Weiss Associates *Environmental and Geologic Services*

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September 18, 1995

Juliet Shin
Alameda County Department of Environmental Health
Environmental Protection Division
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Re: **Subsurface Investigation and Site Closure Workplan**
Shell Service Station
WIC #204-5508-2808
9570 Golf Links Road
Oakland, California
WA Job #81-1055-35

Dear Ms. Shin:

Weiss Associates (WA), on behalf of Shell Oil Products Company (Shell), is submitting this workplan in response to the request for a ground water investigation stated in your letter to Mr. Dan Kirk, dated August 8, 1995. This workplan outlines the proposed drilling and sampling procedures that WA will conduct to determine whether ground water has been impacted by the release from the former waste oil tank at the above-referenced site (Figure 1). If results from the proposed investigation confirm that ground water has not been impacted, WA will include a request for case closure as part of the investigation report. A site background summary and the proposed scope of work are presented below.

SITE BACKGROUND

Station Setting: The site is an operating Shell service station located at the north corner of Golf Links Road and Mountain Boulevard in Oakland, California (Figure 1). The area surrounding the site is both commercial and residential.

Tank Removal: On March 7, 1995, WA documented the removal of one 550-gallon, single-walled, steel waste oil tank and sampled the soil below the tank. Analytical laboratory results indicate that soil samples collected from below the tank, at a depth of 7 feet below ground surface (bgs), contained 12,000 parts per million (ppm) petroleum oil and grease (POG), 3,900 ppm total petroleum hydrocarbons as diesel (TPH-D), 190 ppm total petroleum hydrocarbons as gasoline (TPH-G), 0.43 ppm toluene, 0.6 ppm polychlorinated biphenyls (PCBs), and 49 ppm total chromium. The analytic results are summarized in Table 1. No new tank was installed to replace the former tank.

Over-excavation: On March 7, 1995, after the above-mentioned tank was removed, WA directed the over-excavation of about four feet of soil from the tank pit bottom, to a total depth of 11 feet bgs, and about six inches of soil from each sidewall. The total in-situ volume of overexcavated soil was about 15 yards. Confirmatory soil samples were collected from the over-excavation floor at 11 feet bgs and from each sidewall at 7 to 8 feet bgs. Analytical laboratory results indicate that soil samples collected from the over-excavation pit floor contained 62 ppm POG, 0.072 ppm toluene, 12 ppm total chromium, and did not contain TPH-D, TPH-G or PCB's above laboratory detection limits. Analytical laboratory results also indicate that concentrations in the over-excavation sidewall soil samples ranged from 0.083 to 0.19 ppm toluene and from 44 to 56 ppm total chromium. No POG, TPH-D, TPH-G, or PCBs were detected above laboratory detection limits in any of the sidewall soil samples.

Site Lithology: The following sediments were encountered during the above-referenced waste oil tank removal and over-excavation: gravel road base to a depth of about 1 foot bgs, sandy clay to about 10 feet bgs, and gravelly clay to about 11 feet bgs.

Ground Water Depth: No ground water was encountered during excavation of the former waste oil tank pit. Results from a 1/2-mile radius well search performed by the County of Alameda, Public Works Agency indicate that depth to ground water in this area ranges from about 23 to 50 feet bgs.

PROPOSED SCOPE OF WORK

The objective of this work is to confirm that downgradient ground water has not been impacted by the release from the waste oil tank formerly beneath this site. To meet this objective, WA proposes drilling one soil boring, collecting soil and ground water samples, and submitting the samples to a state-certified laboratory for analysis. Upon receipt of the analytical results, WA will prepare and submit a subsurface investigation report.

Site Safety: WA will prepare a site safety plan, and locate underground and overhead utility lines.

Drilling: WA will drill one soil boring at the approximate location shown on Figure 2. The soil boring will be located outside of the over-excavation boundary, but within 10 feet of the former waste oil tank, in the anticipated downgradient ground water flow direction. The boring will be drilled either to a depth of 15 feet below the encountered ground water table or to a maximum of 50 feet bgs. The boring will be filled with grout and WA will arrange for the disposal of drill cuttings and steam cleaning rinsate. Our standard field procedures are included as Attachment A.

