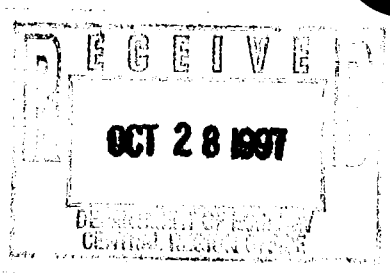
ACTIVE

RICHARD C. KENT
PROFESSIONAL GEOLOGIST

Site #100231
GASMAX III



GEOLOGIC LOGS

Site Location:
AMOCO STATION
528 South Ely
Kennewick, Washington

State of Washington Department of Ecology Site ID Number 100231

Prepared for:
USA Holdings, Inc.
919 West Lewis
Pasco, Washington 99302

June 18, 1997

Project Number 97006

Post Office Box 26, Battle Ground, Washington 98604 • (360) 687-0509

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TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

1.1. Purpose and Scope of Work

The purpose of this report is to summarize geologic logs and laboratory analyses for two (2) drill holes on U.S.A. Holdings, Inc. property located at an AMOCO Service Station, 528 South Ely Street, Kennewick, Washington. The field work was completed on May 28 and May 29, 1997. The drill holes, adjacent to a previous remedial excavation of a diesel dispenser island area, were completed to evaluate the potential extent of contamination. The purpose of this report specifically excludes an evaluation or assessment of the Site hydrogeologic conditions.

Richard C. Kent, Professional Geologist ("Consultant"), was authorized by U.S.A. Holdings, Inc. ("Client") to begin work on May 23, 1997 under the supervision of Client's agent. U.S.A. Holdings, Inc. ("Landowner") assumes responsibility and authority for the final locations of the drill holes. Any evaluation, analysis or opinion expressed in this report regarding geologic logs and laboratory analyses are for clarification purposes and should not be construed to represent an evaluation or assessment of the Site hydrogeologic conditions.

1.2. Location

The project location is shown in Figure 1, "Area Map" and drill hole locations are shown in Figure 2, "Site Map". The Site is currently utilized as a service station, offering gasoline and diesel at two (2) dispensing areas and a convenience store. The active portions of the site are covered by asphalt pavement and the remainder covered with crushed rock or disturbed native soil. The Site is surrounded by residences to the west; and, businesses and open land to the north and south along South Ely Street. South Ely Street abuts the Site to the east.

The Site is located in the NW/4, SE/4, Section 3, Township 8 N, Range 29 E, Benton County, Washington at an approximate elevation of 492-feet above mean sea level ("MSL"). Normal pool elevation of the Columbia River, approximately 1.4-miles north of the Site, is 340-feet above MSL. The land gently slopes north until steep bluffs at the Columbia River. Annual precipitation is approximately 7-inches.

The Site previously contained two (2) each gasoline and diesel underground storage tanks ("UST"). The gasoline USTs were located north of the convenience store and the diesel USTs were located south of the convenience store. Previous work indicates that the replaced tanks were 24 to 30 years old. New gasoline and diesel USTs have been installed at the Site in the approximate respective locations of the old USTs.

1.3. Previous Work

The following report was provided for review and should be referenced for detailed locations of prior USTs, soil sampling locations during remedial excavation, and laboratory analyses.

1. "Underground Storage Tank Site Assessment, Amoco Station, 528 South Ely, Kennewick, Washington" by GN Northern, Inc., Kennewick, Washington, dated May 1997.

An unknown quantity of petroleum hydrocarbons were discharged over a period of time into the soil surrounding former underground storage tanks, pipelines, dispenser areas, and a service vehicle building. It is assumed that discharge to the soil was primarily through overspill during tank filling operations, a lack of integrity in tank(s) and pipelines, and other spillages.

Previous work conducted between December 4, 1996 and March 26, 1997, indicates elevated volatile organic constituents were present in soil samples collected from the south end of a gasoline UST excavation, within a diesel UST excavation, and beneath a diesel dispenser island. There may have been discharge into a dry well system connected to a former service bay (the service bay-vehicle repair building was converted to a convenience store about 1990).

Remediation by soil removal and over-excavation to approximately 14- to 16- feet below ground surface ("bgs") was reported for the previous gasoline and diesel tanks. Previous work indicates that soil surrounding the prior gasoline USTs was over-excavated to soil containing below contaminant cleanup levels of the Washington Department of Ecology ("WADOE"). Bioremediation of excavated soil contaminated by diesel and gasoline is reportedly being performed at the Site. Elevated diesel concentrations were previously reported from an auger boring at 23-feet depth within the area of the previous diesel excavation.

2. METHODS AND PROCEDURES

2.1. Drill Holes

Drill Holes, B-1 and B-2, were drilled by Environmental West Exploration, Inc., Spokane, Washington ("drilling company") using a Shramm T300E equipped with an auxiliary trailer-mounted air compressor unit rated at maximum 750 cubic feet per minute at 300 pounds per square inch (air-rotary method). An eccentric, nominal 6-inch diameter, button bit was driven by an air-hammer which allowed underreaming for the casing to fall as drilling progressed. Using this method, as the casing is advanced, material above and within water bearing zones is effectively sealed off by the casing. High-volume air lifted the drill cuttings between the drill rods and casing to the surface where the cuttings were discharged to a 55-gallon drum with a lid.

As the drum with drill cuttings became full, it was carried and emptied onto existing spoil piles in the southern part of the Site. Both drill holes were backfilled to total depth with bentonite as the casing was pulled out of the hole. Drilling and sampling equipment were cleaned between holes with pressurized water and air dried.

Table 1 - Summary of Drill Holes

Drill Hole	Total Depth	Water Encountered
B-1	95-feet bgs*	~95.0-95.3-feet bgs
B-2	100-feet bgs*	~95.0-95.5-feet bgs ~100.0-101.0-feet bgs

"bgs" - below ground surface
** excluding depth of penetration by SPT sampler of about one (1)-foot beyond drilled depth*

2.2. Soil Sampling

Geologic Logs are included in Appendix A. Soil sampling began at 20-feet bgs in B-1 and B-2, below the depths of the UST excavations which had been previously sampled. Descriptions of material encountered during drilling include hydrocarbon odors, type of material based on the Unified Soil Classification System Visual Method, name of material based on particle size, apparent density based on the Standard Penetration Test blow counts, color typically based on Geological Society of America color chart, moisture content based on stickiness and color change when dry, and general remarks. Sixteen (16) and seventeen (17) soil samples were collected in, respectively, B-1 and B-2. Five (5) and six (6) soil samples were submitted for analysis from B-1 and B-2, respectively.

Soil samples for description were collected using a Standard Penetration Test ("SPT") system. SPT samples were collected by lowering a 2-inch diameter split-barrel sampler ("split-spoon") through the casing, then driving for up to 30-inches at total depth with a 140-pound dead weight hammer falling 30-inches. The number of hammer blow counts per 6-inches of drive depth were recorded. The number of blow counts was used to describe the relative density of material per 6-inches using a standard correlation table.

Indicators of petroleum hydrocarbon contamination (e.g. petroleum hydrocarbon odors, color, sheen) were not observed in SPT soil samples during drilling. However, cuttings in the 55-gallon barrel from approximately 20-feet depth in Drill Hole B-1 had a strong diesel odor. Field testing for sheen was performed by placing a portion of the SPT or grab sample in a glass sample jar with clean water, shaking, and observing for sheen on the water in the jar. These field tests were only for preliminary screening purposes and may have failed to discover petroleum hydrocarbons which could exist, and such indicator field tests should not be relied upon to define or characterize contamination of the Site.

Soil samples in the SPT sampler were removed using a triple rinsed stainless steel spoon. A representative sample for testing was obtained by scraping the upper half of the split spoon sample. Samples for possible laboratory analysis were retained in plastic sandwich 'baggies', labeled, and stored in an ice chest for delivery to a laboratory.

2.3. Saturated Soil Sampling

Split spoon sample B-1/S-16 from drill hole B-1, contained a saturated, well sorted, light yellow brown, fine sand with little matrix from approximately 95.0- to 95.3-feet. From approximately 95.3- to 95.5-feet, the sampler contained a very damp to wet, well sorted, very light yellow brown, very fine sand with little matrix. From approximately 95.5- to 95.9-feet, the sampler contained a wet, well sorted, very light yellow brown, very fine sand with little matrix. Two (2) samples were collected from the split spoon sampler: B-1/S-16 with material from the entire sampler; and, a second sample, Sample B-1/S-16-Water, containing water and soil discreetly collected from the 95.0- to 95.3-feet saturated zone within the sampler.

