottom of the boring to 2 feet above the perforated interval. A 1 to 2-feet thick bentonite plug will be placed above this filter material to prevent grout infiltration into the filter material. Approximately 1 to 2 gallons of distilled water will be added to hydrate the bentonite pellets. The well is then sealed from the top of the bentonite seal to the surface with concrete or neat cement (containing about 5% bentonite) (see Well Construction Detail).

For protection from vandalism and surface water contamination, Christy boxes with a special type of Allen screw are installed around the well head, (for wells in parking lots, drive-ways and building areas). Steel stovepipes with padlocks are usually set over well heads in landscaped areas.

In general, groundwater monitoring wells shall extend to the base of the upper aquifer, as defined by the consistent (less than 5 feet thick) clay layer below the upper aquifer, or at least 10 to 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 foot to 2 feet into such a clay layer.

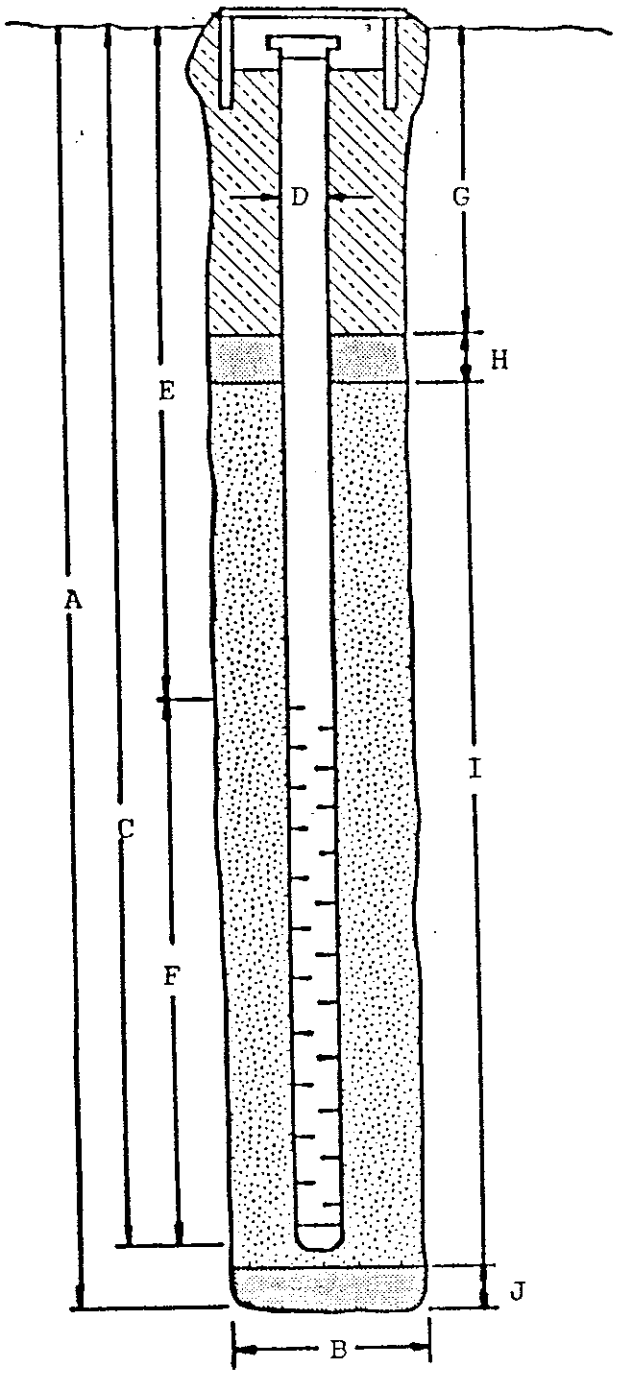
WELL DETAILS

PROJECT NAME:_____ BORING/WELL NO._____

PROJECT NUMBER:_____ CASING ELEVATION:_____

WELL PERMIT NO.:_____ SURFACE ELEVATION:_____

G-5 Vault Box



A. Total Depth:_____

B. Boring Diameter:_____

Drilling method:_____

C. Casing Length:_____

Material:_____

D. Casing Diameter:_____

E. Depth to Perforations:_____

F. Perforated Length:_____

Perforated Interval:_____

Perforation Type:_____

Perforation Size:_____

G. Surface Seal:_____

Seal Material:_____

H. Seal:_____

Seal Material:_____

I. Gravel Pack:_____

Pack Material:_____

Size:_____

J. Bottom Seal:_____

Seal Material:_____

File No. 10-93-570-SA

WELL DEVELOPMENT AND WATER LEVEL MEASUREMENTS

For all newly-installed groundwater monitoring wells, the well casing, filter pack and adjacent formation shall be cleared of disturbed sediment and water.

