

PRELIMINARY SITE ASSESSMENT REPORT

**BP Oil Company, U.S.A.
BP Oil Service Station No. 11120
6400 Dublin Boulevard
Dublin, California**

Prepared for:

**BP OIL COMPANY
Northwest Division
Southcenter Place Building
16400 Southcenter Parkway - Suite 301
Tukwila, Washington 98188**

Prepared by:

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

**2363 Mariner Square Drive, Suite 243
Alameda, California 94501**

HETI Job No. 9-040 (510) 521-2684

January 7, 1993

CERTIFICATION

This report was prepared under the supervision of a registered professional engineer. All statements, conclusions and recommendations are based solely upon field observations and analytical analyses performed by a state-certified laboratory related to work performed by Hydro-Environmental Technologies, Inc.

It is possible that variations in soil or ground water conditions exist beyond the points explored in this investigation. Also, site conditions are subject to change at some time in the future due variations in rainfall, temperature, regional water usage, or other factors.

The service performed by Hydro-Environmental Technologies, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Hydro-Environmental Technologies, Inc. includes in this report chemical analytical data from a state-certified laboratory. These analyses are performed according to procedures suggested by the U.S. EPA and the State of California. Hydro-Environmental Technologies, Inc. is not responsible for laboratory errors in procedure or result reporting.

Please note that contamination of soil and ground water contamination must be reported to the appropriate agencies in a timely manner.

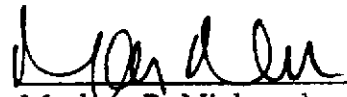
HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

Prepared by:

Reviewed by:



Henry A. Hurkmans
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- A Sensitive Receptor Survey and Well Search
Soil Boring/Well Construction Details and Boring Log Legend
Field Crew Health and Safety Plan
Well Permits
- B Drilling, Well Installation, and Sampling Procedures
- C Water Table Elevation Data and Water Sampling Field Notes
- D Official Laboratory Reports and Chain-of-Custody Records

1.0 INTRODUCTION

BP Oil Company retained Hydro-Environmental Technologies, Inc. (HETI) in August 1992 to conduct a preliminary environmental site assessment at BP Oil Service Station No. 11120, located at 6400 Dublin Boulevard in Dublin, California. The site location map is shown as Figure 1.

1.1 Purpose and Scope

This preliminary site investigation work was performed to assess the nature and extent of petroleum hydrocarbons in the subsurface soil and/or groundwater at the site, if any, and to determine the appropriate courses of action to comply with applicable laws and regulations.

The tasks performed under this preliminary assessment study included the following:

- Conduct a sensitive receptors survey including existing well search
- Drill and log exploratory soil borings and collect soil samples
- Install monitoring wells, if ground water is encountered within the specified depth of the borings
- Develop and survey monitoring wells and collect ground water samples for laboratory analysis of specified hydrocarbon constituents
- Analyze data/results and prepare a report presenting the findings of the preliminary assessment

1.2 Site Location and Description

BP Oil Service Station No. 11120 is located on the south corner of the intersection of Dublin Boulevard and Dougherty Road in Newark, California. **The site is presently an operating service station with three underground gasoline storage tanks and one underground used oil tank.** Figure 2 shows the layout of the site and the location of existing underground storage tanks and dispenser islands.

1.3 Sensitive Receptor Survey

A sensitive receptor survey and existing well search were performed to identify nearby environmental elements and land uses that may be affected by the existing BP Oil site or affect the subsurface conditions at the site. A copy of the completed sensitive receptor survey form and the results of the well survey are presented in Appendix A.

2.0 FIELD METHODS

The procedures and methods used during field activities are discussed below, and a description of the drilling and sampling procedures is presented as Appendix B.

2.1 Soil Borings and Sampling

On October 13, 1992, four exploratory borings were drilled at the site. All drilling activities were performed by Bayland Drilling Company of Menlo Park, California using a truck-mounted CME-75 drilling rig. All soil borings were drilled using 8 3/4-inch diameter hollow-stem augers, to depths of between 19-20.5 feet below grade. Boring B-1 was drilled in the vicinity of the used oil tank and borings B-2, B-3, and B-4 were drilled in the vicinity of the existing underground fuel tanks, dispenser islands, and associated piping.

Boring logs were prepared using the Unified Soil Classification System including a description of soil characteristics such as color, moisture, consistency and field readings using an organic vapor meter (OVM). The boring logs are included in Appendix A.

2.2 Monitoring Well Installation and Construction

Soil borings B-1, B-2, B-3 and B-4 were converted to monitoring wells MW-1, MW-2, MW-3 and MW-4, respectively, in accordance with the installation procedures and construction details presented in Appendix B. All the monitoring wells were constructed with clean, 2-inch-diameter, flush threaded, Schedule 40, polyvinyl chloride (PVC) blank casing and 0.010-inch slotted casing to depths ranging from 14 to 19 feet below grade. The locations of the wells are shown in Figure 2. Well construction details are included in the boring logs presented in Appendix A.

2.3 Monitoring Well Development and Sampling

Well development and sampling procedures were conducted in accordance with the guidelines established by the lead regulatory agencies. A description of the general field procedures for well development and sampling is presented in Appendix B.

All monitoring wells were developed on October 27, 1992. Prior to development, each well was first observed for the presence or absence of free floating product. The wells were developed by surging with a mechanical block and purging using a 2-inch PVC bailer. Purging continued until at least 10 casing volumes were removed, or until the water was relatively free of sand and silt, or until the well purged dry.

During purging and prior to sample collection, pH, specific conductivity, and temperature were measured and allowed to stabilize, indicating that formation water had entered the well. Field observations during well development and sampling are presented in the purge/sample sheets included in Appendix C. All samples were transported in a cooler to a State-certified laboratory following the proper chain-of-custody procedures.

2.4 Ground Water Level Monitoring and Well Surveying

The monitoring wells were surveyed to the top of each well casing in reference to an temporary benchmark with an assumed elevation of 330 feet above mean sea level. The depth to ground water in the wells were measured from the top of the well casing to the nearest 0.01 foot, using an interface probe on October 27, 1992. A summary of ground water gauging information is presented in the Water Table Elevation Data sheet included in Appendix A. The graphical interpretation of the ground water gradient beneath the site is presented in Figure 3.

3.0 ANALYTICAL METHODS

All laboratory analyses of soil samples were performed by a California-certified analytical laboratory, using standard test methods of the U.S. Environmental Protection Agency (EPA) and the California Department of Health Services (DHS). PACE Laboratory of Novato, California analyzed all the soil and ground water samples.

Two soil samples collected from each boring were analyzed for the following constituents:

- Total petroleum hydrocarbons as gasoline (TPHg) using EPA Methods 8015
- Total petroleum hydrocarbons as diesel (TPHd) using EPA Methods 3550/8015
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) constituents using EPA Method 8020
- Total oil and grease (TOG) using Standard Method 5520
- Halogenated volatile organic compounds (HVO) using EPA Method 8010

Water samples collected from each monitoring well were analyzed for the following constituents:

- Total petroleum hydrocarbons as gasoline (TPHg) using EPA Methods 8015
- Total petroleum hydrocarbons as diesel (TPHd) using EPA Methods 3550/8015
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) constituents using EPA Method 8020

Because of the proximity of monitoring well MW-1 to the used oil tank, water samples collected from MW-1 were also analyzed for HVO and TOG.

The results of the laboratory analyses of soil and ground water samples are summarized in Table 1 and Table 2, respectively. Some of the ground water sample results are also graphically presented in Figure 4. The official laboratory reports and chain of custody records are included in Appendix D.

4.0 DISCUSSION OF RESULTS

The results of the field activities and laboratory analyses of soil and ground water samples collected during this preliminary investigation are discussed below.

- **Ground water was first encountered** in the soil borings at a depth of approximately **17 feet** below grade. Ground water appeared to be present in a thin (0.5 to 3 feet thick) saturated layer at that depth. After penetration of the saturated zone by the augers, **ground water levels later rose to approximately 9 feet** below grade.

- Soil types encountered at the site generally consisted of clay with some sands present at shallow depths and a deeper saturated zone of undetermined lithology.
- TPHg was detected in soil samples collected from borings B-3 and B-4. Concentrations of TPHg ranged from 2.9 parts per million (ppm) in the soil sample collected from B-4 at a depth of 10.5 feet, to 350 ppm in the soil sample collected from B-4 at a depth of 5.5 feet below grade.
- TPHd was detected in soil samples collected from boring B-4. Concentrations of TPHd were 7.9 ppm in soil sample B-4-10.5' and 140 ppm in soil sample B-4-5.5'.
- Benzene was detected in soil samples collected from borings B-3 and B-4. Concentrations of benzene ranged from 0.030 ppm in the soil sample collected from B-4 at a depth of 10.5 feet below grade, to 0.80 ppm in the soil sample collected from B-4 at a depth of 5.5 feet below grade (see Table 1 for BTEX results).
- TOG was detected in soil samples collected from boring B-4. Concentrations of TOG were 63 ppm in soil sample B-4-10.5' and 380 ppm in soil sample B-4-5.5'.
- HVO and TOG were not detected in concentrations exceeding method detection limits in soil samples B-1-5.5' and B-1-10.5' collected from the boring adjacent the used oil tank.
- No free product or sheen was observed in any of the monitoring wells.
- TPHg was detected in water samples collected from monitoring wells MW-3 and MW-4. Concentrations of TPHg were 210 parts per billion (ppb) in the water sample collected from MW-3 and 2,300 ppb in the water sample collected from MW-4.
- TPHd was detected in water samples collected monitoring well MW-4 at a concentration of 190 ppb.
- Benzene was detected in water samples collected from monitoring wells MW-3 and MW-4 in concentrations of 3.0 and 23 ppb, respectively.
- TOG and HVO were not detected in concentrations exceeding method detection limits in water samples collected from MW-1, the well adjacent the used oil tank.
- Ground water gradient was calculated to be approximately 0.0016 ft/ft in a general southwest direction across the site.

Table 1

SOIL SAMPLES
SUMMARY OF ANALYTICAL RESULTS

BP Service Station No. 11120
 6400 Dublin Boulevard
 Dublin, California

Sample Description	TPHg (ppm)	TPHd (ppm)	B (ppm)	T (ppm)	E (ppm)	X (ppm)	HVO (ppm)	TOG (ppm)
B-1-5.5'	ND	ND	ND	ND	ND	ND	ND	ND
B-1-10.5'	ND	ND	ND	ND	ND	ND	ND	ND
B-2-5.5'	ND	ND	ND	ND	ND	ND	ND	ND
B-2-10.5'	ND	ND	ND	ND	ND	ND	ND	ND
B-3-5.5'	10	ND	0.069	0.58	0.23	1.8	ND	ND
B-3-10.5'	22	ND	0.043	0.26	0.41	1.8	ND	ND
B-4-5.5'	350	140	0.80	7.9	5.8	31	ND	380
B-4-10.5'	2.9	7.9	0.030	0.11	0.10	0.44	ND	63
MDL	1	5	0.005	0.005	0.005	0.005	0.005-0.02	50

TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8015

TPHd = Total petroleum hydrocarbons as diesel by EPA Method 8015

B = Benzene

T = Toluene

E = Ethylbenzene

X = Total Xylenes

BTEX by EPA Method 8020

HVO = Halogenated volatile organics by EPA Method 8010

TOG = Total oil and grease by Standard Method 5520

NT = Not tested

ND = Not detected in concentrations exceeding laboratory method detection limits

MDL = Laboratory method detection limits for all analyses where results are ND

Table 2

**GROUND WATER SAMPLES
SUMMARY OF ANALYTICAL RESULTS**

BP Service Station No. 11120
6400 Dublin Boulevard
Dublin, California

Sample Description	TPHg (ppb)	TPHd (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	HVO (ppb)	TOG (ppb)
MW-1	ND	ND	ND	ND	ND	ND	ND	ND
MW-2	ND	ND	ND	ND	ND	ND	NT	NT
MW-3	210	ND	3.0	0.7	0.9	30	NT	NT
MW-4	2,300	190	23	54	50	320	NT	NT
MDL	50	50	0.5	0.5	0.5	0.5	0.5-2.0	5,000

TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8015

TPHd = Total petroleum hydrocarbons as diesel by EPA Method 8015

B = Benzene

T = Toluene

E = Ethylbenzene

X = Total Xylenes

BTEX by EPA Method 8020

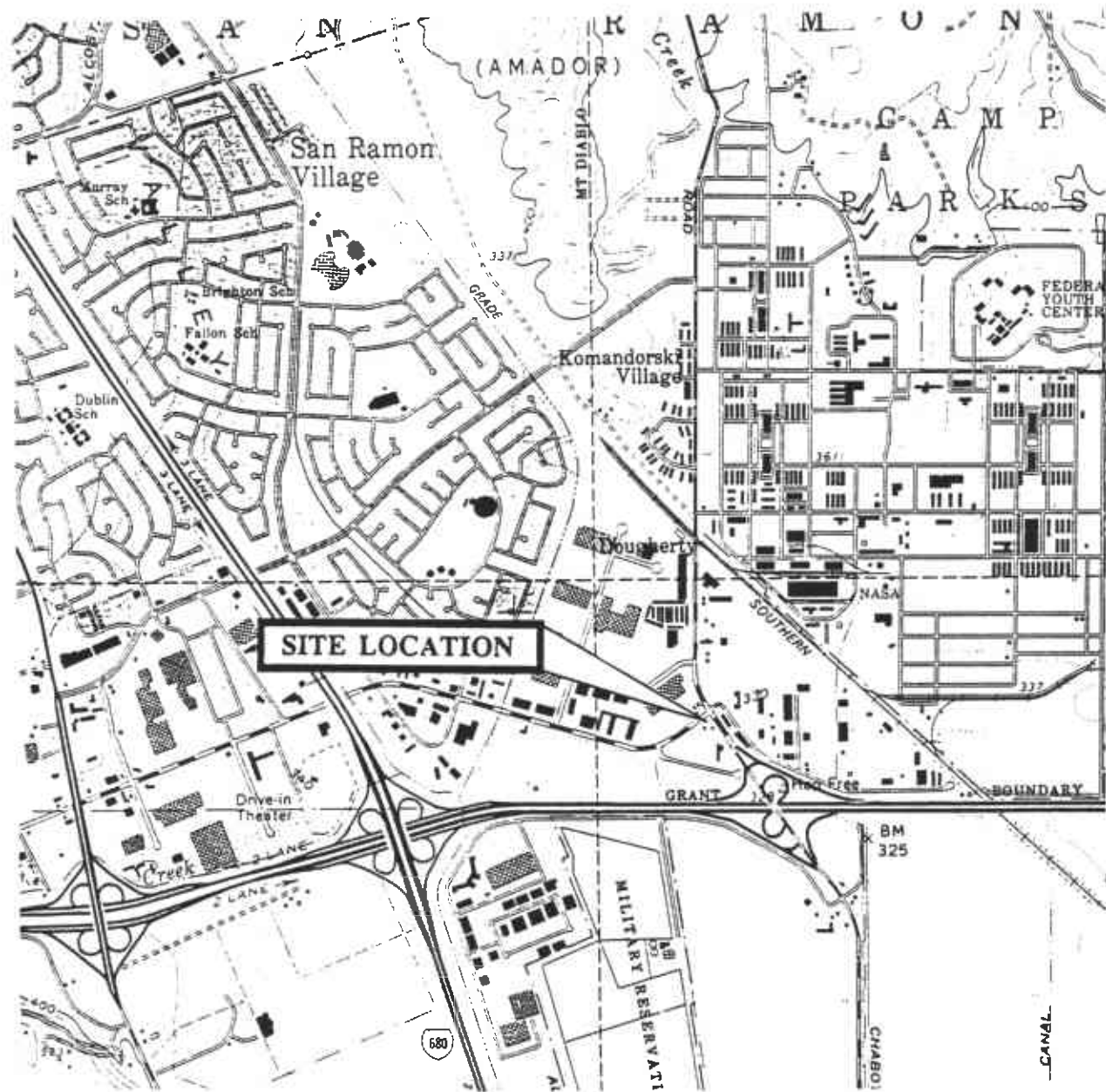
HVO = Halogenated volatile organics by EPA Method 8010

TOG = Total oil and grease by Standard Method 5520

NT = Not tested

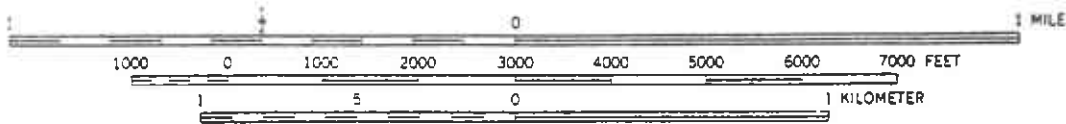
ND = Not detected in concentrations exceeding laboratory method detection limits

MDL = Laboratory method detection limits for all analyses where results are ND



SOURCE:
 USGS QUADRANGLE, 7.5 MINUTE SERIES
 ENTITLED "DUBLIN, CA"
 SCALE 1: 24 000

North








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Site Location Map
 BP Service Station No. 1120
 6400 Dublin Boulevard
 Dublin, California

