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REPORT

OF

GROUNDWATER MONITORING WELL INSTALLATION

SITE LOCATION:

706 Harrison Street
Oakland, California

PREPARED FOR:

Mr. Bo K. Gin
Oakland Auto Parts
288 Eleventh Street
Oakland, California

DBA Project 1514N

By:

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REGISTERED GEOLOGIST
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Exp. 6/'94.

829
3493h

Dennis Bates Associates, Inc.
494 Alvarado Street, Suite B
Monterey, CA 93940
and
2011 Feliz Road
Novato, CA 94945

20 September 1993

1.0 INTRODUCTION

The detailed scope of work for this work was described in the amendment to the 13 January 1993 workplan which called for the installation of three groundwater monitoring wells, the installation of two vapor recovery wells, the installation of two soil borings in the vicinity of the main tank excavation, the evaluation of the pump island area adjacent to Seventh Street for lead contamination, the performance of a Soil Performance Test (SPT), the sampling of stockpiled soil on site and the preparation of a summary technical report.

not yet done

All work done at this site was done in accordance with DBA Standard Operating Procedures which are attached as Appendix A.

2.0 BACKGROUND/SITE HISTORY

The Site is a vacant lot located at the southeast corner of the intersection of Seventh and Harrison Streets in the City of Oakland, California. It is located in a highly congested area of downtown Oakland with emphasis on commercial use. PLATE 1.

The Site was operated by Mr. Gin as a service station with two pump islands from 1963 to 1985 when retail operations ceased. The site contained two 6000 gallon UST's and four 1000 gallon single wall steel UST's which were used to store Supreme Unleaded, Regular Unleaded, and Regular gasolines and one small Waste Oil Tank.

All UST's were removed in January of 1991. The previously existing service station buildings were demolished and seven (7) Underground Storage Tanks (UST's) were excavated and removed in January of 1991 and the site is presently a vacant lot.

3.0 PREVIOUS WORK AT SITE

DBA supervised the attempt to overexcavate and resample the main tank excavation on 10 February 1993. This work was planned to remove, to the extent, possible petroleum hydrocarbon containing soil remaining in the subsurface beneath the former tank location. Unfortunately the sidewalls of the main tank excavation became so unstable that it was not possible to continue the overexcavation beyond one area where the maximum depth that could be safely reached was 16 feet below land surface (BLS). The instability of the excavation required that the excavation be halted and the pit immediately backfilled and compacted to prevent significant damage to 7th Street and adjacent underground utilities.

1 Sheet

One soil sample was obtained from the excavator bucket from Excavation 2 (Plate 2A). During the removal of debris from this excavation preparatory to backfilling and compaction, the sidewalls began sloughing into the excavation. This soil sample was obtained from what we believed to be the native soil and, for safety reasons, the excavation was immediately backfilled with on-site materials. Backfill material was placed in two-foot lifts and compacted with a 'sheeps-foot' compactor. This sample contained 93 ug/kg (parts per billion) of Total Petroleum Hydrocarbons as

Gasoline (TPHg). There were no Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX) fractions detected in this sample.

Two soil samples were obtained from the excavation prior to the sloughing/caving of the sidewalls. One sample (16 foot) was obtained from the excavator bucket from a depth of 16 feet below land surface and one sidewall sample (SW 10 feet) was obtained hand auguring into the sidewall at about 10 feet below land surface (PLATE 2A).

The 16 foot sample contained 4,300,000 ug/kg (parts per billion) TPHg, 66,000 ug/kg Benzene, 320,000 ug/kg Toluene, 130,000 ug/kg Ethyl Benzene and 730,000 ug/kg Xylenes.

No TPHg, BTEX was detected in the 10 foot sidewall sample.

4.0 SCOPE OF WORK

The approved work plan called for the characterization of the spoils pile, the installation and initial sampling of three groundwater monitoring wells, the installation of two vapor recovery wells, a soil performance pilot test and the evaluation of the pump island area for lead in the shallow soil.

5.0 DRILLING AND WELL CONSTRUCTION

5.1 GROUNDWATER MONITORING WELLS

Three groundwater monitoring wells and two vapor extraction wells (MW-1, MW-2, MW-3, VW-1 and VW-2) were installed on 22 and 23 July 1993 (PLATE 3).

Borings for the groundwater monitoring wells were drilled to an approximate depth of 28 feet below land surface using continuous-flight, hollow-stem augers and a Mobile B-53 truck-mounted drill rig.

NOTE: The wells were initially specified to be drilled to a total depth of 40 feet BLS in order to perform a geotechnical investigation at the same time. This portion of the project discussed in the amended work plan was cancelled by the owner immediately prior to the drilling date.

The groundwater monitoring wells were constructed using 2-inch diameter, threaded PVC casing. No chemical cements, glues or solvents were used in the construction of the well.

The well annulus for each monitoring well was packed with washed No. 2/12 sand from the bottom of the borehole at 28 feet to about 2 feet above the screened interval at 18 feet BLS. The wells were screened with 0.02-inch slotted casing from 28 feet below the water table to 18 feet BLS. (above the water table.) A 1-foot bentonite seal was placed above the filter pack. The well annulus was then be backfilled to the surface with neat cement.

Each well head was protected with waterproof "box" and a locking cap and seal.

The auger flights were steam-cleaned before each use to minimize the possibility of introducing contamination.

Well logs and construction details can be found in Appendix B.

Rinsate water was placed in 55-gallon drums which will be removed from the site and transported to an appropriate disposal or reprocessing facility, if required.

Drill cuttings from the monitoring wells were placed on the existing soil pile and covered with plastic.

5.2 VAPOR RECOVERY WELLS

The vapor recovery wells were installed and constructed as described for the groundwater monitoring wells except that the screened interval did not extend into the saturated zone and were screened only through the hydrocarbon impacted zone. Screened intervals for both VW-1 and VW-2 was from 21 to 16 feet BLS.

Well logs and construction details can be found in Appendix B.

Drill cuttings from the Vapor Recovery Wells were placed in labeled drums and temporarily stored on site.

Rinsate water was placed in 55-gallon drums which will be removed from the site and transported to an appropriate disposal or reprocessing facility, if required.

5.3 SOIL SAMPLES

During drilling operations, soil samples were collected using a California-modified, split-spoon sampler (2-inch inside diameter) equipped with clean brass sleeves. The samples will be collected by advancing the boring to a point just above the sampling depth, then driving the sampler into the native soil through the hollow center of the auger. The sampler was driven 18 inches with a standard 140-pound hammer dropped 30 inches. The number of blows required to drive the sampler each successive 6 inches was counted and recorded to provide an indication of soil consistency. These data along with geologic observations were recorded in the boring logs found in Appendix B.

Samples from wells installed through backfill material were collected at five foot intervals beginning at the bottom of the backfill.

One soil sample was collected at the soil-groundwater interface.

Groundwater in the borings was encountered at about 20 BLS.

5.4 WELL DEVELOPMENT

Development of the groundwater monitoring wells occurred on 10 August 1993 when the wells were checked for free product using a

clear bailer. No free product or sheen was observed. The wells were then developed by pumping each well using a dedicated 12 volt DC pump until the ground water cleared and remained clear for about ten minutes. Well development worksheets can be found in Appendix C.

Water brought to the surface during well development is temporarily stored on-site in 55-gallon drums and properly labeled as to contents.

5.5 GROUNDWATER SAMPLING

Groundwater sampling was done on 13 August 1993 after the developed wells have been allowed to stabilize for a minimum of 72 hours.

Subjective evaluation of a water sample from the well was subsequently be made to check for floating product or sheen. Since the observed samples were "clean" then the well was purged of approximately four well volumes using a dedicated 12 volt DC submersible pump.

Water level measurements (measured to the nearest 0.01-foot) were taken prior to well purging.

The wells recovered immediately to their static level as determined before purging began.

Water samples for laboratory analysis were obtained using a clean dedicated 12 volt DC submersible pump.

Water samples will be carefully placed into appropriate containers, labeled and placed in a cooler containing 'Blue Ice'.

Samples will be maintained under strict Chain-of-Custody procedures until received by the laboratory.

5.6 RESULTS OF ANALYSES

5.6.1 CHARACTERIZATION OF SPOILS PILE

Task 5 of the approved workplan required the collection and analysis of representative samples from the existing spoils pile and have them analyzed for Total Petroleum Hydrocarbons as Gasoline, Benzene, Toluene, Ethyl Benzene, Xylenes (TPHg/BTEX), Total Recoverable Petroleum Hydrocarbons (TRPH) and Total Lead.

On 17 June 1993 the spoils pile was divided into two equal portions and five representative samples were taken from each half for a total of 10 samples. Samples SPA1, SPA2, SPA3, SPA4 and SPA5 were taken from the portion of the pile towards Eighth Street and samples SPB1, SPB2, SPB3, SPB4 and SPB5 were taken from the portion of the pile towards Seventh Street. The laboratory was requested to composite the samples and analyze as described above.

The results of these analyses are presented in Table 1, page 5. Copies of the laboratory results and chain-of-custody documents can be found in Appendix D.

Table 1

Analytical Results for Composite Soils

Total Recoverable Petroleum Hydrocarbons (TRPH)
Total Lead (Pb)
TPH as Gasoline (TPHg)
Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX)

stockpile

Date Sampled: 17 June 1993
All Results Reported in PPM (mg/kg)

Sample	TRPH	Pb	TPHg	B	T	EB	X
SPA	ND	8.9	2.4	ND	ND	0.0072	0.11
SPB	ND	18	3.4	0.0078	0.0074	0.044	0.18

ND = Not Detected at the method reporting limit

how did the TRPH get to ND from 200ppm O+G on 1-17-91? They combined w.o. SP + fuel SP, si?

5.6.2 BORING/WELL INSTALLATION

During the installation of the three groundwater monitoring wells and the two vapor extraction wells soil samples were collected at five-foot intervals unless otherwise described and analyzed for TPHg/BTEX and Total Lead. For soil samples collected during the installation of MW-3 an additional analysis for TRPH was done on each sample.

really? not doc. in well logs.

The results from these analyses can be found in Table 2, page 6. Copies of the laboratory results and chain-of-custody documents can be found in Appendix D.

Pb went fm 430 ppm in wo SP on 1-17-91 to 18 ppm on 6-17-93 (combined SP).

Table 2

Analytical Results for Soils

Total Recoverable Petroleum Hydrocarbons (TRPH)
Total Lead (Pb)
TPH as Gasoline (TPHg)
Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX)

Date Sampled: 22/23 July 1993
All Results Reported in PPM (mg/kg)

WELL	DEPTH	TRPH	PB	TPHg	B	T	EB	X
MW-1	5	NA	ND	ND	ND	ND	ND	ND
	10	NA	ND	ND	ND	ND	ND	ND
	15	NA	ND	ND	ND	ND	ND	ND
	20	NA	ND	ND	ND	ND	ND	ND
MW-2	5	NA	ND	ND	ND	ND	ND	ND
	10	NA	ND	ND	0.059	0.036	0.0061	0.031
	15	NA	ND	48	0.56	2.8	1.5	8.8
MW-3	5	ND	ND	ND	ND	ND	ND	ND
	10	ND	ND	ND	ND	ND	ND	ND
	15	ND	ND	ND	ND	ND	ND	ND
	20	ND	ND	ND	ND	ND	ND	ND
VW-1	17	NA	ND	360	18	40	13	68
VW-2	17	NA	ND	6000	210	890	210	1200

NA = SAMPLE NOT ANALYZED FOR THIS COMPOUND
ND = NOT DETECTED

NOTE: A 20 FOOT SAMPLE FROM MW-2 WAS NOT COLLECTED BECAUSE OF GROUNDWATER at 19'

MW3 gw at 21'

MW1 gw at ?

5.6.3 GROUNDWATER ANALYSIS

The three groundwater monitoring wells were developed on 10 August 1993 and sampled on 13 August 1993. All samples were to be analyzed for TPHg/BTEX and Total Lead. One groundwater sample from well MW-3 was to be analyzed using EPA Method 8270, Semivolatile (Extractable Organics) by GC/MS.

The results from the TPHg/BTEX and Total Lead analyses can be found in Table 3 below.