Sampling: WA will collect soil samples at least every 5 feet and at the capillary fringe for hydrogeologic description and chemical analysis. Ground water samples will be collected using a Geoprobe ground water sampler. WA will store all soil and ground water samples in an iced-cooler and transport them to a state-certified laboratory under chain-of-custody protocol.

Laboratory Analysis: The analytical laboratory will analyze the soil and ground water samples for TPH-G and TPH-D by modified EPA Method 8015, POG by American Public Health Association Standard Method 5520E, and benzene, ethylbenzene, toluene and xylenes (BETX) by EPA method 8020.

Investigation Report: A comprehensive report detailing the subsurface investigation and presenting all subsurface data and laboratory results will be submitted to your office upon completion of the above described work.

SAMPLING MODIFICATIONS

Your August 8, 1995, letter also requested further sampling for heavy metals and PCBs. Based on the analytic results, WA and Shell do not believe metals or PCBs have impacted the subsurface. Our rationales for not sampling for these analytes are presented below.

Heavy Metals: According to the footnote in Table II, Section 66261.24(a)(2)(A), Chapter 11, Division 4.5, Title 22, California Code of Regulations for the chromium III Soluble Threshold Limit Concentration (STLC): if a waste is not otherwise determined hazardous, the 560 mg/l chromium III STLC is to be used for comparison; if the waste is otherwise determined hazardous, the 5 mg/l STLC is to be used for comparison (Attachment B). The soil generated from the tank removal and over-excavation was classified as non-hazardous waste. Thus, the 560 mg/l STLC chromium value should be used for comparing soil impacted by the former waste oil tank. The highest chromium concentration in soil was 56 ppm, well below ten-times the 560 mg/l chromium III STLC (i.e. 5,600 ppm). Therefore, further heavy metal analyses of soil and ground water are not necessary.

PCBs: Analytical laboratory results indicate that soil sample WO-1, collected from below the former waste oil tank at 7 feet bgs, contained 0.6 ppm of PCBs. This concentration is well below the STLC and TTLC for PCBs. In addition, analytical results indicate that no PCBs were detected in any of the confirmatory soil samples collected after the over-excavation at this site. Therefore, further analyses of soil boring and ground water samples for PCBs are not warranted.

If analytical results from this investigation indicate that residual hydrocarbons do not pose a risk to water quality, WA will request site closure. We trust this submittal meets your needs. Please call us if you have any questions or comments.

REGISTERED GEOLOGIST
PETER F. McKEREGHAN
No. HG
CERTIFIED
HYDRO-
GEOLOGIST
STATE OF CALIFORNIA

Sincerely,
Weiss Associates

Tim R. Utterback
Staff Engineer

Peter McKereghan, C.H.G.
Project Hydrogeologist

Attachments:

Figure 1. Site Location Map
Figure 2. Proposed Soil Boring Location
Table 1. Summary of Soil Sample Analytic Results

Attachment A. WA Standard Field Procedures
Attachment B. Clarification of Chromium III STLC

cc:

Jeff Granberry, Shell Oil Products Company, P.O. Box 4023, Concord, CA 94524
Kevin Graves, Regional Water Quality Control Board - San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, CA 94612
Tom Fojut, Weiss Associates