Split spoon sample B-2/S-16 from drill hole B-2, contained a wet to saturated, light yellow brown, fine sand with little matrix from approximately 95.0- to 95.5-feet. From approximately 95.5- to 95.8-feet, the sampler contained a very dry silt. From approximately 95.8- to 96-feet, the sampler contained a damp, well sorted, light yellow brown, very fine sand to fine sandy silt. Two (2) samples were collected: B-2/S-16 with material from the entire sampler; and, a second sample, Sample B-2/S-16-Water, containing water and soil discreetly collected from the 95.0- to 95.5-feet wet to saturated zone within the sampler.

2.4. Groundwater Sampling

An unfiltered water grab sample, B-2/W-1, (labeled "B2-95.9" on lab report) was collected from B-2, which was drilled to 100.0-feet, and a split spoon sampler driven to about 101.0-feet bgs. The groundwater saturated zone in B-2 of fine sand, approximately 100.0- to 101.0-feet bgs, was sampled with a stainless steel bailer which was lowered near the total depth of 98.7-feet. The lowermost portion of the drill hole had apparently encountered conditions of "heave", which is commonly associated with fine, poorly graded, unconsolidated sand within a zone of excess water pressure, indicating that the 100.0- to 101.0-foot zone in B-2 may be under confining groundwater conditions. The water level in B-2 had risen to about 95.9-feet prior to sampling.

3. RESULTS

3.1. Geologic Units

The following is a generalization of geologic units encountered in drill holes B-1 and B-2. Detailed descriptions are included in Appendix A - Geologic Logs. Footages are below ground surface and are approximations.

To 24-Feet

damp, sandy gravels

24- to 38-Feet,

damp, medium to medium dense, well-sorted, yellow brown, sand

38- to 44-Feet

damp, distinctive reddish gray, very stiff, clayey silt

44- to 70.5-Feet

damp, light yellow brown to olive gray, fine, medium dense, well-sorted, quartzitic medium sand. A wet sandy gravel was encountered at about 63- to 64.5-feet in B-2, but not in B-1.

70.5- to 73-Feet

damp, distinctive reddish gray, very stiff, clayey silt. The silt is immediately overlain by a very thin wet zone in the lowermost portion of the overlying fine sand unit. The silt in B-2 is very dry and crumbles into flakes.

73- to 89-Feet

damp, light yellow brown, well sorted, medium dense, medium sand

89- to 91-Feet

clayey silt to fine, light yellow brown, silty sand in B-1 and dense, fine silty, medium sand in B-2 (wet 90- to 90.2-feet in B-2)

B-1

91- to 96-feet: damp, well sorted, light yellow brown, dense, fine sand

(95.0 to 95.3-feet saturated)

B-2

91.0- to 95.0-feet: moist, very stiff, light yellow brown, fine sandy silt

95.0- to 95.5-feet: wet to saturated, light yellow brown, fine sand

95.5- to 95.8-feet: very dry, very stiff, light yellow brown silt

95.8- to 96.0-feet: damp, well sorted, light yellow brown, very fine sand to fine sandy silt

100.0- to 101.0-feet: saturated, light yellow brown, dense, fine sand

3.2. Lab Analysis - Soil

Laboratory reports are included in Appendix B - Laboratory Reports. The following Table is a summary of analyses performed on soil samples.

Table 2 - Summary of Soil Analyses

Sample Number	Depth, bgs	Analysis	Result
B-1/S-2	25- to 26-feet	HCID	Below Ranges
B-1/S-4	35- to 36-feet	HCID	Below Ranges
B-1/S-11	70- to 71-feet	HCID	Below Ranges
B-1/S-16	95- to 96-feet	HCID	Below Ranges
B-1/S-16-Water	95.0- to 95.3-feet	TPHg	Not Detected
B-1/S-16-Water	95.0- to 95.3-feet	BTEX	Not Detected
B-1/S-16-Water	95.0- to 95.3-feet	PAH	Not Detected
B-2/S-2	25- to 26-feet	HCID	Below Ranges
B-2/S-4	35- to 36-feet	HCID	Below Ranges
B-2/S-11	70- to 71-feet	HCID	Below Ranges
B-2/S-15	90- to 91-feet	HCID	Below Ranges
B-2/S-16	95- to 96-feet	HCID	Below Ranges
B-2/S-17-Water	95.0- to 95.5-feet	TPHg	Not Detected
B-2/S-17-Water	95.0- to 95.5-feet	BTEX	Not Detected
B-2/S-17-Water	95.0- to 95.5-feet	PAH	Not Detected

Notes:

Gasoline range compounds B - Benzene, T - Toluene, E - Ethyl Benzene, X - m, p and o, Xylene were analyzed per EPA Method 8020 (Aromatic Volatile Organics). WTPH-G ("TPHg") - Total Petroleum Hydrocarbons in the gasoline range were analyzed per State of Washington methodology which adapts EPA SW-846 Methods 5030 and/or 8020.

HCID Laboratory Below Ranges for Gasoline is 20 ppm, for Diesel is 50 ppm, and for Oil is 100 ppm. WTPH-HCID ("HCID") is a Washington Total Petroleum Hydrocarbons-HydroCarbons IDentification qualitative detection screening method for petroleum products.

Polynuclear Aromatic Hydrocarbons ("PAH") analyzed per EPA Method 8270 (Semi-Volatile Organics).

3.3. Lab Analysis - Water

Laboratory reports are included in Appendix B- Laboratory Reports. The following Table is a summary of the analysis performed on the groundwater grab sample.

Table 3 - Summary of Water Analysis

Sample Number[1]	Depth, bgs[2]	Analysis	Result
B-2/W-1	95.9- to 98.7-feet	TPHg	Not Detected
B-2/W-1	95.9- to 98.7-feet	BTEX	Not Detected
B-2/W-1	95.9- to 98.7-feet	PAH	Not Detected except 2-methylnaphthalene at 2.5 µg/L and phenanthrene at 0.51 µg/L

Notes:
[1] Labeled "B-2-95.9" on laboratory analysis
[2] Groundwater may be under confined conditions and appears to be within a saturated sand unit encountered at 100.0-feet bgs.
Gasoline range compounds B - Benzene, T - Toluene, E - Ethyl Benzene, X - m, p and o, Xylene were analyzed per EPA Method 602 (Purgeable Aromatics). WTPH-G ("TPHg") - Total Petroleum Hydrocarbons in the gasoline range were analyzed per State of Washington methodology which adapts EPA SW-846 Methods 5030 and/or 8020.
Polynuclear Aromatic Hydrocarbons ("PAH") analyzed per EPA Method 8270 (Semi-Volatile Organics).

3.4. Interpretation of Data

3.4.1. Extent of Soil Contamination

Analysis of soil samples collected from drill holes B-1 and B-2, located adjacent to a previous diesel dispenser island excavation, indicate that previously detected petroleum hydrocarbons in the excavation have not migrated laterally to the drill hole locations, nor vertically below approximately 25-feet depth. HCID Below Range results, BTEX, TPHg and PAH analysis of selected soil samples at depths of 25-, 35-, 70- or 95-feet in B-1 and B-2 resulted in no detection, or Below Range, of petroleum hydrocarbon constituents. Preliminary field screening tests during drilling, such as sample odors, colors, and sheen, did not indicate obvious contamination.

3.4.2. Extent of Groundwater Contamination

Analysis of a hand-bailed groundwater sample collected from drill hole B-2 in a saturated sand encountered during split spoon sampling indicate that previously detected gasoline compounds and gasoline range petroleum hydrocarbons have not migrated vertically at the drill hole locations below 100-feet depth. BTEX, TPHg and PAH analysis of the groundwater sample collected at depths of 95.9- to 98.7-feet in B-2 resulted in no detection of petroleum hydrocarbon constituents, except 2-methylnaphthalene (naphthalene CAS #91-20-3) at 2.5 µg/L and phenanthrene (CAS #85-01-8) at

0.51 µg/L. Preliminary field screening tests of the groundwater sample, such as odor, color, and sheen, did not indicate obvious contamination.

The detection of 2-methylnaphthalene and phenanthrene at very low concentrations may be due to offsite migrations, lab contamination, or other reasons. The detected PAH compounds do not have established drinking water Maximum Contaminant Levels (MCL). The source for these two PAH's, if any, is uncertain, or may be due to airborne contamination while collecting the groundwater sample at the active service station.

PAH analysis of soils within, and immediately overlying, the saturated sand from which the groundwater sample was collected resulted in no detection of PAH. In a previous investigation (see Previous Work above), phenanthrene was detected (as was naphthalene but not 2-methylnaphthalene) in a soil sample collected at 10-feet depth below an apparent dry well system near the southwest corner of the convenience store. A vertical migration pathway for groundwater from near surface to the groundwater at 100.0-feet depth appears to be unlikely as evidenced by one (1) or more very dry silt units between the surface and the encountered groundwater. There is no further indication that vertical migration of PAH has occured from the dry well system to the groundwater encountered in B-2 at approximately 100.0-feet depth.