NONE OF THE 54 COMPOUNDS IN THE EPA 8270 METHOD WAS DETECTED IN GROUNDWATER FROM WELL MW-3.

Copies of the laboratory results and chain-of-custody documents can be found in Appendix D.

Table 3

Analytical Results for Groundwater

Total Lead (Pb)
TPH as Gasoline (TPHg)
Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX)

Date Sampled: 13 August 1993
All Results Reported in PPB (ug/l)

WELL	Pb	TPHg	B	T	EB	X
MW-1	ND	20,000		640	280	440
MW-2	ND		6800	10,000	740	3900
MW-3	ND	ND	ND	ND	ND	ND

ND = NOT DETECTED

5.7 WELL SURVEY

The well's will be surveyed by a California Licensed Land Surveyor to determine the top-of-casing (TOC) elevation above Mean Sea Level. This data will be used to calculate the groundwater gradient through the site and will be provided with the Quarterly Monitoring Report to be done in November of 1993.

6.0 GEOLOGIC SETTING

The San Francisco Bay lies in a low area in the Coast Range province, a region of northwest trending faults, hills and valleys. The site itself is situated on the flatlands, approximately 3500 feet from the eastern edge of the present Bay (Alameda Harbor). The Bay is a drowned valley which is thought to have originally formed by erosion of the ancestral Sacramento River (Jenkins, 1951) and subsequently widened by subsidence

and a rise in sea level. Sediments deposited in Pleistocene and recent time, in what is now the Bay, include both shallow marine and continental deposits.

The youngest surficial deposit is known as "Bay Mud" which occurs in areas adjacent to the Bay. Bay Mud is generally composed of unconsolidated, olive gray, blue gray or black silty clay. Bay Mud has been deposited in the Bay for almost 10,000 years (Helley et al., 1979) and continues to be deposited today.

In the Oakland area, several other sedimentary units are noted by Radbruch and Case (1967). The upper two units, the Merritt Sand and the San Antonio Formation, lie within 100 feet below ground surface; this was documented at Clay and 12th Streets approximately 3/4 mile north of the site, by Woodward-Clyde (1987). A deeper sedimentary formation (the Alameda Formation) is also present and is assumed to overlie Jurassic/Cretaceous bedrock known as the Franciscan Formation. The Franciscan Formation is a complex assemblage of deformed and altered sediments and volcanic rocks which commonly form bedrock in the San Francisco Bay region.

6.1 SITE HYDROGEOLOGY

The geologic materials observed during the installation of the wells consisted of relatively clean to clay-rich sands. The sandy unit consisted of fine-grained brown sand with varying proportions of clay.

The sandy unit may be equivalent to the Merritt Sands which were deposited as dune and beach sediment.

Ground water was encountered at about 20 feet BLS.

Ground water can be considered essentially non-potable in this area. These factors are important in evaluating this site because maximum contaminant levels (MCLs) set by the Department of Health Services generally apply to drinking water aquifers.

data?

7.0 DISCUSSION

Two tasks as described in the workplan remain to be completed: the well survey which is scheduled to be done in early October, 1993 and the soil performance test which will be done when financial resources are available.

The composite analyses of the spoils pile are sufficiently low to allow the soil to remain on-site and be used to bring the lot to a level grade.

have we determined gradients? see 5.7 pp. 7

Other than in the vent wells, TPHg/BTEX was detected in the subsurface soil in the upgradient well, MW-2. At 15 feet TPHg was detected at 48 ppm, Benzene at 0.56 ppm, Toluene at 2.8 ppm, Ethyl Benzene at 1.5 ppm and Xylenes at 8.8 ppm. TPHg was not detected at 10 feet and the BTEX fractions were found at 0.059 ppm Benzene, 0.036 ppm Toluene, 0.0061 ppm Ethyl Benzene and 0.031 ppm of Xylenes.

Samples from the bottom of Excavation 2, the location of the 6000 gallon UST, indicated a very minor gasoline impaction of the native soil

beneath this tank. While there is some question as to the validity of these samples, had the hydrocarbons detected at 15 feet BLS in well MW-2 come from this tank these samples should have been significantly higher. No lead was detected in any of the soil samples analyzed.

TRPH was not detected in any of the soil samples from well MW-3.

No petroleum hydrocarbons or semivolatile compounds were detected in the groundwater from well MW-3.

Groundwater from wells MW-1 and MW-2 shows significant petroleum hydrocarbon impaction.

Groundwater from well MW-1 is located downgradient from the area of known subsurface hydrocarbon impaction and contains TPHg at 20,000 ppb, Benzene at 8500 ppb, Toluene at 640 ppb, Ethyl Benzene at 280 ppb and Xylenes at 440 ppb. It is reasonable to assume that the hydrocarbons impacting the groundwater in this well come from the two identified 'hot-spots' awaiting remediation by soil vacuum extraction.

TPHg at 360 ppm, Benzene at 18 ppm, Toluene at 40 ppm, Ethyl Benzene at 13 ppm and Xylenes at 68 ppm were detected in the sample obtained at 17 feet BLS from vent well VW-1.

In vent well VW-2 the 17 foot BLS sample indicated the presence of TPHg at 6000 ppm, Benzene at 210 ppm, Toluene at 890 ppm, Ethyl Benzene at 210 ppm and Xylenes at 1200 ppm. These results were not unexpected since these wells were installed in known areas of gasoline impaction as determined by previous sampling and excavation.

Groundwater from well MW-2, the upgradient well, contains TPHg at 34,000 ppb, Benzene at 6800 ppb, Toluene at 10,000 ppb and Ethyl Benzene at 740 ppb and Xylenes at 3900 ppb.

One possible explanation for the hydrocarbons detected at 10 and 15 feet BLS in this well is the volatilization of the compounds from the heavily impacted groundwater found in well MW-2. The nature and characteristics of this sandy soil will allow for the volatile hydrocarbons to leave the liquid/water phase and enter the pore spaces in the soil as a vapor. These volatilized compounds will continue to rise in the soil column until they reach the atmosphere or are metabolized by the naturally occurring microorganisms in the soil.

There is known groundwater contamination at the Unocal Station located at 800 Harrison Street. This station is in a known up-gradient location from the 706 Harrison Street site. Unocal has recently installed two additional groundwater monitoring wells across Eighth Street adjacent to the Shell station. The well survey will include these wells so that a broader groundwater gradient definition can be obtained. **Future groundwater monitoring episodes will be scheduled to correspond with the Unocal schedule.** If this is not possible DBA will seek permission to measure the groundwater levels in these two wells when we are on-site for water level measurements or sampling.

It is also possible that petroleum hydrocarbons may be migrating onto the site from the **Shell Service Station** located immediately adjacent to and upgradient. No exploratory work has been done at this station and

we understand that the owner is presently negotiating with Shell to remove the existing UGT's and close the station.

8.0 CONCLUSIONS

Characterization of the spoils pile remaining on-site indicate sufficiently low amounts of TPHg/BTEX, TRPH and Total Lead to allow it to remain on site and be used as a base to complete the re-grading and leveling of the lot.

Soil recovered during the installation of MW-2 exhibits minor impaction by petroleum hydrocarbons at 10 and 15 foot BLS.

Two areas with high petroleum hydrocarbon impaction to soil remain in the subsurface in the vicinity of VW-1 and VW-2.

The groundwater in the western ? not portion of the site is significantly impacted by petroleum hydrocarbons.

There is a possibility of off-site migration of petroleum hydrocarbons onto the site.

The groundwater in the vicinity of the waste oil tank is not impacted by petroleum hydrocarbons or semivolatile hydrocarbons.

No lead was detected in any soil or groundwater sample analyzed.
except the SP.

10.0 RECOMMENDATIONS

Because no lead was detected in any soil or groundwater sample the evaluation of the shallow soil in the vicinity of the pump island should not be done. Sorry - we had 370 ppm in I1-N on 1-17-91 - diff lkg (surface soils)

When the well survey is done, include the two UNOCAL wells in Eighth Street adjacent to the Shell Station in order to obtain a more definitive evaluation of the groundwater gradient in the area.

Perform the soil performance pilot test as soon as resources are available. how bout vacuum extraction pilot test ?

Obtain monthly groundwater levels from the three on-site and, if possible, the two off-site monitoring wells for at least one calendar quarter.

Establish a quarterly monitoring program to analyze groundwater from the three on-site wells for Total Petroleum Hydrocarbons as Gasoline, Benzene, Toluene, Ethyl Benzene and Xylenes.

11.0 WARRANTY AND LIMITATIONS

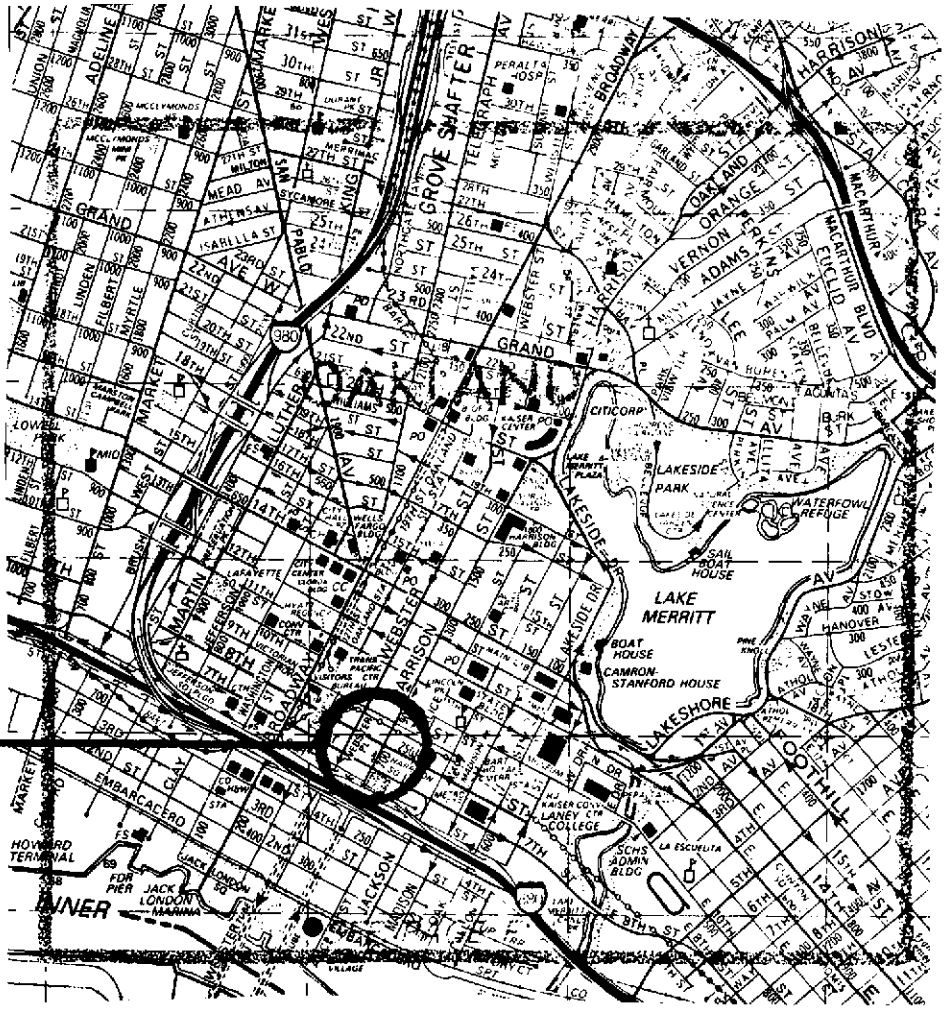
11.1 Warranty

Dennis Bates Associates, Inc. warrant all services to be of high professional quality. No other warranty, either expressed or implied, as to the quality or result to be achieved as a consequence of this work, is made.

11.2 Limitations

This report presents a summary of previous work done at 706 Harrison Street, Oakland, California (SITE). All information contained herein is based upon conditions and information made available to Dennis Bates Associates, Inc. to date.

Liability is not assumed in cases where the client or other parties involved have failed to disclose known environmental information. No responsibility is assumed for the control or correction of conditions or practices existing at the premises of the client.