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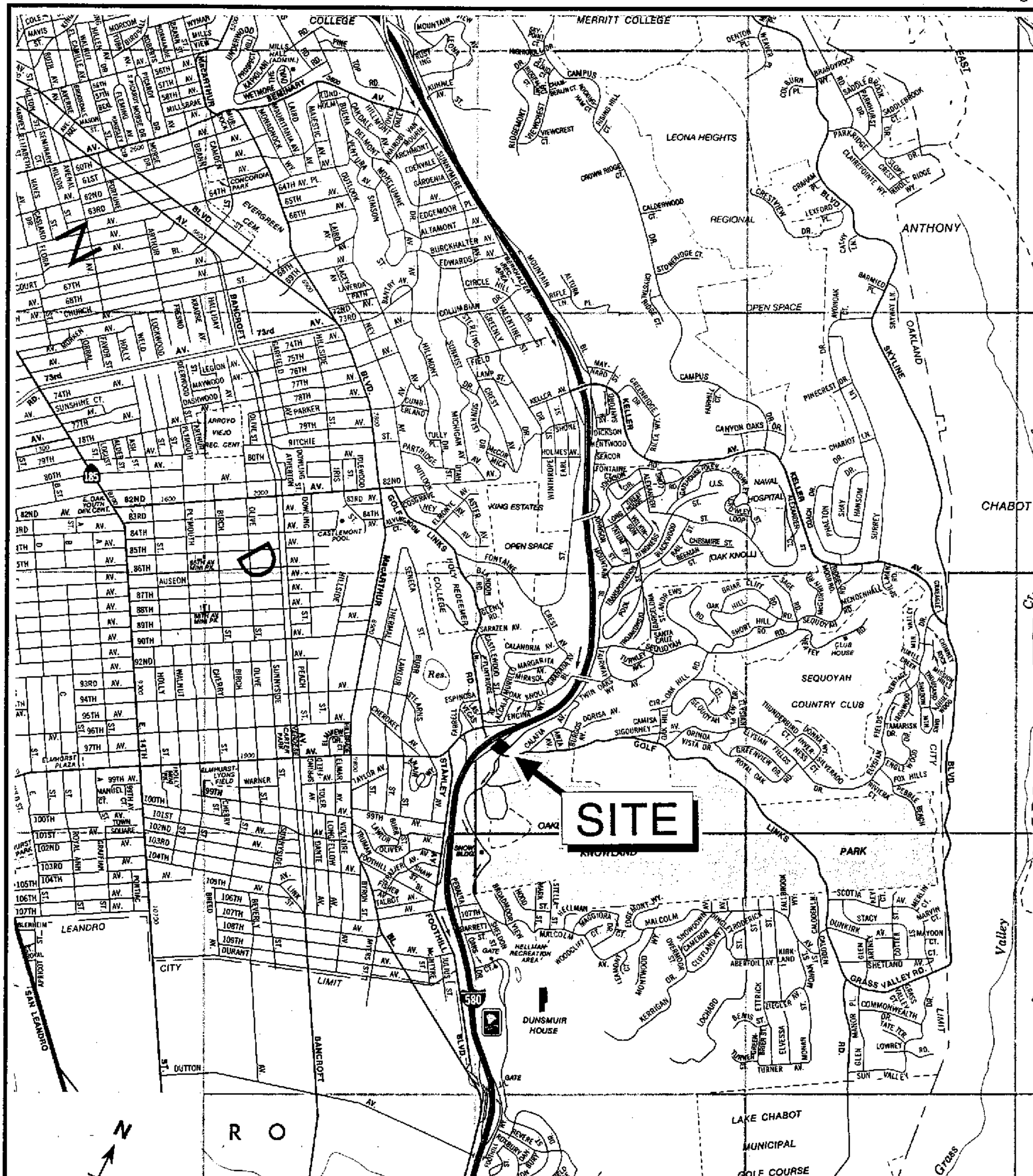

Figure 1. Site Location Map - Shell Service Station, WIC# 204-5508-2808, 9570 Golf Links Road, Oakland, California

