GROUND WATER OCCURRENCE IN THE VICINITY OF THE FORMER CHUCK OLSON CHEVROLET FACILITY

17545 AURORA AVENUE NORTH SHORELINE, WASHINGTON

PREPARED FOR: CHUCK OLSON CHEVROLET

AESI PROJECT NO. BV97011 APRIL 26, 1999

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1.0 Introduction

This report documents the results of a water well and soil boring survey conducted by Associated Earth Sciences, Inc. (AESI) in the vicinity of the former Chuck Olson Chevrolet facility (the Site). The primary focus of the survey was to identify known water wells and soil borings pertinent to evaluating ground water occurrence in order to assess whether historical petroleum releases at the Site have the potential to impact ground water beneath the Site.

The Site is located in the Richmond Highlands section of Shoreline, Washington, on the west side of Aurora Avenue North, and is situated along a topographic high that forms a north-south trending ridge (Figure 1). The approximate site elevation is 475 feet above mean sea level (msl). The topography in the area generally slopes away from the Site in all directions. An isolated topographic high is present approximately 2,500 feet north-northwest of the Site.

2.0 Area Geology

Based on 24 soil borings drilled at the Site during Phase II site assessment activities (*Preliminary Report of Phase II Environmental Site Assessment Activities*, AESI, June 27, 1997), subsurface deposits at the Site are characterized as the Vashon Lodgement Till, a compact deposit emplaced beneath glacial ice during the most recent regional glaciation event. Soil boring information indicates that the Vashon Till at the Site consists of gray, very dense, silty sands with gravel, with no discernable bedding of other depositional structures. The till was encountered in all borings, which extended to a maximum depth of 32 feet below ground surface (bgs) at exploration boring EB-24 located at the south end of the main service shop building at the Site. Regionally, the thickness of the Vashon Till generally varies from a few feet to as much as 40 feet thick.

Geologic information from nearby water supply wells and deep environmental soil borings indicates that Quaternary sediments underlie Vashon Till, and generally consist of less consolidated sandy deposits laid down by glacial meltwaters in advance of the glacial ice. Regionally, these advance outwash deposits underlying the Vashon Till consist of interbedded sands and gravels, but may contain discontinuous lenses of silt. The uppermost perennial unconfined aquifer is generally found in the upper portion of the advance outwash deposits.

3.0 Well and Soil Boring Data

Water wells were identified within a 1-mile radius of the Site using information from the *Geology and Ground-Water Resources of Northwestern King County, Washington* (USGS, Division of Water Resources, 1963), and Water Well Reports compiled by the Washington State Department of Ecology. Additional soil boring information from site-specific environmental investigation reports in the area was also evaluated. Thirty-four wells were identified that have been used primarily for domestic purposes or for undetermined uses. Soil boring information from four sites investigated for environmental reasons was also evaluated, including selected on-site borings. Details for each well or boring are summarized in Table 1. The locations for the wells and borings are noted in Figure 2. Water well reports and soil boring logs are provided in Appendix A.

4.0 Ground Water Occurrence

Ground water was not encountered in any of the nine remedial excavations (previously conducted to remove hydrocarbon-impacted soil under the service shop building). In addition, no indication of ground water or saturated soil was noted in any of the 24 exploration borings advanced at the Site, including the deepest boring (EB-24) advanced to 32 feet bgs at the south end of the service shop building.

Ground water was also not encountered during environmental activities conducted at the Equilon Enterprises (Texaco) site, located approximately 200 feet south of the Site. Excavations to remove petroleum-impacted soil at the Texaco site (*Compliance Soil Sampling Results*, Groundwater Technology, Inc., June 1, 1994) did not encounter ground water, and soil borings drilled up to 50 feet bgs also did not encounter ground water (*Cleanup Status Update*, Equilon Enterprises (letter correspondence to the Department of Ecology), October 13, 1998). The Texaco property is at an elevation comparable to that of the Site.