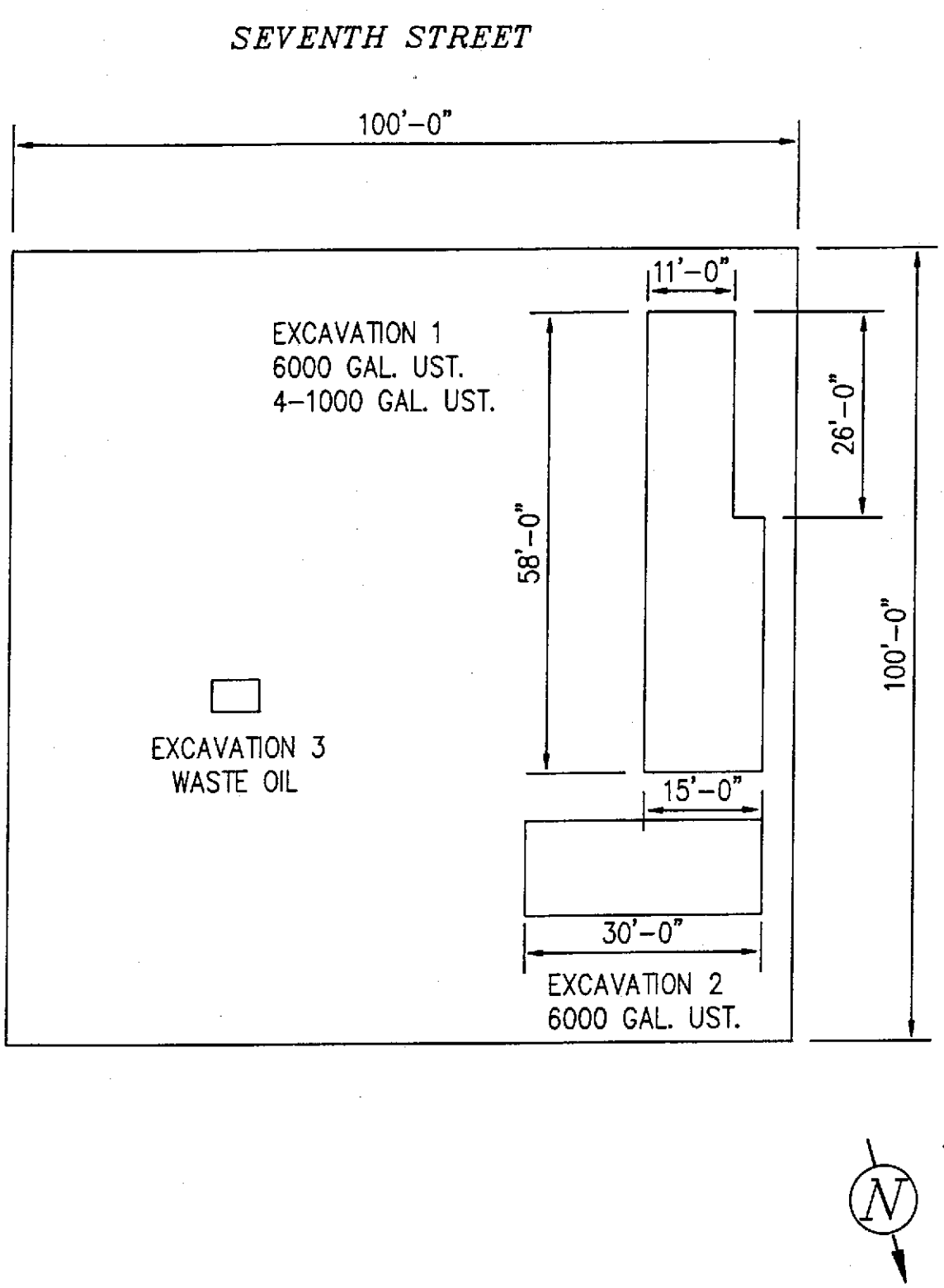


TITLE: SITE LOCATION SITE OAKLAND AUTO PARTS ADDRESS: 706 HARRISON STREET, OAKLAND, CA.	SCALE: PROJECT # 1514N DATE:

DENNIS BATES ASSOCIATES, INC.

494 Alvarado Street, Suite B Monterey, CA. 93940
2011 Feliz Road, Novato, CA. 94945

PLATE: **1**



TITLE: SITE PLAN – UGT EXCAVATIONS
SITE OAKLAND AUTO PARTS
ADDRESS: 706 HARRISON STREET, OAKLAND, CA.

SCALE: 1 INCH = 20 FEET
PROJECT # 1514N
DATE: 16 MARCH 1993

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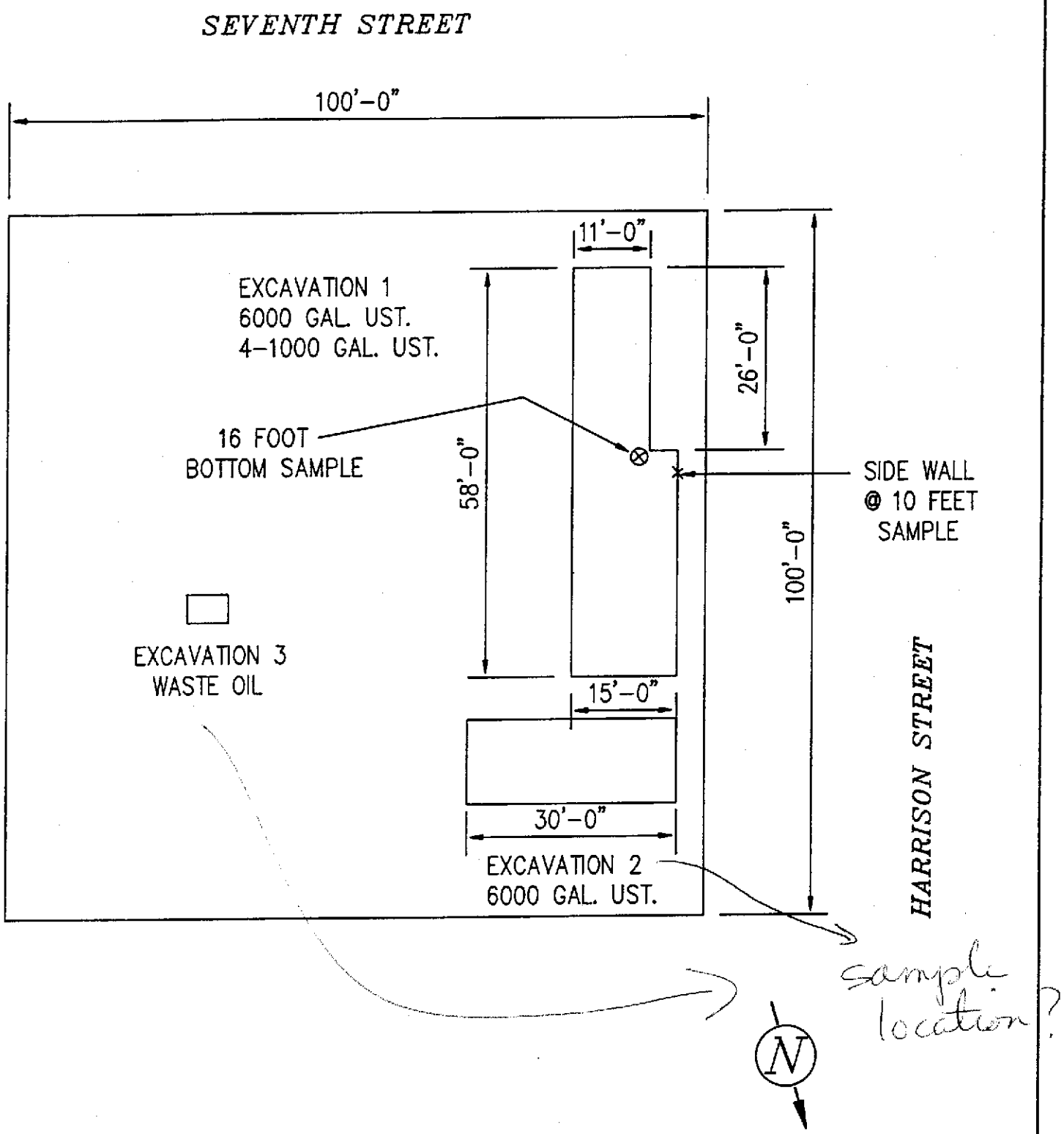
PLATE: **2**



TITLE: SITE PLAN – UGT EXCAVATIONS/SAMPLE LOCATIONS SITE OAKLAND AUTO PARTS ADDRESS: 706 HARRISON STREET, OAKLAND, CA.	SCALE: 1 INCH = 20 FEET PROJECT # 1514N DATE: 16 MARCH 1993

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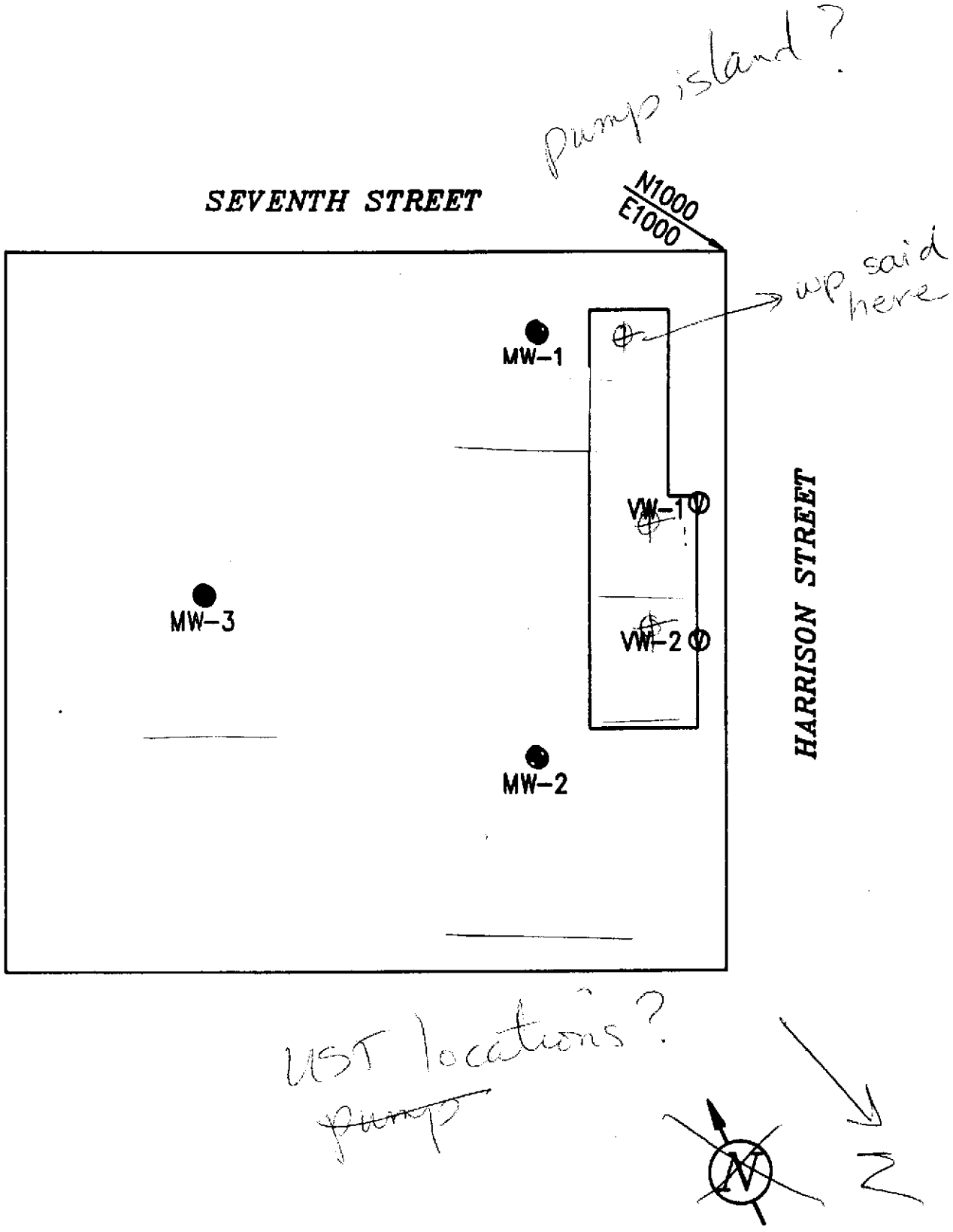
PLATE: **2A**



TITLE: MONITORING WELLS & VAPOR RECOVERY WELL LOCATIONS	SCALE: 1 INCH = 20 FEET
SITE OAKLAND AUTO PARTS	PROJECT # 1514N
ADDRESS: 706 HARRISON STREET, OAKLAND, CA.	DATE: 15 SEPTEMBER 1993

DENNIS BATES ASSOCIATES, INC.
494 Alvarado Street, Suite B Monterey, CA. 93940
2011 Feliz Road, Novato, CA. 94945

PLATE: 3

DENNIS BATES ASSOCIATES, INC
STANDARD OPERATING PROCEDURE
SOP 2

SOIL CLASSIFICATION

Introduction

The purpose of this SOP is to establish standard operating procedures for all employees and subcontractors. This ensures that all work is done appropriately and the data developed is comparable to other sites/projects.