Well development techniques will include pumping, bailing, surging, swabbing, jetting, flushing and air lifting by using a stainless steel or Teflon bailer, submersible stainless steel pump, or air lift pump. The well development will continue until the groundwater appears to be relatively free of fine-grained sediments and/or until field measurements of pH, electrical conductivity and temperature stabilize.

To assure that cross-contamination does not occur between wells, all well development tools be thoroughly washed in a Tri-Sodium Phosphate (TSP) solution followed by a rinse in distilled water or steam-cleaned before each well development.

Subsequent to well installation, the well(s) will be surveyed to the nearest benchmark to an accuracy of 0.01 feet, in order to accurately measure the groundwater elevation. The depth to the static water surface in all wells will be measured monthly.

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MONITORING WELL SURVEY SHEET

NAME: _____ DATE: _____

FACILITY NAME AND ADDRESS: _____

_____

PROJECT NO.: _____

FIELD ACTIVITIES

WELL NUMBER	ROD READING	RIM ELEVATION	WATER ELEVATION

WARNING: HAVE YOU SURVEYED ALL WELLS? LOCATED ALL WELLS?

HAVE YOU CHECKED FOR AND SURVEYED EXISTING MONITORING WELLS ON ADJACENT PROPERTIES OR PROPERTIES ACROSS THE STREET?

DO WE HAVE ACCURATE SKETCHES AT 1"=30' (AND 1"=100' IF NECESSARY)? IF NOT, MAKE THEM.

\SURVEY

SOP8

File No. 10-93-570-SA

GROUNDWATER SAMPLING

Prior to collection of groundwater samples, all of the sampling equipment (i.e. bailer, cables, bladder pump, discharge lines and etc...) are cleaned by pumping TSP water solution followed by distilled water.

Prior to purging the well, "Water Sampling Field Survey Forms" will be filled out (depth to water level and total depth of well and well casing volume calculated). The well will be then bailed or pumped to remove four to ten well-volumes or until the discharged water temperature, conductivity and pH stabilize. "Stabilized" is defined as three consecutive readings within 15% of one another.

The groundwater sample will be collected when the water level in the well recovers to 80% of its static level.

Forty milliliter (ml.) glass Volatile Organic Analysis (VOA) vials with Teflon septa will be used as sample containers. The groundwater sample will be decanted into each VOA vial in such a manner that no air space is present. The cap is quickly placed over the top of the vial and securely tightened. The groundwater sample will be labeled and refrigerated for delivery with proper chain-of-custody to the laboratory. Chain-of-custody information should include a sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

In general, a laboratory-cleaned bailer will be used for each monitoring well sampled.