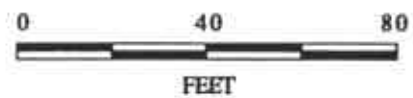
Job No.
 9-040
 Figure
 1

North

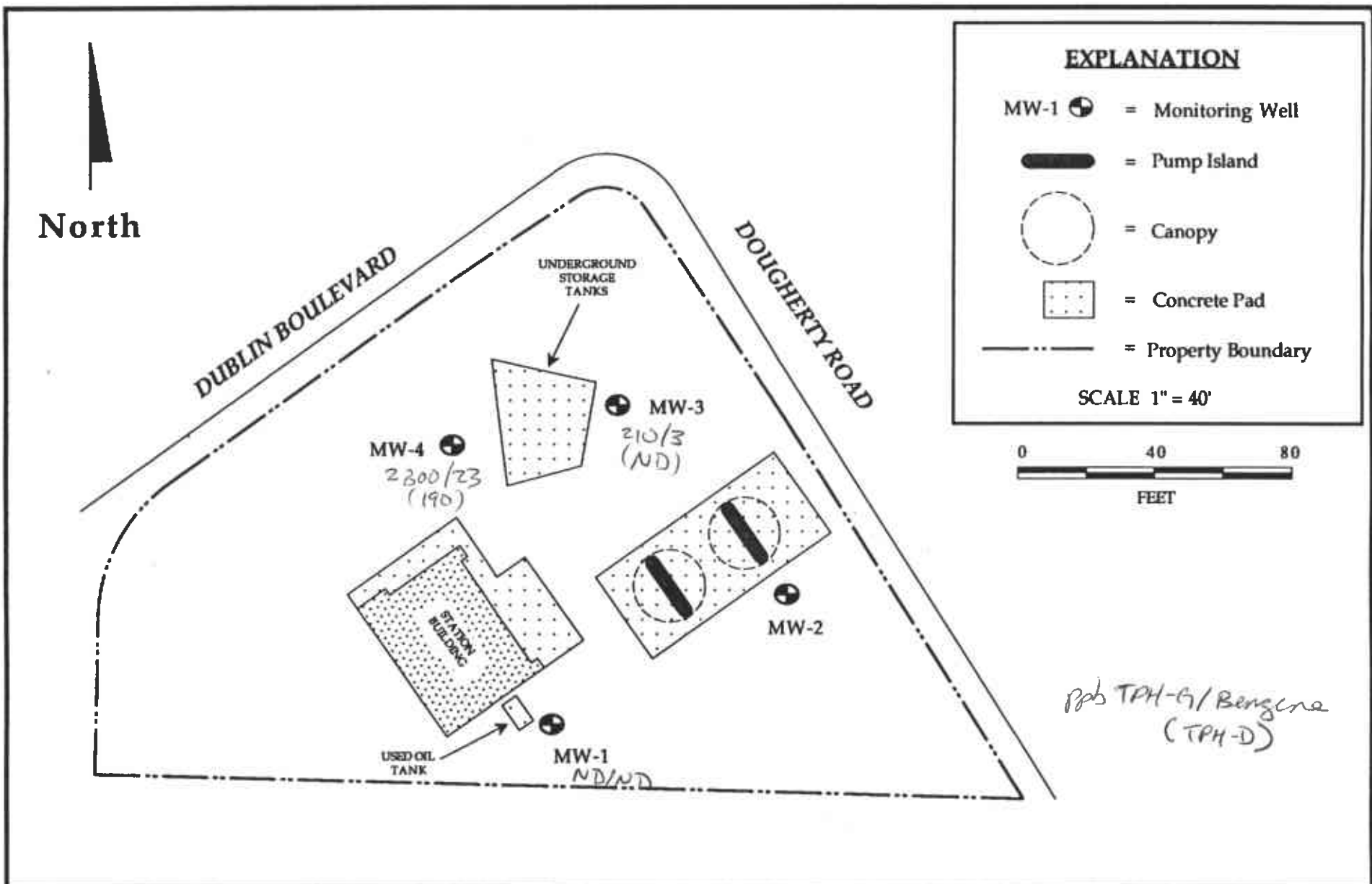
EXPLANATION

- MW-1  = Monitoring Well
-  = Pump Island
-  = Canopy
-  = Concrete Pad
-  = Property Boundary

SCALE 1" = 40'



*ppb TPH-G/Benzene
(TPH-D)*

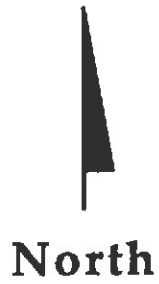


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SITE PLAN
BP Service Station No. 11120
6400 Dublin Boulevard
Dublin, California

Job No.
9-040
Figure
2

DATA COLLECTED ON 10/27/92



EXPLANATION

MW-2 = Monitoring well

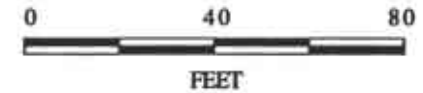
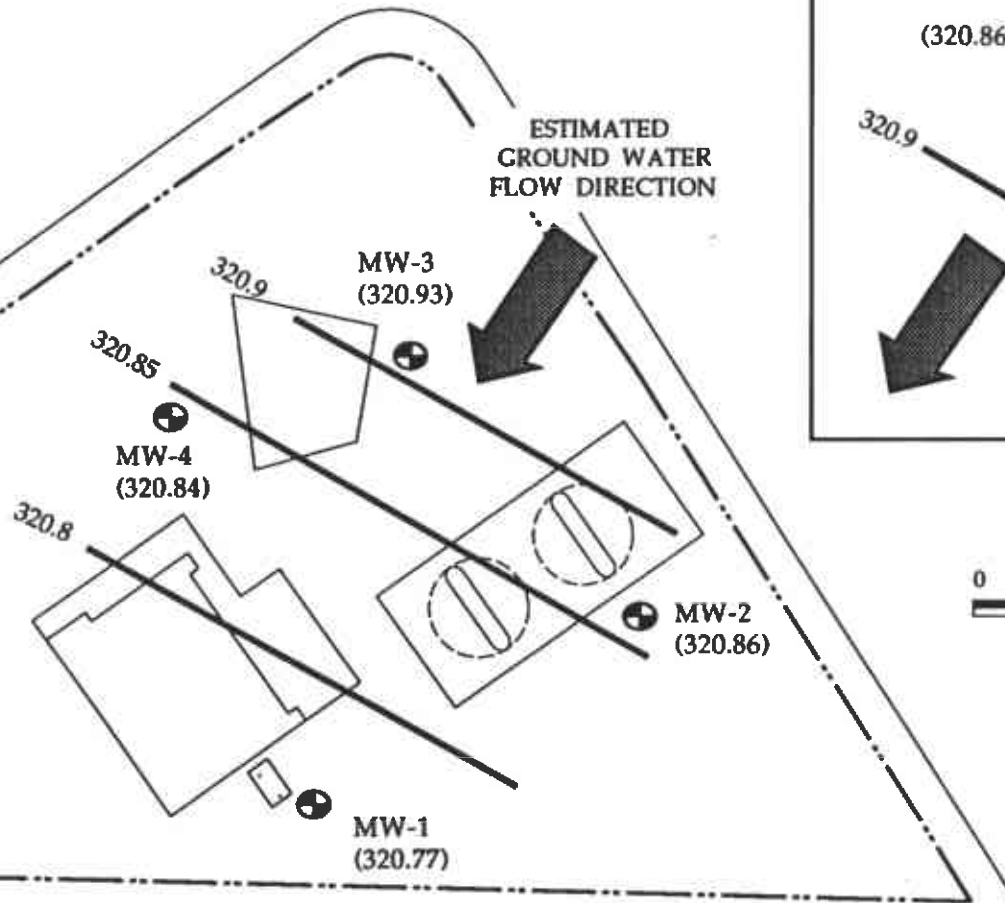
(320.86) = Ground water elevation - in feet (based on project datum)

320.9 = Ground water elevation contour - in feet

= Inferred direction of groundwater gradient

SCALE 1" = 40'

ESTIMATED
GROUND WATER
FLOW DIRECTION



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GROUND WATER CONTOUR MAP

BP Service Station No. 11120
6400 Dublin Boulevard
Dublin, California


Job No.
9-040
Figure
3

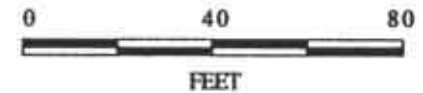
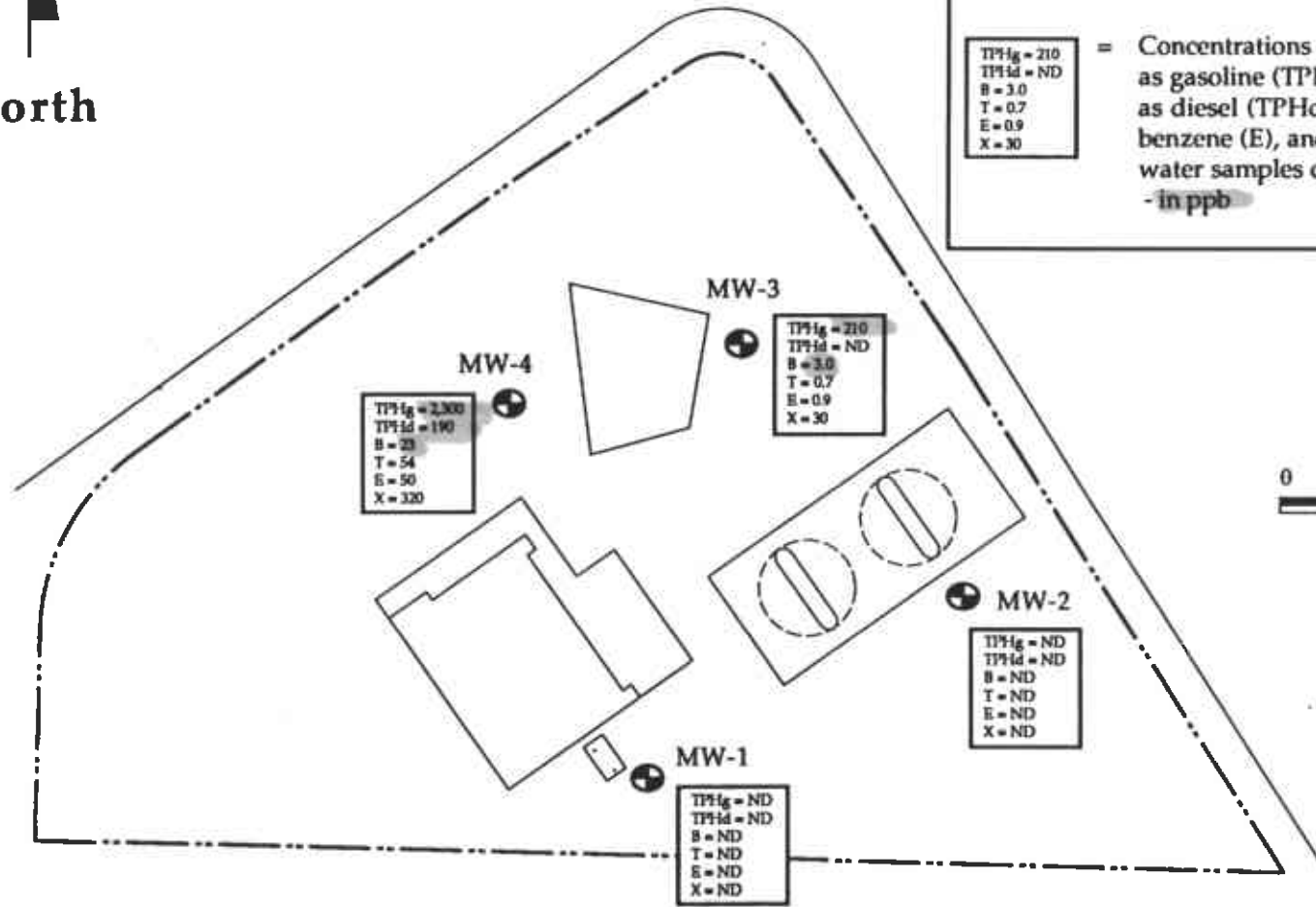
GROUND WATER SAMPLES COLLECTED ON 10/27/92

North

EXPLANATION

MW-3  = Monitoring well

 = Concentrations of: total petroleum hydrocarbons as gasoline (TPHg), total petroleum hydrocarbons as diesel (TPHd), benzene (B), toluene (T), ethylbenzene (E), and total xylenes (X) dissolved in water samples collected from monitoring well - in ppb



SCALE 1" = 40'

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TPHg, TPHd & BTEX CONCENTRATION MAP

BP Service Station No. 11120
6400 Dublin Boulevard
Dublin, California

Job No.
9-040
Figure
4

APPENDIX A

SENSITIVE RECEPTORS SURVEY
Site Survey and Literature Research

Store No: 11120
Location: 6400 Dublin Boulevard
City/State: Dublin, CA

I. Provide answers to the following questions:

- a. Is a public water supply well within 2500 ft? (y/n)
If yes, Distance (ft) _____
- b. Is a private water supply well within 1000 ft? (y/n)
If yes, Distance (ft) _____
- c. Is a subway within 1000 ft? (y/n)
If yes, Distance (ft) _____
- d. Is a basement within 1000 ft? (y/n)
If yes, Distance (ft) _____
- e. Is a School within 1000 ft? (y/n)
If yes, Distance (ft) _____
- f. Is a surface body of water within 1000 ft? (y/n)
If yes, Distance (ft) _____

II. Describe type of local water supply:

Public
*Supplier's Name San Ramon Svcs. Distrt. - Zone 7
*Supplier's Source Delta, (3) Local Groundwater - Livermore Valley Pleasanton
*Distance to Site ~ 25 mi. (3) Del Valle
Private N/A

III. Aquifer Classification, if available:

- _____ Class I: Special Ground Waters
Irreplaceable Drinking Water Sources
Ecologically Vital
N/A
- _____ Class II: Current and Potential Drinking Water
- _____ Class III: Not Potential Source of Drinking Water




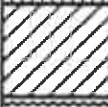


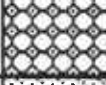





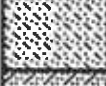
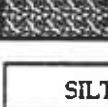

IV. Describe observation wells, if any:

Number 4
Free Product _____ (y/n)

V. Signature of Preparer Henry Hunkamann Date 11-4-92

UNIFIED SOIL CLASSIFICATION SYSTEM

(ASTM D-1586)

MAJOR DIVISIONS		LTR	DESCRIPTION	MAJOR DIVISIONS	LTR	DESCRIPTION				
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS		GW	Well-graded gravels or gravel-sand mixtures, little or no fines.	FINE GRAINED SOILS		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.		
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines.			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.		
			GM	Silty gravels, gravel-sand-clay mixtures.			OL	Organic silts and organic silt-clays of low plasticity.		
			GC	Clayey gravels, gravel-sand-clay mixtures.			MH	Inorganic silts, micaceous or distarcaceous fine sandy or silty soils, elastic silts.		
	SAND AND SANDY SOILS		SW	Well-graded sands or gravelly sands, little or no fines.		SILTS AND CLAYS LL > 50		CH	Inorganic clays of high plasticity, fat clays.	
			SP	Poorly-graded sands or gravelly sands, little or no fines.				OH	Organic clays of medium to high plasticity.	
			SM	Silty sands, sand-silt mixtures.			HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils.
			SC	Clayey sands, sand-clay mixtures.						

Retained for Analysis {  } Sample Interval

SANDS & GRAVELS		SILTS & CLAYS	
	BLOWS/FT*		BLOWS/FT*
VERY LOOSE	0 - 4	SOFT	0 - 4
LOOSE	4 - 10	FIRM	4 - 8
MED. DENSE	10 - 30	STIFF	8 - 16
DENSE	30 - 50	VERY STIFF	16 - 32
VERY DENSE	OVER 50	HARD	OVER 32



Approximate stabilized water level



Approximate first encountered water level

NOTE: Blow count represents the number of blows of a 140-lb hammer falling 30 inches per blow required to drive a sampler through the last 12 inches of an 18-inch penetration.