Soil samples are classified according to the Unified Soil Classification System. Representative portions of the samples may be submitted to an analytical laboratory for further examination for further verification of the in-field classification descriptions relative to physical properties as observed from sample analysis.

Any sample or portion of a sample that is submitted to a laboratory for analysis or examination will be handled under strict Chain-of-Custody procedures.

The soil types, when applicable, will be indicated on logs of either excavations or borings together with depths corresponding to the sampling points. Other pertinent information may be included on logs.

DENNIS BATES ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE
SOP 3

SAMPLE IDENTIFICATION AND CHAIN-OF-CUSTODY PROCEDURES

Introduction

Sample identification and chain-of-custody procedures ensure sample integrity and document sample possession from the time of collection to its ultimate disposal. Each sample container to be submitted for analysis is labeled to identify the job name, job number, date, time of sample collection and a number unique to the sample.

Field Measurements

Any in-field measurements made, sampling methodology used, name(s) of on-site personnel and any other pertinent field observations are recorded in the field log book and on the boring log.

Chain-of-Custody

Chain-of-custody forms are used to record possession of the sample from time of collection to its arrival at the laboratory. During shipment, the person with custody of the samples will relinquish them to the next person by signing the chain-of-custody form(s) and noting the date and time of the transaction. Chain-of-custody forms have sections/blocks appropriate for these transactions.

Original Chain-of-Custody forms will be included in reports to jurisdictional regulatory agencies.

Laboratory

Upon arrival at the designated laboratory, the sample control officer will verify sample integrity, correct preservation, confirm collection in the proper container(s), and ensure adequate volume for analysis. If these conditions are met, the samples will be assigned unique laboratory numbers for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in the legally-required log book maintained in the laboratory. The sample description, date received, client's name and any other relevant information will also be recorded.

DENNIS BATES ASSOCIATES
STANDARD OPERATING PROCEDURE
SOP 4

MONITORING WELLS

Introduction

This SOP describes procedures to be followed by all employees and subcontractors during installation and development and abandonment of temporary and/or temporary groundwater monitoring wells and piezometers. The procedures in this SOP are intended for general use. During actual field work, appropriate revisions will be made and approved by the project manager or principal in charge of the project.

Design/Specifications

Each monitoring well will be designed to register the potentiometric surface of the ground water and to permit sampling of a specific water bearing zone. The field geologist or engineer, under the direct supervision of a California Registered Geologist or Professional Engineer, will specify the screened interval using the lithologic log for control and will design the materials and techniques for well completion to be compatible with the formations.

Installation

Boreholes for monitoring wells are drilled using a truck- mounted, hollow-stem auger drill rig. The borehole diameter will be a minimum of 4 inches larger than the outside diameter of the casing when installing well screen. The hollow-stem auger provides minimal interruption of subsurface structures when drilling while permitting soil sampling at desired intervals. Soil samples are collected by either hammering or hydraulically pushing a conventional split- barrel sampler containing pre-cleaned brass or stainless steel tubes. A geologist or engineer from DBA continuously logs each borehole during drilling and constantly checks drill cuttings for indications of both the first recognizable occurrence of groundwater and/or volatile hydrocarbons using a field photoionization detector. The sampler is rinsed between sampling events and either steam cleaned or washed with all other drilling equipment between borings to minimize the potential for cross-contamination.

Well Materials/Construction

Monitoring wells are cased with threaded, factory-perforated and blank Schedule 40 PVC pipe. The perforated interval consists of slotted casing, generally with 0.020-inch wide by 1.5 inch long slots, with 42 slots per foot. A PVC cap will be secured to the bottom of the casing. No solvents or cements are to be used. Centering devices may be fastened to the casing to ensure even distribution of filter material and grout within the borehole annulus. The well casing is to be thoroughly washed and/or steam cleaned, or may be purchased pre-cleaned prior to installation.

Filter Pack/Grouting/Completion
After setting the casing inside the hollow-stem auger, sand or gravel filter material is poured into the annular space to fill from boring bottom to generally 1 foot above the perforated interval. A 1-to-2 foot thick layer of bentonite pellets will be placed on top of the filter pack. The depth to the top of the bentonite pellet layer will be verified by measuring using the tremie pipe or a weighted tape.

A neat cement grout seal [with bentonite additive] will be placed from the top of the bentonite pellet layer to the ground surface. The grout seal will be placed in hollow stem auger borings by free fall through the augers as they are incrementally raised or by pumping through a flexible hose fitted with a steel pipe extension lowered to near the bottom of the grouted zone. The grout must be tremied if there is any standing water in the augers above the bentonite. Only clean water from a municipal supply will be used to prepare the grout.

NO WORK WILL BE DONE ON THE MONITORING WELL UNTIL THE GROUT HAS SET A MINIMUM OF 24 HOURS.

Well Head Protection
A suitable slip-on cap, threaded end cap or waterproof locking cap will be fitted to the top of the riser casing to prevent entry of surface runoff or foreign matter. An appropriate well cover (valve box) or steel above-ground monument will be set in concrete or grout around the riser casing for protection. All wells will be locked for security.

Developing
When the monitoring well installation is complete, the well will be developed by surging, bailing and/or pumping. The objective of well development is to remove sediment that may have accumulated during construction and to consolidate the filter pack around the well screen.

The first step in well development is to bail the well to remove sediment and turbid water from the bottom. A swab or surge block may be run along the length of the screened interval to flush fine sediment(s) from the filter pack and adjacent formations. Following this activity the well will be bailed again to remove sediment and turbid water.

For final well developing the well will be pumped using a positive displacement pump, a gas-driven bladder pump or a submersible pump. A bailer may be used to develop low-yield wells. During development the clarity of the water will be monitored and the pH, specific conductance and temperature of the return water may also be measured. If the screened interval is to great to be adequately developed in one stage the pump intake will be raised or lowered to various depths to ensure that the well is adequately developed. Well pumping will continue until, in the opinion of DBA field personnel, the return water is of sufficient clarity and field water quality parameters have stabilized.

IN SOME CASES, ESPECIALLY IN SHALLOW LOW-YIELD WELLS, THE WATER WILL REMAIN CLOUDY/TURBID EVEN AFTER SIGNIFICANT DEVELOPMENT ACTIVITIES.

Documentation

Details of well installation, construction, development and any field measurements of water quality parameters will be summarized as daily entries in the daily field records or data sheets. These data will be submitted to the project manager upon completion of the task.

A well construction diagram for each monitoring well will be completed by the field geologist or engineer and submitted to the project manager.

Abandonment

The method of abandonment will be dependent on such factors as the depth of the boring, the number and type of aquifers penetrated and the geology of the site. All methods chosen or recommended must conform to the California Department of Water Resources Bulletin 74-90 'California Well Standards' as well as local agency guidelines or regulations.

Shallow groundwater monitoring wells and piezometers will be abandoned by over-drilling with appropriately sized hollow-stem augers to depth or by pressure grouting with neat cement or cement/bentonite grout.

When the over-drilling method is used all recovered soil and well construction materials, other than pipe and screen, will be placed in DOT Drums. Pipe and screen will be steam-cleaned on site and the rinsate placed in DOT drums. Composite soil samples will be taken from each drum and analyzed as appropriate for the contaminants previously found in the well or piezometer.

THESE PROCEDURES ARE NOT APPLICABLE FOR WELLS OR PIEZOMETERS WHERE NO CONTAMINATION HAD BEEN DETECTED DURING INITIAL INSTALLATION OR SUBSEQUENT SAMPLING. IN THIS CASE THE SOIL AND PIPING WILL BE STOCKPILED ON SITE FOR LATER DISPOSAL TO AN APPROPRIATE DISPOSAL SITE.

Once the well or piezometer has been over-drilled to depth the bore will be filled with neat cement or cement/bentonite grout. Depending upon local regulations or well depth, the grout will be placed as the augers are removed.

Temporary wells or piezometers will be abandoned by removing the casing and screen and filling with neat cement or cement/bentonite grout. Care must be taken during the filling operation to avoid bridging of the grout.

NOTE: WELL ABANDONMENT PROCEDURES WILL BE DONE UNDER APPROPRIATE PERMITS FROM THE LOCAL AGENCY WITH JURISDICTION.

DENNIS BATES ASSOCIATES
STANDARD OPERATING PROCEDURE
SOP 5

WATER LEVEL AND DEPTH MEASUREMENTS

Introduction

This SOP describes procedures to be followed during water level and well depth measurements. The procedures are intended to be general in nature and may be revised by the field geologist/engineer and project manager.

Water Level and Depth Measurements

All water level measurements will be recorded to the nearest hundredth foot and all well depth measurements will be noted to the nearest half-foot. All equipment placed in the wells for water level and well depth measurements will be cleaned prior to use and each time before it is introduced into another monitoring well. Care must be taken not to drop any foreign objects into the wells and to not allow the tape or sounding device to touch the ground around the well during monitoring.

ALL EQUIPMENT WILL BE CLEANED IN ACCORDANCE WITH THE PROCEDURES LISTED IN SOP 6.

Water Level Measurements

Water level measurements will be done by one of the following methods:

Wetted-tape Method

A steel surveyor's tape will be prepared by coating several feet of the lower end of the tape with chalk or water indicating paste. A lead weight is attached to the lower end of the steel tape to keep it taut. the tape is lowered into the well until a foot or two of the marked portion is submerged. Tape without weight can be used if the well opening or pump casing clearance is too small and restricts thee passage of the weight. the proper length to lower the tape may have to be determined experimentally in the field.

Measurements will be done as follows:

1. Lower and hold the tape at an even foot mark at the Measuring Point (MP) and note this reading.

2. Remove the steel tape from the well. Subtract the wetted length from the even foot mark noted in Step 1 and record this as the water level below MP on the appropriate data sheet.

Electric Sounder Method

An electric sounder consists of a contact electrode that is suspended by an insulated electric cable from a reel that has an ammeter, a buzzer, a light or other closed circuit indicator attached. The indicator shows a closed circuit and flow of current when the electrode touches the water surface.

The procedure for measuring water levels with an electric sounder is:

1. Turn switch on.

2. Lower the electric sounder cable into the well until the instrument indicates a closed circuit. Raise and lower the electric cable slightly until the shortest length of cable that gives the maximum response on the indicator is found.

3. Holding the cable in this fixed position, note the length of cable at the MP.

4. Because the electric cable is graduated in intervals a pocket steel tape measure that is graduated in hundredths of a foot [Engineering Scale] must be used to interpolate between consecutive marks. Care must be taken that the tape measurements are subtracted from graduated mark footage value when the water level hold point [determined in Step 3] is below the graduated mark and added when above the mark. Record the resulting value as water level below MP.

Interface Probe

An Interface Probe is used to measure product thickness and depth to water in wells where free product is present on the groundwater surface.

Procedures to follow in using the Interface Probe to measure product thickness:

1. Ground the probe to a metal object. if no ground is available, reproducible measurements can be obtained by clipping the ground lead to the handle of the interface probe case.

2. Cover the well casing to ensure that ambient light does not interfere with the operation of the probe's optical mechanism.

3. The probe tip is lowered into the well and submerged in the groundwater. An oscillating/beeping tone indicates that the probe is in water. Raise the probe slowly until the tone stops or becomes steady - this is the depth-to-water (DTW) measurement. The steady tone indicates floating hydrocarbons. Raise the probe slowly until this tone stops - this is the depth-to-product (DTP) measurement.