4. CONCLUSIONS

It is concluded from analysis of soil samples from drill holes B-1 and B-2, and a groundwater sample from B-2, that lateral or vertical migration of contaminants previously detected during excavation remediation has not occurred below a depth of approximately 25-feet below ground surface at the hole locations.

It is further concluded that PAH compounds detected in a bailed groundwater grab sample from B-2, appear to be from sources unrelated to in-situ, geologic ambient factors at depth and may have been due to airborne conditions, laboratory error, or an unknown source related to sampling techniques. Furthermore, the detected PAH compounds appear to be below cleanup action levels suggested in the Washington Model Toxics Control Act Chapter 173-340 WAC ("Toxic Cleanup Program").

5. RECOMMENDATIONS

Based on the results summarized in this report, it is recommended that no further groundwater investigation below 20-feet depth be performed. It is suggested that WADOE be notified of the findings in this report.

6. LIMITATIONS

This report is restricted to a preliminary review of geologic logs, and, soil and groundwater analyses as presented herein. Drilling services were performed under separate agreement with the landowner and Consultant makes no claim of responsibility for services provided by drilling services or others. This report has been prepared for the Client, landowner(s), or landowner's agents, and Consultant shall not accept liability or responsibility for detachment, partial use or separation by third parties and such use shall be at user's sole risk.

Services have been performed, findings obtained, and recommendations prepared in a manner generally exercised by members of the profession under similar conditions at the time services were rendered. Findings apply only to present conditions, and opinions expressed are subject to revision when additional or new information is submitted in writing by the landowner or Client. This warranty is in lieu of all other warranties, either expressed or implied.

It is possible that previous explorations failed to reveal the presence of hazardous materials at areas where hazardous materials were assumed, suspected or expected to exist (hazardous as used herein shall also mean contaminated and polluted). Landowner and/or Client understand that failure to locate drill holes, borings or groundwater monitoring well locations through appropriate and mutually agreed-upon techniques does not guarantee that hazardous materials can, or will be, detected at the drilled locations. Similarly, areas which in fact are unaffected by hazardous materials at the time of this report, may later, due to natural causes or human intervention, become contaminated. Consultant is not responsible for failing to locate drill holes, borings or groundwater monitoring wells which have not discovered hazardous materials at the time of this report or in the future.

This report should not be construed as presenting a value to the Site nor the condition as to construction capabilities. In the event of changes in future development plans as understood at the time of this report, the conclusions and recommendations made herein shall be invalid until given the opportunity to review and modify this report in writing. Portions of an Agreement to perform professional services for the Client may or may not be disclosed in this report.

Respectfully submitted,

RICHARD C. KENT
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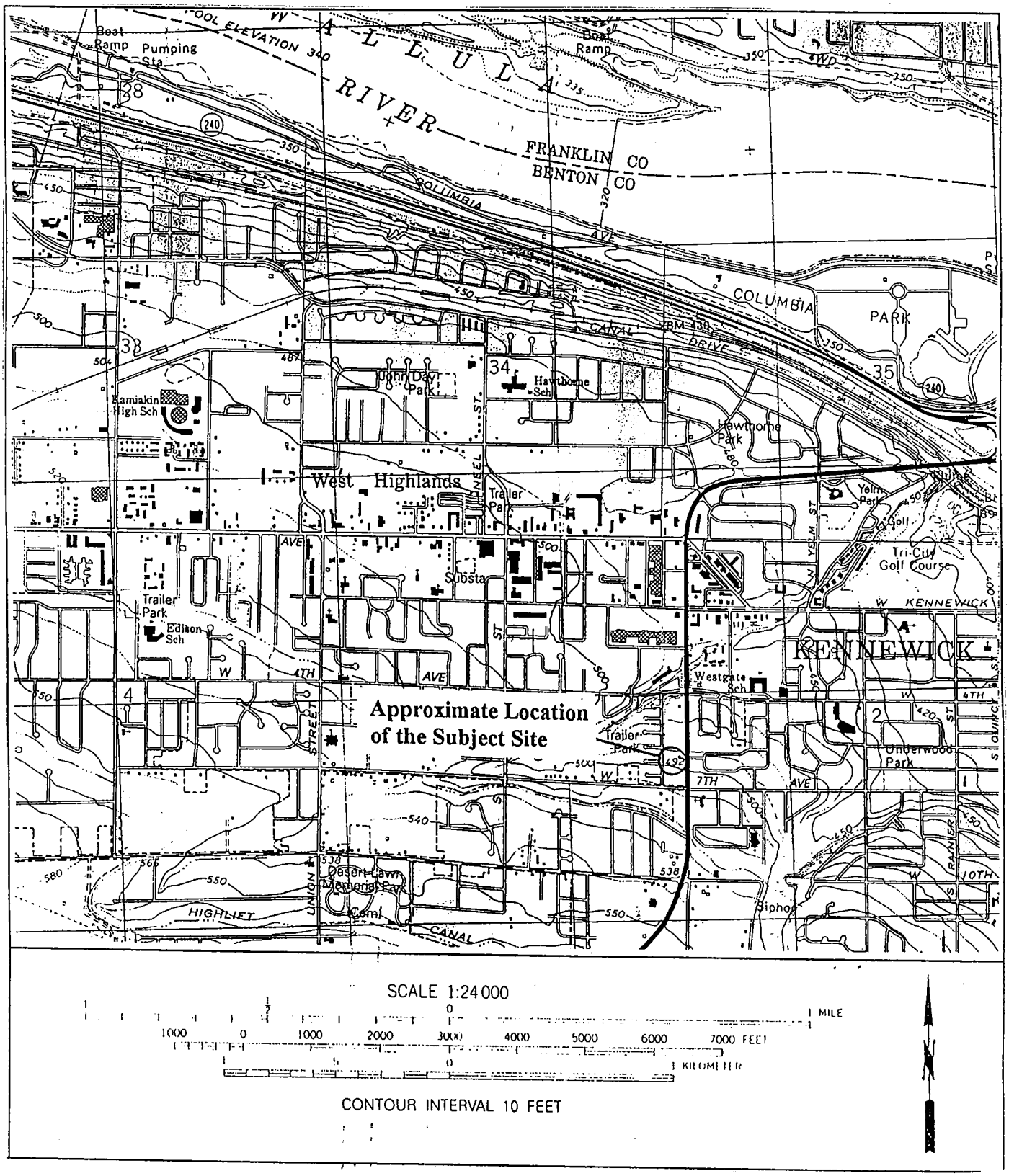
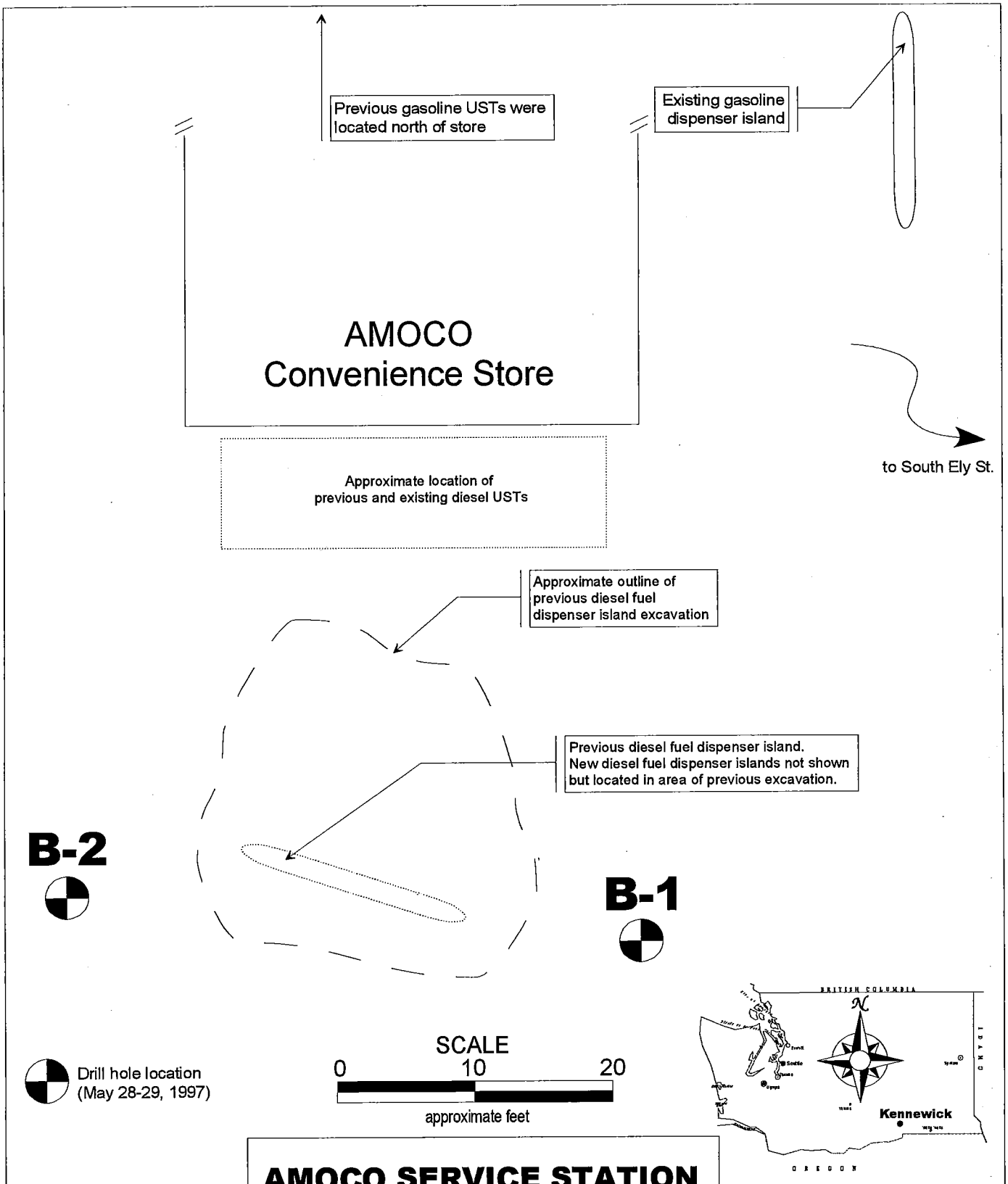