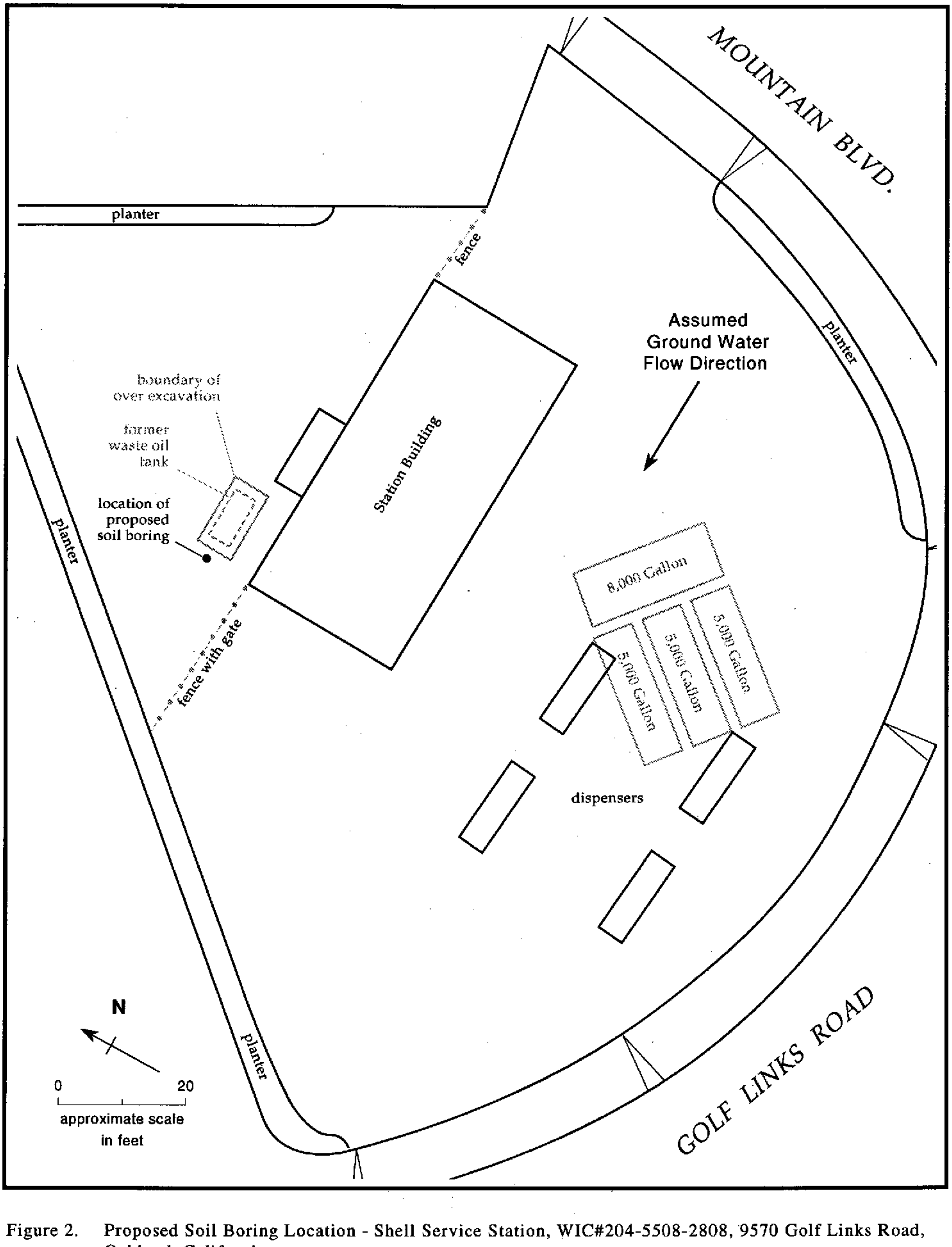

Figure 2. Proposed Soil Boring Location - Shell Service Station, WIC#204-5508-2808, 9570 Golf Links Road, Oakland, California

Table 1. Soil Analytic Results, Shell Service Station , WIC #204-5508-2808, 9570 Golf Links Rd., Oakland, California

SAMPLE NAME/ID	DEPTH BELOW GROUND SURFACE (ft)	POG	TPH-D	TPH-G	B	T	E	X	Cd	Cr	Pb	Ni	Zn	VOCs	SVOCs	PNAs	PCBs	CREOSOTE
		parts per million (mg/kg)																
WO1	7.0	12,000	3900	190	<0.25	0.43	1.0	2.2	<0.5	49	18	39	55	a	ND	ND	0.60	<1,700
WO2	11.0	62	<1.0	<1.0	<0.005	0.072	<0.005	<0.005	<0.5	12	11	7.8	210	ND	ND	ND	ND	<1,700
NSW	7.5	<50	<1.0	<1.0	<0.005	0.10	<0.005	<0.005	<0.5	51	7.0	37	59	a	ND	ND	ND	<1,700
SSW	7.0	<50	<1.0	<1.0	<0.005	0.19	<0.005	<0.005	<0.5	44	6.7	39	79	ND	ND	ND	ND	<1,700
ESW	7.0	<50	<1.0	<1.0	<0.005	0.18	<0.005	<0.005	<0.5	46	<5.0	48	69	a	ND	ND	ND	<1,700
WSW	7.8	<50	<1.0	<1.0	<0.005	0.083	<0.005	<0.005	<0.5	56	6.5	40	62	ND	ND	ND	ND	<1,700