REPEAT THE PROCESS SEVERAL TIMES TO ENSURE ACCURATE DTW AND DTP MEASUREMENTS.

4. Confirm the presence of product by lowering a disposable bailer into the well. Record these observations on the data sheet as "product thickness".

DENNIS BATES ASSOCIATES
STANDARD OPERATING PROCEDURE
SOP 6

EQUIPMENT CLEANING

Introduction

It is important that all drilling equipment, well materials and any equipment that is introduced into the completed well be thoroughly cleaned before use and before reuse in other wells. These procedures prevent cross-contamination or carryover contamination from boring to boring during drilling and from well to well during development, gauging or sampling events. These procedures are general in nature and allow for subcontractors to use a different approach so long as it has been approved by the field geologist or engineer.

DBA'S POLICY IS TO REQUIRE ALL DRILLING CONTRACTORS TO CLEAN THEIR EQUIPMENT 'IN THE YARD' BEFORE ARRIVING AT THE SITE AND DAILY IF THE JOB LASTS MORE THAN ONE DAY. ALL WELL MATERIALS WILL BE CLEANED BY THE CONTRACTOR PRIOR TO INSTALLATION.

Equipment Cleaning

Steel tapes, electric well sounders and interface probes will be cleaned in the field before use and after measurements in each well are completed.

Cleaning procedures are as follows:

1. Wash probe and cable/tape with a TSP solution.
2. Rinse thoroughly with deionized water.
3. Dry with a clean paper towel.

Solutions resulting from cleaning procedures will be collected and placed in a designated storage tank by the person doing the work.

DENNIS BATES ASSOCIATES
STANDARD OPERATING PROCEDURE
SOP 7

SAMPLING OF MONITORING WELLS AND WATER SUPPLY WELLS

Introduction

The collection of water samples in the field requires strict attention to detail to avoid cross-contamination or carry over contamination from well to well. If this occurs then all the samples collected during the event are questionable or invalid.

Sampling

Monitoring Wells

ALL WELLS WILL BE SUBJECTIVELY CHECKED FOR FLOATING PRODUCT OR SHEEN BEFORE ANY SAMPLING EVENT.

EACH SAMPLING SEQUENCE WILL BEGIN WITH THE WELL HAVING THE LEAST SUSPECTED/KNOWN CONTAMINATION. SUCCESSIVE SAMPLES WILL BE OBTAINED FROM WELLS OF INCREASING SUSPECTED/KNOWN CONTAMINATION.

GROUNDWATER SAMPLES WILL NOT BE OBTAINED FROM WELLS WITH FLOATING PRODUCT.

1. A minimum of three well casing volumes of groundwater will be removed from the well prior to sampling. Additional groundwater may be purged if water quality parameters have not stabilized. To verify that the groundwater samples are representative of the aquifer, periodic measurements of the temperature, pH and specific conductance may be made with field equipment. Groundwater samples will be collected ONLY when the water quality parameters reach relatively constant values.

2. A submersible pump, a positive air displacement pump or a suitable bailer may be used for purging the monitoring well casing. In those wells where dedicated submersible sampling pumps are not available a disposable bailer will be used to obtain the water samples.

3. For those wells where a dedicated, 12-volt, sampling pump is available the pump will be removed from its storage bag and lowered into the well to an appropriate depth and the well purged of a minimum of three well volumes of water. To collect the samples the tubing should be restricted about two feet from the end to allow for a slow, non-turbulent flow into the appropriate sample collection container. At the conclusion of the sampling event the pump and tubing shall be removed from the well and the pump rinsed in deionized water. It is not necessary to rinse the inside of the tubing.

IN THE EVENT THAT THE PURGING DRAWS PRODUCT INTO THE WELL OR EQUIPMENT SHOWS VISIBLE EVIDENCE OF PRODUCT THE TUBING SHALL BE REMOVED AND DISCARDED. THE PUMP AND ELECTRIC WIRES WILL BE CLEANED AS DESCRIBED IN SOP 6.

Water Supply Wells
Water supply wells will be sampled by purging the wells for a minimum of 15 minutes. Water samples will then be collected from the discharge point nearest to the well head.

Field Data Recording
A monitoring well sampling record will be used to record the following information.

1. Sample number or name.
2. Date and Time sampled.
3. Well designation (State well numbering system for water supply wells and the well number of the monitoring well.
4. Owner's name or other common designation for water supply wells.
5. Method of purging (bailing, pumping etc.)
6. Amount of water purged.
7. Extraordinary circumstances.
8. Name of sample collector.
9. Results of field measurements (temperature, pH, conductivity).
10. Depth from which sample was obtained (if known).

Sample Containers and Preservatives
Sample containers for the analyses to be performed will be obtained from the analytical laboratory in accordance with EPA SW-846 or the SWRCB LUFT Manual. Various sample methods, amounts of analyate required as well as preservation, storage and handling procedures are attached to this SOP.

DENNIS BATES ASSOCIATES, INC
STANDARD OPERATING PROCEDURE
SOP 8

SOIL SAMPLING

Introduction

The purpose of this SOP is to establish standard operating procedures for all employees and subcontractors. This ensures that all work is done appropriately and the data developed is comparable to other sites/projects.

Sample Collection (during drilling/boring operations)

Soil samples are typically collected at 5-foot intervals with a California Modified split-spoon sampler driven 18 inches by a 140-pound hammer falling 30 inches. The number of blows necessary to drive the sampler will be recorded on the boring log to assist in evaluating the consistency of the materials encountered. Additional soil samples may be collected based on significant lithologic changes and/or potential contamination. Soil removed from the top two liners (typically 6-inches in length) and the end cone will be used for visual logging purposes, field analytical screening. This material will be disposed of with cuttings removed during drilling operations.

The bottom liner will be saved for laboratory analysis. This ends of this liner will be covered with either foil or teflon tape, covered with a plastic cap and sealed with duct tape. A self-adhesive label will be placed on each container with the following information written in waterproof ink:

1. Project Number
2. Sample Number
3. Date and time the sample was collected
4. Signature or initials of sample collector
5. Requested analysis or method

Samples will be sealed in individual zip-lock bags and placed in a container with blue-ice.

Samples will be delivered to, or picked up by the laboratory, in sufficient time to ensure that the established time limits for holding times are not exceeded.

Any sample or portion of a sample that is submitted to a laboratory for analysis or examination will be handled under strict Chain-of-Custody procedures.

Labeling of Samples

Sample containers must be labeled with self-adhesive labels with the following information written in waterproof ink:

1. Project number.
2. Sample number.
3. Date and time the sample was collected.
4. Signature or initials of sample collector.
5. Requested analysis or method.

name? sign?

DAILY FIELD RECORD - CONTINUED

Dennis Bates associates INCORPORATED

Page _____ of _____

Project Number: 1514N Date: 7/22 year?

Time	Location of Work / Work Performed / Field Equipment Used / Etc.
0800	Arrive on-site HEW drilling on-site
	Set up to drill MW-1
0805	Collect MW1-5
0812	" MW1-10
0825	" MW1-15
0848	" MW1-20
	Water at approx 22' bgs
	Install casing 10' slot 18' blank seated at 28' bgs
	Sand 2' above slots 1' bentonite seal
	Move to VW-1 drill to 17' & sample
1050	collect VW1-17
	drill to 20' and install casing 5' slot 15' blank
	Sand 2' above slots 1' bentonite seal
	Move to VW2 and drill to 17'
1245	Collect VW2-17
	drill to 20' & construct well same as VW-1
	Move to MW2
1355	collect MW2-5
1410	Collect MW2-10
1420	" MW2-15
1430	" MW2-20 Sample below water-tag only
	Insufficient casing on-site to install more wells.
	Will drill & sample MW3 to 20', grout & cap
	completed wells & finish drilling tomorrow 7/23
	Move to MW3
1510	Collect MW3-5
1520	MW3-10
1530	MW3-15
1544	MW3-20
	Grout & cap MW1, VW1 & VW2
	Secure site
1730	Glen offsite to lab. Drillers to leave shortly

Page 1

EXPLORATORY BORING LOG

PROJECT NAME : 1514 H
PROJECT NUMBER : Oakland Auto Park LOGGED BY: Glen White
BORING: MW1
DATE: 7/22/93

DEPTH	DTW	SAMP #	OVA	USC	SOIL DESCRIPTION
5		MW1-5		SM	Sand, Silty, slightly clayey, goldish brown, moist, firm, no odor. gw level?
10		MW1-10		SC	Sand, Clayey, Silty, blue-gray, moist, firm, heavy or old Hydrocarbon odor.
15		MW1-15		SM	Sand, Silty, olive green, moist, firm, heavy hc odor
20		MW1-20		SM	Sand, silty, slightly clayey, olive green, slight odor [redacted] firm
25		—		SM	Sand, Silty, dark brown, [redacted] no odor.

Neat Cement
Sand

EXPLORATORY BORING LOG

PROJECT NAME : Oakland Auto Parts
PROJECT NUMBER : 1514N
LOGGED BY: Glen White
BORING: MW1
DATE: 7/22

DEPTH	DTW	SAMP #	OVA	USC	SOIL DESCRIPTION
26					
27					
28		EOB			Bottom of boring at 28'
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					

Page 1

EXPLORATORY BORING LOG

PROJECT NAME : Oakland Auto Parts
PROJECT NUMBER : 151YN
LOGGED BY: Glen White
BORING: MW-2
DATE: 7/22

DEPTH	DTW	SAMP #	OVA	USC	SOIL DESCRIPTION
5		MW2-5	9/12/15	SM	Sand, Silty, Slightly clayey, goldish brown, moist, firm, no odor
10		MW2-10	11/12/12	SM	Sand, Silty, goldish brown, moist, firm, no odor
15		MW2-15	11/14/23	SM	Sand, A.A. no odor
20			9/10/12	SM	Sand, Silty, brown, [redacted] soft
					No Sample collected, Below water
25			10/22/14	SM	Sand, As above, some sheen on sample, Slight odor in Soil.

gas level? PID reading etc? soil sample?

EXPLORATORY BORING LOG

PROJECT NAME : Oakland Auto Parts
PROJECT NUMBER : 1514N
LOGGED BY: Glen white

BORING: MW-2
DATE: 7/23

DEPTH	DTW	SAMP #	OVA	USC	SOIL DESCRIPTION
26					
27					
28					EOB @ 28'
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					

Page 1

EXPLORATORY BORING LOG

PROJECT NAME : Oakland Auto Parts
PROJECT NUMBER : 151YN
LOGGED BY: Glen White
BORING: [redacted]
DATE: 7/22

DEPTH	DTW	SAMP #	OVA	USC	SOIL DESCRIPTION
5		MW3-5	7/16/20	SM	Sand, Silty, goldish brown, moist, firm, no odor
10		MW3-10	7/11/14	SM	Sand, as above, hard. no odor
15		MW3-15	24/30/44	SM	Sand, Silty, goldish brown, hard, moist, no odor
20		MW3-20	7/16/23	SM	Sand, Silty, brown, [redacted] firm, no odor
21	[redacted]				
24			15/22/44		Sand, Silty, brown w/ some rust, [redacted] soft, [redacted] no odor
25					

Soil sample? screen etc?