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WELL MONITORING/SAMPLING

Name:_____ Date:_____

FACILITY NAME AND ADDRESS:_____

_____

DATE WELLS DEVELOPED:_____

FIELD ACTIVITIES

DEVELOPING MONITORING PURGING (PUMP/BAIL) SAMPLING

WELL NUMBER	WELL DEPTH	WATER DEPTH	PRODUCT THICKNESS	SHEEN PRESENCE	ODOR	VOLUME WATER	PURGED PRODUCT

SKETCH -- REMARKS

Volume of Water in Casing or Hole

Diameter of Casing or Hole (In)	Gallons per foot of Depth	Cubic Feet per Foot of Depth	Liters per Meter of Depth	Cubic Meters per Meter of Depth
1	0.041	0.0055	0.509	0.509×10^{-3}
$1\frac{1}{2}$	0.092	0.0123	1.142	1.142×10^{-3}
2	0.163	0.0218	2.024	2.024×10^{-3}
$2\frac{1}{2}$	0.255	0.0341	3.167	3.167×10^{-3}
3	0.367	0.0491	4.558	4.558×10^{-3}
$3\frac{1}{2}$	0.500	0.0668	6.209	6.209×10^{-3}
4	0.653	0.0873	8.110	8.110×10^{-3}
$4\frac{1}{2}$	0.826	0.1104	10.26	10.26×10^{-3}
5	1.020	0.1364	12.67	12.67×10^{-3}
$5\frac{1}{2}$	1.234	0.1650	15.33	15.33×10^{-3}
6	1.469	0.1963	18.24	18.24×10^{-3}
7	2.000	0.2673	24.84	24.84×10^{3}
8	2.611	0.3491	32.43	32.43×10^{3}
9	3.305	0.4418	41.04	41.04×10^{3}
10	4.080	0.5454	50.67	50.67×10^{3}
11	4.937	0.6600	61.31	61.31×10^{3}
12	5.875	0.7854	72.96	72.96×10^{3}
14	8.000	1.069	99.35	99.35×10^{3}
16	10.44	1.396	129.65	129.65×10^{3}
18	13.22	1.767	164.18	164.18×10^{3}
20	16.32	2.182	202.68	202.68×10^{3}
22	19.75	2.640	245.28	245.28×10^{3}
24	23.50	3.142	291.85	291.85×10^{3}
26	27.58	3.687	342.52	342.52×10^{3}
28	32.00	4.276	397.41	397.41×10^{3}
30	36.72	4.909	456.02	456.02×10^{3}
32	41.78	5.585	518.87	518.87×10^{3}
34	47.16	6.305	585.68	585.68×10^{3}
36	52.88	7.069	656.72	656.72×10^{3}

1 Gallon = 3.785 Liters
1 Meter = 3.281 Feet
1 Gallon Water Weighs 8.33 lbs. = 3.785 Kilograms
1 Liter Water Weighs 1 Kilogram = 2.205 lbs.
1 Gallon per foot of depth = 12.419 liters per foot of depth
1 Gallon per meter of depth = 12.419×10^{3} cubic meters per meter of depth

From Groundwater and Wells, Second Edition

CHAIN OF CUSTODY RECORD

SOP12

PROJ. NO.	NAME
SAMPLERS: *(Signature)*	

NO.	DATE	TIME	Soil	Water	LOCATION	CON-TAINER	Analyses Requested (2)	REMARKS

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Receive by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

SOIL TECH ENGINEERING

Soil, Foundation and Geological Engineers

—2[illegible] ROK OAD. NTA \RA, — 950[illegible] ■ (408) 866-0919 ■ (415) 791-6406

Sample Type: Soils, Oils, Solvents, Polids, Highly Contaminated Liquids (c)

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (recommended/regulatory)
Weak Acids and Bases		plastic or glass		
Photosensitive materials		amber glass		
Volatile organics		40 ml glass vial with TFE lined septum		
Non-volatile organics		glass with TFE lined cap		
Measurement - General Chemical Categories, Inorganic				
Inorganics, general		plastic or glass		
Metals, total		plastic or glass		
Measurement - General Chemical Categories, Organic				
Acid extractables		glass with TFE lined cap		
Base/neutral extractables		glass with TFE lined cap		
Measurement Specific Chemicals - Inorganic				
Hydrofluoric acid		plastic		
Phosphoric acid		plastic		

Sample Type: Waste

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (d) (recommended/regulatory)
Measurement - Specific Chemicals, Inorganic				
Ammonia			add 1 ml conc H_3PO_4	24 hrs
Arsenic			add 6 ml conc HNO_3/L	6 months
Chlorine			cool 4°C	24 hrs
Chromium VI			add 6 ml conc H_2SO_4/L	24 Hrs
Cyanide, total			add 2.5 ml of 50% NaOH/L, cool 4°C	24 hrs
Fluoride			cool 4°C	7 days
Mercury, total			add 5 ml conc HNO_3L	38 days
Mercury, dissolved			filter, add 5 ml conc HNO_3/L	38 days
Selenius			add 5 ml conc HNO_3/L	6 months
Sulfide			add 2 ml conc HC1/1	24 hrs
Zinc			add 2 ml conc HC1/1	-
Sample Type: Soils, Oils, Solvents, Solids, Highly Contaminated Liquids (c)				
Strong acids, pH<2		glass		
Strong bases, pH>12.5		plastic		

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (d) (recommended/regulatory)
Sulfate	50 ml	plastic or glass	cool 4°C	7 days/28 days
Sulfide	500 ml	plastic or glass	cool 4°C, add 4 drops 2N Zn acetate/100 ml	24 hrs/28 days
Sulfite	50 ml	plastic or glass	determine on site	no holding
Measurement - Specific Chemicals, Organic				
NTA	50 ml	plastic or glass waterline & center	cool 4°C	24 hrs
Measurement - Physical Properties				
Acidity			cool 4°C	24 hrs
Alkalinity			cool 4°C	24 hrs
pH			determine on site	6 hrs
			cool 4°C	
Measurement - General Chemical Categories, Inorganic				
Metals, dissolved			filter on site, add 5 ml conc HNO_3/L	6 months
Metals, total			add 5 ml conc HNO_3/L	6 months
Measurement - General Chemical Categories, Organic				
Phenolics			add H_3PO_4 to pH 4 and 1 g $CuSO_4$/L, cool 4°C	24 hrs