RICHARD C. KENT **Professional Geologist** Post Office Box 26, Battle Ground, WA 98604 (360) 687-0509 Project No. 97006 June, 1997	**AMOCO SERVICE STATION** **528 South Ely St.** **Kennewick, Washington** **WA DOE Site ID Number 100231**	**AREA MAP** Fig. 1



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WA DOE Site ID Number 100231

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Project No. 97006
June, 1997

SITE MAP
Fig. 2

Appendix A
Geologic Logs

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GEOLOGIC LOG

Project No./Name: 97006/Amoco UST Investigation	LAND OWNER: USA Holdings, Inc.
Project Location: 528 S. Ely, Kennewick, WA	**Drill Hole No.: B-1**
Drilling Co./Foreman: Env West Exp/Ron Sink	Geologist: rck
Drilling Method/C57/Rig: Schramm T300E 6" Air Rotary	Sampling Method(s): SPT and grab

Drilling Start Date/Time: 5/28/97, 09:45	Drilling End Date/Time: 5/28/97, 15:15	Elevation: aprox. 492 ft MSL	Total Depth: 95 feet SPT to 96 feet	Surface Conditions: asphalt	Samples: 1 Water
Depth 1st Water Date/Time: ~95-ft, 5/28/97, 15:00	Sec-Tws-Rng NE/SE 3, T8N, R29E	GeoPhys Logs na	Laboratory: Onsite	C-O-C Number: 52897-006	16 Soil

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
1						backfill sand and gravel				previous drilling and excavation indicate potential contamination cleanup to 23-feet, therefore drilled to 20-ft before begin SPT sampling
2										
3										
4										
5										
6										
7				none (inside cuttings barrel)						
8										
9										
10			10:22							
11										
12						backfill med sand well sorted		lt brn		grab
13										
14										
15										
16										
17										
18				----?---- strong diesel (in barrel)						
19										
20			10:27					lt grn brn	damp	cuttings odor

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GEOLOGIC LOG

Project No./Name: 97006/Amoco UST Investigation	LAND OWNER: USA Holdings
Project Location: 528 S. Ely, Kennewick, WA	Drill Hole No.: **B-1**

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
21	S-1	47 50/3	10:37	none	gm	sandy gravel	dense-m. dense	lt brn	damp	basalt pebbles, med-well rnded
22										
23										
24										
25										
26	S-2	21 50/4	10:51	none	sp	med, well sorted sand w/gravel of well rd basalt pebbles	med-v. dense	dk yel brn 10YR4/2		
27										
28										
29										
30										
31	S-3	27 35 50/4	11:00	none		occ gravel				
32										
33										no pebbles
34										
35										
36	S-4	25 50/5	11:11	none		grading to fn sand	med dense			
37										
38										
39										
40										
41	S-5	18 50/5	11:22	none	ml	v. slightly clayey silt	v stiff	pale reddish gray		no plastic roll
42										
43										
44										
45										

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GEOLOGIC LOG

Project No./Name:	LAND OWNER:
97006/Amoco UST Investigation	USA Holdings
Project Location:	Drill Hole No.: B-1
528 S. Ely, Kennewick, WA	

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
46	S-6	23 50/5	11:45	none	sp	med-fn, well sorted sand w/v little matrix	med dense	dk yel brn		qtzitic, angular, >40% clear qtz grains; occ micaceous occ grains of wht/org qtz
47										
48										
49										
50										
51	S-7	25 55	11:55	none		slight inc grain size slight fines		lt olive gray		less micaceous
52										
53										
54										
55										
56	S-8	24 47 50/4	12:15	none		med, well sorted qtzitic sand				slight inc yel mica, grains v. angular
57										
58										
59										
60							med dense-dense	lt olive gray to yel brn		rare mica, occ yel qtz
61	S-9	20 35 50/5	12:28	none						
62										
63										apparent gradational color change
64										
65										
66	S-10	28 55	12:45	none				med yel brn		
67										
68										
69										
70									damp	

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97006/Amoco UST Investigation	USA Holdings
Project Location: 528 S. Ely, Kennewick, WA	**Drill Hole No.: B-1**

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
71	S-11	30 55	13:05	none	ml	v. slightly clayey silt	v stiff to hard	lt reddish gray	wet damp	70-70.5-ft wet zone, no sheen S-11 silt only
72										
73										
74										
75										
76	S-12	30 50/6	13:24	none	sp	med, well sorted sand	med dense	lt yel brn		slight micaceous v quartzitic, angular grains dec clear quartz grains
77										
78										
79										
80										
81	S-13	25 50/3	13:45	none						basalt grains m rnded dec mica
82										
83										
84										
85										
86	S-14	20 50/5	14:07	none						inc clear qtz, v angular grains
87										
88										
89					ml	slightly clayey silt	v stiff	reddish gray	inc damp	cuttings grab
90										
91	S-15	20 50/4	14:23	none	ml-sp ---?---- sp	v fn, silty sand ------?------ v fn sand	m dense	lt yel brn	wet ------?------	no sheen
92										
93										
94										
95										total depth drilled 95.0 ft
										SPT 95-96 ft

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Project Location: 528 S. Ely, Kennewick, WA	**Drill Hole No.: B-1**

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
96	S-16 S-16W	23 50/5	15:00	none	sp	v fn well sorted sand	dense	lt yel brn	sat wet	95-95.3' saturated 95.3-95.6 v damp-wet 95.6-96 wet possible thin perched zone from 95-95.3 no sheen on water 95-96 ft
97										
98										
99										
100										
101										
102										
103										
104										
105										
106										
107										
108										
109										
110										
111										
112										
113										
114										
115										
116										
117										
118										
119										
120										

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GEOLOGIC LOG

Project No./Name: 97006/Amoco UST Investigation	LAND OWNER: USA Holdings, Inc.
Project Location: 528 S. Ely, Kennewick, WA	**Drill Hole No.: B-2**
Drilling Co./Foreman: Env West Exp/Ron Sink	Geologist: rck
Drilling Method/C57/Rig: Schramm T300E 6" Air Rotary	Sampling Method(s): SPT and grab

Drilling Start Date/Time: 5/28/97, 17:10	Drilling End Date/Time: 5/29/97, 13:10	Elevation: aprox. 492 ft MSL	Total Depth: 100 feet	Surface Conditions: asphalt	Samples: 2 Water
Depth 1st Water Date/Time: ~95-ft, 5/29/97, 12:20	Sec-Tws-Rng NE/SE 3, T8N, R29E	Geophys Logs na	Laboratory: Onsite	C-O-C Number: 52897-006	17 Soil

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
1						backfill sand and gravel				previous drilling and excavation indicate potential contamination cleanup to 23-feet, therefore drilled to 20-ft before begin SPT sampling
2										
3										
4										
5										
6										
7			17:35	none (inside cuttings barrel)						
8										
9										
10			17:40							
11										
12						backfill med sand		lt olive brn		large cobble? v. slow drilling
13										
14										
15										
16										
17										
18										
19										
20										

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GEOLOGIC LOG

Project No./Name:	LAND OWNER:
97006/Amoco UST Investigation	USA Holdings
Project Location: 528 S. Ely, Kennewick, WA	**Drill Hole No.: B-2**