EXPLORATORY BORING LOG

PROJECT NAME : Dakland Auto Parts
PROJECT NUMBER : 1514N
LOGGED BY: Glen white

BORING: MW3
DATE: 7/23

DEPTH	DTW	SAMP #	OVA	USC	SOIL DESCRIPTION
26					
27					
28					EOB @ 28'
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					

Page 1

EXPLORATORY BORING LOG

PROJECT NAME : Oakland Auto Parts
PROJECT NUMBER : 1514 N
LOGGED BY: Glen White
BORING: VW1
DATE: 7/22/93

DEPTH	DTW	SAMP #	OVA	USC	SOIL DESCRIPTION
1					Fill material
10					Odor in cuttings - fill material
17	15gal	VW1-17		SM	Sand, silty, Olive green-gray, soft, moist, strong gasoline odor.
20					E.O.B. at 20'

soil sample? yes

Page 1

EXPLORATORY BORING LOG

PROJECT NAME : Oakland Auto Parts

PROJECT NUMBER : 1514N

LOGGED BY: Glen White

BORING: VW2

DATE: 7/22/93

DEPTH	DTW	SAMP #	OVA	USC	SOIL DESCRIPTION
1					Fill material
10					odor encountered, slight hydrocarbon
17	Sand	VW2-17	19/35/40		Sand, Silty, olive green, moist, soft, strong gasoline odor.
20					E.O.B. @ 20'

Heat Cement Grout

Soil sample? yes

db

Dennis Bates associates INCORPORATED

MONITORING WELL SAMPLING RECORD AND WELL DEVELOPMENT DATA

Well ID: MW 1
Sample ID.: _____ Duplicate ID.: _____
Sample Depth: _____
Project No: ENV 1514 N
Project Name: Oakland Auto Parts
Date: 5/10/93
Sampled By: JS

Initial Depth to Water: 17.1
Depth to Water after Purging: _____
Total Depth of Well: 28
Well Diameter: 2"
1 Casing Volume = _____
4 Casing Volumes = _____
Method of Purging: 2 Stage Submersible
Method of Sampling: _____

TIME	INTAKE DEPTH	RATE (gpm)	CUM. VOL (gal)	TEMP. (°C)	pH (units)	CONDUCTIVITY (µmhos/cm)	REMARKS (color, turbidity & sediment)
1230	27'	1.5	–				Water turbid
1240	27'	1.5	15				Water Clear
1300	27'	1.5	45				Development Stopped

Ph CALIBRATION (CHOOSE TWO) — Model or Unit No.:

Buffer Solution	pH 4.0	pH 7.0	pH 10.0	
Temp. °C				
Instrument Reading				

SPECIFIC CONDUCTANCE - CALIBRATION: — Model or Unit No.:

KCL Solution (µmhos/cm at 20°C	1409	12856			
Temp. °C					
Instrument Reading					

Notes No field parameters done - recovery immediate
water 71' down

db Dennis Bates associates INCORPORATED

MONITORING WELL SAMPLING RECORD AND WELL DEVELOPMENT DATA

Well ID: mw1
Sample ID.: mw1 Duplicate ID.:
Sample Depth:
Project No: 1514N
Project Name: Oakland Auto Part II
Date: 8/13/93
Sampled By: JS/JD

Initial Depth to Water: 17.4'
Depth to Water after Purging: 17.4' ✓
Total Depth of Well: 28'
Well Diameter: 2"
1 Casing Volume = 1.63
4 Casing Volumes = 6.52
Method of Purging: 12 VOC Submersible
Method of Sampling: 12 VOC Submersible

TIME	INTAKE DEPTH	RATE (gpm)	CUM. VOL. (gal)	TEMP. (°C)	pH (units)	CONDUCTIVITY (µmhos/cm)	REMARKS (color, turbidity & sediment)
1330	27'	1.5	10				water clear

Ph CALIBRATION (CHOOSE TWO)					Model or Unit No.:
Buffer Solution	pH 4.0	pH 7.0	pH 10.0		
Temp. °C					
Instrument Reading					

SPECIFIC CONDUCTANCE - CALIBRATION:						Model or Unit No.:
KCL Solution (µmhos/cm at 20°C	1409	12856				
Temp. °C						
Instrument Reading						

Notes 3 VOA's preserved EHCl, 500 mls preserved
4 total bottles
TPHG/BTEX, Total Lead

db **Dennis Bates associates INCORPORATED**

MONITORING WELL SAMPLING RECORD AND WELL DEVELOPMENT DATA

Well ID: MW2
Sample ID.: MW2 Duplicate ID.:
Sample Depth: 27'
Project No: 1514N
Project Name: Oakland Auto Parts
Date: 8/13/93
Sampled By: JS/JD

Initial Depth to Water: 17.05
Depth to Water after Purging: 17.05 ✓
Total Depth of Well: 28
Well Diameter: 2"
1 Casing Volume = 1.63
4 Casing Volumes = 6.52
Method of Purging: 12 VDC Submersible
Method of Sampling: 12 VDC Submersible

TIME	INTAKE DEPTH	RATE (gpm)	CUM. VOL. (gal)	TEMP. (°C)	pH (units)	CONDUCTIVITY (µmhos/cm)	REMARKS (color, turbidity & sediment)
1310	27'	1.5	12				Water Clear

Ph CALIBRATION (CHOOSE TWO)					Model or Unit No.:
Buffer Solution	pH 4.0	pH 7.0	pH 10.0		
Temp. °C					
Instrument Reading					

SPECIFIC CONDUCTANCE - CALIBRATION:						Model or Unit No.:
KCL Solution (µmhos/cm at 20°C	1409	12856				
Temp. °C						
Instrument Reading						

Notes 3 VOA's & HCl - TPHG/BTEX
1 500 (preserved) - Total Lead

db

Dennis Bates associates INCORPORATED

MONITORING WELL SAMPLING RECORD AND WELL ~~DEVELOPMENT~~ DATA

Well ID: MW-2

Sample ID.: — Duplicate ID.: —

Sample Depth:

Project No: 1514 N

Project Name: Oakland Auto Parts

Date: 8/10/93

Sampled By: JS

Initial Depth to Water: 17.05

Depth to Water after Purging:

Total Depth of Well: 28

Well Diameter: 2"

1 Casing Volume =

4 Casing Volumes =

Method of Purging: 2 Stage Submersible

Method of Sampling:

TIME	INTAKE DEPTH	RATE (gpm)	CUM. VOL. (gal)	TEMP. (°C)	pH (units)	CONDUCTIVITY (µmhos/cm)	REMARKS (color, turbidity & sediment)
1240	23'	1.5	—				Water Clear
1250	23'	1.5	15				Water Clear
1310	23'	1.5	45				Water Clear
							Development Stopped

Ph CALIBRATION (CHOOSE TWO)					Model or Unit No.:
Buffer Solution	pH 4.0	pH 7.0	pH 10.0		
Temp. °C					
Instrument Reading					

SPECIFIC CONDUCTANCE - CALIBRATION:						Model or Unit No.:
KCL Solution (µmhos/cm at 20°C	1409	12856				
Temp. °C						
Instrument Reading						

Notes: No field parameters done - recovery immediate

Water Thrown down

db

Dennis Bates associates INCORPORATED

MONITORING WELL ~~SAMPLING~~ RECORD AND WELL DEVELOPMENT DATA

Well ID: MW 3
Sample ID.: MW 3 Duplicate ID.:
Sample Depth: 21'
Project No: 1514 N
Project Name: Oakland Auto Parts
Date: 8/13/93
Sampled By: JS/JP

Initial Depth to Water: 12.05
Depth to Water after Purging: 12.05
Total Depth of Well: 21'
Well Diameter: 2"
1 Casing Volume = 1.63
4 Casing Volumes = 6.52
Method of Purging: 12 VDC Submersible
Method of Sampling: 12VDC Submersible

TIME	INTAKE DEPTH	RATE (gpm)	CUM. VOL. (gal)	TEMP. (°C)	pH (units)	CONDUCTIVITY (µmhos/cm)	REMARKS (color, turbidity & sediment)
1300	21'	1.5	10	—	—	—	Water Clear

Ph CALIBRATION (CHOOSE TWO)					Model or Unit No.:
Buffer Solution	pH 4.0	pH 7.0	pH 10.0		
Temp. °C					
Instrument Reading					

SPECIFIC CONDUCTANCE - CALIBRATION:						Model or Unit No.:
KCL Solution (µmhos/cm at 20°C	1409	12856				
Temp. °C						
Instrument Reading						

Notes 3 - VOA's THCL - TPHs / BTEX
1 - 500ml (preserved) - Total Lead
1 - 1000ml brown - EPA 8270

db Dennis Bates associates INCORPORATED

MONITORING WELL SAMPLING RECORD AND WELL DEVELOPMENT DATA

Well ID: MW3
Sample ID.: — Duplicate ID.: —
Sample Depth: —
Project No: 1514 H
Project Name: Dakland Auto Parts
Date: 8/10/93
Sampled By: JS

Initial Depth to Water: 16.9
Depth to Water after Purging:
Total Depth of Well: 28
Well Diameter: 2"
1 Casing Volume =
4 Casing Volumes =
Method of Purging:
Method of Sampling:

TIME	INTAKE DEPTH	RATE (gpm)	CUM. VOL (gal)	TEMP. (°C)	pH (units)	CONDUCTIVITY (µmhos/cm)	REMARKS (color, turbidity & sediment)
1245	23'	1.5	—				Water Clear
1255	23'	1.5	15				water Clear
1305	23'	1.5	45				Water Clear
							Development Stopped

Ph CALIBRATION (CHOOSE TWO)					Model or Unit No.:
Buffer Solution	pH 4.0	pH 7.0	pH 10.0		
Temp. °C					
Instrument Reading					

SPECIFIC CONDUCTANCE - CALIBRATION:						Model or Unit No.:
KCL Solution (µmhos/cm at 20°C	1409	12856				
Temp. °C						
Instrument Reading						

Notes No field parameters done
Water in drum

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 2939
DATE SAMPLED: 02/10/93
DATE RECEIVED: 02/11/93
DATE EXTRACTED: 02/18/93
DATE ANALYZED: 02/19/93
DATE REPORTED: 03/04/93

CUSTOMER: Dennis Bates Associates, Inc.

REQUESTER: John Sammons

PROJECT: No. 15, Oakland

Sample Type: Soil

Method and Constituent:	Units	16 Foot Concentration	16 Foot Reporting Limit	6K Tank Concentration	6K Tank Reporting Limit	WO Tank Concentration	WO Tank Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	[illegible]	2,800	93	500 = .5 ppm ok	ND	500
Modified EPA Method 8020 for:							
Benzene	ug/kg	[illegible]	800	ND	5.0	ND	5.0
Toluene	ug/kg	320,000	690	ND	5.0	ND	5.0
Ethylbenzene	ug/kg	130,000	930	ND	5.0	ND	5.0
Xylenes	ug/kg	730,000	2,400	ND	15	ND	15

Method and Constituent:	Units	SW 10 ft. Concentration	SW 10 ft. Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:					
Total Petroleum Hydrocarbons as Gasoline	ug/kg	ND	500	ND	500
Modified EPA Method 8020 for:					
Benzene	ug/kg	ND	5.0	ND	5.0
Toluene	ug/kg	ND	5.0	5.3	5.0
Ethylbenzene	ug/kg	ND	5.0	ND	5.0
Xylenes	ug/kg	ND	15	ND	15

QC Summary:

% Recovery: 150
% RPD: 0.46

Concentrations reported as ND were not detected at or above the reporting limit.

Louis W. DuPuis
Quality Assurance/Quality Control Manager

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
(Telephone (510) 783-6960
Facsimile (510) 783-1512

2939

TAL

CHAIN OF CUSTODY RECORD

Proj.No.	Project Name	No. of Containers	Analyses: TPH G/BTEX	REMARKS
15				

Company Name and Address: Dennis Bates Associates, Inc. 494 Alvarado St., Suite B, Mont. CA

Project Manager: John Sammons

Sample ID	Date	Time	Site Location	Containers	TPH G/BTEX	REMARKS
16 foot	2/10/93		Ocean.	1	X	
GK Tank				1	X	
WO Tank				1	X	
Six 10 ft.				1	X	

Sampled by: (signature)	Date/Time	Relinquished by: (signature)	Date/Time
John Sammons, PhD	2/10/93	Dennis P. Bates	2/11/93 2:40 PM
Received by: (signature)	**Date/Time**	**Relinquished by: (signature)**	**Date/Time**

Received for Laboratory by: (signature)	Date/Time	TURNAROUND TIME
Karen Louricella for TAL	2/11/93 2:40pm	Reg.

REMARKS walk-in, Soil (1) B-T ea, ice, Y-G, Reg TAT KL

ENV. 1514 N

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545

Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

March 4, 1993

Mr. John Sammons
Dennis Bates Associates, Inc.
294 Alvarado Street, Suite B
Monterey, California 93940

Dear Mr. Sammons:

Trace Analysis Laboratory received four soil samples on February 11, 1993 for your Project No. 15, Oakland (our custody log number 2939).