Environmental explorations conducted at a former Unocal service station, located approximately 1,000 feet east of, and over 50 feet lower in elevation than Site, have indicated that there may be a perched water table within or above the Vashon Till (*Report of Geoenvironmental Services*, GeoEngineers, Inc., November 21, 1988) at that location. The presence of seasonal, perched ground water zones on the Vashon Till is not unusual, particularly in areas located down slope of extensive topographic highs that are mantled by till. Soil borings installed to 150 feet bgs at the Unocal site indicate that although seasonally perched zones may be present, the regional ground water table in the site vicinity occurs at a depth of at least 150 feet bgs.

Table 1 presents a summary of water wells and soil borings within a 1-mile radius of the Site. Static water levels were measured for most of the water wells in 1953. Current water levels (expressed as depth to water (in feet) from the top of the well casing) or water-level trends are unknown for these wells, but the measured static levels are a general indication of ground water occurrence in the area. Among wells that are in close proximity to each other, water levels are similar (Table 1). However, some of the wells that are near each other have markedly different levels (e.g., the 7H and 7K wells). These differences generally correspond to differences in ground-surface elevation and well depth. Also, based on the well depths, casing depths, and reported producing formation, some wells may produce from the advance outwash sands, some may produce from the till, while others may produce from both the advance outwash sands and the overlying till.

Reported static water level elevations (relative to mean sea level) for all wells in Table 1, except wells 6M1 and 6M2 located approximately 2,500 feet north-northwest of the Site, are lower in elevation than the maximum depth of all soil boring explorations and excavations at the Site. Wells 6M1 and 6M2 are relatively deep wells (224 feet and 443 feet, respectively). The wells are likely completed in deeper, confined water-bearing zones below the advance outwash deposits.

The average reported water level elevation of all wells listed in Table 1 is 370 feet (73 feet lower than the bottom elevation of the EB-24, the deepest boring installed at the Site). Based on the water-level information for the water wells in the area and the absence of ground water in exploration borings or excavations at the Site, it is a reasonable conclusion that there is considerable separation between the base of the residual TPH-impacted soil and the first occurrence of ground water beneath the Site.

5.0 Implications for Ground Water Impacts from the Site

Subsurface investigations previously conducted by AESI at the Site indicated the presence of impacted soil related to historical uses of the Site as an automotive repair facility. Soil borings were drilled to delineate the lateral and vertical extent of these impacts, and indicated that the highest petroleum concentrations in soil (indicated by total petroleum hydrocarbon (TPH) analyses) were generally limited to depths of less than 10 feet below existing grade. Samples collected from the bottom of borings in each impacted area (generally related to service bays) were collected to confirm that petroleum-impacted soil had been vertically delineated, and that the relative impact of petroleum had diminished vertically to a concentration at or near the laboratory method detection limits. Five of these borings

were drilled to 20 feet or greater; three of the borings indicated TPH concentrations below the method detection limit and two indicated TPH concentrations of 60 milligrams per kilogram (mg/kg). One of the samples indicating 60 mg/kg was collected from EB-24 (Bay #12, on the southern portion of the Site) at a depth of 32 feet bgs. The other sample indicating 60 mg/kg was collected from EB-17 (Bay #6, in the main service shop) at a depth of 20 feet bgs. These two areas represent the deepest zone of impact at the Site, but also indicate that the borings had penetrated through the zone of greatest impact, based on the TPH concentrations for shallower samples that were significantly higher than 60 mg/kg.

During late 1998 and early 1999, approximately 1,213 tons of soil impacted by TPH were excavated from the Site and treated off site by thermal desorption. The results of this remedial action are documented in the *Remedial Action Report – Former Chuck Olson Chevrolet Facility*, AESI, April 26, 1999). The majority of the TPH-impacted soil at the Site was removed. A site-specific residential TPH cleanup level of 7,000 mg/kg was established for the Site. This calculated site-specific maximum residential soil TPH concentration was also determined to be adequately protective of the soil-to-ground-water pathway.

