Advanced GeoEnvironmental, Inc.

08 August 2007
AGE-NC Project No. 03-1101

Mr. Jerry Wickham
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: **Additional Soil Boring Work Plan - Addendum**
RINEHART OIL, INC. - OAKLAND TRUCK STOP
1107 5th Street, Oakland, California

Dear Mr. Wickham:

Advanced GeoEnvironmental, Inc. has prepared the enclosed *Additional Soil Boring Work Plan - Addendum* for the above-referenced site. The scope of work includes the modification of methods proposed for the advancement of two paired soil borings in the eastern portion of the site as well as advancement of one paired soil boring to the west of Adeline Street.

The opportunity to provide this service is greatly appreciated. If you have any questions or require further information, please contact our office at (707) 570-1418.

Sincerely,

***Advanced* GeoEnvironmental, Inc.**

Jeremiah J. Puget
Project Environmental Scientist

Enclosure

cc: Reed Rinehart, Rinehart Oil, Inc.

2318 Fourth Street, Santa Rosa, California 95404
Telephone (707) 570-1481 Fax (707) 570-1461

Additional Soil Boring Work Plan - Addendum

RINEHART OIL, INC. - OAKLAND TRUCK STOP
1107 5th Street, Oakland, California

08 August 2007
AGE-NC Project No. 03-1101

PREPARED FOR:

Mr. Reed Rinehart
RINEHART OIL, INC.

PREPARED BY:

Advanced GeoEnvironmental, Inc.

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RINEHART OIL, INC. - OAKLAND TRUCK STOP
1107 5th Street, Oakland, California

08 August 2007
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Advanced **GeoEnvironmental, Inc.**
2318 Fourth Street, Santa Rosa, California

PREPARED BY:

Jeremiah J. Puget
Project Environmental Scientist

PROJECT MANAGER:

Jeremiah J. Puget
Project Environmental Scientist

REVIEWED BY:

REGISTERED GEOLOGIST
CALVIN F. LEE
No. 7327
STATE OF CALIFORNIA

Calvin F. Lee
Senior Project Geologist
California Professional Geologist No. 7327

Additional Soil Boring Work Plan - Addendum
RINEHART OIL, INC. - OAKLAND TRUCK STOP
1107 5th Street, Oakland, California

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Additional Soil Boring Work Plan - Addendum
RINEHART OIL, INC. - OAKLAND TRUCK STOP
1107 5th Street, Oakland, California

1.0. INTRODUCTION

At the request of Mr. Reed Rinehart of Rinehart Oil, Inc., *Advanced* GeoEnvironmental, Inc. (AGE) has prepared this *Additional Soil Boring Work Plan - Addendum* for the site located at 1107 5th Street, Oakland, California. In a directive letter dated 14 December 2006 (Appendix A), Alameda County Environmental Health Services (ACEHS-DEP) required further vertical and lateral delineation of petroleum hydrocarbon contamination resulting from an unauthorized release from underground storage tanks (USTs). In response to the ACEHS-DEP directive, AGE submitted *Additional Soil Boring Work Plan*, dated 26 February 2007, which proposed to advance two paired soil borings in the eastern portion of the site as well as advancement of one paired soil boring to the west of Adeline Street for collection of soil and ground water samples, utilizing GeoProbe and hollow-stem auger technologies.

This work plan addendum proposes to modify the boring and sampling methods, utilizing Cone penetrometer testing (CPT) equipment to acquire a continuous lithologic log and collect ground water samples. The rational for the proposed modification includes:

- Compared to collection of continuous soil samples, which is a slow process and can result in no-recovery, especially in sand-rich intervals, CPT lithologic log provides a rapid method of identifying subsurface soil type to assess for the most appropriate deep-interval water-bearing unit for ground water sampling. In addition, collection of soil samples at depths greater than 20 feet below surface grade (bsg) for analysis for petroleum-hydrocarbon compounds may not be necessary, since based on previous site soil data, it appears unlikely that petroleum hydrocarbon-impacted soil extends to below 20 feet bsg.
- By collecting discrete ground water samples in selected, subsurface water-bearing intervals based on CPT identification, and by utilizing the CPT direct-push boring method compared to hollow-stem auger boring method, here is considerably less risk of risk of cross-contamination while assessing the vertical impact to ground water.

2.0. SCOPE OF WORK

The purpose of the proposed investigation is to assess the vertical extent petroleum hydrocarbon-impacts to ground water on the eastern portion of the site and the lateral extent northwest of the site. The ground water assessment will consist of the following tasks:

- Permitting and pre-field work activities;
- Advancement of Three (3) CPT probes at two on-site and one off-site locations;

- Collection and analysis of depth-discrete ground water samples from the CPT locations; and
- Report preparation.