These samples were analyzed for Total Petroleum Hydrocarbons as Gasoline, and Benzene, Toluene, Ethylbenzene and Xylenes. Our analytical report and the completed chain of custody form are enclosed for your review.

Trace Analysis Laboratory is certified under the California Environmental Laboratory Accreditation Program. Our certification number is 1199.

If you should have any questions or require additional information, please call me.

Sincerely yours,

Rachel Dolbier
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 3346
DATE SAMPLED: ~~06/17/93~~
DATE RECEIVED: 06/21/93
DATE EXTRACTED: 06/23/93
DATE ANALYZED: 06/25/93
DATE REPORTED: 07/19/93

CUSTOMER: Dennis Bates Associates, Inc.

REQUESTER: John Sammons

PROJECT: No. ENV1514N, Oakland Auto Parts

		Sample Type: SPB Soil					
		Composite of SPA1,2,3,4,5		Composite of SPA1,2,3,4,5		Method Blank	
Method and Constituent:	Units	Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	mg/kg	2.4	0.50	3.4	0.50	ND	0.50
Modified EPA Method 8020 for:							
Benzene	mg/kg	ND	0.0050	0.0078	0.0050	ND	0.0050
Toluene	mg/kg	ND	0.0050	0.0074	0.0050	ND	0.0050
Ethylbenzene	mg/kg	0.0072	0.0050	0.044	0.0050	ND	0.0050
Xylenes	mg/kg	0.11	0.015	0.18	0.015	ND	0.015

QC Summary:

% Recovery: 86
% RPD: 8.7

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3346
DATE SAMPLED: 06/17/93
DATE RECEIVED: 06/21/93
DATE EXTRACTED: 07/12/93
DATE ANALYZED: 07/14/93
DATE REPORTED: 07/19/93
PAGE: Two

Sample Type: Soil

Method and Constituent:	Units	Composite of SPA1,2,3,4,5 Concentration	Composite of SPA1,2,3,4,5 Reporting Limit	Composite of SPB1,2,3,4,5 Concentration	Composite of SPB1,2,3,4,5 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 418.1:							
Total Recoverable Petroleum Hydrocarbons	mg/kg	ND	50,000	ND	50,000	ND	50,000

QC Summary:

% Recovery: 88
% RPD: 14

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3346
DATE SAMPLED: 06/17/93
DATE RECEIVED: 06/21/93
DATE EXTRACTED: 06/22/93
DATE ANALYZED: 06/23/93
DATE REPORTED: 07/19/93
PAGE: Three

Sample Type: Soil

Method and Constituent:	Units	Composite of SPA1,2,3,4,5 Concentration	Composite of SPA1,2,3,4,5 Reporting Limit	Composite of SPB1,2,3,4,5 Concentration	Composite of SPB1,2,3,4,5 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 7420:							
Lead	mg/kg	8.9	3.6	18	3.6	ND	3.6

QC Summary:

% Recovery: 71
% RPD: **

Concentrations reported as ND were not detected at or above the reporting limit.
**The RPD is not reportable since the sample prepared in duplicate was not detectable.

Louis W. DuPuis
Quality Assurance/Quality Control Manager

3346 # ample Analysis Request/Chain of Custody

DENNIS BATES ASSOCIATES, INC.
2011 FELIZ ROAD,
NOVATO, CA 94945
(415) 892 4131 FAX (415) 892-1912

JOB NAME: Oakland Auto Parts

JOB NUMBER: ENV 1514 N

P.O. Nunber:

Samplers: Darin Reinholdt

Sample I.D.	Date	Time	Comp.	Grab	Location	No. of Containers	Matrix	ANALYSES: TPH as Gasoline	BTXE	TPH as Diesel	TRPH	Lead (AA Flame)		Turn Around Time
SPA 1-5	6/17	11:10		/	Stockpile A	5	Soil	x	x		+	x		NTAT
SPB 1-5	/	11:28		/	Stockpile B	5	Soil	x	x		+	x		NTAT

Relinquished By (Signature	Date	Time	Accepted By (Signature
1 Darin Reinholdt	6/17/93	13:10	1
2	6/21/93	15:35	2
3			3

Laboratory Name & Address:
TRACE ANALYSIS LABORATORY
3423 INVESTMENT BLVD., UNIT 8
HAYWARD, CA 94545
(415) 783-0980

P/u, Soil, 10-BT, SF, Y-3 reg

REMARKS: Lab to composite five tubes into one Sample

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

July 19, 1993

Mr. John Sammons
Dennis Bates Associates, Inc
2011 Feliz Road
Novato, California 94945

Dear Mr. Sammons:

Trace Analysis Laboratory received ten soil samples on June 21, 1993 for your project No. ENV1514N, Oakland Auto Parts (our custody log number 3346).

These samples were composited and analyzed for Total Petroleum Hydrocarbons as Gasoline, Benzene, Toluene, Ethylbenzene, Xylenes, Lead, and by EPA Method 418.1. Our analytical report and the completed chain of custody form are enclosed for your review.

Trace Analysis Laboratory is certified under the California Environmental Laboratory Accreditation Program. Our certification number is 1199.

If you should have any questions or require additional information, please call me.

Sincerely yours,

For Scott T. Ferriman
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 3459
DATE SAMPLED: 07/22/93
DATE RECEIVED: 07/22/93
DATE EXTRACTED: 07/27/93
DATE ANALYZED: 07/29/93
DATE REPORTED: 08/06/93

CUSTOMER: Dennis Bates Associates, Inc.

REQUESTER: John Sammons

PROJECT: No. 1514N, Oakland Auto Parts

Sample Type: Soil

Method and Constituent:	Units	MW1-5 Concentration	MW1-5 Reporting Limit	MW1-10 Concentration	MW1-10 Reporting Limit	MW1-15 Concentration	MW1-15 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	mg/kg	ND	0.50	ND	0.50	ND	0.50
Modified EPA Method 8020 for:							
Benzene	mg/kg	ND	0.0050	ND	0.0050	ND	0.0050
Toluene	mg/kg	ND	0.0050	ND	0.0050	ND	0.0050
Ethylbenzene	mg/kg	ND	0.0050	ND	0.0050	ND	0.0050
Xylenes	mg/kg	ND	0.015	ND	0.015	ND	0.015

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3459
DATE SAMPLED: 07/22/93
DATE RECEIVED: 07/22/93
DATE EXTRACTED: 07/27/93
DATE ANALYZED: 07/29/93
DATE REPORTED: 08/06/93
PAGE: Two

Sample Type: Soil

Method and Constituent:	Units	MW1-20 Concentration	MW1-20 Reporting Limit	MW2-5 Concentration	MW2-5 Reporting Limit	MW2-10 Concentration	MW2-10 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	mg/kg	ND	0.50	ND	0.50	ND	0.50
Modified EPA Method 8020 for:							
Benzene	mg/kg	ND	0.0050	ND	0.0050	0.059	0.0050
Toluene	mg/kg	ND	0.0050	ND	0.0050	0.036	0.0050
Ethylbenzene	mg/kg	ND	0.0050	ND	0.0050	0.0061	0.0050
Xylenes	mg/kg	ND	0.015	ND	0.015	0.031	0.015

Method and Constituent:	Units	MW2-15 Concentration	MW2-15 Reporting Limit	MW3-5 Concentration	MW3-5 Reporting Limit	MW3-10 Concentration	MW3-10 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	mg/kg	48	2.3	ND	0.50	ND	0.50
Modified EPA Method 8020 for:							
Benzene	mg/kg	0.56	0.097	ND	0.0050	ND	0.0050
Toluene	mg/kg	2.8	0.10	ND	0.0050	ND	0.0050
Ethylbenzene	mg/kg	1.5	0.11	ND	0.0050	ND	0.0050
Xylenes	mg/kg	8.8	0.28	ND	0.015	ND	0.015

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3459
DATE SAMPLED: 07/22/93
DATE RECEIVED: 07/22/93
DATE EXTRACTED: 07/27/93
DATE ANALYZED: 07/29/93
DATE REPORTED: 08/06/93
PAGE: Three

Sample Type: Soil

Method and Constituent:	Units	MW3-15 Concentration	MW3-15 Reporting Limit	MW3-20 Concentration	MW3-20 Reporting Limit	VW1-17 Concentration	VW1-17 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	mg/kg	ND	0.50	ND	0.50	360	2.3
Modified EPA Method 8020 for:							
Benzene	mg/kg	ND	0.0050	ND	0.0050	18	0.097
Toluene	mg/kg	ND	0.0050	ND	0.0050	40	0.10
Ethylbenzene	mg/kg	ND	0.0050	ND	0.0050	13	0.11
Xylenes	mg/kg	ND	0.015	ND	0.015	68	0.28

Method and Constituent:	Units	VW2-17 Concentration	VW2-17 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:					
Total Petroleum Hydrocarbons as Gasoline	mg/kg	6,000	7,700	ND	0.50
Modified EPA Method 8020 for:					
Benzene	mg/kg	210	320	ND	0.0050
Toluene	mg/kg	890	330	ND	0.0050
Ethylbenzene	mg/kg	210	350	ND	0.0050
Xylenes	mg/kg	1,200	920	ND	0.015

QC Summary:

% Recovery: 134
% RPD: 0.23

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3459
DATE SAMPLED: 07/22/93
DATE RECEIVED: 07/22/93
DATE EXTRACTED: 07/29/93
DATE ANALYZED: 07/30/93
DATE REPORTED: 08/06/93
PAGE: Four

Sample Type: Soil

Method and Constituent:	Units	MW3-5 Concentration	MW3-5 Reporting Limit	MW3-10 Concentration	MW3-10 Reporting Limit	MW3-15 Concentration	MW3-15 Reporting Limit
EPA Method 418.1:							
Total Recoverable Petroleum Hydrocarbons	mg/kg	ND	50	ND	50	ND	50

Method and Constituent:	Units	MW3-20 Concentration	MW3-20 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 418.1:					
Total Recoverable Petroleum Hydrocarbons	mg/kg	ND	50	ND	50

QC Summary:

% Recovery: 88
% RPD: 4.8

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3459
DATE SAMPLED: 07/22/93
DATE RECEIVED: 07/22/93
DATE EXTRACTED: 07/28/93
DATE ANALYZED: 08/02/93
DATE REPORTED: 08/06/93
PAGE: Five

Sample Type: Soil

Method and Constituent:	Units	MW1-5 Concentration	MW1-5 Reporting Limit	MW1-10 Concentration	MW1-10 Reporting Limit	MW1-15 Concentration	MW1-15 Reporting Limit
EPA Method 7420:							
Lead	mg/kg	ND	3.6	ND	3.6	ND	3.6

Method and Constituent:	Units	MW1-20 Concentration	MW1-20 Reporting Limit	MW2-5 Concentration	MW2-5 Reporting Limit	MW2-10 Concentration	MW2-10 Reporting Limit
EPA Method 7420:							
Lead	mg/kg	ND	3.6	ND	3.6	ND	3.6

Method and Constituent:	Units	MW2-15 Concentration	MW2-15 Reporting Limit	MW3-5 Concentration	MW3-5 Reporting Limit	MW3-10 Concentration	MW3-10 Reporting Limit
EPA Method 7420:							
Lead	mg/kg	ND	3.6	ND	3.6	ND	3.6

Method and Constituent:	Units	MW3-15 Concentration	MW3-15 Reporting Limit	MW3-20 Concentration	MW3-20 Reporting Limit	VW1-17 Concentration	VW1-17 Reporting Limit
EPA Method 7420:							
Lead	mg/kg	ND	3.6	ND	3.6	ND	3.6

Concentrations reported as ND were not detected at or above the reporting limit.

TAL Trace Analysis Laboratory, Inc.

LOG NUMBER: 3459
DATE SAMPLED: 07/22/93
DATE RECEIVED: 07/22/93
DATE EXTRACTED: 07/28/93
DATE ANALYZED: 08/02/93
DATE REPORTED: 08/06/93
PAGE: Six

Sample Type: Soil

Method and Constituent:	Units	VW2-17 Concentration	VW2-17 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 7420:					
Lead	mg/kg	ND	3.6	ND	3.6

QC Summary:

% Recovery: 94*
% RPD: 0.29

Concentrations reported as ND were not detected at or above the reporting limit.

* The Recovery is for the Laboratory Control Sample, due to interference in the spiked sample.