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
21	S-1	50/4	17:47	none	gm	sandy gravel	v dense	lt yel brn	damp	sample loss >70%
22										
23										
24										
25										
26	S-2	16 50/6	18:00	none	sp	fn-med, well sorted sand slightly silty, qrtzitic		v lt yel brn		
27										
28										
29										
30							m dense			
31	S-3	15 24 50/5	18:16	none						
32										
33										drill pipe very moist (compressor condensation?)
34										
35										
36	S-4	15 30 50/5	18:28	none						
37						finer grained				
38										
39										
40										
41	S-5	20 50/4	18:49	none	ml	v slightly clayey silt grading to v fn sand w/ silty matrix	v stiff	pale reddish gray		no plastic roll
42										
43										
44										
45										

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GEOLOGIC LOG

Project No./Name: 97006/Amoco UST Investigation	LAND OWNER: USA Holdings
Project Location: 528 S. Ely, Kennewick, WA	**Drill Hole No.: B-2**

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
46	S-6	23 35 50/5	19:05	none	sp	well sorted fn sand	m dense-dense	lt yel brn	damp	
47					ml (2")	silt			moist	
48										
49						becoming coarser				
50										end 5/28/97 at 51-ft
51	S-7	20 50/6	19:22	none	sp	fn, well sorted qtzitic sand	m dense		damp	
52										
53										
54										
55										
56	S-8	20 32 50/5	08:05	none		med grained		lt olive gray		coarser grained near 56.5-ft
57										
58										
59										
60										
61	S-9	18 45 50/5	08:20	none						
62										
63										
64					gw	sandy gravel	dense	lt yel brn	wet	wet gravel - driller
65										
66	S-10	22 50/5	08:37	none	sp	fn-med, well sorted qtzitic sand			damp	
67										
68										
69						clayey, v fn grained				
70										

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GEOLOGIC LOG
SHEET 4 of 5

Project No./Name: 97006/Amoco UST Investigation	LAND OWNER: USA Holdings
Project Location: 528 S. Ely, Kennewick, WA	**Drill Hole No.: B-2**

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
71	S-11	30 50/4	08:50	none	ml	silt slightly clayey	v stiff to hard	pale reddish gray	v dry	70-70.2 wet, no sheen slightly micaceous
72										
73										
74										
75										
76	S-12	30 50/4	09:10	none	sp	fn-med, well sorted qtzitic sand v little matrix	med dense	lt yel brn	damp	>40% clear qtz grains; v angular grains
77										
78										
79										
80										apparent compressor condensation on sampler
81	S-13	33 50/5	09:25	none		med grained	dense			
82										
83										
84										
85										
86	S-14	27 50/6	09:45	none						
87										
88										
89										
90										
91	S-15	15 50/5	10:05	none	sm	v silty fn sand	med dense		-----wet----- moist	90-90.2 wet fn sand, no sheen
92					ml	fn sandy silt	v stiff			
93										
94										
95										

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GEOLOGIC LOG

Project No./Name:	LAND OWNER:
97006/Amoco UST Investigation	USA Holdings
Project Location:	**Drill Hole No.: B-2**
528 S. Ely, Kennewick, WA	

DEPTH (feet)	SAMPLE NO.	SPT	Time	HC Odor	USCS CLASS	NAME	DENSITY	COLOR	MOISTURE	REMARKS
96	S-16	28	12:20	none	---sp- - ml	--fn sand-- silt	--dense- - v stiff	lt yel brn	--wet/sat--- v dry (silt)	95-95.2 ft saturated sand
97	S-16W	50/5			sp	v fn sand to fn sandy silt	dense			no sheen; possible thin perched zone
98	(W-1 bailer 95.9-98.7 ft.)									
99										
100										total depth drilled 100 ft
101	S-17	14 18	12:45	none	sp	fn sand	dense	lt yel brn	saturated	sand heave, no sheen 13:18 2.8 ft of water in cased hole (water level at 95.9 ft from ground surface); TD at 98.7 ft (cave due to apparent sand heave)
102										
103										
104										
105										
106										
107										water grab sample with ss bailer, no sheen (B-2/W-1)
108										
109										
110										
111										
112										
113										
114										
115										
116										
117										
118										
119										
120										

GEOLOGIC LOGS

ABBREVIATIONS

------- approximate contact

_____ observed contact

__?__ questionable contact

__S-1__ split spoon soil sample

SPT column: hammer blow per 6-inches

USCS - Unified Soil Classification System

brn - brown

cse - coarse

dec - decreasing

dk - dark

ft - feet

fn - fine

gry - gray

grn - green

inc - increasing

lt - light

med - medium

mod - moderate

occ - occasional

peb - pebble

qtz - quartz, quartzitic

rnd, rnded, rded - rounded

TD - total depth

v - very

wht - white, whitish

w/ - with

yel - yellow

Appendix B
Laboratory Reports

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

WTPH-HCID

Date Extracted: 6-02-97
Date Analyzed: 6-02-97

Matrix: Soil

Client ID	Lab ID	GC Characterization	o-terphenyl Surrogate Recovery	Flags
B-1/S-2 25-26'	05-132-01	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	104%	
B-1/S-4 35-36'	05-132-02	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	105%	
B-1/S-11 70-71'	05-132-03	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	110%	
B-1/S-16 95-96'	05-132-04	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	104%	
B-2/S-2 25-26'	05-132-06	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	96%	
B-2/S-4 35-36'	05-132-07	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	95%	
B-2/S-11 70-71'	05-132-08	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	104%	
B2/S-15 90-91'	05-132-09	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	105%	
B2/S-16 95-96'	05-132-10	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	106%	

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

WTPH-HCID
METHOD BLANK QUALITY CONTROL

Date Extracted: 6-02-97
Date Analyzed: 6-02-97

Matrix: Soil

Lab ID: MB0602S1

	GC Characterization	o-terphenyl Surrogate Recovery	Flags
Method Blank	<20 ppm Gasoline range hydrocarbons <50 ppm Diesel range hydrocarbons <100 ppm Oil range hydrocarbons	103%	

4

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

EPA 8020 & WTPH-G

Date Extracted:	6-02-97					
Date Analyzed:	6-02-97					
Matrix: Soil						
Units: mg/Kg (ppm)						
Lab ID:	05-132-5			05-132-11		
Client ID:	**B-1/ S-16 95-96'**			**B2/S-17 100-101'**		
Dilution Factor	50			50		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.066	**ND**		0.061
Toluene	**ND**		0.066	**ND**		0.061
Ethyl Benzene	**ND**		0.066	**ND**		0.061
m,p-Xylene	**ND**		0.066	**ND**		0.061
o-Xylene	**ND**		0.066	**ND**		0.061
TPH-Gas	**ND**		6.6	**ND**		6.1
Fluorobenzene Surrogate Recovery	83%			85%		

5

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

EPA 8020 & WTPH-G
METHOD BLANK QUALITY CONTROL

Date Extracted: 6-02-97
Date Analyzed: 6-02-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB0602S1

Dilution Factor 50

	Result	Flags	PQL
Benzene	ND		0.050
Toluene	ND		0.050
Ethyl Benzene	ND		0.050
m,p-Xylene	ND		0 050
o-Xylene	ND		0.050
TPH-Gas	ND		5.0
Fluorobenzene Surrogate Recovery	106%		

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

EPA 8020 & WTPH-G
DUPLICATE QUALITY CONTROL

Date Extracted: 6-02-97
Date Analyzed: 6-02-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	05-130-1 Original	05-130-1 Duplicate	RPD
Dilution Factor	50	50	
Benzene	ND	ND	NA
Toluene	ND	ND	NA
Ethyl Benzene	ND	ND	NA
m,p-Xylene	ND	ND	NA
o-Xylene	ND	ND	NA
TPH-Gas	ND	ND	NA
Fluorobenzene Surrogate Recovery	91%	94%	

7

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

EPA 8020 & WTPH-G
MS/MSD QUALITY CONTROL

Date Extracted: 6-02-97
Date Analyzed: 6-02-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID spiked @ 1 ppm	05-130-1 MS	Percent Recovery	05-130-1 MSD	Percent Recovery	RPD
Dilution Factor	50		50		
Benzene	1.02	102	1.01	101	1.5
Toluene	1.05	105	1.07	107	1.9
Ethyl Benzene	1.04	104	1.04	104	0
m,p-Xylene	1.03	103	1.06	106	2.9
o-Xylene	1.04	104	1.05	105	1.4
Fluorobenzene Surrogate Recovery	98%		96%		

8

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

PAHs by EPA 8270

Date Extracted:	06-02-97
Date Analyzed:	06-02-97
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	05-132-5
Client ID:	B-1/ S-16 95-96'
Dilution Factor :	0.033