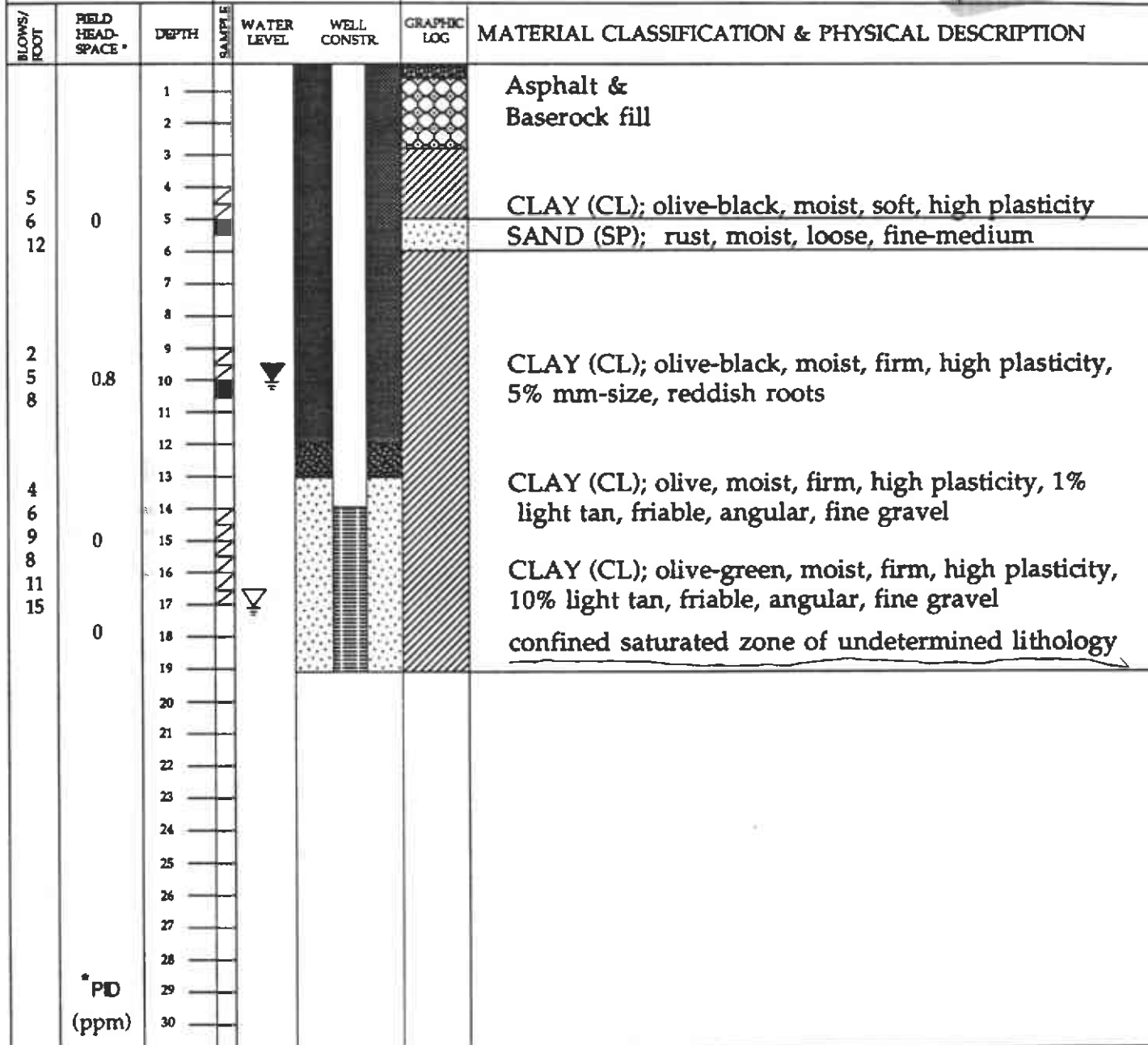
* Blows per foot using a standard penetrometer

NR = No Recovery
 NT = Not Tested
 NFE = No Free Water Encountered
 PHO = Petroleum Hydrocarbon Odor

No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only.

S = Sampler sank into medium under the weight of the hammer (no blow count)
 P = Sampler was pushed into medium by drilling rig (no blow count)

SITE/LOCATION 6400 Dublin Blvd., Dublin, CA		BEGUN 10/13/92	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO. B-1
DRILLING CONTRACTOR Bayland Drilling		COMPLETED 10/13/92	FIRST ENCOUNTERED WATER DEPTH 17 Feet		
OPERATOR Tom Schmidt		LOGGED BY H. Hurkmans	STATIC WATER DEPTH/DATE 10 Feet/10-13-92		
DRILL MAKE & MODEL CME 75		SAMPLING METHOD California modified split-spoon			BOTTOM OF BORING 19 Feet
WELL MATERIAL Sch. 40 PVC	SLOT SIZE 0.010	FILTER PACK #2/12	BORING SEAL Neat cement		WELL NO. MW-1



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**SOIL BORING LOG B-1
AND
WELL CONSTRUCTION
LOG MW-1**

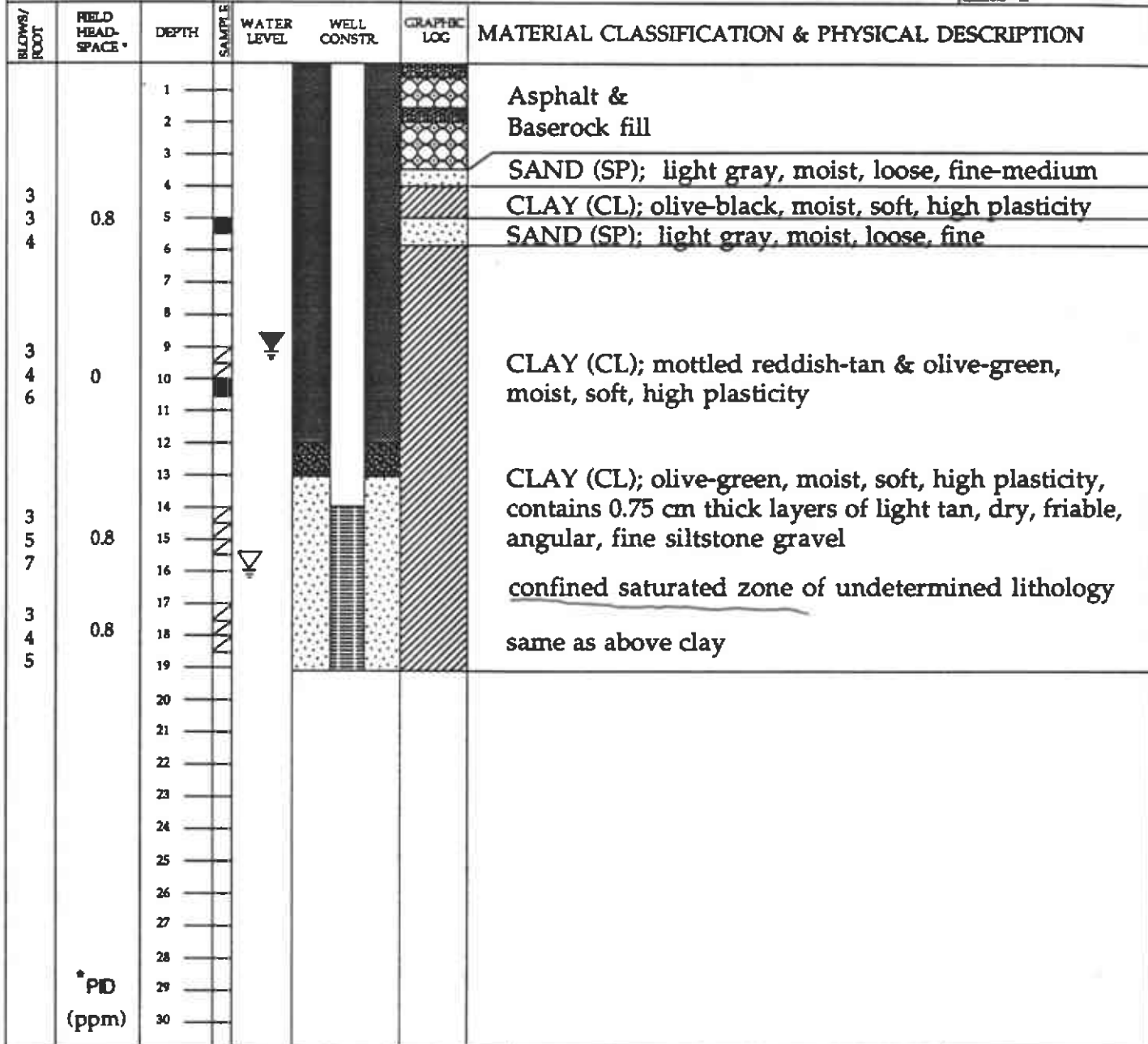
**PLATE
A-1**

BP Oil Station No. 11120
6400 Dublin Blvd.
Dublin, CA

**JOB NO.
9-040**

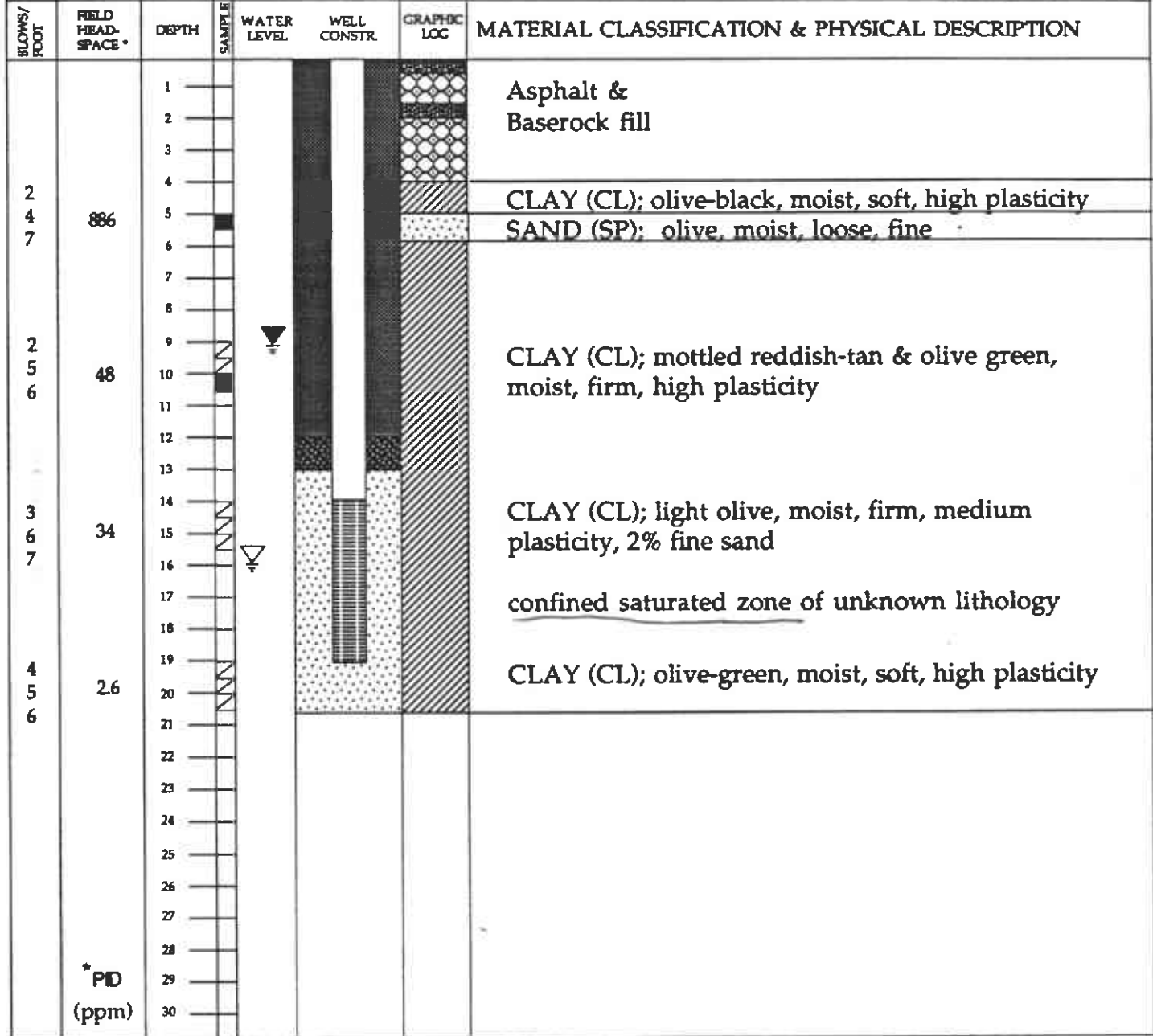
DATE: 10/16/92
APPROVED BY: John Turney

SITE/LOCATION 6400 Dublin Blvd., Dublin, CA		SECUN 10/13/92	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO B-2
DRILLING CONTRACTOR Bayland Drilling		COMPLETED 10/13/92	FIRST ENCOUNTERED WATER DEPTH 16 Feet		
OPERATOR Tom Schmidt		LOGGED BY H. Hurkmans	STATIC WATER DEPTH/DATE 9 Feet/10-13-92		
DRILL MAKE & MODEL CME 75		SAMPLING METHOD California modified split-spoon			BOTTOM OF BORING 19 Feet
WELL MATERIAL Sch. 40 PVC	SLOT SIZE 0.010	FILTER PACK #2/12	BORING SEAL Neat cement		WELL NO. B-2



HYDRO- ENVIRONMENTAL TECHNOLOGIES, INC.	SOIL BORING LOG B-2 AND WELL CONSTRUCTION LOG MW-2	PLATE A-2
	BP Oil Station No. 11120 6400 Dublin Blvd. Dublin, CA	JOB NO. 9-040
DATE: 10/16/92		
APPROVED BY: John Turney		

SITE/LOCATION 6400 Dublin Blvd., Dublin, CA		BEGUN 10/13/92	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO B-3
DRILLING CONTRACTOR Bayland Drilling		COMPLETED 10/13/92	FIRST ENCOUNTERED WATER DEPTH 16 Feet		
OPERATOR Tom Schmidt		LOGGED BY H. Hurkmans	STATIC WATER DEPTH/DATE 9 Feet/10-13-92		
DRILL MAKE & MODEL CME 75		SAMPLING METHOD California modified split-spoon			BOTTOM OF BORING 20.5 Feet
WELL MATERIAL Sch. 40 PVC	SLOT SIZE 0.010	FILTER PACK #2/12	BORING SEAL Neat cement		WELL NO. MW-3



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DATE: 10/16/92
APPROVED BY: John Turney

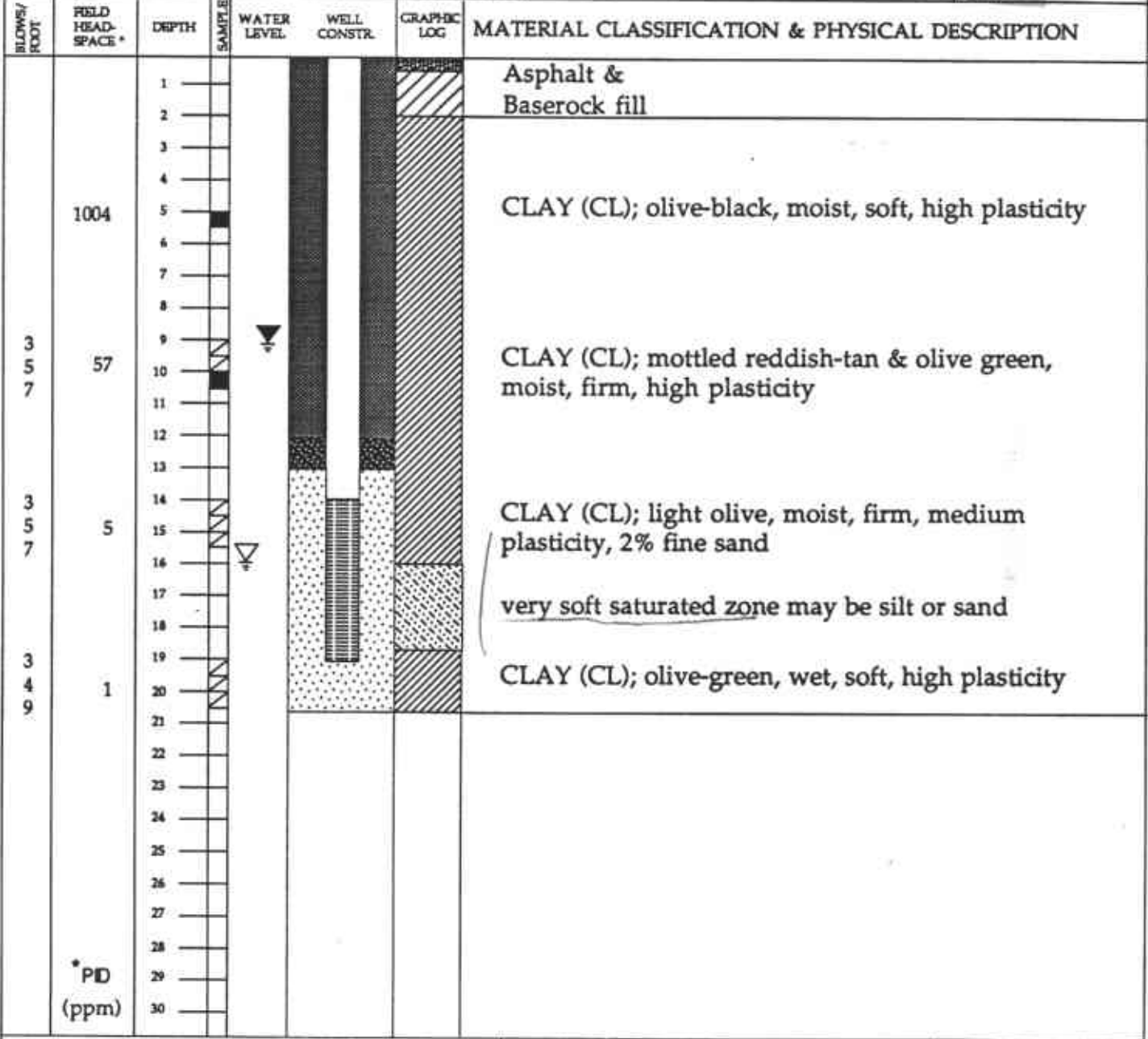
**SOIL BORING LOG B-3
AND
WELL CONSTRUCTION
LOG MW-3**

BP Oil Station No. 11120
6400 Dublin Blvd.
Dublin, CA

PLATE
A-3

JOB NO.
9-040

SITE/LOCATION 6400 Dublin Blvd., Dublin, CA		BEGUN 10/13/92	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO B-4
DRILLING CONTRACTOR Bayland Drilling		COMPLETED 10/13/92	FIRST ENCOUNTERED WATER DEPTH 16 Feet		
OPERATOR Tom Schmidt		LOGGED BY H. Hurkmans	STATIC WATER DEPTH/DATE 9 Feet/10-13-92		
DRILL MAKE & MODEL CME 75		SAMPLING METHOD California modified split-spoon			BOTTOM OF BORING 20.5 Feet
WELL MATERIAL Sch. 40 PVC	SLOT SIZE 0.010	FILTER PACK #2/12	BORING SEAL Neat cement		WELL NO. MW-4



HYDR- ENVIRONMENTAL TECHNOLOGIES, INC.	SOIL BORING LOG B-4 AND WELL CONSTRUCTION LOG MW-4	PLATE A-4
	BP Oil Station No. 11120 6400 Dublin Blvd. Dublin, CA	JOB NO. 9-040
DATE: 10/16/92		
APPROVED BY: John Turney		

FIELD CREW HEALTH & SAFETY PLAN

PRE-ACTIVITY BRIEFING

Project Location: 6400 Dublin Blvd., Dublin, CA
Client: BP Oil Job No. 9-040

POTENTIAL PHYSICAL HAZARDS AT WORKSITE: Underground/overhead utility lines; flying/falling objects; pinch points/caught between objects; exertion or strain; lifting, slipping, tripping, falling, moving equipment and vehicle traffic at worksite; noise creating a hazardous situation; burns from steam or engine parts; heat stress or exhaustion. Trash with nails; broken glass, fires, explosion, electrical shock.