Abbreviations:

POG = Total oil and grease by EPA Method 5520E
TPH-D = Total petroleum hydrocarbons as diesel by modified EPA Method 8015
TPH-G = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
B = Benzene By EPA Method 8020
T = Toluene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
X = Xylenes by EPA Method 8020
VOCs = Volatile organic compounds by EPA Method 8240
SVOCs = Semivolatile organic compounds by EPA Method 8270
PNAs = Polynuclear organic compounds by EPA Method 8100
PCBs = Polychlorinated biphenyls by EPA Method 8080
CREOSOTE = Creosote by EPA Method 8270
Cd, Cr, Pb, Ni, Zn = Total cadmium, chromium, lead, nickel and zinc by EPA Method 6010
<n = Not detected at detection limit of n mg/kg
ND = All compounds tested by this method were below laboratory detection limits.

Notes:

Samples collected on 03/08/95 by Weiss Associates and analyzed by Sequoia Analytical, Redwood City, California
a = No VOCs detected except for constituents of BTEX

ATTACHMENT A

WA STANDARD FIELD PROCEDURES

STANDARD FIELD PROCEDURES

WA has developed standard procedures for drilling and sampling soil borings and installing, developing and sampling ground water monitoring wells. These procedures comply with Federal, State and local regulatory guidelines. Specific procedures are summarized below.

FIELD WORK PREPARATIONS

Site Safety Plan

WA prepares a site-specific safety plan based upon the site history, previous work and analytic results for soil and water samples previously collected at the site for each phase of work at a particular site. The safety plan will identify potential site hazards and specify procedures to protect site workers and the public.

Utility Lines

Prior to drilling, WA typically visits the site to locate overhead and underground utility lines. WA notifies Underground Service Alert of all scheduled drilling activities and often contracts a private line locator as well. All borings are hand-dug and probed to at least 5 ft depth before drilling.

SOIL BORING AND SAMPLING

Objectives/Supervision

Soil sampling objectives include characterizing subsurface lithology, assessing whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and collecting samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG).

Soil Boring and Sampling

Deep soil borings or borings for well installation are typically drilled using hollow-stem augers. Split-barrel samplers lined with steam-cleaned brass or stainless steel tubes are driven through the hollow auger stem into undisturbed sediments at the bottom of the borehole using a 140 pound hammer dropped 30 inches. Soil samples can also be collected without using hollow-stem augers by progressively driving split-barrel soil samplers to depths of up to 30 ft.

Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Near the water table and at lithologic changes, the sampling interval may be less than five ft. Ground water sample may be collected from a soil boring by inserting a temporary slotted casing in the boring, purging the boring of as much water as possible with a steam-cleaned bailer and decanting ground water from the bailer into the appropriate sample containers.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Analysis

After noting the lithology at each end of the sampling tubes, the tube chosen for analysis is immediately trimmed of excess soil and capped with teflon tape and plastic end caps. The sample is labelled, stored at or below 4°C, and transported under chain-of-custody to a State-certified analytic laboratory.

Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID measurements are used along with the stratigraphy and ground water depth to select soil samples for analysis.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe. If wells are completed in the borings, the well installation, development and sampling procedures summarized below are followed.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Wells are installed to monitor ground water quality and determine the ground water elevation, flow direction and gradient. Well depths and screen lengths are based on ground water depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 15 ft below and 5 ft above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three ft thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two ft thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of cement with 3-5% bentonite.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark by a California-registered land surveyor.

Well Development

After 24 hours, the wells are developed using a combination of ground water surging and extraction. Surging agitates the ground water and dislodges fine sediments from the sand pack. After about ten minutes of surging, ground water is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of ground water are extracted and the sediment volume in the ground water is negligible. All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Floating Hydrocarbon Thickness and Water Level Measurements

Prior to sampling, each well is checked for the presence of floating hydrocarbons. If floating hydrocarbons are present, WA will measure the floating hydrocarbon thickness in the well with an oil/water interface probe. The water level in each well is also measured with respect to the top of the PVC casing to the nearest 0.01 ft using an electric sounder. The sounder is thoroughly rinsed with deionized water between measurements to prevent cross-contamination.