Compound:	Results	Flags	PQL
Naphthalene	ND		0.044
2-Methylnaphthalene	ND		0.044
Acenaphthylene	ND		0.044
Acenaphthene	ND		0.044
Fluorene	ND		0.044
Phenanthrene	ND		0.044
Anthracene	ND		0.044
Fluoranthene	ND		0.044
Pyrene	ND		0.044
Benzo[a]anthracene	ND		0.044
Chrysene	ND		0.044
Benzo[b]fluoranthene	ND		0.044
Benzo[k]fluoranthene	ND		0.044
Benzo[a]pyrene	ND		0.044
Indeno[1,2,3-cd]pyrene	ND		0.044
Dibenz[a,h]anthracene	ND		0.044
Benzo[g,h,i]perylene	ND		0.044

Surrogate :	Percent Recovery	Flags	Control Limits
2-Fluorophenol	42		25 - 121
Phenol-d6	51		24 - 113
Nitrobenzene-d5	40		23 - 120
2-Fluorobiphenyl	60		30 - 115
2,4,6-Tribromophenol	74		19 - 122
Terphenyl-d14	80		18 - 137

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

PAHs by EPA 8270

Date Extracted:	06-02-97
Date Analyzed:	06-02-97
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	05-132-11
Client ID:	B2/S-17 100-101'
Dilution Factor :	0.033

Compound:	Results	Flags	PQL
Naphthalene	ND		0.041
2-Methylnaphthalene	ND		0.041
Acenaphthylene	ND		0.041
Acenaphthene	ND		0.041
Fluorene	ND		0.041
Phenanthrene	ND		0.041
Anthracene	ND		0.041
Fluoranthene	ND		0.041
Pyrene	ND		0.041
Benzo[a]anthracene	ND		0.041
Chrysene	ND		0.041
Benzo[b]fluoranthene	ND		0.041
Benzo[k]fluoranthene	ND		0.041
Benzo[a]pyrene	ND		0.041
Indeno[1,2,3-cd]pyrene	ND		0.041
Dibenz[a,h]anthracene	ND		0.041
Benzo[g,h,i]perylene	ND		0.041

Surrogate :	Percent Recovery	Flags	Control Limits
2-Fluorophenol	40		25 - 121
Phenol-d6	45		24 - 113
Nitrobenzene-d5	36		23 - 120
2-Fluorobiphenyl	55		30 - 115
2,4,6-Tribromophenol	70		19 - 122
Terphenyl-d14	76		18 - 137

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

PAHs by EPA 8270
METHOD BLANK QUALITY CONTROL

Date Extracted:	06-02-97
Date Analyzed:	06-02-97
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0602S1
Dilution Factor :	0.033

Compound:	Results	Flags	PQL
Naphthalene	ND		0.033
2-Methylnaphthalene	ND		0.033
Acenaphthylene	ND		0.033
Acenaphthene	ND		0.033
Fluorene	ND		0.033
Phenanthrene	ND		0.033
Anthracene	ND		0.033
Fluoranthene	ND		0.033
Pyrene	ND		0.033
Benzo[a]anthracene	ND		0.033
Chrysene	ND		0.033
Benzo[b]fluoranthene	ND		0.033
Benzo[k]fluoranthene	ND		0.033
Benzo[a]pyrene	ND		0.033
Indeno[1,2,3-cd]pyrene	ND		0.033
Dibenz[a,h]anthracene	ND		0.033
Benzo[g,h,i]perylene	ND		0.033

Surrogate :	Percent Recovery	Flags	Control Limits
2-Fluorophenol	67		25 - 121
Phenol-d6	76		24 - 113
Nitrobenzene-d5	65		23 - 120
2-Fluorobiphenyl	79		30 - 115
2,4,6-Tribromophenol	83		19 - 122
Terphenyl-d14	89		18 - 137

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

SEMIVOLATILES by EPA 8270
MS/MSD QUALITY CONTROL

Date Extracted: 06-02-97
Date Analyzed: 06-02-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 05-128-14

Dilution Factor: 0.033

Compound:	Spike Amount	MS	Percent Recovery	MSD	Percent Recovery	RPD
Phenol	3.30	2.37	72	2.31	70	2.8
2-Chlorophenol	3.30	2.36	72	2.31	70	2.3
1,4-Dichlorobenzene	1.65	1.13	68	1.12	68	0.88
N-Nitroso-di-n-propylamine	1.65	1.26	76	1.22	74	3.3
1,2,4-Trichlorobenzene	1.65	1.21	74	1.19	72	2.1
4-Chloro-3-methylphenol	3.30	3.08	93	2.88	87	6.7
Acenaphthene	1.65	1.40	85	1.34	81	4.7
2,4-Dinitrotoluene	1.65	1.41	86	1.33	81	6.0
4-Nitrophenol	3.30	2.88	87	2.99	91	3.8
Pentachlorophenol	3.30	3.33	101	3.19	97	4.5
Pyrene	1.65	1.44	87	1.38	83	4.2

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

PAHs by EPA 8270

Date Extracted:	06-03-97
Date Analyzed:	06-05-97
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	05-132-13
Client ID:	B2-95.9-
Dilution Factor:	0.00050

Compound:	Results	Flags	PQL
Naphthalene	ND		0.50
2-Methylnaphthalene	2.5		0.50
Acenaphthylene	ND		0.50
Acenaphthene	ND		0.50
Fluorene	ND		0.50
Phenanthrene	0.51		0.50
Anthracene	ND		0.50
Fluoranthene	ND		0.50
Pyrene	ND		0.50
Benzo[a]anthracene	ND		0.50
Chrysene	ND		0.50
Benzo[b]fluoranthene	ND		0.50
Benzo[k]fluoranthene	ND		0.50
Benzo[a]pyrene	ND		0.50
Indeno[1,2,3-cd]pyrene	ND		0.50
Dibenz[a,h]anthracene	ND		0.50
Benzo[g,h,i]perylene	ND		0.50

Surrogate	Percent Recovery	Control Limits
2-Fluorophenol	25	21 - 100
Phenol-d6	20	10 - 94
Nitrobenzene-d5	54	35 - 114
2-Fluorobiphenyl	62	43 - 116
2,4,6-Tribromophenol	55	10 - 123
Terphenyl-d14	82	33 - 144

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

PAHs by EPA 8270
METHOD BLANK QUALITY CONTROL

Date Extracted:	06-03-97
Date Analyzed:	06-05-97
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	MB0603W1
Dilution Factor:	0.00050

Compound:	Results	Flags	PQL
Naphthalene	ND		0.50
2-Methylnaphthalene	ND		0.50
Acenaphthylene	ND		0.50
Acenaphthene	ND		0.50
Fluorene	ND		0.50
Phenanthrene	ND		0.50
Anthracene	ND		0.50
Fluoranthene	ND		0.50
Pyrene	ND		0.50
Benzo[a]anthracene	ND		0.50
Chrysene	ND		0.50
Benzo[b]fluoranthene	ND		0.50
Benzo[k]fluoranthene	ND		0.50
Benzo[a]pyrene	ND		0.50
Indeno[1,2,3-cd]pyrene	ND		0.50
Dibenz[a,h]anthracene	ND		0.50
Benzo[g,h,i]perylene	ND		0.50

Surrogate	Percent Recovery	Control Limits
2-Fluorophenol	23	21 - 100
Phenol-d6	17	10 - 94
Nitrobenzene-d5	48	35 - 114
2-Fluorobiphenyl	50	43 - 116
2,4,6-Tribromophenol	65	10 - 123
Terphenyl-d14	76	33 - 144

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

SEMIVOLATILES by EPA 8270
SB/SBD QUALITY CONTROL

Date Extracted: 05-23-97
Date Analyzed: 05-29-97

Matrix: Water
Units: ug/L (ppb)

Lab ID: SB0523W1

Dilution factor: 0.00050

Compound:	Spike Amount	SB	Percent Recovery	SBD	Percent Recovery	RPD
Phenol	50	10.9	22	12.0	24	10
2-Chlorophenol	50	30.6	61	29.2	58	5.0
1,4-Dichlorobenzene	25	11.8	47	10.8	43	9.0
N-Nitroso-di-n-propylamine	25	15.0	60	14.0	56	7.0
1,2,4-Trichlorobenzene	25	12.7	51	12.0	48	6.0
4-Chloro-3-methylphenol	50	39.9	80	40.2	80	1.0
Acenaphthene	25	16.0	64	15.7	63	2.0
2,4-Dinitrotoluene	25	15.9	64	15.9	64	0
4-Nitrophenol	50	11.7	23	14.5	29	21
Pentachlorophenol	50	34.4	69	33.9	68	2.0
Pyrene	25	17.0	68	16.8	67	1.0

Date of Report: June 9, 1997
Samples Submitted: May 31, 1997
Lab Traveler: 05-132
Project: 48-000-463