2.1. PERMITTING AND PRE-FIELD WORK ACTIVITIES

All necessary encroachment, obstruction and excavation permits will be obtained from the City of Oakland Office of Building and Planning and a water resources well permit will be obtained from the Alameda County Public Works Agency (ACPWA). Prior to mobilization, each CPT probe location will be clearly marked and a utility clearance obtained through Underground Service Alert. The ACPWA will be contacted 48 hours prior to conducting investigation activities.

2.2. CONE PENETROMETER TESTING

AGE proposes to conduct vertical assessment of soil stratigraphy and impacts to ground water utilizing CPT techniques. A 25-ton truck-mounted CPT rig is utilized to advance an electronic piezocone (CPTU) into the subsurface to total depth. As the CPTU is advanced, it provides a nearly continuous electronic log ("sounding") of subsurface soil resistence, friction, and pore water pressure that are utilized to interpret subsurface stratigraphy and hydrogeologic characteristics, which is useful to identify permeable strata at various depths to target for collection of in-situ (depth-discrete) ground water samples. The initial boring will be a advanced to a depth of at least 60 feet below surface grade (bsg), to assist in targeting coarser grained, water-bearing zones for collection of discrete ground water samples; however, the total depth of the boring may vary according to geologic/hydrogeologic conditions encountered during drilling activities. At selected depth intervals during each CPT sounding, pore water pressure will be monitored to determine relative hydraulic conductivity and hydrostatic head (ground water level). CPT procedures are presented in Section 3.1.

2.3. IN-SITU GROUND WATER SAMPLING AND ANALYSIS

It is proposed that ground water samples will be collected from two depth-discrete intervals below 30 feet bsg in the two locations on the eastern portion of the site for the purpose of vertical assessment (Figure 2); the ground water samples will be collected from a separate boring other than the CPT sounding boring. In the boring to the northwest (5th Street parking area) it is proposed that the ground water samples will be collected at the first encountered water-bearing unit (water table interval) and from the two subsequent water-bearing intervals below 30 feet bsg (B-Zone and C-Zone) as identified from the CPT sounding data. Based on results of the previous CPT investigations in the area, it is anticipate that ground water samples will be collected at

approximately 5 to 10 feet bsg, 30 to 35 feet bsg, and a undetermined depth between 35 and 60 feet bsg. However, actual sampling intervals will be selected based on the results of the CPT soundings; the total depth of the soundings may be advanced deeper than 60 feet bsg, pending subsurface conditions. In-situ ground water sample collection procedures are presented in Section 3.1.

Selected ground water samples will be analyzed by a State of California Department of Health Services (DHS)-certified laboratory for the following.

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260B;
- Total petroleum hydrocarbons as diesel (TPH-d) by EPA Method 8015M;
- Total petroleum hydrocarbons as gasoline (TPH-g) by EPA Method 8015M; and
- Fuel additives including MTBE, di-isopropyl ether (DIPE), ethyl tertiary-butyl ether (ETBE), tertiary-amyl methyl ether (TAME), tertiary-butyl alcohol (TBA), 1,2-dichloroethane (1,2-DCA), and 1,2-dibromoethane (EDB) by EPA Method 8260B.

Laboratory reports of ground water analyses, testing methods, laboratory quality assurance/quality control (QA/QC) reports, and sample chain-of-custody documentation will be presented in a report with the findings and recommendations. Electronic deliverable format (EDF) files of the laboratory analytical results will be submitted to the State of California GeoTracker database.

2.4. REPORT PREPARATION

Upon completion of field work and receipt of final laboratory analysis, a report will be prepared presenting the findings of the additional ground water assessment. The report will include a description of the work performed, results and findings of the sampling and analysis, as well as conclusions and applicable recommendations. The report will be in a format acceptable to the ACEHS-DEP, and will be reviewed and signed by a California Professional Geologist.

3.0. FIELD PROCEDURES

All field procedures will be overseen by an AGE representative under the supervision of a California Geologist. Procedures for the CPT investigation, ground water sampling, sample shipment, equipment decontamination, and boring destruction are outlined below.

3.1. CONE PENETROMETER TESTING

The CPT test will be performed in accordance with ASTM Standard D3441. CPT soil borings will be advanced utilizing a 25-ton truck-mounted CPT rig equipped with 1.5-inch diameter hollow-stem push rods. The CPT rig utilizes a hydraulic ram to advance an electronically instrumented piezocone (CPTU) attached to the push rods. The CPTU measures cone bearing (tip resistence), sleeve friction, and dynamic pore water pressure at 5-cm intervals during penetration; at selected depth intervals, pore water pressure can be monitored to estimate relative hydraulic conductivity and hydrostatic head. Utilizing the CPTU measurements, the *Hogentogler Co.* computer program or similar programs can interpret general lithology types based on the *CPT Soil Behavior Classification System* (Robertson, P.K., Campanella, R.G, Gillespie, D, and Greig, J., 1986) and displayed the interpreted lithologies on a continuous CPT boring log.