After site remediation was completed, approximately 195 cubic yards of soil impacted with TPH above the calculated site-specific cleanup level of 7,000 mg/kg remains beneath the service shop area, where the depth of excavation and/or the proximity to the building foundations precluded additional excavation.

6.0 Summary of Findings

The first perennial aquifer beneath the Site likely occurs in the advance outwash sands at a depth of greater than 150 bgs. Information collected during both the site investigation and soil remediation phases at the Site demonstrates that the maximum vertical extent of TPH impacts at the Site were in the Bay #12 area, where trace concentrations of TPH (60 mg/kg) were detected at a depth of 32 feet bgs. Significant TPH impacts to soil did not extend below this depth. This indicates that the minimum vertical separation between the historic (and remaining residual) TPH-impacted soil and ground water is in excess of 100 feet, and therefore ground water would not have come in contact that TPH-impacted soil beneath the Site.

An additional consideration related to the mobility of releases of TPH at the Site is that infiltration of surface water is restricted because the Site is entirely paved or covered with low permeability asphalt or concrete surfaces. This factor, coupled with lack of observed

saturated soils or ground water beneath the Site, indicates that potential for ground water impact is minimal. Because the residual TPH at the Site is composed of the higher carbon ranges fractions (diesel to heavy-oil), its downward mobility is further restricted due to its relatively high viscosity and sorptive characteristics.

In conclusion, neither the historic or residual TPH-impacted soil at Site is considered a risk for impacting ground water beneath the Site. This conclusion is based on:

1. The maximum depth of the TPH-impacted soil at the Site (approximately 32 feet bgs).

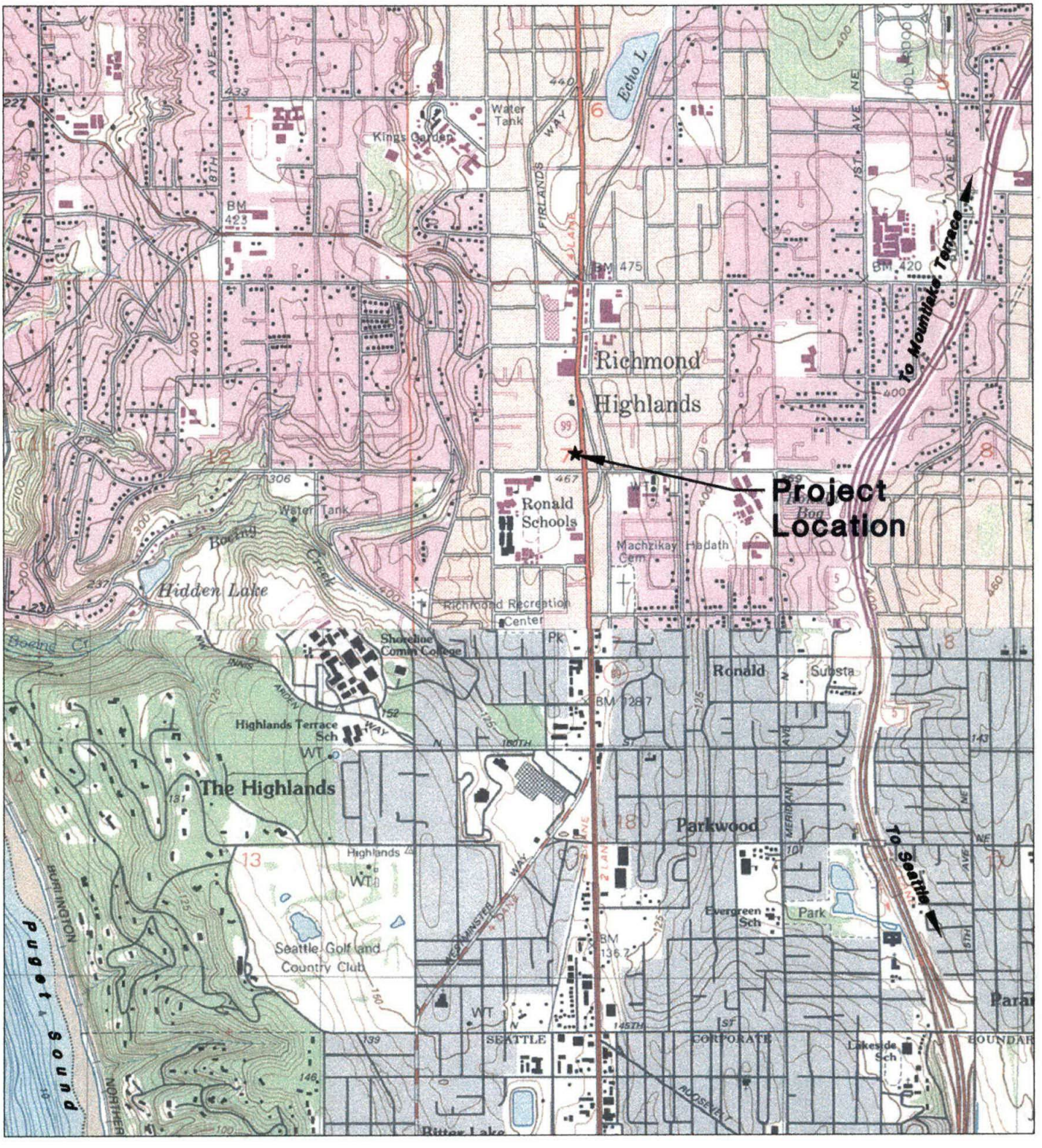
2. The absence of wet soils or ground water conditions during the soil exploration and remedial excavation. Given the abnormally high amount of rainfall during the site exploration and excavation period, perched ground water conditions, if present, would likely have been observed.