Ground Water Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of ground water are purged prior to sampling. Purging continues until ground water pH, conductivity, and temperature have stabilized. Ground water samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labelled, placed in protective foam sleeves, stored at 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

SOIL DISPOSAL

Drill cuttings are temporarily stockpiled on and covered with plastic sheeting or in steel 55-gallon steel at the site. One soil sample is collected for approximately every 12.5 cubic yards of soil. Up to four soil stockpile samples may be composited into one sample for analysis. A certified analytic laboratory generally analyzes the sample(s) for compounds that are suspected to be in the subsurface. Pending the analytic results and acceptance at an appropriate disposal facility, the soil will be transported to the disposal facility by a licensed waste hauler.

ATTACHMENT B

CLARIFICATION OF CHROMIUM III STLC

SOIL CYCLE, INC SOIL CYCLE, INC SOIL CYCLE, INC

2646 DUPONT DRIVE SUITE 20-250 IRVINE, CA 92715 (714) 833-2965 FAX (714) 833-3468

Contact: William W. Collins, Jr., R.E.A.

REGULATORY GUIDANCE

CHROMIUM III (Cr^{3+}) SOLUBLE THRESHOLD LIMIT CONCENTRATION (STLC) INTERPRETATION

Chromium III Soluble Threshold Limit Concentration (STLC) Interpretation The Department's interpretation and explanation of the Chromium III STLC and the associated footnote in Table II, Section 66261.24(a)(2)(A), Chapter 11, Division 4.5, Title 22, California Code of Regulations (22CCR) is as follows:

During the 1991 effort to recodify 22 CCR to incorporate federal regulations and maintain federal equivalency, the Department appeared to dramatically change the chromium III STLC from 560 mg/l to 5 mg/l*. However, the associated footnote accompanying the chromium III STLC clarifies the the application of the 5 mg/l and 5 mg/l thresholds and in most cases has not changed the application from the previous. 22 CCR. To paraphrase the footnote, if a waste is analyzed by the Waste Extraction Test (WET) and is not a RCRA hazardous waste by the Toxicity Characteristic Leaching Procedure (TCLP) or by other characteristics or listings, the WET concentration may be compared to 560 mg/l instead of 5 mg/l to determine whether it is a non-RCRA hazardous waste for chromium III. Since Chapter 11, 22 CCR, only identifies hazardous waste, it is implicit within the footnote that the WET concentrations between 5 mg/l and 560 mg/l are not hazardous waste due to the chromium III content if the waste is not otherwise a RCRA hazardous waste.

Excerpt from Statement of Reasons for this section states:

* "Section 66261.24(a)(2)(A) Table II contains a change in the numerical value for the Soluble Threshold Limit Concentration for the trivalent chromium with a corresponding footnote denoted by a double asterisk. The federal hazardous waste level for soluble chromium, trivalent or hexavalent is 5 mg/l. Existing State regulations differentiate between trivalent and hexavalent chromium. The State level for soluble trivalent Chromium is 560 mg/l. To ensure that wastes exhibiting the federal characteristics for toxicity for chromium are identified as hazardous wastes in the State, the numerical value in Table II is being changed and a foot note is being added. The footnote sets forth the procedures to follow in order to demonstrate that such a presumptive RCRA hazardous waste is a non-RCRA hazardous waste. Consequently, the current State regulatory threshold for trivalent chromium remains. The change adds another step in order to maintain the stringency of the regulation."

Pursuant to Section 66262.11, Title 22, California Code of Regulations (22 CCR), it is the generator's responsibility to determine if his waste is hazardous or non-hazardous by testing representative samples of the waste using the methods set forth in Chapter 11, Division 4.5, 22 CCR and /or applying knowledge of hazardous waste characteristics of the waste in light of if the materials or processes used to generate the waste. If the waste exhibits any of these characteristics, it is classified as a hazardous waste and must be managed as such. The classification of wastes is not to be confused with the establishment of cleanup levels. Waste classification determines only whether a waste must be managed as hazardous waste.

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