3.2. IN-SITU GROUND WATER SAMPLE COLLECTION

At each CPT location, depth-discrete (in-situ) ground water sampling will be conducted in a separate and co-located boring (a twin boring) adjacent to the initial CPT sounding location. Depth-discrete ground water samples will be collected from selected depths based on the CPT-lithologic data identifying potential hydrostratigraphic units. In-situ ground water samples will be collected from selected relatively permeable saturated intervals using a hydropunch-equivalent sampler. A stainless steel hydropunch-equivalent sampling tool will be attached to hollow-stem push rods and advanced in a closed position to the desired sampling interval. Subsequently, the push rod and sampler will then be retracted approximately three feet exposing the sampler inlet screen and allowing ground water to flow into the sampler. Ground water samples will be collected utilizing a ½-inch diameter stainless steel bailer. Samples will be drawn and collected in such a manner that agitation and exposure of the ground water to the atmosphere is minimal.

3.3. SAMPLE HANDLING

Each preserved soil and ground water sample container will be labeled with the boring and/or well location, depth, time, date and sampler's initials. Ground water samples will be collected into laboratory supplied containers. Ground water samples for BTEX, TPH-g, and fuel additives analyses will be collected into laboratory-supplied, 40-ml volatile organic analysis (VOA) vials containing 0.5-ml of hydrochloric acid as preservative. Samples for TPH-d analysis will be collected into laboratory-supplied, 1-liter amber glass containers. Following collection the soil and ground water samples will be appropriately labeled, placed on ice and kept in a cooler until delivered to the laboratory for analysis. Chain-of-custody protocols will be used to document sample custody transfer from the field to the analytical laboratory. A chain-of-custody form will accompany the samples.

3.4. EQUIPMENT DECONTAMINATION

All sampling tools used for sample collection will be thoroughly washed with a solution of Alconox and rinsed with clean water prior to use at each sampling location. All down-hole and probing equipment will be steam cleaned prior to advancement at each location. Decontamination rinseate disposal is presented in Section 3.5.