Louis W. DuPuis
Quality Assurance/Quality Control Manager

3459

ample Analysis Request/Chain of Custody

DENNIS BATES ASSOCIATES, INC.
2011 FELIZ ROAD,
NOVATO, CA 94945
(415) 892 4131 FAX (415) 892 1912

JOB NAME: Oakland Auto Parts p. 1 of 2

JOB NUMBER: 1514 N

P.O. Nunber:

Sonplers: Glen White Glen White

Sonple I.D.	Date	Tine	Conp.	Grab	Location	No. of Contoiners	Matrix	ANALYSES: TPH as Gasoline	BTXE	TPH as Diesel	Total Lead				Turn Around Tine
MW1-5	7/22	0805				1	Soil	X	X		X				
MW1-10	"	0812				1	"	X	X		X				
MW1-15	"	0825				1	"	X	X		X				
MW1-20	"	0848				1	"	X	X		X				
VW1-17	"	1050				1	"	X	X		X				
VW2-17	"	1245				1	"	X	X		X				
MW2-5	"	1355				1	"	X	X		X				
MW2-10	"	1410				1	"	X	X		X				
MW2-15	"	1420				1	"	X	X		X				
[redacted]	GW						"	X	X		X				

Relinquished By (Signature	Date	Tine	Accepted By (Signature
1 Glen White	7/22/93	5:55pm	1 for TAL
2			2
3			3

Laboratory Nane & Address: Trace Analysis

REMARKS: walked in, soil, 1-BTEX, TPH, Reg TAT, [redacted] Y-1

3459

Sample Analysis Request / Chain of Custody

DENNIS BATES ASSOCIATES, INC.
2011 FELIZ ROAD,
NOVATO, CA 94945
(415) 892 4131 FAX (415) 892 1912

JOB NAME: Oakland Auto Parts p. 2 of 2

JOB NUMBER: 1514N

P.O. Number:

Samplers: Glen White Glen White

Sample I.D.	Date	Time	Comp.	Grab	Location	No. of Containers	Matrix	TPH as Gasoline	BTXE	TPH as Diesel	418.1 Oil & Grease	Total Lead			Turn Around Time
								ANALYSES							
MW3-5	7/22	1510				1	Soil	X	X		X	X			
MW3-10	↓	1520				1	↓	X	X		X	X			
MW3-15		1530				1		X	X		X	X			
MW3-20	↓	1544				1	↓	X	X		X	X			

Relinquished By (Signature)	Date	Time	Accepted By (Signature
1 Glen White	7/23/93	5:55PM	1 for TAL
2			2
3			3

Laboratory Name & Address:
Trace Analysis
Hayward

REMARKS:
water, soil, BTEX

Y-1

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

August 6, 1993

Mr. John Sammons
Dennis Bates Associates, Inc
2011 Feliz Road
Novato, California 94945

Dear Mr. Sammons:

Trace Analysis Laboratory received thirteen soil samples on July 22, 1993 for your project No. 1514N, Oakland Auto Parts (our custody log number 3459).

These samples were analyzed according to your chain of custody. Our analytical report and the completed chain of custody form are enclosed for your review.

Trace Analysis Laboratory is certified under the California Environmental Laboratory Accreditation Program. Our certification number is 1199.

If you should have any questions or require additional information, please call me.

Sincerely yours,

Scott T. Ferriman

Scott T. Ferriman
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 3517
DATE SAMPLED: ~~08/13/93~~
DATE RECEIVED: 08/13/93
DATE EXTRACTED: 08/19/93
DATE ANALYZED: 08/26/93
DATE REPORTED: 09/02/93

CUSTOMER: Dennis Bates Associates, Inc.

REQUESTER: John Sammons

PROJECT: No. 1514N, Oakland Auto Parts

Sample Type: Water

Method and Constituent:	Units	MW-3 Concentration	MW-3 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 8270:					
N-Nitrosodimethylamine	ug/l	ND	10	ND	10
Phenol	ug/l	ND	10	ND	10
Bis (-2-Chloroethyl) ether	ug/l	ND	10	ND	10
2-Chlorophenol	ug/l	ND	10	ND	10
1,3-Dichlorobenzene	ug/l	ND	10	ND	10
1,4-Dichlorobenzene	ug/l	ND	10	ND	10
1,2-Dichlorobenzene	ug/l	ND	10	ND	10
N-Nitroso-Di-N-Propylamine	ug/l	ND	10	ND	10
Hexachloroethane	ug/l	ND	10	ND	10
Nitrobenzene	ug/l	ND	10	ND	10
Isophorone	ug/l	ND	10	ND	10
2-Nitrophenol	ug/l	ND	10	ND	10
2,4-Dimethylphenol	ug/l	ND	10	ND	10
Bis(-2-Chloroethoxy) Methane	ug/l	ND	10	ND	10
2,4-Dichlorophenol	ug/l	ND	10	ND	10
1,2,4-Trichlorobenzene	ug/l	ND	10	ND	10
Naphthalene	ug/l	ND	10	ND	10

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3517
DATE SAMPLED: 08/13/93
DATE RECEIVED: 08/13/93
DATE EXTRACTED: 08/19/93
DATE ANALYZED: 08/26/93
DATE REPORTED: 09/02/93
PAGE: Two

Sample Type: Water

Method and Constituent	Units	MW-3 Concentration	MW-3 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 8270 (Continued):					
Hexachlorobutadiene	ug/l	ND	10	ND	10
4-Chloro-3-Methyl-phenol	ug/l	ND	20	ND	20
Hexachlorocyclo-pentadiene	ug/l	ND	10	ND	10
2,4,6-Trichlorophenol	ug/l	ND	10	ND	10
2-Chloronaphthalene	ug/l	ND	10	ND	10
Dimethyl Phthalate	ug/l	ND	10	ND	10
Acenaphthylene	ug/l	ND	10	ND	10
Acenaphthene	ug/l	ND	10	ND	10
2,4-Dinitrophenol	ug/l	ND	50	ND	50
4-Nitrophenol	ug/l	ND	50	ND	50
2,4-Dinitrotoluene	ug/l	ND	10	ND	10
2,6-Dinitrotoluene	ug/l	ND	10	ND	10
Diethylphthalate	ug/l	ND	10	ND	10
4-Chlorophenylphenyl Ether	ug/l	ND	10	ND	10
Fluorene	ug/l	ND	10	ND	10
N-Nitrosodiphenylamine	ug/l	ND	10	ND	10
4-Bromophenylphenyl Ether	ug/l	ND	10	ND	10
Hexachlorobenzene	ug/l	ND	10	ND	10
Pentachlorophenol	ug/l	ND	50	ND	50
Phenanthrene	ug/l	ND	10	ND	10
Anthracene	ug/l	ND	10	ND	10

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3517
DATE SAMPLED: 08/13/93
DATE RECEIVED: 08/13/93
DATE EXTRACTED: 08/19/93
DATE ANALYZED: 08/26/93
DATE REPORTED: 09/02/93
PAGE: Three

Sample Type: Water

Method and Constituent:	Units	MW-3 Concentration	MW-3 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 8270 (Continued):					
Di-N-Butylphthalate	ug/l	ND	10	ND	10
Fluoranthene	ug/l	ND	10	ND	10
Benzidine	ug/l	ND	10	ND	10
Pyrene	ug/l	ND	10	ND	10
Butylbenzylphthalate	ug/l	ND	10	ND	10
3,3'-Dichlorobenzidine	ug/l	ND	20	ND	20
Benzo(a)Anthracene	ug/l	ND	10	ND	10
Bis(2-Ethylhexyl) Phthalate	ug/l	ND	10	ND	10
Chrysene	ug/l	ND	10	ND	10
Di-N-Octyl Phthalate	ug/l	ND	10	ND	10
Benzo(b)Fluoranthene	ug/l	ND	10	ND	10
Benzo(k)Fluoranthene	ug/l	ND	10	ND	10
Benzo(a)Pyrene	ug/l	ND	10	ND	10
Indeno(1,2,3-cd)Pyrene	ug/l	ND	10	ND	10
Dibenzo(a,h)Anthracene	ug/l	ND	10	ND	10
Benzo(g,h,i)Perylene	ug/l	ND	10	ND	10
Surrogate % Recovery:					
2-Fluorophenol		138		106	
Phenol d6		117		91	
Nitrobenzene d5		92		75	
2-Fluorobiphenyl		121		92	
2,4,6-Tribromophenol		90		73	
p-Terphenyl d14		147		118	

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3517
DATE SAMPLED: 08/13/93
DATE RECEIVED: 08/13/93
DATE ANALYZED: 08/18/93
DATE REPORTED: 09/02/93
PAGE: Four

Sample Type: Water

Method and Constituent:	Units	MW-1 Concentration	MW-1 Reporting Limit	MW-2 Concentration	MW-2 Reporting Limit	MW-3 Concentration	MW-3 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/l	20,000	1,200	34,000	580	ND	50
Modified EPA Method 8020 for:							
Benzene	ug/l	8,500	50	6,800	25	ND	0.50
Toluene	ug/l	640	55	10,000	27	ND	0.50
Ethylbenzene	ug/l	280	57	740	28	ND	0.50
Xylenes	ug/l	440	150	3,900	75	ND	1.5

Method and Constituent:	Units	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:			
Total Petroleum Hydrocarbons as Gasoline	ug/l	ND	50
Modified EPA Method 8020 for:			
Benzene	ug/l	ND	0.50
Toluene	ug/l	ND	0.50
Ethylbenzene	ug/l	ND	0.50
Xylenes	ug/l	ND	1.5

QC Summary:

% Recovery: 78
% RPD: 10

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 3517
DATE SAMPLED: 08/13/93
DATE RECEIVED: 08/13/93
DATE EXTRACTED: 08/23/93
DATE ANALYZED: 08/25/93
DATE REPORTED: 09/02/93
PAGE: Five

Sample Type: Water

Method and Constituent:	Units	MW-1 Concentration	MW-1 Reporting Limit	MW-2 Concentration	MW-2 Reporting Limit	MW-3 Concentration	MW-3 Reporting Limit
EPA Method 7420:							
Lead	ug/l	ND	100	ND	100	ND	100

Method and Constituent:	Units	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 7420:			
Lead	ug/l	ND	100

QC Summary:

% Recovery: 91
% RPD: 0.83

Concentrations reported as ND were not detected at or above the reporting limit.

Louis W. DuPuis
Quality Assurance/Quality Control Manager

3517 Sample Analysis Request/Chain of Custody

DENNIS BATES ASSOCIATES, INC.
2011 FELIZ ROAD,
NOVATO, CA 94945
(415) 892 4131 FAX (415) 892 1912

JOB NAME: Oakland Auto Parts

JOB NUMBER: 1514 A

P.O. Nunber:

Samplers: JS/JD

Sample I.D.	Date	Time	Comp.	Grab	Location	No. of Containers	Matrix	ANALYSES: TPH as Gasoline	BTXE	TPH as Diesel	Total Lead	EPA 8270			Turn Around Time
mw1	8/13/93	1330		X		4		X	X		X				NTAT
mw2	8/13/93	1310		X		4		X	X		X				NTAT
mw3	8/13/93	1308		X		6		X	X		X	X			NTAT

Relinquished By (signature)	Date	Time	Accepted By (Signature
1	8/13/93	1335	1
2	8/13/93	2:20pm	2 For TAL
3			3

Laboratory Name & Address: Trace, Hayward

REMARKS: NTAT

walk in, water, 2 L, 3-500ml 9 VOAS, HCl, HNO_3, Reg TAT. Green, SF

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

September 2, 1993

Mr. John Sammons
Dennis Bates Associates, Inc
2011 Feliz Road
Novato, California 94945

Dear Mr. Sammons:

Trace Analysis Laboratory received three water samples on August 13, 1993 for your Project No. 1514N, Oakland Auto Parts (our custody log number 3517).

These samples were analyzed according to your chain of custody. Our analytical report and the completed chain of custody form are enclosed for your review.

Trace Analysis Laboratory is certified under the California Environmental Laboratory Accreditation Program. Our certification number is 1199.

If you should have any questions or require additional information, please call me.

Sincerely yours,

Scott T. Ferriman

Scott T. Ferriman
Project Specialist

Enclosures