CHEMICAL HAZARDS: May involve exposure to methane gas at landfills; gasoline vapors, solvents, etc. Chemical hazards may include respiratory and skin contact.

RESPIRATORY PROTECTIVE EQUIPMENT: None required unless organic vapor levels in work area exceed current state or federal minimum, then half-face respirator with appropriate vapor filter cartridge as required.

PROTECTIVE CLOTHING AND EQUIPMENT: Normal work clothes: No shorts, hardhat mandatory for all personnel working at site; steel-toed boots recommended for geologist, required for driller and helper. Ear and eye protection as needed. Hazardous conditions require nitrile gloves, Tyvek coveralls, and respirators.

SITE SPECIFIC INSTRUCTIONS: Driller will examine all wires/cables and ropes daily. Drilling equipment will be maintained in safe operating condition and meet state safety requirements. Know location of first aid kit, fire extinguisher, and telephone. Block/chock rig as required. No drilling or working at site without project geologist being present. Use hand tools safely. Driller and helper will wear hard hat at all times while at job.

Driller's Signature Tom [Signature] Date: 10-13-92

Helper [Signature] Date: 10-13-92

Project Geologist Henry Hurkmans Date: 10-13-92

NEAREST HOSPITAL OR CLINIC Amador Valley Medical Clinic

HOSPITAL ADDRESS & DIRECTIONS FROM JOB SITE _____

From BP left on Dougherty, proceed through Dublin
Blvd to Amador Valley Blvd, clinic on right

EMERGENCY PROCEDURE: Begin appropriate first-aid,
Send person for help. Call 911



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94566 (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 6400 Dublin Blvd. Dublin - BP Service Station cross street = Dougherty

PERMIT NUMBER 92485 LOCATION NUMBER

CLIENT Name BP Oil Company #301 Address 16400 Southcenter Pkwy Phone (206) 575-4077 City Tukwila, WA Zip 98188

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT Name Hydro-Environmental Tech, Inc #243 Address 2363 Mariner Sq. Dr. Phone (910) 521-2684 City Alameda Zip 94501

A. GENERAL

- 1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date. 2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects. 3. Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS

- 1. Minimum surface seal thickness is two inches of cement grout placed by tremie. 2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic, irrigation, and monitoring wells unless a lesser depth is specially approved. C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings. D. CATHODIC. Fill hole above anode zone with concrete placed by tremie. E. WELL DESTRUCTION. See attached.

DESCRIPTION OF PROJECT Water Well Construction [checked] Geotechnical Investigation [checked] Cathodic Protection [] General [] Well Destruction [] Contamination []

PROPOSED WATER WELL USE Domestic [] Industrial [] Irrigation [] Municipal [] Monitoring [] Other [checked]

PROPOSED CONSTRUCTION Drilling Method: Mud Rotary [] Air Rotary [] Auger [checked] Cable [] Other []

DRILLER'S LICENSE NO. C57374152

WELL PROJECTS Drill Hole Diameter 8 in. Maximum Casing Diameter 7 in. Depth 37 ft. Surface Seal Depth 29 ft. Number 4

GEOTECHNICAL PROJECTS Number of Borings [] Maximum Hole Diameter [] in. Depth [] ft.

ESTIMATED STARTING DATE 10-12-92 ESTIMATED COMPLETION DATE 10-12-92

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

Approved Wyman Hong Date 30 Sep 92

APPLICANT'S SIGNATURE Henry Huchner HETI Date 9-28-92

APPENDIX B

**HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.
CALIFORNIA**

**DRILLING
WELL CONSTRUCTION
AND
SAMPLING PROTOCOLS**

November 1992

DRILLING, WELL CONSTRUCTION, AND SAMPLING PROTOCOLS

Drilling Protocol

Prior to any drilling activities, Hydro-Environmental Technologies, Inc. (HETI) will verify that necessary drilling permits have been secured.

Prior to drilling, underground and above ground utilities will be located using Underground Service Alert (USA) and site reconnaissance. To the extent possible, drilling will be conducted so that disruptions of normal business activities at the project site are minimized. HETI shall obtain and review available public data on subsurface geology and, if warranted, the location of wells within a quarter mile of the project site will be identified. Drilling equipment will be inspected for suitability and integrity prior to performing work.

Subsurface investigations are typically performed to assess the lateral and vertical extent of petroleum hydrocarbons or other contaminants which may be present in soils and groundwater. Drilling methods will be selected to optimize field data requirements and to be compatible with known or suspected subsurface geologic conditions.

Shallow soil borings will be drilled dry using a truck-mounted hollow-stem auger drilling rig, unless site conditions favor a different drilling method. Drilling and sampling methods will be consistent with ASTM Method D-1452-80. The auger size will be a minimum of 3-inches nominal outside diameter (O.D.) for borings not to be completed as wells. The auger size will be a minimum of 8-inches nominal O.D. for borings to be completed as wells. No drilling fluids will be used during this drilling method. All augers and drill rods will initially be thoroughly steam cleaned before arriving on-site, to prevent the introduction of contaminants from off-site, and augers and drill rods which are used will be steam cleaned between borings away from boring locations. Working components of the drilling rig (subs, collars and all parts of the rig chassis near the borehole) will also be steam cleaned. Cleaned augers, rods and other tools, if required, will be stored and covered when not in use. Decontamination of drilling equipment will consist of steam cleaning, and/or trisodium phosphate wash. Cleaning operations will be observed and supervised by a representative of HETI. The drilling rig will also be inspected by a representative of HETI to ensure that no fluids (hydraulic or lubricant) are leaking from the equipment.

Soil Sampling Protocol

Soil samples are typically collected at 5-foot intervals, from the ground surface to the total depth of the boring, with a California Modified split-spoon sampler driven 18 to 24 inches ahead of the lead auger by a 140-pound hammer falling a minimum of 30 inches. The sampler will be lined with clean brass or stainless steel tubes. The number of blows necessary to drive the sampler will be recorded on the boring log and well construction diagram (Plate A-1) to help evaluate the consistency of the materials encountered. Additional soil samples may be collected based on significant lithologic changes and/or potential chemical content. All equipment that contacts soil samples will be thoroughly cleaned prior to arrival at the project site and between each individual sample collection point on-site. New and used split-spoon samplers will be steam cleaned or washed with a trisodium phosphate or Alconox solution, rinsed with tap water, air dried or wiped dry with a clean towel. Soil removed from the top two liners (typically each 4 to 6 inches in length) and the end cone will be used for visual logging purposes and disposed with cuttings produced during the drilling operations. The bottom liner, if suitable, will be preserved for laboratory analysis. Soil samples from each sampling interval will be lithologically described, consistent with the Unified Soil Classification System, by a HETI geologist. The exact depth of all borings to the nearest 1/2-

foot will be determined in the field. Exploratory boring logs shall be prepared under the direction of a Registered Geologist or Professional Engineer.

Head-space analysis will be performed in the field to check for the presence of volatile organic compounds. Head-space analysis will be performed using an organic vapor meter (either flame-ionization or photo-ionization). The method used will be consistent with the method described by Fitzgerald (1989). Organic vapor concentrations will be recorded on the HETI Soil Boring Log (Figure 1). The selection of soil samples for chemical analysis are typically based on the following criteria:

- a. Soil discoloration
- b. Soil odors
- c. Visual confirmation of chemical in soil
- d. Depth with respect to underground tanks
- e. Depth with respect to groundwater
- f. Organic vapor meter reading

The soil sampler and liners will be cleaned with a trisodium-phosphate or Alconox solution, rinsed with clean tap water and air dried or wiped dry with a clean towel prior to each sampling event. Soil samples (full liners) selected for chemical analyses will be covered with aluminum foil or teflon tape and the ends will be sealed with plastic end caps. The end caps will then be taped to ensure a more secure seal. The samples will then be labeled and entered onto a Chain-of-Custody document, and placed in a cooler on blue ice (hard shell) for transport to a state certified analytical laboratory.

Where copper and zinc contamination are the subject of the investigation, stainless steel liners will be used in lieu of brass liners. Stainless steel liners will also be used when the client, additional sampling protocol or regulatory agencies require.

Soil borings will be backfilled (sealed) to the ground surface using either a neat cement or cement-bentonite grout mixture in accordance with appropriate local regulations.

Pending the outcome of the results of the laboratory analyses, excess drill cuttings will remain on-site and, when deemed necessary, covered with a plastic tarp or drummed. Confirmed uncontaminated soils may be appropriately disposed of on-site by the client. Soils found to contain concentrations of contaminants above applicable local or state limits will be placed in appropriately labeled 55-gallon D.O.T. drums or in a hazardous materials drop bin and left on-site for proper disposal by the client. At the clients request, HETI will act as the client's agent by assisting in the disposal of the contained material. In no case will HETI personel sign a Hazardous Waste Manifest.

Well Construction

Monitoring wells shall be installed using a truck-mounted hollow-stem auger drilling rig or an air or mud-rotary drilling rig. Typically, the hollow stem rig will be used for the installation of wells up to 100 feet deep, if subsurface conditions prove favorable. Wells greater than 100 feet in depth will typically be drilled using air or mud-rotary equipment. Mud-rotary equipment will typically be used when alternate methods have failed or proven ineffective.

Monitoring well casing and screen shall be constructed of a minimum of Schedule 40, flush joint, threaded, polyvinylchloride (PVC) pipe. The well screen will be factory mill-slotted. The screen length shall be determined in the field and shall be placed with the intent of setting the screened interval adjacent to the aquifer material. The screen length shall also be set with the intent of placing the top of the screened interval a minimum of 2 feet above the static water

level. All screens and casings used will be in a contaminant-free condition when placed in the ground. No thread lubrication shall be used, other than teflon tape or distilled water, during the connection of individual lengths of screened and solid well casing. Screen shall not be placed in a borehole that creates hydraulic interconnection of two or more distinctly separate aquifer units. Screen slot size will be chosen to be compatible with the encountered aquifer materials. The screen slot size will be chosen to retain a high percentage of the filter pack or natural formation. The remainder of the well casing, above the screened interval, shall be of solid riser casing. A sand pack shall be placed in the remaining annular space surrounding the well casing to a minimum of 1 foot above the screened interval. Sand pack shall not be placed such that it interconnects two or more distinctly separate aquifer units. Sand pack shall be chosen to be compatible with both the aquifer materials and the screen slot size. Sand pack shall consist of clean, washed, kiln dried silica sand. A minimum 1-foot thick bentonite pellet or bentonite slurry seal shall be placed above the sand pack. All bentonite shall be hydrated by either formation water or steam-distilled water. The remaining annular space above the bentonite seal shall be grouted with a neat cement or bentonite-neat cement mixture and shall be placed from the top of the bentonite pellet seal to within 6 inches of the top of the well. If used, the bentonite content of the mixture shall not exceed 5 percent by weight. Sand pack, bentonite, and cement seal levels will be confirmed during construction by measuring the remaining annular space with a calibrated weighted tape. If shallow water table conditions prevail, the screen interval will be placed such that the screen height above the static water level is reduced and a maximum possible surface seal can be achieved. A field boring log and well construction diagram (Plate A-1) shall be prepared by a representative of HETI for each well completed. Monitoring and extraction wells shall be constructed with Class-A cement/bentonite grout or bentonite pellets tremied into position as a base for the well casing if necessary. The well casing will be set within the aquifer according to the proposed function of the well and the chemistry of the potential contaminants.

In the event a monitoring well is required to be installed in an aquifer unit underlying an existing, shallower aquifer, the well will be completed in the lower aquifer such that only water from the lower aquifer is drawn into the well. The upper aquifer will be sealed by installing a steel conductor casing which extends to the base of the shallow aquifer. The steel casing will be tremied into position with an annular neat cement or cement-bentonite grout seal placed between the outside wall of the casing and the wall of the borehole. The cement grout will be allowed a minimum of 72 hours to set prior to advancing the boring beyond the sealed conductor casing and into the next aquifer. After 72 hours, the boring will be advanced below the seal and completed as a well as described above but within the steel conductor casing.

The tops of all well casings will be sealed and placed in a vandal resistant, traffic rated box to prevent entry of surface contamination, unauthorized entry and tampering.

Monitoring wells will be surveyed to obtain north-end casing elevations to the nearest ± 0.01 foot. Water level measurements will be recorded with an interface probe to the nearest ± 0.01 foot and referenced to either a project datum or mean sea level (MSL). A project site datum is typically chosen such that it will remain in the event the project site undergoes a physical change as a result of construction or other cultural disturbance. Where required, the wells will be surveyed by a licensed land surveyor relative to the nearest bench mark and relative to mean sea level. Typically, the establishment of a known, on-site reference by a licensed survey, is enough to allow for the remaining well top elevations to be determined using a survey level and rod. Unless directed otherwise by local regulatory agencies, the well top elevations will be established in this manner.

Well Development

After installation, all monitoring wells shall be developed to remove fine grained sediments from the well and to stabilize sand, gravel and disturbed aquifer materials in the annular area around the screened interval. Well development will be accomplished by air-lift pump, suction-lift pump, submersible pump, bladder pump, surge block, bailer or any combination of the above. All well development equipment will be decontaminated prior to development using a steam cleaner and/or trisodium-phosphate solution wash, clean water rinse, and steam distilled water rinse. Well development will continue until each well is relatively free of turbidity. The adequacy of well development will be assessed by a HETI geologist. Where appropriate, indicator parameters (pH, specific conductance, temperature, and turbidity) will be monitored during well development. Field instrument calibrations will be performed prior to use according to manufacturers specifications.

Well Head Completion and Site Clean-up

Monitoring wells shall be completed below grade unless special conditions exist that require above grade design. Monitoring well casing (including the well locking seal and cap) will be completed approximately two inches below the vandal resistant traffic rated road box cover. Except in areas where snow plows might be used, the road box cover shall be completed approximately one inch above the existing grade surface to allow for precipitation runoff. All concrete work, both inside and outside the road box, shall be completed with a smooth finish.

Above ground completions will be set inside a 2 to 3 foot tall locking steel protective casing. If traffic conditions dictate, three 4-inch diameter steel pipes will be set in concrete in a triangular pattern to act as bumper posts. The posts will be set 2 feet deep and will be filled with concrete. A four foot square, 3-inch thick concrete pad which slopes away from the well will be set around each well. Both the protective steel well casing and the bumper posts will be painted yellow.

The project site shall be left as clean as possible. All soils and excess concrete produced from each monitoring well will be placed in appropriate areas to be disposed as previously described. All monitoring well locations will either be broomed or washed down such that staining of the existing surface cover is minimized.

GROUNDWATER SAMPLING AND ANALYSIS

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by HETI for groundwater sampling and monitoring follow specific Quality Assurance/Quality Control (QA/QC) guidelines. Quality Assurance (QA) objectives have been established by HETI to develop and implement procedures for obtaining field data and evaluating water quality in an accurate, precise and complete manner so that sampling procedures and field measurements provide information that is comparable and representative of the actual field conditions. Quality Control (QC) is maintained by HETI by using specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. It is the goal of HETI to provide data that are accurate, precise, complete, comparable, and representative. The definitions for accuracy, precision, completeness, comparability, and representativeness are as follows:

1. Accuracy - the degree of agreement of a measurement with an accepted reference or true value.
2. Precision - a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of standard deviation.
3. Completeness - the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.
4. Comparability - the confidence with which one data set can be compared with another.
5. Representativeness - the degree to which a sample or group of samples reflect the characteristics of a media at a given sampling point. Also includes the degree to which a sampling point represents the actual parameter variations which are under study.