Date Analyzed: 6-02-97

% MOISTURE

Client ID	Lab ID	% Moisture
B-1/S-16 95-96'	05-132-05	24
B2/S-17 100-101'	05-132-11	18

Date of Report: June 5, 1997
Samples Submitted: June 4, 1997
Lab Traveler: 06-016
Project: 48-000-463

EPA 602 & WTPH-G

Date Extracted:	6-04-97
Date Analyzed:	6-04-97
Matrix: Water	
Units: ug/L (ppb)	
Lab ID:	06-016-1
Client ID:	**B2-95 ' 9-**
Dilution Factor	1.0

	Result	Flags	PQL
Benzene	**ND**		1.0
Toluene	**ND**		1.0
Ethyl Benzene	**ND**		1.0
m,p-Xylene	**ND**		1.0
o-Xylene	**ND**		1.0
TPH-Gas	**ND**		100
Fluorobenzene Surrogate Recovery	86%		

Date of Report: June 5, 1997
Samples Submitted: June 4, 1997
Lab Traveler: 06-016
Project: 48-000-463

EPA 602 & WTPH-G
METHOD BLANK QUALITY CONTROL

Date Extracted: 6-04-97
Date Analyzed: 6-04-97

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0604W1

Dilution Factor 1.0

	Result	Flags	PQL
Benzene	**ND**		1.0
Toluene	**ND**		1.0
Ethyl Benzene	**ND**		1.0
m,p-Xylene	**ND**		1.0
o-Xylene	**ND**		1.0
TPH-Gas	**ND**		100

Fluorobenzene
Surrogate Recovery 82%

Date of Report: June 5, 1997
Samples Submitted: June 4, 1997
Lab Traveler: 06-016
Project: 48-000-463

EPA 602 & WTPH-G
DUPLICATE QUALITY CONTROL

Date Extracted: 6-04-97
Date Analyzed: 6-04-97

Matrix: Water
Units: ug/L (ppb)

Lab ID:	06-016-1	06-016-1	
	Original	**Duplicate**	**RPD**
Dilution Factor	1.0	1.0	
Benzene	**ND**	**ND**	NA
Toluene	**ND**	**ND**	NA
Ethyl Benzene	**ND**	**ND**	NA
m,p-Xylene	**ND**	**ND**	NA
o-Xylene	**ND**	**ND**	NA
TPH-Gas	**ND**	**ND**	NA
Fluorobenzene Surrogate Recovery	86%	86%	

Date of Report: June 5, 1997
Samples Submitted: June 4, 1997
Lab Traveler: 06-016
Project: 48-000-463

EPA 602 & WTPH-G
MS/MSD QUALITY CONTROL

Date Extracted: 6-04-97
Date Analyzed: 6-04-97

Matrix: Water
Units: ug/L (ppb)

Lab ID spiked @ 50 ppb Dilution Factor	06-016-1 **MS** 1.0	Percent Recovery	06-016-1 **MSD** 1.0	Percent Recovery	RPD
Benzene	44.3	89	45.4	91	2.5
Toluene	44.0	88	45.5	91	3.4
Ethyl Benzene	44.0	88	45.9	92	4.2
m,p-Xylene	43.7	87	45.6	91	4.3
o-Xylene	43.7	87	45.0	90	2.9
Fluorobenzene Surrogate Recovery	88%		88%		

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

A - Due to high sample concentration, amount spiked insufficient for meaningful MS/MSD data recovery.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD outside control limits due to analyte concentration within five times the quantitation limit.

D - Data from 1:____ dilution.

E - Value reported exceeds the quantitation range. Value is an estimate.

F - Surrogate recovery data not available due to the high concentration in the sample.

G - Insufficient sample quantity for duplicate analysis.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD outside control limited due to sample inhomogeniety. Sample re-extracted and re-analyzed with similar results.

L - Quantitated from C7-C34 as diesel fuel #2.

M - Predominantly _____ range hydrocarbons present in the sample.

N - Hydrocarbons in the gasoline range (C7-toluene) present in the sample.
N1 - Hydrocarbons in the gasoline range (C7-toluene) present in the sample which are elevating the diesel result.

O - Hydrocarbons in the heavy oil range (>C24) present in the sample.
O1 - Hydrocarbons in the heavy oil range (>C24) present in the sample which are elevating the diesel result.

R - Hydrocarbons outside defined gasoline range present in the sample.

S - Surrogate recovery data not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - Matrix Spike/Matrix Spike Duplicate RPD outside control limits due to matrix effects.

V - Matrix Spike/Matrix Spike Duplicate recoveries outside control limits due to matrix effects.

Z - Interferences were present which prevented the quantitation of the analyte below the detection limit reported.

ND - Not Detected

MRL - Method Reporting Limit

PQL - Practical Quantitation

Appendix C
Water Grab Sample Field Logs

RICHARD C. KENT
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Battle Ground, WA 98604
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WATER GRAB SAMPLE FIELD LOG

Project Name: Amoco UST Investigation

Project Location: 528 S. Ely, Kennewick, WA

Client: U.S.A. Holdings, Inc.

Project Number: 97006

DATE: May 28, 1997 Time Sample Collected: 15:00	**SAMPLE NO.: B-1/S-16 WATER (95.0- to 95.3-ft.)**
	DRILL HOLE NO.: **B-1**
COC and RFA Number: 52897-006	No. of Sample Containers: 1
Static Water Level: not available	SWL Time: na
Total depth drilled: 95-ft, SPT to 95.9-ft	Drilling date: 5/28/97
Sample Collection Method: A saturated soil sample was collected from the split spoon sampler with a triple-rinsed (TSP) stainless steel tablespoon by scraping the upper half of the material in the split spoon sampler and placing it in an 8-oz, clear glass, widemouth jar with a teflon liner. The jar was filled to prevent air-entrapment. The sample jar was placed in an ice chest with blu-ice for transport to the laboratory. Samples were collected while wearing new latex gloves which were disposed after sampling.	
Turbidity: very high (saturated soil sample)	
Color: light yellow brown	Odor: none
COMMENTS: Split spoon sample, B-1/S-16-Water, contains a saturated, well sorted, light yellow brown, fine sand with little matrix from approximately 95.0- to 95.3-feet. From approximately 95.3 to 95.5-feet, the sampler contained a very damp-wet, well sorted, very light yellow brown, very fine sand with little matrix. From approximately 95.5- to 95.9-feet, the sampler contained a wet, well sorted, very light yellow brown, very fine sand with little matrix. Two (2) samples were collected from the split spoon sampler: B-1/S-16 with material from the entire sampler as described above; and a second sample, Sample B-1/S-16-Water, containing water and soil specifically collected from the 95.0- to 95.3-ft. saturated zone.	

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WATER GRAB SAMPLE FIELD LOG

Project Name: Amoco UST Investigation

Project Location: 528 S. Ely, Kennewick, WA

Client: U.S.A. Holdings, Inc.

Project Number: 97006

DATE: May 29, 1997 Time Sample Collected: 12:20	**SAMPLE NO.: B-2/S-16-WATER (95.0- to 95.5 ft.)**
	DRILL HOLE NO.: **B-2**
COC and RFA Number: 52897-006	Number of Sample Containers: 1
Static Water Level: na	SWL Time: na
Total depth drilled: 100 ft., SPT to 101 ft.	Drilling date: 5/29/97
Sample Collection Method: A saturated soil sample was collected from the split spoon sampler with a triple-rinsed (TSP) stainless steel tablespoon by scraping the upper half of the material in the split spoon sampler and placing it in an 8-oz, clear glass, widemouth jar with a teflon liner. The jar was filled to prevent air-entrapment. The sample jar was placed in an ice chest with blu-ice for transport to the laboratory. Samples were collected while wearing new latex gloves which were disposed after sampling.	
Turbidity: very high (saturated soil sample)	
Color: light yellow brown	Odor: none
COMMENTS: Split spoon sample, B-2/S-16-Water, contained a wet to saturated, light yellow brown, fine sand with little matrix from approximately 95.0- to 95.5-feet. From approximately 95.5- to 95.8-feet, the sampler contained a very dry silt. From approximately 95.8- to 96.0-feet, the sampler contained a damp, well sorted, light yellow brown, very fine sand to fine sandy silt. . Two (2) samples were collected from the split spoon sampler: B-1/S-16 with material from the entire sampler as described above; and a second sample, Sample B-1/S-16-Water, containing water and soil specifically collected from the 95.0-95.5 wet to saturated zone.	

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WATER GRAB SAMPLE FIELD LOG

Project Name: Amoco UST Investigation

Project Location: 528 S. Ely, Kennewick, WA

Client: U.S.A. Holdings, Inc.