3. The covered or capped nature of the Site surface, which effectively restricts the infiltration of incident precipitation.

4. The anticipated depth to ground water beneath the Site (>150 feet), and the corresponding large vertical separation between the TPH-impacted soil and ground water (>100 feet).

5. The low solubility and relative immobility of the TPH fractions present.

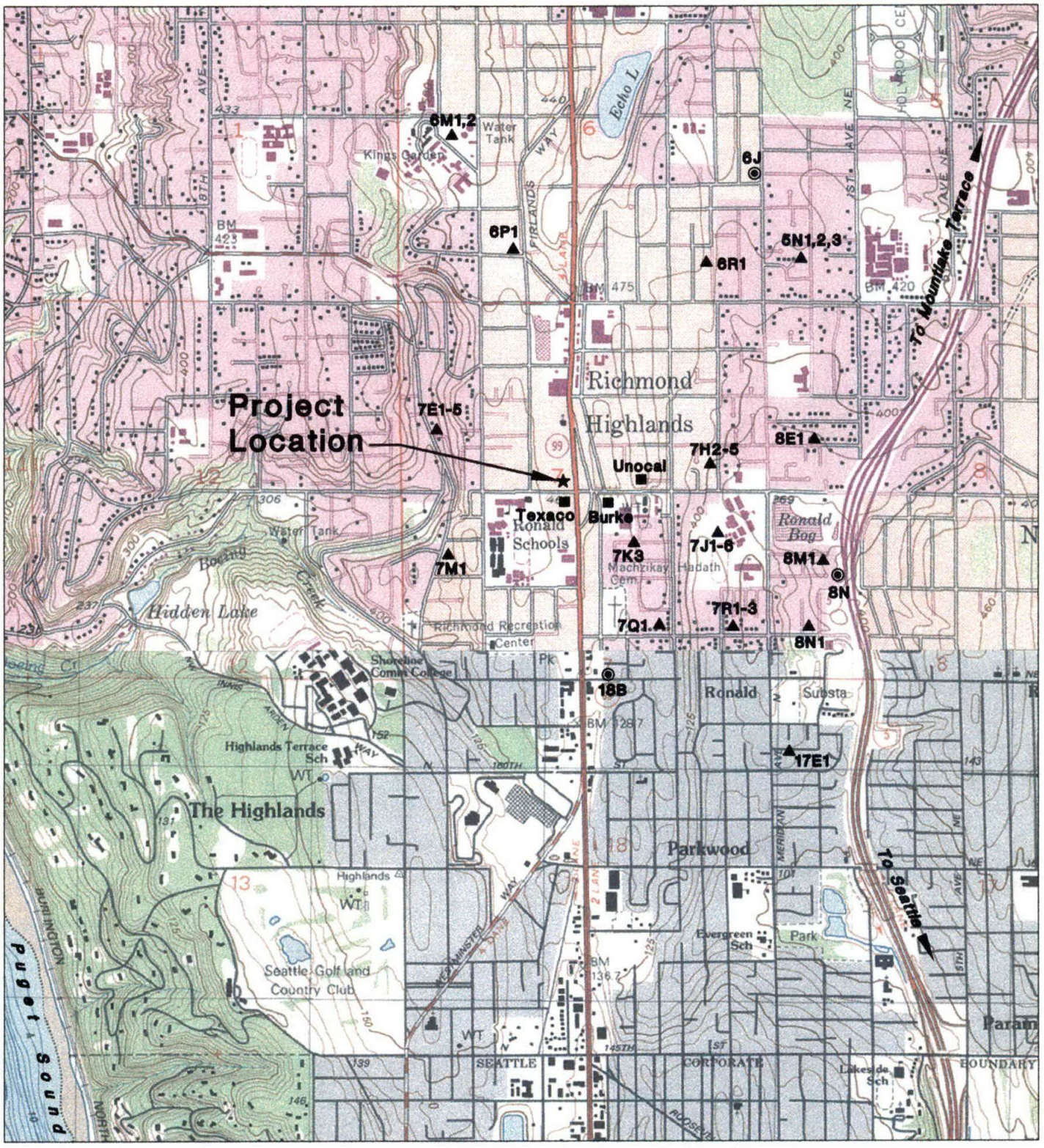
6. The low hydraulic conductivity of the unsaturated till present beneath the Site.



Site Vicinity Map
Former Chuck Olson Chevrolet
Shoreline, Washington

ASSOCIATED EARTH SCIENCES, INC

FIGURE
1



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Well/Boring Location Map
Former Chuck Olson Chevrolet
Shoreline, Washington

FIGURE

2

Table 1

Water Well and Soil Boring Records in the Vicinity of the Former Chuck Olson Chevrolet Facility