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (d) (recommended/regulatory)
Measurements - Specific Chemicals, Inorganic				
Ammonium	500 ml	plastic or glass	cool, 4°C, add H_2SO_4 to pH<2	24 hr/28 days
Boron	100 ml	plastic	none required	28 days/28 days
Chlorine	200 ml	plastic or glass	determine on site	no holding
Chromium VI	300 ml	plastic or glass, rinse with 1:1 HNO_3	cool, 4°C	24 hrs/28 days
Cyanide, total	500 ml	plastic or glass add NaOH to pH>12	cool, 4°C, dark	24 hrs/14 days
Cyanide, amenable to chlorination	50 ml	plastic or glass	add 100 mg NaS_2O_3	
Fluoride	300 ml	plastic	none required	7 days/28 days
Iodide	100 ml	plastic or glass	cool, 4°C	24 hrs/ -
Iodine	500 ml	plastic or glass	determine on site	1/2 hr/ -
Mercury, total	500 ml	plastic or glass rinsed with 1:1 HNO_3	cool, 4°C add HNO_3 to pH<2	28 days/28 days
Mercury, dissolved	100 ml	plastic or glass	filter on site add HNO_3 to pH<1	glass: 38 days hard plastic: 13 days
Nitrate	100 ml	plastic or glass	cool, 4°C add H_2SO_4 to pH<2	24 hrs/48 hrs
Nitrate & nitrate	200 ml	plastic or glass	cool, 4°C add H_2SO_4	24 hrs/28 days
Nitrate	100 ml	plastic or glass	cool, 4°C or freeze	

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater

General Composition	Sample Volume	Sample Container	Preservative	Holding Time (d) (recommended/regulatory)
Measurement - General Chemical Categories, Organic				
Acid extractables		2 liter glass with TFE lined cap		
Base/neutral extractable		2 liter glass with TFE lined cap		
MBA's	250 ml	plastic or glass	cool, 4°C	24 hr
Oil and Grease	1000 ml	glass, wide mouthed, calibrated	cool, 4°C, H_2SO_4 to pH<2	24 hr/28 days 24 hr/28 days
Organics		glass rinsed with organic solvents, TFE cap		
Phenolics	500 ml	glass		24 hr/28 days
Purgeables by purge and trap	50 ml	glass, TFE lined cap		

Sample Type: Water and Wastewater (a,b,c)

General Composition	Sample Volume	Sample Container	Preservative	Holdin Time (d) (recommended/regulatory)
Nonvolatile organics		2 liter glass with TFE lined cap		
Photosensitive materials		1 liter amber glass		
Volatile organics		40 ml glass vial with TFE lined cap (collect in duplicate)		
Volatile	100 ml	Plastic or glass	cool, 4°C	7 days
Measurement - Physical Properties				
Acidity	100 ml	plastic or borosilioate glass	cool, 4°C	24 hr/14/days
Alkalinity	200 ml	plastic or glass	cool, 4°C	24 hr/14/days
pH	25 ml	plastic or glass	determine on site	2 hr/2 hr
Temperature	1000 ml	plastic or glass	determine on site	no holding
Measurement - General Chemical Categories, Inorganic				
metals, dissolved	200 ml	plastic(g) or glass	filter on site (f)	6 mos (e)
metals, total	100 ml	plastic(g) or glass rinsed with 1:1 HNO_3	HNO_3 to pH<2 (g)	6 mos/6 mos (e)