Project Number: 97006

DATE: May 29, 1997	**SAMPLE NO.: B-2/W-1 (S-17) WATER**
Time Sample Collected: 13:40	DRILL HOLE NO.: **B-2**
COC and RFA Number: 52897-006	Number of Sample Containers: 3
Static Water Level: 95.9 ft. bgs	SWL Time: 13:18
Total depth drilled: 100 ft., SPT to 101 ft.	Drilling date: 5/29/97
Sample Collection Method: A water grab sample was collected by hand bailing using a stainless steel bailer. The bailer was lowered to a few inches above the apparent "sand-heaved" collapsed total hole depth of 98.7-feet (total drilled and casing depth was 100.0-feet). Sample B-2/S-17-Water (also referenced as "B-2/W-1" and "B-2/95.9") was collected by pouring from the holes in the top of the bailer into two (2) 40-ml vials and one (1) 1-liter glass bottles. The vials were clear glass and the liter bottle was amber glass. All bottles were sealed with a teflon septum or lid and placed in an ice chest with blu-ice for transport to the laboratory.	
Turbidity: very high	
Color: light yellow brown	Odor: none
COMMENTS: The total drilled depth of B-2 was 100.0-feet (nominal 6-inches diameter). Water discharge was not observed during drilling to total depth. After performing the SPT sampling from 100.0- to 101.0-feet, the drill hole contained approximately 2.8-feet of water. Because the casing was driven to total drilled depth of 100.0-feet, a groundwater zone with excess water pressure may have been encountered at about 100.0-feet. The static water level indicates a possible confined zone because the water level rose in the casing above the depth of the SPT sampling. The split spoon sampler did not contain a fully recovered soil sample; however, the inside sides of the sampler were slightly coated with a saturated, light yellow brown, fine sand with little matrix.	

Appendix D
Daily Field Reports

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DAILY FIELD REPORT

DAY/DATE: Weds., 5/28/97	SHEET 1 of 1
PROJECT NAME: Amoco UST Investigation	**PROJECT NO.**: 97006
PROJECT LOCATION: 528 S. Ely, Kennewick, WA Weather: overcast in AM, fair, 55-79°, 26-49% humidity, winds calm from W, mist in AM	
WORK PERFORMED: Drilled B-1 to 95.0 ft and B-2 to 50.0 ft.	
PROBLEM ENCOUNTERED na	**CORRECTIVE ACTION TAKEN**
EQUIPMENT ON-SITE: Schramm T300 Air Rotary, Compressor trailer, support truck with decontamination sprayer. Level D PPE.	
SAMPLING PERFORMED: Split spoon B-1 (Soil S-1 through S-16, S-16 Water) and B-2 (Soil S-1 through S-6). Drill cuttings to existing spoil pile.	
PERSONNEL AND VISITORS ON-SITE: Drillers, Peter Trabusiner, Al Pogue	
TELEPHONE CALLS MADE: na	

DAILY FIELD REPORT

DAY/DATE: Thurs., 5/29/97	SHEET 1 of 1
PROJECT NAME: Amoco UST Investigation	**PROJECT NO.**: 97006
PROJECT LOCATION: 528 S. Ely, Kennewick, WA Weather: fair, 55-79°, 26-49% humidity, winds calm from SW, no precipitation	
WORK PERFORMED: Drilled B-2 50.0 ft. to 100.0 ft.	
PROBLEM ENCOUNTERED na	**CORRECTIVE ACTION TAKEN**
EQUIPMENT ON-SITE: Schramm T300 Air Rotary, Compressor trailer, support truck with decontamination sprayer. Level D PPE.	
SAMPLING PERFORMED: Split spoon B-2 (Soil S-7 through S-17, S-16 Water, B-2/W-1 Water). Drill cuttings to existing spoil pile.	
PERSONNEL AND VISITORS ON-SITE: Drillers, Peter Trabusiner, Al Pogue	
TELEPHONE CALLS MADE: na	

RED FLAGS MARK SAMPLING POINTS

NORTHERLY REMEDIATION AREA

RED FLAGS MARK SAMPLING POINTS

NORTHERLY REMEDIATION AREA

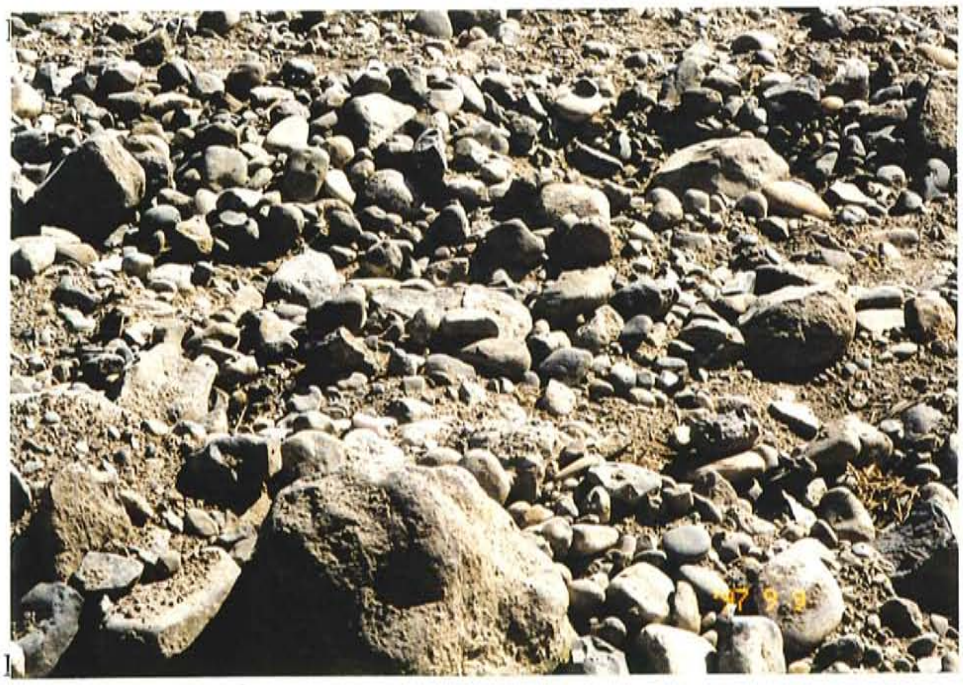
MATERIAL AT THE NORTHERLY AREA

THE REMEDIATION AREA AS SEEN FROM HIGHWAY 395

MATERIAL AT THE NORTHERLY AREA

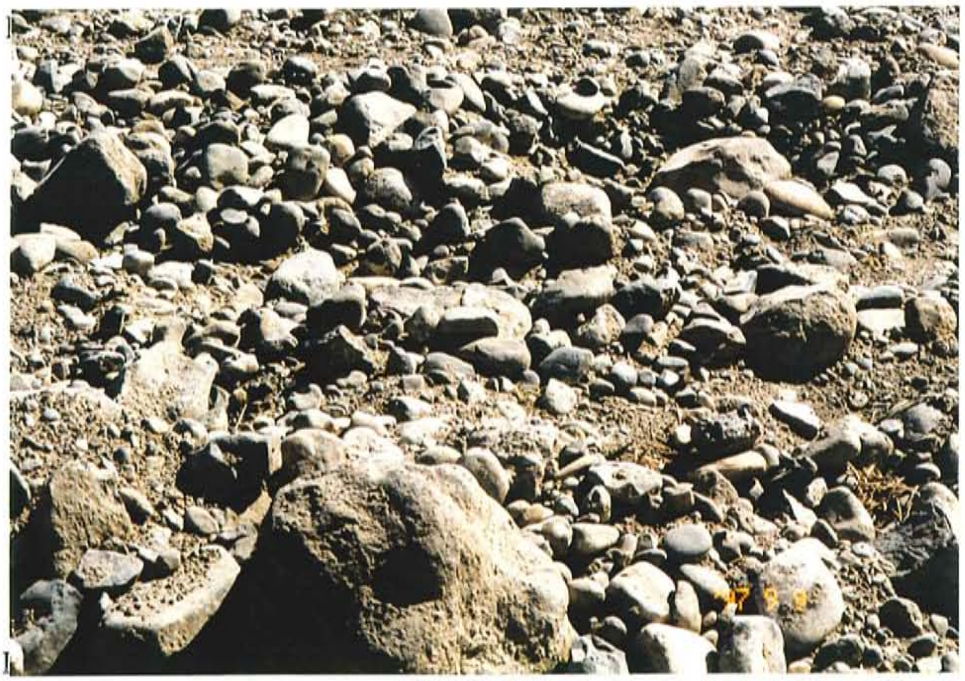
THE REMEDIATION AREA AS SEEN FROM HIGHWAY 395

SOUTHERLY REMEDIATION AREA



CLOSEUP OF THE MATERIAL UNDERGOING REMEDIATION

SOUTHERLY REMEDIATION AREA



CLOSEUP OF THE MATERIAL UNDERGOING REMEDIATION