As part of the HETI QA/QC program, applicable federal, state and local reference documents are to be followed. The procedures outlined in these regulations, manuals, handbooks, guidance documents and journals are incorporated into the HETI sampling procedures to assure that: (1) groundwater samples are properly collected, (2) groundwater samples are identified, preserved, and transported in a manner such that they are representative of field conditions, and (3) chemical analyses of samples are accurate and reproducible.

**GUIDANCE AND REFERENCE DOCUMENTS USED
TO COLLECT GROUNDWATER SAMPLES**

U.S.E.P.A. - 339/9-51-002	NEIC Manual for Groundwater/ Subsurface Investigation at Hazardous Waste Sites
U.S.E.P.A. - 503/SW611	Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (August, 1977)
U.S.E.P.A. - 600/4-79-020	Methods for Chemical Analysis of Water and Wastes (1983)
U.S.E.P.A. - 600/4-82-029	Handbook for Sampling and Sample Preservation of Water and Wastewater (1982)
U.S.E.P.A. - SW-846#, 3rd Edition	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (November, 1986) and latter additions
40 CFR 136.3e Table II	Required Containers, Preservation Techniques, and Holding Times
Resources Conservation and Recovery Act (OSWER 9950.1)	Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986)
California Regional Water Quality Control Board (Central Valley Region)	A Compilation of Water Quality Goals (September, 1988); Updates (October, 1988)
California Regional Water Quality Control Board (North Coast, San Francisco Bay, and Central Valley)	Regional Board Staff Recommendations for Initial Evaluations and Investigation of Underground Tanks: Tri-Regional Recommendations (June, 1988)
California Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Board	Leaking Underground Fuel Tank Control (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)

State of California Water Resources
85), Control Board

Title 23 (Register #85.#33-8-17-
Subchapter 16: Underground Tank
Regulations; Article 3, Sections 2632
and 2634; Article 4, Section 2647
(October, 1986)

Santa Clara Valley Water District

Guidelines for Investigating Fuel
Leaks (March, 1989)

Santa Clara Valley Water District

Guidelines for Preparing or Reviewing
Sampling Plans for Soil and
Groundwater Investigation of Fuel
Contamination Sites (January, 1989)

Alameda County Water District

Groundwater Protection Program:
Guidelines for Groundwater and Soil
Investigations at Leaking
Underground Fuel Tank Sites (most recent

revision)

American Public Health
Association

Standard Methods for the Examination
of Water and Wastewaters, 16th
Edition

Analytical Chemistry (journal)

Principles of Environmental Analysis
Volume 55, pages 2212-18, December,
1983

American Petroleum Institute
Environmental Affairs Dept.,
June, 1983

Groundwater Monitoring & Sample Bias

The Bay Area Air Quality
Management District

Regulation 8 - Rule 40 & Rule 48

Because groundwater samples collected by HETI are analyzed in the parts per billion (ppb) range for many analytes, care is exercised to prevent contamination of samples. When volatile or semivolatile organic compounds are included for analysis, HETI sampling crew members will adhere to the following precautions in the field:

1. A new pair of clean, disposable, latex (or comparable material) gloves are to be worn for each well to be sampled.
2. When possible, samples will first be collected from wells known or suspected to contain the fewest contaminants, followed by wells in increasing order of degree of contamination.
3. All sample bottles and equipment are to be kept away from fuels and solvents. When possible, gasoline (used in generators and water pumps) is to be shipped to the project site in separate compartments of the same vehicle or in a separate vehicle as that in which sample bottles are shipped.

4. Sampling bailers are to be composed of polyethylene (when dedicated to the well), Teflon or stainless steel. Other materials, such as acrylic, may contain phthalate esters which can interfere with gas chromatography (GC) analyses. Well purging may be performed with PVC bailers.
5. Volatile organic groundwater samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples). Sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle. The Teflon side of the septum (in cap) is positioned against the meniscus and the cap is screwed on tightly. The sample is then inverted and lightly tapped while the sampler inspects the contents of the bottle for an air bubble. The absence of an air bubble indicates a successful seal. If a bubble is evident, the cap is removed and more water is added to the sample. The inspection procedure is repeated and if bubbles persist, the vial is discarded in a container designated for used and broken vials and bottles and the sample filling procedure is repeated with another vial.
6. Extra vials shall be available for use in the event of dropped bottles and/or caps. Any bottle which has come in contact with the ground shall be considered contaminated and shall not be used. When replacing septa, or if septa become inverted, care shall be taken to assure that the Teflon seal faces the interior of the bottle.
7. All preservatives shall be provided by the contract analytical laboratory.

Laboratory and field handling procedures of samples may be monitored by including QC samples for analysis with sample lots from a project site. QC samples may include any combination of the following:

1. Trip Blank - Used for purgable organic compounds only; QC samples shall be collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic free water. Trip blanks should be sent to the project site, and travel with the samples from the project site. Trip blanks are not opened, and are returned from the project site with the samples from the project site for analysis.
2. Field Blank - Prepared in the field using steam-distilled water. Field blank QC samples shall accompany project site samples to the laboratory and shall be analyzed for the same chemical parameters as those samples taken from the project site.
3. Equipment Blank - Equipment Blank QC samples shall be prepared in the field using field equipment rinsate between two different wells after the equipment has been washed and rinsed. The equipment blank will consist of deionized water retained in the sampling equipment. These QC samples will only be taken when a dedicated bailer is not used for sampling.
4. Duplicates - Duplicate QC samples shall be collected "second samples" from a selected well and project site. Duplicates shall be collected as either split samples or second-run samples (i.e. later date) from the same well.

The number and types of QC samples shall be determined by HETI on a site-specific basis.

GROUNDWATER SAMPLE COLLECTION

This section describes the routine procedures followed by HETI while collecting groundwater samples for chemical analysis. These procedures include decontamination, water level measurements, well purging, physical parameter measurements, sample collection, sample preservation, and sample handling. Critical sampling objectives for HETI are to:

1. Collect groundwater samples which are representative of the sampled matrix.
2. Maintain sample integrity from the time of sample collection to delivery to the analytical laboratory.

Sample analyses, methods, containers, preservation, and holding times are presented in Table A-1.

Decontamination Procedures

All physical parameter measuring and sampling equipment shall be decontaminated prior to measurement and sample collection using a trisodium phosphate or Alconox solution wash, followed by two separate rinses in tap water, followed by one rinse in steam-distilled water. Any sampling equipment surfaces or parts that might absorb specific contaminants, such as plastic pump valves, impellers, etc., are to be cleaned in the same manner.

Sample bottles, bottle caps, and septa used for sampling volatile organics are thoroughly pre-cleaned in either the laboratory or the factory. All appropriate measures shall be taken to assure continued sterility of the containers issued by the contract laboratory prior to usage at the project site.

During field sampling, equipment which has been placed in a well shall be decontaminated by washing with a trisodium-phosphate or Alconox solution followed by two rinses in tap water and one rinse in steam-distilled water.

Water Level Measurements

Prior to purging and sampling any wells, the static-water level shall be measured by use of an electronic sounder and/or calibrated portable oil-water interface probe. Both static water level and separate phase product thickness shall be measured and noted to the nearest ± 0.01 foot. Interface probe results shall be confirmed by sampling the top of the water column with a clear bailer and measuring any floating product thickness to the nearest ± 0.01 foot with an engineers scale tape. In all cases a clear bailer sample will be taken from each well to check for color, sheen and undetected floating product. If floating product of any measureable thickness is observed, no sampling will be performed for that well. If visible product sheen is observed, sampling shall proceed under normal protocols.

The line used to lower the bailer shall be discarded after each use to preclude the possibility of cross contamination. Field observations (e.g., well integrity, product odor, turbidity, water color, odors, etc.) shall be recorded on the HETI Purge/Sample Sheet (Plate A-2). Before and after the use of the electric sounder, interface probe, non-dedicated bailer, or any other down well equipment, each will be decontaminated by washing in a trisodium phosphate or Alconox solution, followed by a double rinse with tap water, followed by a rinse with steam-distilled water.

Well Purging

Before sampling commences, well casing storage water and interstitial water in the artificial sand pack shall be purged from the well using: (1) a positive displacement bladder pump constructed of inert non-wetting Teflon and stainless steel; (2) a pneumatic-airlift pumping system; (3) a centrifugal pumping system; or (4) a PVC, Teflon or stainless steel bailer. Methods of purging will be assessed based on the well size, location, depth, accessibility, and known chemical conditions. Individual well purge volumes are calculated from the casing volumes. In general, a minimum of 3 to 5 casing volumes will be purged. Wells which dewater or demonstrate slow recharge capacities (i.e., low yield wells which only recover to 70 percent of initial water column height after 1 hour) during purging activities may be sampled after fewer than 3 to 5 purging cycles. If a low yield well is to be sampled, sampling shall not take place until at least 70 percent of the previously measured water column has been replaced by recharge. Monitoring wells shall be purged according to the protocol flowchart presented in Plate A-3. Water removed from the wells will either be disposed or stored in 55-gallon DOT drums for future disposal according to procedures outlined for contaminated soil cuttings in the Soil Sampling Protocol section above. Where appropriate, physical parameters (pH, specific conductance, and temperature) will be monitored by HETI field crew during well purging operations. If necessary, purging may continue until all three physical parameters have stabilized. Stability shall be defined as a change of less than 0.2 pH units, less than 10 percent in micro mhos, and less than 1.0 degree Centigrade. The pH meters shall be read to the nearest ± 0.1 pH units. Specific conductance meters shall be read to the nearest ± 10 micro-mhos per centimeter. Both types of meters shall be calibrated daily to manufacturer's specifications. Temperature shall be read to the nearest ± 0.1 degree centigrade. Field data collected while developing, purging and sampling the wells will be entered onto the HETI Purge/Sample Sheet (Plate A-2). Copies of the Purge/Sample Sheets will be reviewed for accuracy and completeness for each well sampled.

DOCUMENTATION

Sample Container Labels

Each sample container shall be labeled immediately after the sample is collected and sealed. The label shall include:

- Company Name (HETI)
- Source (i.e., well number or code)
- Sampler's identification
- Project number
- Date and time of collection
- Type of preservation (if any) used

Field Sampling Data Sheets

In the field, the HETI sampling crew will record the following information on the Purge/Sample Sheet (Plate A-2) for each well sampled:

- Project number
- Client
- Location
- Source (i.e., well number or code)
- Time and date of development, purging and sampling
- Well accessibility and integrity
- Pertinent well data (e.g., total depth, product thickness, static water level)
- Physical parameters when appropriate (e.g., specific conductance, pH, temperature) - may be more than one reading
- Gallons and well casing volumes purged

Chain-of-Custody

A chain-of-custody record shall be completed and will accompany every shipment of samples to the analytical laboratory in order to establish documentation tracing sample possession from the time of collection until delivery to the laboratory. The record will contain the following information:

- Sample or station number or code (ID)
- Signature of the collector, sampler, or recorder
- Date and time of collection
- Place of collection (project address and name of business)
- Sample type (soil or water)
- Type of analysis requested
- Signatures of persons involved in chain of possession (in chronological order)
- Dates and times of individual possession (inclusive)
- Laboratory comments regarding the sample receptacle conditions

Samples will always be accompanied by a Chain-of-Custody record. When transferring the samples, the individuals relinquishing and receiving the samples will sign, date and note the time on the Chain-of-Custody record.

Sample Collection, Handling, Storage and Transport

All water samples will be collected in an order such that those parameters most sensitive to volatilization will be sampled first. A general order of collection for some common groundwater parameters is as follows:

- Volatile Organic Compounds (VOC's)
- Total Organic Halogens (TOH)
- Total Organic Carbon (TOC)
- Extractable Organics
- Total Metals
- Dissolved Metals
- Phenols
- Sulfate and Chloride
- Nitrate and Ammonia
- Turbidity

All samples from the same well shall be collected immediately after purging or when the well recovers to 70 percent of the original water column height. All samples from one sampling set from a single well should be collected on the same day.

All chemical sample handling and storage will be conducted under the direction of HETT's consulting analytical chemist. All laboratory chemical testing will be accomplished by a state approved analytical laboratory.

All water samples will be held at 4°C by packing them in a water-tight container inside an ice chest and covering with hard shelled "blue ice™". In no event shall the time between sample collection and delivery to the contract laboratory be greater than 72 hours. Preservatives will not be added to any sample by the sampling crew, unless instructed by the consulting analytical chemist. If added in the field, preservatives shall be supplied by the contract analytical laboratory. No one will open the samples other than laboratory personnel who will perform the specified chemical analyses.

If it is necessary for samples or sample ice chests to leave the immediate control of the sampling crew prior to delivery to the laboratory or laboratory courier, such as shipment by a common carrier (e.g., UPS™), a custody seal will be placed on each sample container and/or sample chest. Custody seals will be placed to ensure that the samples have not been tampered with during shipment and will contain the samplers signature, the date and time the seal was emplaced.

TABLE A-1

SAMPLE ANALYSIS METHODS, CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

<u>Parameter</u>	<u>Analytical Method</u>	<u>Reporting Units</u>	<u>Container*</u>	<u>Preservation†</u>	<u>Maximum Holding Time</u>
Total Petroleum Hydrocarbons (low to med. b.p. i.e. gasoline)	EPA 8015 (DHS modified)	ppb ug/l	40ml glass vial, Teflon lined septum	4°C HCl to pH<2**	14 days
Benzene Toluene Ethylbenzene Xylenes (BTEX)	EPA 8020	ppb ug/l	40ml glass vial, Teflon lined septum	4°C HCl to pH<2**	7 days(w/o preservative) 14 days (w/preservative)
Oil & Grease	SM 503A&E	ppb ug/l	1L glass jar, Teflon lined cap	4°C H2SO4 to pH<2	28 days
Total Petroleum Hydrocarbons (high. b.p. i.e. diesel)	EPA 8015 (DHS modified)	ppb ug/l	1L glass jar, Teflon lined cap	4°C	14 days
Halogenated Volatile Organics (chlorinated solvents)	EPA 8010	ppb ug/l	40ml glass vial, Teflon lined septum	4°C	14 days
Non-Chlorinated Solvents	EPA 8020	ppb ug/l	as above	4°C	14 days
Volatile Organics (GC/MS)	EPA 8240	ppb ug/l	as above	4°C	14 days
Semi-Volatile Organics (GC/MS)	EPA 8270	ppb ug/l	as above	4°C	14 days
Metals	ICP-EPA 200.7 or A.A.EPA-	ppb ug/l	100 ml	4°C HNO3 to pH<2	6 months

* Containers listed are for water - soil containers are to be brass or stainless steel tubes with plastic end caps.




† Applies only to liquid samples.

** May vary depending on lab requirements.

SITE/LOCATION		BEGUN	BORING DIAMETER	ANGLE/BEARING	BORING NO
DRILLING CONTRACTOR		COMPLETED	FIRST ENCOUNTERED WATER DEPTH		
OPERATOR		LOGGED BY	STATIC WATER DEPTH/DATE		
DRILL MAKE & MODEL		SAMPLING METHOD			BOTTOM OF BORING
WELL MATERIAL	SLOT SIZE	FILTER PACK	BORING SEAL		WELL NO.

BLOWS/ FOOT	FIELD HEAD- SPACE *	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					
		26					
		27					
		28					
		29					
		30					

* PD
(ppm)

HYDR  ENVIR  TECHNOLOGIES, INC. 	SOIL BORING LOG MW-4 AND WELL CONSTRUCTION MW-4	PLATE A-1
		JOB NO.
DATE:		
APPROVED BY:		

PURGED/SAMPLED BY: _____ DATE: _____

GAUGING DATA:

Depth to bottom: _____ ft.

Depth to water: _____ ft.

Saturated Thickness: _____ ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume _____ gallons

volumes to purge x _____ vols.

*Total volume to purge = _____ gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer/ Submersible pump/ Suction lift pump/ _____
(circle one)

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH

Color: _____

Turbidity: _____

Recharge: _____

SPP _____ ft.