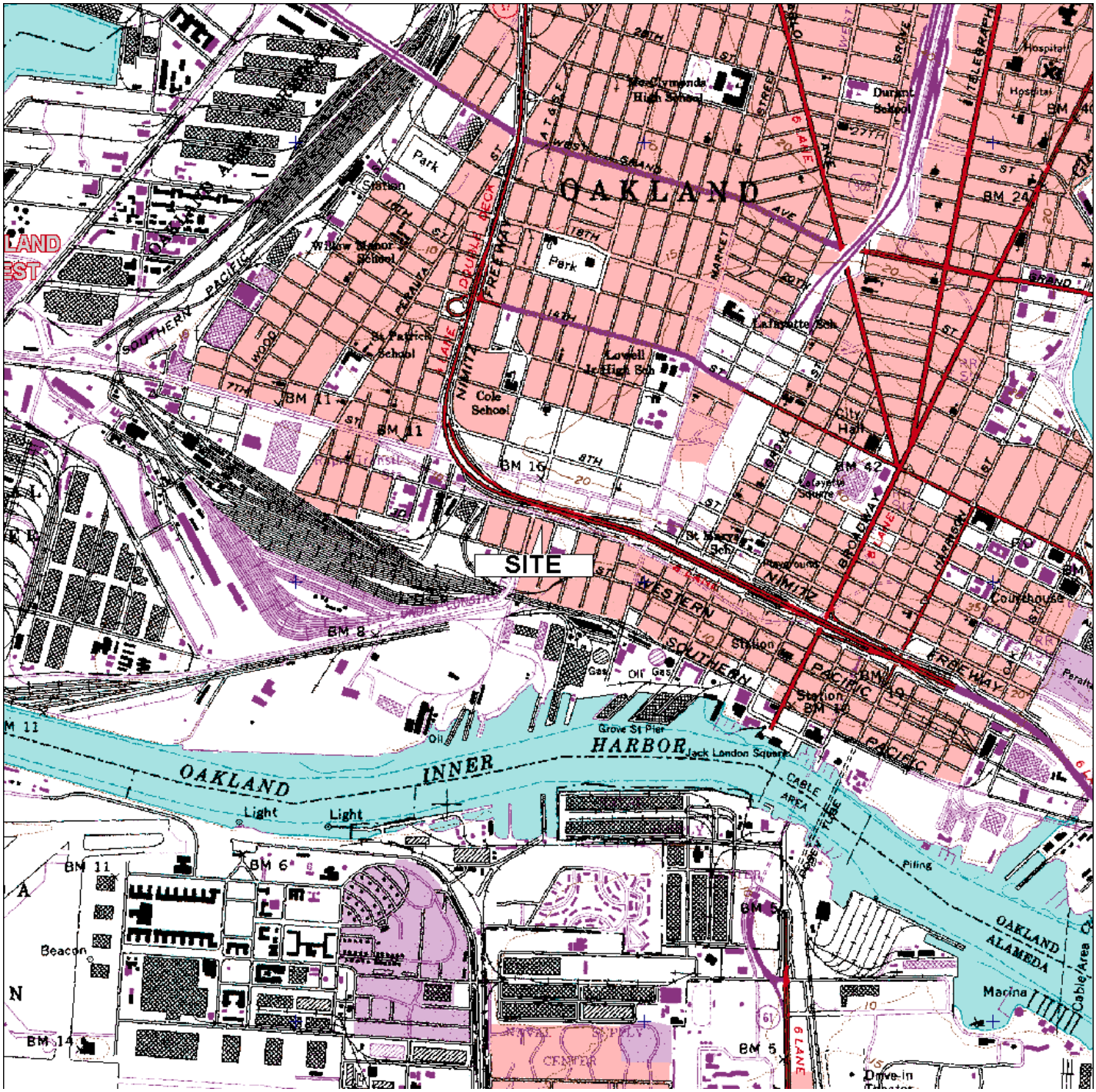
3.5. BORING DESTRUCTION

All soil borings will be permanently sealed to prevent vertical migration of potential contaminants. Soil borings and/or probe shall be destroyed by backfilling with cement-bentonite grout from the total depth to surface grade. Borings advanced below the ground water table will be backfilled with grout utilizing tremmie procedures. The ACPWA will be notified for grout inspection at least 48 hours prior to conducting grouting procedures.

3.6. WASTE DISPOSAL

Investigation-derived waste, including decontamination rinseate, generated during CPT and well sampling activities will be containerized in appropriately labeled DOT-approved 55-gallon drums and stored on-site pending disposal, or the CPT contractor will undertake the removal and disposal of the drums of rinseate.

FIGURES



OAKLAND WEST QUADRANGLE, CALIFORNIA
7.5 MINUTE SERIES (U.S. GEOLOGICAL SURVEY)

LOCATION MAP

RINEHART – OAKLAND TRUCK STOP
1107 5TH STREET
OAKLAND, CALIFORNIA

Advanced GeoEnvironmental, Inc.
of Northern California

PROJECT NO. AGE-NC-03-1101	FILE: LOCATION	FIGURE: 1
DATE: 27 SEPTEMBER 2004	DRAWN BY: MAC	

SITE PLAN

RINEHART – OAKLAND TRUCK STOP
1107 5TH STREET
OAKLAND, CALIFORNIA

Advanced GeoEnvironmental, Inc.
of Northern California

PROJECT NO. AGE-NC-03-1101 | FILE: Oakland EX Fig2 | FIGURE: 2
DATE: August 2007 | DRAWN BY: MAC

BART AERIAL TRACKS

INTERSTATE 880 OVERPASS

5TH STREET

PARKING

BUILDING

GATED PARKING

APARTMENTS

BUILDINGS

ADELINE STREET

APPROXIMATE EXTENT OF SCALE EXCAVATION

DRIVEWAY

DRIVEWAY

SCALE

PUMP ISLANDS

FORMER USTs

CURRENT USTs

PUMP ISLANDS

CURB

CURB

WALL

BUILDING

BUILDING

BUILDING

BUILDINGS

FENCE

CHESTNUT STREET

DRIVEWAY

DRIVEWAY

MW-1
MW-3N
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16

P1
P1-W
P2
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P3-W
P4
P4-W
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SCALE
0 40 80
FEET

LEGEND

- FORMER UNDERGROUND STORAGE TANK (UST) LOCATION
- EXISTING STRUCTURE
- MW-1 GROUND WATER MONITORING WELL LOCATION & DESIGNATION
- B-6 SOIL BORING LOCATION & DESIGNATION (JULY 2002)
- OZ1 OZONE SPARGE WELL LOCATION
- OZ6 FORMER OZONE SPARGE WELL LOCATIONS
- SOIL BORING/HYDROPUNCH BORING LOCATION (JULY 2006)
- GEOPROBE SOIL BORING LOCATION (JULY 2006)
- PROPOSED GROUND WATER MONITORING WELL LOCATION
- PROPOSED CPT/HYDROPUNCH BORING LOCATION