SOIL TECH ENGINEERING

Soil, Foundation and Geological Engineers

298 BROKAW ROAD, SANTA CLARA, CA 95050 ■ (408) 866-0919 ■ (415) 791-6406

GENERAL FORMAT
SOIL SAMPLING FOR DISPOSAL
and/or
SITE SUPERVISION

REPRESENTATIVE_____ DATE_____

FACILITY NAME AND ADDRESS_____

_____

FACILITY CONTACT/ENGINEER:_____ PHONE:(___)_____

DEALER/OWNER :_____ PHONE:(___)_____

CONTRACTOR :_____ PHONE:(___)_____

FIRE DEPARTMENT :_____ PHONE:(___)_____

COUNTY HEALTH DEPARTMENT :_____ PHONE:(___)_____

STATE AGENCY :_____ PHONE:(___)_____

SOIL DESCRIPTION(Circle one): SANDY SILTY CLAY SANDY/CLAY SILTY/SAND

ODOR DESCRIPTION (Circle one): NONE FAINT MINOR STRONG

SOIL SAMPLING

NUMBER OF COMPOSITE SAMPLES:_____DEPTH SAMPLES TAKEN AT:_____(FT)

NUMBER OF SAMPLES PER COMPOSITE:_____

SITE SUPERVISION

AERATION: DATE PERMISSION OBTAINED FROM BAAQMD:_____

TOTAL VOLUME OF SOIL TO BE AERATED :_____cu.yds.

VOLUME OF SOIL AERATED ON THIS DATE :_____cu.yds.

EXCAVATION: DESCRIBE PURPOSE:_____

_____

_____

APPROXIMATE VOLUME OF SOIL EXCAVATED:_____cu.yds.

_____

REMARKS:_____

_____

_____

File No. 10-93-570-ST

OUTLINE OF DRUM HANDLING PROCEDURES
FOR THE PROPERTY
LOCATED AT 525 98TH AVENUE
OAKLAND, CALIFORNIA

1. Test material per site-specific test requirements.

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

3. 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 24 hours after analytical results are received.

   * Hazardous Label: Required within 24 hours after analytical results are received.

   * For Pick-Up Label: Must be affixed to drum prior to arranged pick-up date by certified hauler.

4. Remove within 21 days of generation. Empty drums, where material was disposed in bulk, must be removed the same day they are emptied.

5. Disposal of Material:

   * Clean: Any local landfill.

   * Non-Hazardous: Class III landfill.

   * Hazardous: Class I landfill.

6. Manifests may be signed by the on-site contractor or consultant, owner, or other authorized representatives. The transporter should not sign the manifest.

   It is the responsibility of the contractor, consultant and owner to arrange for a person to sign the manifest on the day of pick-up.

7. Reporting:

   Reports shall include the following:

   * Completed soil and water worksheets.

   * Copy of the analytical results.

   * State how and where material was disposed.

   * If drums are emptied and material was disposed of in bulk, state how empty drums were handled.

   * The signed blue and yellow copies of the hazardous waste manifest.

SOIL:

1. Test Requirements and Methods: Per STE site-specific test requirements.

   * TPH: EPA Method 8015.

   * BTEX: EPA Method 8020.

   * O&G: 503 D&E.

   * Lead:

     -Total Lead - EPA Method 7421.

-Inorganic (soluble) Lead: DOS Title 22, Waste Extraction Test, §22-66700.

-Organic - EPA Method 8240.

* Ignitable:

2. Classification:

* Clean: TPH, BTEX, O&G, VOC and non-detectable (<100 ppm).

* Non-Hazardous if any are true:

-TPH less than 1,000 ppm.

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

* Hazardous if any are true:

-TPH greater than 1,000 ppm.

-Lead - Inorganic (soluble) Lead greater than 5 ppm (STLC) or greater than 1,000 ppm (TTLC).
- Organic Lead greater than 13 ppm (TTLC).

-Ignitable - If TPH > 1,000 ppm, then conduct Bunsen Burner Test.
- If soil bums vigorously and persistently, soils are RCRA D001.

* VOC - less than 1,000 ppm.

3. Responsibility for Disposal:

* Clean: Consultant, contractor or owner.

* Non-Hazardous: Consultant, contractor or owner.

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

5. Disposal Facility:

   * Clean: Any local landfill.

   * Non-Hazardous: Class III or II landfill.

   * Hazardous: Class I landfill.

WATER:

1. Test Requirements and Methods: Per site-specific test requirements.

   * TPH: EPA Method 8015.

   * BTEX: EPA Method 602.

2. Classification:

   * Clean Water: TPH and BTEX non-detectable.

   * 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 owner.

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

5. Disposal Facility:

   * Clean Water: Into sanitary sewer per Local Sewer District approval or into storm sewer with proper approval from Water Board.

   * Non-Hazardous:

     -Water with TPH and BTEX only.

     -Water with free product.

     -Arrange certified waste hauler to pick and dispose.

   * Hazardous:

     -Free product only.

     -Arrange disposal by a certified hazardous waste hauler.