SAMPLING DATA:

Sampling method: Dedicated bailer / _____

Sample for: (circle)

- TPHg/BTEX METALS TOC 8010
- TPHd O-Pb TEL 8020
- TPH mo Total Pb EDB 8240
- 601 602 Nitrates 8260 8270
- Other: _____



MONITORING WELL PURGE/SAMPLE SHEET
WELL # _____
LOCATION _____

PLATE
A-2

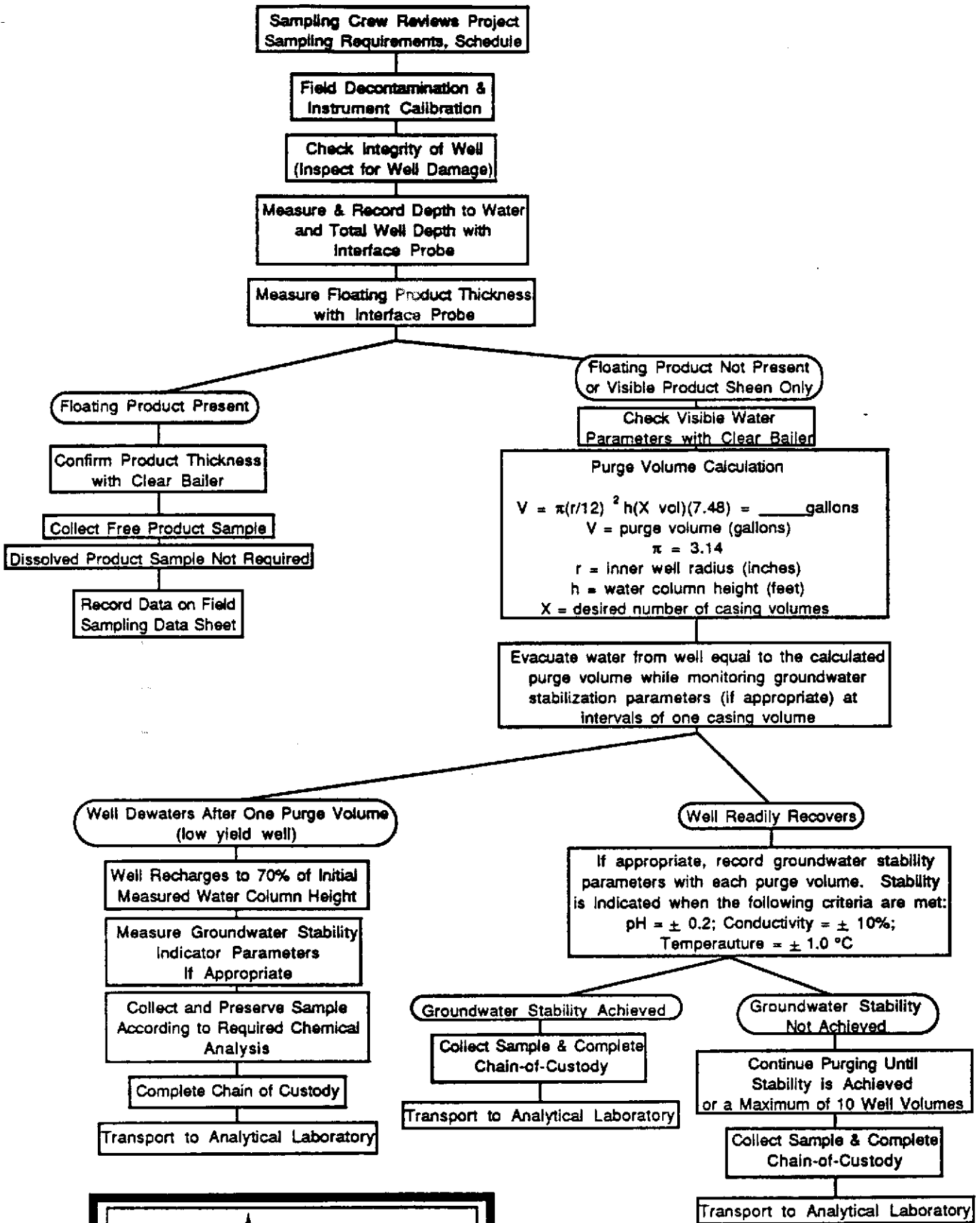


PLATE A-3
WATER SAMPLING
FLOWCHART

APPENDIX C

**WATER TABLE
ELEVATION DATA**

BP Service Station No. 11120
6400 Dublin Boulevard
Dublin, California

Monitoring well number	Top of casing elevation (ft)	Depth to water (ft)	Ground water elevation (ft)
MW-1	328.96	8.19	320.77
MW-2	328.50	7.64	320.86
MW-3	329.36	8.43	320.93
MW-4	329.45	8.61	320.84

Notes:

Groundwater gauging conducted by HETI on 10/27/92.

All monitoring wells are 2 inches in diameter.

Top of casing data is based on temporary benchmark (assumed elevation = 330 ft)--
west corner of lampost located in site's southeast planter box.

PURGED/SAMPLED BY: HH/TS

DATE: 10-27-92

GAUGING DATA:

Depth to bottom: 18.42 ft.
Depth to water: 8.19 ft.
Saturated Thickness: 10.23 ft.

Conversion	
diam.	gals/ft
<u>2 in.</u>	<u>x 0.16</u>
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.63 gallons
volumes to purge x 10 vols.
*Total volume to purge = 16.5 gallons
* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump / Suction lift pump / _____
(circle one)

dry →

Time	Volume (gallons)	Temp. (°F) °C	Conductivity (mS/cm)	pH
9:51	0	—	—	—
9:56	5	22.5	2.94 ms	8.54
9:59	10	20.8	2.77 ms	7.89

Color: +an

Turbidity: moderate

Recharge: poor

SPP ∅ ft.

SAMPLING DATA:

Sampling method: Dedicated bailer

Sample for: (circle)

- TPH_g/BTEX
 - METALS
 - TOC 8010
 - TPH_h
 - O-Pb
 - TEL 8020
 - TPH_{no}
 - Total Pb
 - ED8 8240
 - 601
 - 602
 - Nitrates 8260 8270
- Other: _____



MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-1
LOCATION 6400 Dublin Blvd.
Dublin, CA

JOB NO. 9-040

PURGED/SAMPLED BY: HH/TS

DATE: 10-27-92

GAUGING DATA:

Depth to bottom: 18.40 ft.

Depth to water: 7.64 ft.

Saturated Thickness: 10.76 ft.

Conversion	
diam.	gals/ft.
<u>2 in.</u>	<u>x 0.16</u>
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.72 gallons

volumes to purge x 10 vols.

*Total volume to purge = 17.5 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump / Suction lift pump / _____
(circle one)

dry →

Time	Volume (gallons)	Temp. (°C)	Conductivity (mS/cm)	pH
10:05	0	—	—	—
10:11	5	23.8	10.53 ms	7.26
10:17	10	22.7	9.51 ms	7.08

Color: tan

Turbidity: moderate

Recharge: poor

SPP ∅ ft.

SAMPLING DATA:

Sampling method: Dedicated bailer

Sample for: (circle)

- IPHg/STEX METALS TOC 8010
- IPHd O-Pb TEL 8020
- IPH no Total Pb EDB 8240
- 601 602 Nitrates 8260 8270
- Other: _____



MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-2
LOCATION 6400 Dublin Blvd.
Dublin, CA

JOB NO. 9-040

PURGED/SAMPLED BY: HH/TS

DATE: 10-27-92

GAUGING DATA:

Depth to bottom: 18.62 ft.
 Depth to water: 8.43 ft.
 Saturated Thickness: 10.19 ft.

Conversion	
diam.	gals/ft.
<u>2 in.</u>	<u>x 0.16</u>
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 163 gallons
 # volumes to purge x 10 vols.
 *Total volume to purge = 16.5 gallons
 * unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump / Suction lift pump / _____
 (circle one)

Time	Volume (gallons)	Temp. (°F) °C	Conductivity (mS/cm)	pH
10:27	0	—	—	—
10:32	5	23.2	5.25 ms	7.42
10:35	10	23.8	5.07 ms	7.14
10:39	12	23.4	5.06 ms	7.16

Color: tan Turbidity: moderate
 Recharge: poor SPP 0 ft.

SAMPLING DATA:

Sampling method: Dedicated bailer

- Sample for: (circle)
- TPH_g/BTEX METALS TOC 8010
 - TPH_d O-Pb TEL 8020
 - TPH_{no} Total Pb ED8 8240
 - 601 602 Nitrates 8260 8270
- Other: _____



MONITORING WELL PURGE/SAMPLE SHEET
 WELL # MW-3
 LOCATION 6400 Dublin Blvd.
Dublin, CA

JOB NO.
9-040

PURGED/SAMPLED BY: HH/TS

DATE: 10-27-92

GAUGING DATA:

Depth to bottom: 18.32 ft.

Depth to water: 8.61 ft.

Saturated Thickness: 9.71 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.55 gallons

volumes to purge x 10 vols.

*Total volume to purge = 15.5 gallons

* unless chemical parameters stabilize earlier

PURGING DATA:

Purge method: PVC bailer / Submersible pump / Suction lift pump / _____
(circle one)

Time	Volume (gallons)	Temp. (°C)	Conductivity (mS/cm)	pH
1044	0	—	—	—
1051	5	24°C	3.64 _{uS}	7.26
1054	10	23.8°C	3.35	7.21
1059	15	23.5°C	3.06	7.21

Color: Tan Turbidity: moderate

Recharge: ~~low~~ moderate SPP 0 ft.

SAMPLING DATA:

Sampling method: Dedicated bailer

Sample for: (circle)

- TPHg/BTEX METALS TOC 8010
- TPHd C-Pb TEL 8020
- TPH mo Total Pb EDB 8240
- 601 602 Nitrates 8260 8270
- Other: _____



MONITORING WELL PURGE/SAMPLE SHEET

WELL # MW-4
LOCATION 6400 Dublin Blvd. Dublin, CA

JOB NO. 9-040

APPENDIX D



REPORT OF LABORATORY ANALYSIS

Hydro-Environmental Technologies, Inc.
 2363 Mariner Square Dr., Suite 243
 Alameda, CA 94501

October 28, 1992
 PACE Project Number: 421015513

Attn: Mr. Markus Niebanck

Client Reference: B.P. #11120

PACE Sample Number: 70 0226023
 Date Collected: 10/13/92
 Date Received: 10/15/92
 Client Sample ID: B-1-5.5'

Parameter	Units	MDL	DATE ANALYZED
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/22/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	10/22/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/22/92
Benzene	ug/kg wet	5.0	ND	10/22/92
Toluene	ug/kg wet	5.0	ND	10/22/92
Ethylbenzene	ug/kg wet	5.0	ND	10/22/92
Xylenes, Total	ug/kg wet	5.0	ND	10/22/92

EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	ND	10/26/92
Date Extracted			10/23/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND	10/21/92
Date Extracted			10/20/92	

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/kg	20	ND	10/16/92
Chloromethane	ug/kg	20	ND	10/16/92
Vinyl Chloride	ug/kg	20	ND	10/16/92
Bromomethane	ug/kg	20	ND	10/16/92
Chloroethane	ug/kg	20	ND	10/16/92
Trichlorofluoromethane	ug/kg	20	ND	10/16/92
1,1-Dichloroethene	ug/kg	5.0	ND	10/16/92
Methylene Chloride	ug/kg	20	ND	10/16/92
trans-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
cis-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
1,1-Dichloroethane	ug/kg	5.0	ND	10/16/92
Chloroform	ug/kg	5.0	ND	10/16/92
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	10/16/92



REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
Page 2

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226023
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-1-5.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Carbon Tetrachloride	ug/kg	5.0	ND	10/16/92
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	10/16/92
Trichloroethene (TCE)	ug/kg	5.0	ND	10/16/92
1,2-Dichloropropane	ug/kg	5.0	ND	10/16/92
Bromodichloromethane	ug/kg	5.0	ND	10/16/92
2-Chloroethyl vinyl ether	ug/kg	5.0	ND	10/16/92
cis-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
trans-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
1,1,2-Trichloroethane	ug/kg	5.0	ND	10/16/92
Tetrachloroethene	ug/kg	5.0	ND	10/16/92
Dibromochloromethane	ug/kg	5.0	ND	10/16/92
Chlorobenzene	ug/kg	5.0	ND	10/16/92
Bromoform	ug/kg	5.0	ND	10/16/92
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	10/16/92
1,3-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,4-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,2-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
Bromochloromethane (Surrogate Recovery)			76%	10/16/92
1,4-Dichlorobutane (Surrogate Recovery)			57%	10/16/92

Mr. Markus Niebanck
 Page 3

October 28, 1992
 PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226040
 Date Collected: 10/13/92
 Date Received: 10/15/92
 Client Sample ID: B-1-10.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/22/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	10/22/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/22/92
Benzene	ug/kg wet	5.0	ND	10/22/92
Toluene	ug/kg wet	5.0	ND	10/22/92
Ethylbenzene	ug/kg wet	5.0	ND	10/22/92
Xylenes, Total	ug/kg wet	5.0	ND	10/22/92

EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	ND	10/20/92
Date Extracted			10/19/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND	10/21/92
Date Extracted			10/20/92	

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/kg	20	ND	10/16/92
Chloromethane	ug/kg	20	ND	10/16/92
Vinyl Chloride	ug/kg	20	ND	10/16/92
Bromomethane	ug/kg	20	ND	10/16/92
Chloroethane	ug/kg	20	ND	10/16/92
Trichlorofluoromethane	ug/kg	20	ND	10/16/92
1,1-Dichloroethene	ug/kg	5.0	ND	10/16/92
Methylene Chloride	ug/kg	20	ND	10/16/92
trans-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
cis-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
1,1-Dichloroethane	ug/kg	5.0	ND	10/16/92
Chloroform	ug/kg	5.0	ND	10/16/92

1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	10/16/92
Carbon Tetrachloride	ug/kg	5.0	ND	10/16/92
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	10/16/92
Trichloroethene (TCE)	ug/kg	5.0	ND	10/16/92



REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
Page 4

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226040
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-1-10.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/kg	5.0	ND	10/16/92
Bromodichloromethane	ug/kg	5.0	ND	10/16/92
2-Chloroethylvinyl ether	ug/kg	5.0	ND	10/16/92
cis-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
trans-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
1,1,2-Trichloroethane	ug/kg	5.0	ND	10/16/92
Tetrachloroethene	ug/kg	5.0	ND	10/16/92
Dibromochloromethane	ug/kg	5.0	ND	10/16/92
Chlorobenzene	ug/kg	5.0	ND	10/16/92
Bromoform	ug/kg	5.0	ND	10/16/92
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	10/16/92
1,3-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,4-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,2-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
Bromochloromethane (Surrogate Recovery)			50%	10/16/92
1,4-Dichlorobutane (Surrogate Recovery)			54%	10/16/92



REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
Page 5

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226058
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-2-5.5'

Parameter	Units	MDL	DATE ANALYZED
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/23/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	10/23/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/23/92
Benzene	ug/kg wet	5.0	ND	10/23/92
Toluene	ug/kg wet	5.0	ND	10/23/92
Ethylbenzene	ug/kg wet	5.0	ND	10/23/92
Xylenes, Total	ug/kg wet	5.0	ND	10/23/92

EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	ND	10/20/92
Date Extracted			10/19/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND	10/21/92
Date Extracted			10/20/92	

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/kg	20	ND	10/16/92
Chloromethane	ug/kg	20	ND	10/16/92
Vinyl Chloride	ug/kg	20	ND	10/16/92
Bromomethane	ug/kg	20	ND	10/16/92
Chloroethane	ug/kg	20	ND	10/16/92
Trichlorofluoromethane	ug/kg	20	ND	10/16/92
1,1-Dichloroethene	ug/kg	5.0	ND	10/16/92
Methylene Chloride	ug/kg	20	ND	10/16/92
trans-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
cis-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
1,1-Dichloroethane	ug/kg	5.0	ND	10/16/92
Chloroform	ug/kg	5.0	ND	10/16/92
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	10/16/92
Carbon Tetrachloride	ug/kg	5.0	ND	10/16/92
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	10/16/92
Trichloroethene (TCE)	ug/kg	5.0	ND	10/16/92

REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
Page 6

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226058
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-2-5.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/kg	5.0	ND	10/16/92
Bromodichloromethane	ug/kg	5.0	ND	10/16/92
2-Chloroethylvinyl ether	ug/kg	5.0	ND	10/16/92
cis-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
trans-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
1,1,2-Trichloroethane	ug/kg	5.0	ND	10/16/92
Tetrachloroethene	ug/kg	5.0	ND	10/16/92
Dibromochloromethane	ug/kg	5.0	ND	10/16/92
Chlorobenzene	ug/kg	5.0	ND	10/16/92
Bromoform	ug/kg	5.0	ND	10/16/92
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	10/16/92
1,3-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,4-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,2-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
Bromochloromethane (Surrogate Recovery)			65%	10/16/92
1,4-Dichlorobutane (Surrogate Recovery)			47%	10/16/92

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October 28, 1992
 PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226074
 Date Collected: 10/13/92
 Date Received: 10/15/92
 Client Sample ID: B-2-10.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/23/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	10/23/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/23/92
Benzene	ug/kg wet	5.0	ND	10/23/92
Toluene	ug/kg wet	5.0	ND	10/23/92
Ethylbenzene	ug/kg wet	5.0	ND	10/23/92
Xylenes, Total	ug/kg wet	5.0	ND	10/23/92

EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	ND	10/20/92
Date Extracted			10/19/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND	10/21/92
Date Extracted			10/20/92	

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/kg	20	ND	10/16/92
Chloromethane	ug/kg	20	ND	10/16/92
Vinyl Chloride	ug/kg	20	ND	10/16/92
Bromomethane	ug/kg	20	ND	10/16/92
Chloroethane	ug/kg	20	ND	10/16/92
Trichlorofluoromethane	ug/kg	20	ND	10/16/92
1,1-Dichloroethene	ug/kg	5.0	ND	10/16/92
Methylene Chloride	ug/kg	20	ND	10/16/92
trans-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
cis-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
1,1-Dichloroethane	ug/kg	5.0	ND	10/16/92
Chloroform	ug/kg	5.0	ND	10/16/92

1,1,1-Trichloroethane (TCA)

Carbon Tetrachloride	ug/kg	5.0	ND	10/16/92
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	10/16/92
Trichloroethene (TCE)	ug/kg	5.0	ND	10/16/92

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October 28, 1992
 PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226074
 Date Collected: 10/13/92
 Date Received: 10/15/92
 Client Sample ID: B-2-10.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/kg	5.0	ND	10/16/92
Bromodichloromethane	ug/kg	5.0	ND	10/16/92
2-Chloroethylvinyl ether	ug/kg	5.0	ND	10/16/92
cis-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
trans-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
1,1,2-Trichloroethane	ug/kg	5.0	ND	10/16/92
Tetrachloroethene	ug/kg	5.0	ND	10/16/92
Dibromochloromethane	ug/kg	5.0	ND	10/16/92
Chlorobenzene	ug/kg	5.0	ND	10/16/92
Bromoform	ug/kg	5.0	ND	10/16/92
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	10/16/92
1,3-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,4-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,2-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
Bromochloromethane (Surrogate Recovery)			90%	10/16/92
1,4-Dichlorobutane (Surrogate Recovery)			77%	10/16/92



REPORT OF LABORATORY ANALYSIS

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October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226090
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-3-5.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/23/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	10000	10/23/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/23/92
Benzene	ug/kg wet	5.0	69	10/23/92
Toluene	ug/kg wet	5.0	580	10/23/92
Ethylbenzene	ug/kg wet	5.0	230	10/23/92
Xylenes, Total	ug/kg wet	5.0	1800	10/23/92

EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	ND	10/20/92
Date Extracted			10/19/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND	10/21/92
Date Extracted			10/20/92	

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/kg	20	ND	10/16/92
Chloromethane	ug/kg	20	ND	10/16/92
Vinyl Chloride	ug/kg	20	ND	10/16/92
Bromomethane	ug/kg	20	ND	10/16/92
Chloroethane	ug/kg	20	ND	10/16/92
Trichlorofluoromethane	ug/kg	20	ND	10/16/92
1,1-Dichloroethene	ug/kg	5.0	ND	10/16/92
Methylene Chloride	ug/kg	20	ND	10/16/92
trans-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
cis-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
1,1-Dichloroethane	ug/kg	5.0	ND	10/16/92
Chloroform	ug/kg	5.0	ND	10/16/92

1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	10/16/92
Carbon Tetrachloride	ug/kg	5.0	ND	10/16/92
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	10/16/92
Trichloroethene (TCE)	ug/kg	5.0	ND	10/16/92



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October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226090
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-3-5.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/kg	5.0	ND	10/16/92
Bromodichloromethane	ug/kg	5.0	ND	10/16/92
2-Chloroethylvinyl ether	ug/kg	5.0	ND	10/16/92
cis-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
trans-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
1,1,2-Trichloroethane	ug/kg	5.0	ND	10/16/92
Tetrachloroethene	ug/kg	5.0	ND	10/16/92
Dibromochloromethane	ug/kg	5.0	ND	10/16/92
Chlorobenzene	ug/kg	5.0	ND	10/16/92
Bromoform	ug/kg	5.0	ND	10/16/92
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	10/16/92
1,3-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,4-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,2-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
Bromochloromethane (Surrogate Recovery)			72%	10/16/92
1,4-Dichlorobutane (Surrogate Recovery)			61%	10/16/92

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October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226104
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-3-10.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/23/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	22000	10/23/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/23/92
Benzene	ug/kg wet	5.0	43	10/23/92
Toluene	ug/kg wet	5.0	260	10/23/92
Ethylbenzene	ug/kg wet	5.0	410	10/23/92
Xylenes, Total	ug/kg wet	5.0	1800	10/23/92

EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	ND	10/20/92
Date Extracted			10/19/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND	10/21/92
Date Extracted			10/20/92	

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/kg	20	ND	10/16/92
Chloromethane	ug/kg	20	ND	10/16/92
Vinyl Chloride	ug/kg	20	ND	10/16/92
Bromomethane	ug/kg	20	ND	10/16/92
Chloroethane	ug/kg	20	ND	10/16/92
Trichlorofluoromethane	ug/kg	20	ND	10/16/92
1,1-Dichloroethene	ug/kg	5.0	ND	10/16/92
Methylene Chloride	ug/kg	20	ND	10/16/92
trans-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
cis-1,2-Dichloroethene	ug/kg	5.0	ND	10/16/92
1,1-Dichloroethane	ug/kg	5.0	ND	10/16/92
Chloroform	ug/kg	5.0	ND	10/16/92
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	10/16/92
Carbon Tetrachloride	ug/kg	5.0	ND	10/16/92
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	10/16/92
Trichloroethene (TCE)	ug/kg	5.0	ND	10/16/92

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 PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226104
 Date Collected: 10/13/92
 Date Received: 10/15/92
 Client Sample ID: B-3-10.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/kg	5.0	ND	10/16/92
Bromodichloromethane	ug/kg	5.0	ND	10/16/92
2-Chloroethylvinyl ether	ug/kg	5.0	ND	10/16/92
cis-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
trans-1,3-Dichloropropene	ug/kg	5.0	ND	10/16/92
1,1,2-Trichloroethane	ug/kg	5.0	ND	10/16/92
Tetrachloroethene	ug/kg	5.0	ND	10/16/92
Dibromochloromethane	ug/kg	5.0	ND	10/16/92
Chlorobenzene	ug/kg	5.0	ND	10/16/92
Bromoform	ug/kg	5.0	ND	10/16/92
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	10/16/92
1,3-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,4-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
1,2-Dichlorobenzene	ug/kg	5.0	ND	10/16/92
Bromochloromethane (Surrogate Recovery)			69%	10/16/92
1,4-Dichlorobutane (Surrogate Recovery)			66%	10/16/92

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October 28, 1992
 PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226120
 Date Collected: 10/13/92
 Date Received: 10/15/92
 Client Sample ID: B-4-5.5'

Parameter	Units	MDL		DATE ANALYZED
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/23/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	20000	350000	10/23/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/23/92
Benzene	ug/kg wet	100	800	10/23/92
Toluene	ug/kg wet	100	7900	10/23/92
Ethylbenzene	ug/kg wet	100	5800	10/23/92
Xylenes, Total	ug/kg wet	100	31000	10/23/92

EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	140	10/21/92
Date Extracted			10/19/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	380	10/21/92
Date Extracted			10/20/92	

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/kg	100	ND	10/19/92
Chloromethane	ug/kg	100	ND	10/19/92
Vinyl Chloride	ug/kg	100	ND	10/19/92
Bromomethane	ug/kg	100	ND	10/19/92
Chloroethane	ug/kg	100	ND	10/19/92
Trichlorofluoromethane	ug/kg	100	ND	10/19/92
1,1-Dichloroethene	ug/kg	25	ND	10/19/92
Methylene Chloride	ug/kg	100	ND	10/19/92
trans-1,2-Dichloroethene	ug/kg	25	ND	10/19/92
cis-1,2-Dichloroethene	ug/kg	25	ND	10/19/92
1,1-Dichloroethane	ug/kg	25	ND	10/19/92
Chloroform	ug/kg	25	ND	10/19/92
1,1,1-Trichloroethane (TCA)	ug/kg	25	ND	10/19/92
Carbon Tetrachloride	ug/kg	25	ND	10/19/92
1,2-Dichloroethane (EDC)	ug/kg	25	ND	10/19/92
Trichloroethene (TCE)	ug/kg	25	ND	10/19/92

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October 28, 1992
 PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226120
 Date Collected: 10/13/92
 Date Received: 10/15/92
 Client Sample ID: B-4-5.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/kg	25	ND	10/19/92
Bromodichloromethane	ug/kg	25	ND	10/19/92
2-Chloroethylvinyl ether	ug/kg	25	ND	10/19/92
cis-1,3-Dichloropropene	ug/kg	25	ND	10/19/92
trans-1,3-Dichloropropene	ug/kg	25	ND	10/19/92
1,1,2-Trichloroethane	ug/kg	25	ND	10/19/92
Tetrachloroethene	ug/kg	25	ND	10/19/92
Dibromochloromethane	ug/kg	25	ND	10/19/92
Chlorobenzene	ug/kg	25	ND	10/19/92
Bromoform	ug/kg	25	ND	10/19/92
1,1,2,2-Tetrachloroethane	ug/kg	25	ND	10/19/92
1,3-Dichlorobenzene	ug/kg	25	ND	10/19/92
1,4-Dichlorobenzene	ug/kg	25	ND	10/19/92
1,2-Dichlorobenzene	ug/kg	25	ND	10/19/92
Bromochloromethane (Surrogate Recovery)			87%	10/19/92
1,4-Dichlorobutane (Surrogate Recovery)			85%	10/19/92



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October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226147
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-4-10.5'

Parameter	Units	MDL		DATE ANALYZED
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/26/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	2900	10/26/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/26/92
Benzene	ug/kg wet	5.0	30	10/26/92
Toluene	ug/kg wet	5.0	110	10/26/92
Ethylbenzene	ug/kg wet	5.0	100	10/26/92
Xylenes, Total	ug/kg wet	5.0	440	10/26/92

EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	7.9	10/20/92
Date Extracted			10/19/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	63	10/21/92
Date Extracted			10/20/92	

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Dichlorodifluoromethane	ug/kg	100	ND	10/19/92
Chloromethane	ug/kg	100	ND	10/19/92
Vinyl Chloride	ug/kg	100	ND	10/19/92
Bromomethane	ug/kg	100	ND	10/19/92
Chloroethane	ug/kg	100	ND	10/19/92
Trichlorofluoromethane	ug/kg	100	ND	10/19/92
1,1-Dichloroethene	ug/kg	25	ND	10/19/92
Methylene Chloride	ug/kg	100	ND	10/19/92
trans-1,2-Dichloroethene	ug/kg	25	ND	10/19/92
cis-1,2-Dichloroethene	ug/kg	25	ND	10/19/92
1,1-Dichloroethane	ug/kg	25	ND	10/19/92
Chloroform	ug/kg	25	ND	10/19/92
1,1,1-Trichloroethane (TCA)	ug/kg	25	ND	10/19/92
Carbon Tetrachloride	ug/kg	25	ND	10/19/92
1,2-Dichloroethane (EDC)	ug/kg	25	ND	10/19/92
Trichloroethene (TCE)	ug/kg	25	ND	10/19/92

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October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PACE Sample Number: 70 0226147
Date Collected: 10/13/92
Date Received: 10/15/92
Client Sample ID: B-4-10.5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

1,2-Dichloropropane	ug/kg	25	ND	10/19/92
Bromodichloromethane	ug/kg	25	ND	10/19/92
2-Chloroethylvinyl ether	ug/kg	25	ND	10/19/92
cis-1,3-Dichloropropene	ug/kg	25	ND	10/19/92
trans-1,3-Dichloropropene	ug/kg	25	ND	10/19/92
1,1,2-Trichloroethane	ug/kg	25	ND	10/19/92
Tetrachloroethene	ug/kg	25	ND	10/19/92
Dibromochloromethane	ug/kg	25	ND	10/19/92
Chlorobenzene	ug/kg	25	ND	10/19/92
Bromoform	ug/kg	25	ND	10/19/92
1,1,2,2-Tetrachloroethane	ug/kg	25	ND	10/19/92
1,3-Dichlorobenzene	ug/kg	25	ND	10/19/92
1,4-Dichlorobenzene	ug/kg	25	ND	10/19/92
1,2-Dichlorobenzene	ug/kg	25	ND	10/19/92
Bromochloromethane (Surrogate Recovery)			88%	10/19/92
1,4-Dichlorobutane (Surrogate Recovery)			86%	10/19/92

These data have been reviewed and are approved for release.

Darrell Cain for

Mark A. Valentini, Ph.D.
Regional Director



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FOOTNOTES
for pages 1 through 16

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

MDL Method Detection Limit
ND Not detected at or above the MDL.



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QUALITY CONTROL DATA

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

Oil and Grease, Gravimetric (SM5520)

Batch: 70 16364

Samples: 70 0226023, 70 0226040, 70 0226058, 70 0226074, 70 0226090
70 0226104, 70 0226120, 70 0226147

METHOD BLANK:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Method Blank</u>
Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Reference Value</u>	<u>Recv</u>	<u>Dup1 Recv</u>	<u>RPD</u>
Oil and Grease, Gravimetric (SM5520)	mg/kg wet	50	667	93%	91%	2%



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QUALITY CONTROL DATA

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

EXTRACTABLE FUELS EPA 3550/8015

Batch: 70 16342

Samples: 70 0226040, 70 0226058, 70 0226074, 70 0226090, 70 0226104
70 0226120, 70 0226147

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Extractable Fuels, as Diesel	mg/kg	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Extractable Fuels, as Diesel	mg/kg	5.0	33.3	82%	78%	5%



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QUALITY CONTROL DATA

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

EXTRACTABLE FUELS EPA 3550/8015
Batch: 70 16433
Samples: 70 0226023

METHOD BLANK:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Method Blank</u>
Extractable Fuels, as Diesel	mg/kg	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Reference Value</u>	<u>Recv</u>	<u>Dup1 Recv</u>	<u>RPD</u>
Extractable Fuels, as Diesel	mg/kg	5.0	33.3	78%	71%	9%

REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
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QUALITY CONTROL DATA

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Batch: 70 16288

Samples: 70 0226023, 70 0226040, 70 0226058, 70 0226074, 70 0226090
70 0226104

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Dichlorodifluoromethane	ug/kg	20	ND
Chloromethane	ug/kg	20	ND
Vinyl Chloride	ug/kg	20	ND
Bromomethane	ug/kg	20	ND
Chloroethane	ug/kg	20	ND
Trichlorofluoromethane	ug/kg	20	ND
1,1-Dichloroethene	ug/kg	5.0	ND
Methylene Chloride	ug/kg	20	ND
trans-1,2-Dichloroethene	ug/kg	5.0	ND
cis-1,2-Dichloroethene	ug/kg	5.0	ND
1,1-Dichloroethane	ug/kg	5.0	ND
Chloroform	ug/kg	5.0	ND
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND
Carbon Tetrachloride	ug/kg	5.0	ND
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND
Trichloroethene (TCE)	ug/kg	5.0	ND
1,2-Dichloropropane	ug/kg	5.0	ND
Bromodichloromethane	ug/kg	5.0	ND
2-Chloroethylvinyl ether	ug/kg	5.0	ND
cis-1,3-Dichloropropene	ug/kg	5.0	ND
trans-1,3-Dichloropropene	ug/kg	5.0	ND
1,1,2-Trichloroethane	ug/kg	5.0	ND
Tetrachloroethene	ug/kg	5.0	ND
Dibromochloromethane	ug/kg	5.0	ND
Chlorobenzene	ug/kg	5.0	ND
Bromoform	ug/kg	5.0	ND
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND
1,3-Dichlorobenzene	ug/kg	5.0	ND
1,4-Dichlorobenzene	ug/kg	5.0	ND
1,2-Dichlorobenzene	ug/kg	5.0	ND
Bromochloromethane (Surrogate Recovery)			97%



REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
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QUALITY CONTROL DATA

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

HALOGENATED VOLATILE COMPOUNDS EPA 8010

Batch: 70 16288

Samples: 70 0226023, 70 0226040, 70 0226058, 70 0226074, 70 0226090
70 0226104

METHOD BLANK:

Parameter	Units	MDL	Method Blank
1,4-Dichlorobutane (Surrogate Recovery)			92%

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
1,1-Dichloroethane	ug/kg	5.0	10.00	91%	96%	5%
Trichloroethene (TCE)	ug/kg	5.0	10.00	97%	102%	5%
1,1,2-Trichloroethane	ug/kg	5.0	10.00	113%	118%	4%
Tetrachloroethene	ug/kg	5.0	10.00	107%	105%	1%



REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
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QUALITY CONTROL DATA

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

HALOGENATED VOLATILE COMPOUNDS EPA 8010
Batch: 70 16322
Samples: 70 0226120, 70 0226147

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Dichlorodifluoromethane	ug/kg	20	ND
Chloromethane	ug/kg	20	ND
Vinyl Chloride	ug/kg	20	ND
Bromomethane	ug/kg	20	ND
Chloroethane	ug/kg	20	ND
Trichlorofluoromethane	ug/kg	20	ND
1,1-Dichloroethene	ug/kg	5.0	ND
Methylene Chloride	ug/kg	20	ND
trans-1,2-Dichloroethene	ug/kg	5.0	ND
cis-1,2-Dichloroethene	ug/kg	5.0	ND
1,1-Dichloroethane	ug/kg	5.0	ND
Chloroform	ug/kg	5.0	ND
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND
Carbon Tetrachloride	ug/kg	5.0	ND
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND
Trichloroethene (TCE)	ug/kg	5.0	ND
1,2-Dichloropropane	ug/kg	5.0	ND
Bromodichloromethane	ug/kg	5.0	ND
2-Chloroethylvinyl ether	ug/kg	5.0	ND
cis-1,3-Dichloropropene	ug/kg	5.0	ND
trans-1,3-Dichloropropene	ug/kg	5.0	ND
1,1,2-Trichloroethane	ug/kg	5.0	ND
Tetrachloroethene	ug/kg	5.0	ND
Dibromochloromethane	ug/kg	5.0	ND
Chlorobenzene	ug/kg	5.0	ND
Bromoform	ug/kg	5.0	ND
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND
1,3-Dichlorobenzene	ug/kg	5.0	ND
1,4-Dichlorobenzene	ug/kg	5.0	ND
1,2-Dichlorobenzene	ug/kg	5.0	ND
Bromochloromethane (Surrogate Recovery)			95%
1,4-Dichlorobutane (Surrogate Recovery)			94%



REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
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QUALITY CONTROL DATA

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

HALOGENATED VOLATILE COMPOUNDS EPA 8010
Batch: 70 16322
Samples: 70 0226120, 70 0226147

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference	Dupl		
			Value	Recv	Recv	RPD
1,1-Dichloroethane	ug/kg	5.0	10.00	91%	91%	0%
Trichloroethene (TCE)	ug/kg	5.0	10.00	102%	97%	5%
1,1,2-Trichloroethane	ug/kg	5.0	10.00	113%	115%	1%
Tetrachloroethene	ug/kg	5.0	10.00	107%	104%	2%



REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
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QUALITY CONTROL DATA

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

PURGEABLE FUELS AND AROMATICS

Batch: 70 16437

Samples: 70 0226058, 70 0226074, 70 0226090, 70 0226104, 70 0226120

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	200	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			
Benzene	ug/kg wet	1.0	ND
Toluene	ug/kg wet	1.0	ND
Ethylbenzene	ug/kg wet	1.0	ND
Xylenes, Total	ug/kg wet	1.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dup1 Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	200	351	91%	93%	2%
Benzene	ug/kg wet	1.0	40.0	101%	94%	7%
Toluene	ug/kg wet	1.0	40.0	102%	96%	6%
Ethylbenzene	ug/kg wet	1.0	40.0	98%	93%	5%
Xylenes, Total	ug/kg wet	1.0	80.0	111%	103%	7%

REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
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QUALITY CONTROL DATA

October 28, 1992
 PACE Project Number: 421015513

Client Reference: B.P. #11120

PURGEABLE FUELS AND AROMATICS
 Batch: 70 16486
 Samples: 70 0226147

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	200	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/kg wet	1.0	ND
Toluene	ug/kg wet	1.0	ND
Ethylbenzene	ug/kg wet	1.0	ND
Xylenes, Total	ug/kg wet	1.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	200	351	92%	89%	3%
Benzene	ug/kg wet	1.0	40.0	97%	97%	0%
Toluene	ug/kg wet	1.0	40.0	104%	101%	2%
Ethylbenzene	ug/kg wet	1.0	40.0	102%	98%	4%
Xylenes, Total	ug/kg wet	1.0	80.0	112%	108%	3%

REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
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QUALITY CONTROL DATA

October 28, 1992
 PACE Project Number: 421015513

Client Reference: B.P. #11120

TPH GASOLINE/BTEX
 Batch: 70 16394
 Samples: 70 0226023, 70 0226040

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	200	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/kg wet	1.0	ND
Toluene	ug/kg wet	1.0	ND
Ethylbenzene	ug/kg wet	1.0	ND
Xylenes, Total	ug/kg wet	1.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	200	351	95%	99%	4%
Benzene	ug/kg wet	1.0	40	89%	97%	8%
Toluene	ug/kg wet	1.0	40	93%	101%	8%
Ethylbenzene	ug/kg wet	1.0	40	88%	95%	7%
Xylenes, Total	ug/kg wet	1.0	80	89%	106%	17%



REPORT OF LABORATORY ANALYSIS

Mr. Markus Niebanck
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FOOTNOTES
for pages 18 through 27

October 28, 1992
PACE Project Number: 421015513

Client Reference: B.P. #11120

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference

CHAIN OF CUSTODY RECORD

SAMPLER

Printed Name:

Henry Hurkmans

Signature:

Henry Hurkmans

DELIVER TO:

PACE, Inc.

ATTENTION:

Caren Gortag

HETICAL JOB No.:

9-040

SEND RESULTS TO:

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.
2363 MARINER SQUARE DR., SUITE 243

ALAMEDA, CA 94501

(510) 521-2684, (FAX) 521-5078

ATTENTION:

Henry Hurkmans

SEND INVOICE TO:

BP

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
<u>[Signature]</u> HETT	<u>[Signature]</u>	10/15	1120
<u>[Signature]</u>	<u>[Signature]</u> PACE	6/15	1545
Relinquished by:	Received by:		
	LABORATORY		

PROJECT NAME:

BP No. 11120, Dublin

PAGE 1 OF 1

Sample Number	DATE & TIME	No. & Type Container	Analysis Requested					Lab Remarks
			THI (BTEX) (MIS meth)	THI (K) (MIS meth)	Organic Lead	IDLH 5M520	HUD 601	
B-1-5.5'	10-13-92	one brass tube	X	X		X	X	22602.3
B-1-10.5'								04.0
B-2-5.5'								05.8
B-2-10.5'								07.4
B-3-5.5'								09.0
B-3-10.5'								10.4
B-4-5.5'								12.0
B-4-10.5'	∇	∇	∇	∇		∇	∇	14.7
EIS								

Special Instructions: _____

Turnaround:

- 5 DAY 72 HOURS
 10 DAY 24 HOURS

421015-513



REPORT OF LABORATORY ANALYSIS

Hydro-Environmental Tech., Inc.
 2363 Mariner Square Dr., Ste. 243
 Alameda, CA 94501

November 10, 1992
 PACE Project Number: 421028508

9-040

Attn: Mr. Henry Hurkmans

Client Reference: BP Station # 11120

PACE Sample Number: 70 0238269
 Date Collected: 10/27/92
 Date Received: 10/28/92
 MW-1

Parameter	Units	MDL		DATE ANALYZED
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/30/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	10/30/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):				
Benzene	ug/L	0.5	ND	10/30/92
Toluene	ug/L	0.5	ND	10/30/92
Ethylbenzene	ug/L	0.5	ND	10/30/92
Xylenes, Total	ug/L	0.5	ND	10/30/92
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	ND	11/08/92
Chloromethane	ug/L	2.0	ND	11/08/92
Vinyl Chloride	ug/L	2.0	ND	11/08/92
Bromomethane	ug/L	2.0	ND	11/08/92
Chloroethane	ug/L	2.0	ND	11/08/92
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	11/08/92
1,1-Dichloroethene	ug/L	0.5	ND	11/08/92
Methylene Chloride	ug/L	2.0	ND	11/08/92
trans-1,2-Dichloroethene	ug/L	0.5	ND	11/08/92
cis-1,2-Dichloroethene	ug/L	0.5	ND	11/08/92
1,1-Dichloroethane	ug/L	0.5	ND	11/08/92
Chloroform	ug/L	0.5	ND	11/08/92
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	11/08/92
Carbon Tetrachloride	ug/L	0.5	ND	11/08/92
1,2-Dichloroethane (EDC)	ug/L	0.5	ND	11/08/92
Trichloroethene (TCE)	ug/L	0.5	ND	11/08/92
1,2-Dichloropropane	ug/L	0.5	ND	11/08/92
Bromodichloromethane	ug/L	0.5	ND	11/08/92
2-Chloroethylvinyl ether	ug/L	0.5	ND	11/08/92
cis-1,3-Dichloropropene	ug/L	0.5	ND	11/08/92

Mr. Henry Hurkmans
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November 10, 1992
 PACE Project Number: 421028508

Client Reference: BP Station # 11120

PACE Sample Number: 70 0238269
 Date Collected: 10/27/92
 Date Received: 10/28/92
 Client Sample ID: MW-1
 Parameter

Units MDL DATE ANALYZED

ORGANIC ANALYSIS

HALOGENATED VOLATILE COMPOUNDS EPA 8010

trans-1,3-Dichloropropene	ug/L	0.5	ND	11/08/92
1,1,2-Trichloroethane	ug/L	0.5	ND	11/08/92
Tetrachloroethene	ug/L	0.5	ND	11/08/92
Dibromochloromethane	ug/L	0.5	ND	11/08/92
Chlorobenzene	ug/L	0.5	ND	11/08/92
Bromoform	ug/L	0.5	ND	11/08/92

1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	11/08/92
1,3-Dichlorobenzene	ug/L	0.5	ND	11/08/92
1,4-Dichlorobenzene	ug/L	0.5	ND	11/08/92
1,2-Dichlorobenzene	ug/L	0.5	ND	11/08/92
Bromochloromethane (Surrogate Recovery)			126%	11/08/92
1,4-Dichlorobutane (Surrogate Recovery)			119%	11/08/92

EXTRACTABLE FUELS EPA 3510/8015

Extractable Fuels, as Diesel	mg/L	0.050	ND	11/04/92
Date Extracted			11/02/92	

OIL AND GREASE, SILICA GEL (LUFT)

Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	ND	11/06/92
Date Extracted			11/05/92	



REPORT OF LABORATORY ANALYSIS

Mr. Henry Hurkmans
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November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

PACE Sample Number: 70 0238277
Date Collected: 10/27/92
Date Received: 10/28/92
Client Sample ID: MW-2

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>		<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/30/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	10/30/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/30/92
Benzene	ug/L	0.5	ND	10/30/92
Toluene	ug/L	0.5	ND	10/30/92
Ethylbenzene	ug/L	0.5	ND	10/30/92
Xylenes, Total	ug/L	0.5	ND	10/30/92

EXTRACTABLE FUELS EPA 3510/8015

Extractable Fuels, as Diesel	mg/L	0.050	ND	11/04/92
Date Extracted			11/02/92	



REPORT OF LABORATORY ANALYSIS

Mr. Henry Hurkmans
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November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

PACE Sample Number: 70 0238285
Date Collected: 10/27/92
Date Received: 10/28/92
Client Sample ID: MW-3

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	10/30/92
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	210	10/30/92
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	10/30/92
Benzene	ug/L	0.5	3.0	10/30/92
Toluene	ug/L	0.5	0.7	10/30/92
Ethylbenzene	ug/L	0.5	0.9	10/30/92
Xylenes, Total	ug/L	0.5	30	10/30/92

EXTRACTABLE FUELS EPA 3510/8015

Extractable Fuels, as Diesel	mg/L	0.050	ND	11/04/92
Date Extracted			11/02/92	

Mr. Henry Hurkmans
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November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

PACE Sample Number: 70 0238293
Date Collected: 10/27/92
Date Received: 10/28/92
Client Sample ID: ~~MM-4~~

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS			
TOTAL FUEL HYDROCARBONS, (LIGHT):			
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	2300
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			
Benzene	ug/L	0.5	23
Toluene	ug/L	0.5	54
Ethylbenzene	ug/L	0.5	50
Xylenes, Total	ug/L	0.5	320
EXTRACTABLE FUELS EPA 3510/8015			
Extractable Fuels, as Diesel	mg/L	0.050	0.19
Date Extracted			11/02/92

These data have been reviewed and are approved for release.

Davele Cain for
Mark A. Valentini, Ph.D.
Regional Director



REPORT OF LABORATORY ANALYSIS

Mr. Henry Hurkmans
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FOOTNOTES
for pages 1 through 5

November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

MDL Method Detection Limit
ND Not detected at or above the MDL.



REPORT OF LABORATORY ANALYSIS

Mr. Henry Hurkmans
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QUALITY CONTROL DATA

November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

EXTRACTABLE FUELS EPA 3510/8015

Batch: 70 16697

Samples: 70 0238269, 70 0238277, 70 0238285, 70 0238293

METHOD BLANK:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Method Blank</u>
Extractable Fuels, as Diesel	mg/L	0.050	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Reference Value</u>	<u>Recv</u>	<u>Dupl Recv</u>	<u>RPD</u>
Extractable Fuels, as Diesel	mg/L	0.050	1.00	62%	70%	12%



REPORT OF LABORATORY ANALYSIS

Mr. Henry Hurkmans
Page 8

QUALITY CONTROL DATA

November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

HALOGENATED VOLATILE COMPOUNDS EPA 8010
Batch: 70 16807
Samples: 70 0238269

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Dichlorodifluoromethane	ug/L	2.0	ND
Chloromethane	ug/L	2.0	ND
Vinyl Chloride	ug/L	2.0	ND
Bromomethane	ug/L	2.0	ND
Chloroethane	ug/L	2.0	ND
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND
1,1-Dichloroethene	ug/L	0.5	ND
Methylene Chloride	ug/L	2.0	ND
trans-1,2-Dichloroethene	ug/L	0.5	ND
cis-1,2-Dichloroethene	ug/L	0.5	ND
1,1-Dichloroethane	ug/L	0.5	ND
Chloroform	ug/L	0.5	ND
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND
Carbon Tetrachloride	ug/L	0.5	ND
1,2-Dichloroethane (EDC)	ug/L	0.5	ND
Trichloroethene (TCE)	ug/L	0.5	ND
1,2-Dichloropropane	ug/L	0.5	ND
Bromodichloromethane	ug/L	0.5	ND
2-Chloroethylvinyl ether	ug/L	0.5	ND
cis-1,3-Dichloropropene	ug/L	0.5	ND
trans-1,3-Dichloropropene	ug/L	0.5	ND
1,1,2-Trichloroethane	ug/L	0.5	ND
Tetrachloroethene	ug/L	0.5	ND
Dibromochloromethane	ug/L	0.5	ND
Chlorobenzene	ug/L	0.5	ND
Bromoform	ug/L	0.5	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND
1,3-Dichlorobenzene	ug/L	0.5	ND
1,4-Dichlorobenzene	ug/L	0.5	ND
1,2-Dichlorobenzene	ug/L	0.5	ND
Bromochloromethane (Surrogate Recovery)			116%
1,4-Dichlorobutane (Surrogate Recovery)			112%



REPORT OF LABORATORY ANALYSIS

Mr. Henry Hurkmans
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QUALITY CONTROL DATA

November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

HALOGENATED VOLATILE COMPOUNDS EPA 8010
Batch: 70 16807
Samples: 70 0238269

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference	Dupl		
			Value	Recv	Recv	RPD
1,1-Dichloroethane	ug/L	0.5	10.00	80%	81%	1%
Trichloroethene (TCE)	ug/L	0.5	10.00	73%	79%	7%
1,1,2-Trichloroethane	ug/L	0.5	10.00	87%	90%	3%
Tetrachloroethene	ug/L	0.5	10.00	88%	94%	6%



REPORT OF LABORATORY ANALYSIS

Mr. Henry Hurkmans
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QUALITY CONTROL DATA

November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

OIL AND GREASE, SILICA GEL (LUFT)
Batch: 70 16757
Samples: 70 0238269

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Oil and Grease, Gravimetric (SM5520)	mg/L	5.0	20	75%	80%	6%



REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

PURGEABLE FUELS AND AROMATICS

Batch: 70 16591

Samples: 70 0238269, 70 0238277, 70 0238285, 70 0238293

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	346	112%	113%	0%
Benzene	ug/L	0.5	40.0	102%	103%	0%
Toluene	ug/L	0.5	40.0	99%	101%	2%
Ethylbenzene	ug/L	0.5	40.0	109%	110%	0%
Xylenes, Total	ug/L	0.5	80.0	107%	107%	0%



REPORT OF LABORATORY ANALYSIS

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FOOTNOTES
for pages 7 through 11

November 10, 1992
PACE Project Number: 421028508

Client Reference: BP Station # 11120

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference



B.P. OIL MARKETING COMPANY
 33305 First Way South, Federal Way, WA 98003
CHAIN OF CUSTODY

4 2 1 0 2 8 . 5 0 8



Novato, CA, 11 Digital Drive, 94949
 Phone: (415) 883-6100 Fax: (415) 883-2673

Consultant's Name: Hydro Environmental Technologies, Inc. Page 1 of 1

Address: 2363 Mariner Sq. Dr #243 Alameda, CA 94501

Project Contact: Henry Hurkmans Consultant Project #: 9-040 Phone #: 510 521 2684 Fax #: 510 521 5078

Sampled by (print): Henry Hurkmans Sampler's Signature: Henry Hurkmans / Henry Hurkmans

Shipment Method: courier B.P. Site Location #: 1120 B.P. Site Location: 6400 Dublin Blvd Dublin

TAT: 24 hr 48 hr 72 hr Standard (10 day)

ANALYSIS REQUIRED

Sample Condition as Received
 Temperature ° C:
 Cooler #: Via Courier
 Inbound Seal Yes No
 Outbound Seal Yes No

Sample Description	Collection Date/Time	Matrix Soil/Water	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	Oil & Grease SM 5520	HVOC 8010	601									
MW-1	10/27/92	Water	Hcl	6	238269	X				X									
MW-1			NP	2	↓		X	X											
MW-2			Hcl	3	27.7	X													
MW-2			NP	1	↓		X												
MW-3			Hcl	3	28.5	X													
MW-3			NP	1	↓		X												
MW-4			Hcl	3	29.3	X													
MW-4	↓	↓	NP	1	↓		X												

COMMENTS

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time	Additional Comments:
<u>Henry Hurkmans HET I</u>	<u>10/28/92</u>	<u>1115</u>	<u>Donald Ibraski Pace</u>	<u>10/28/92</u>	<u>1115</u>	<u>BP Phase I assessments</u>
<u>Donald Ibraski Pace</u>	<u>10/28/92</u>	<u>1615</u>	<u>Joe Moore HET</u>	<u>10/28/92</u>	<u>1615</u>	