TOWNSHIP	RANGE	WELL/ BORING ID	OWNER	DATE COMPLETED	APPROX. GROUND SURFACE ELEVATION ft msl	APPROX. WELL/ BORING DEPTH ft bgs	APPROX. WELL/ BORING DEPTH ft msl	Approx. Static Water Level, ft bgs	Approx. Static Water Level ft msl	USE	COMMENTS	SOURCE
26N	4E	5N1	G.A. Brown	7/23/53	440	8	432	3	437	None		DWR
26N	4E	5N2	Minnie Anderson	7/23/53	435	22	413	10	425	Destroyed	Formerly domestic	DWR
26N	4E	5N3	Andrew Micholson	7/23/53	440	22	418	10	430	None		DWR
26N	4E	6J	WA Natural Gas	2/24/94	NR	250	NR	NR	—			DOE
26N	4E	6M1	Seattle Water Dept	7/13/53	505	224	281	12	493	None		DWR
26N	4E	6M2	Seattle Water Dept	6/53	505	443	62	8	497	None		DWR
26N	4E	6P1	T. Bjornstad	7/23/53	420	300	120	119	301	None		DWR
26N	4E	6R1	R.H. Van Dyke	7/23/53	440	16	424	8	432	Destroyed		DWR
26N	4E	7E1	E.B. Derricott	7/15/53	370	81	289	77	293	Domestic		DWR
26N	4E	7E2	D.D. Graham	7/15/53	390	102	288	82	308	Domestic		DWR
26N	4E	7E3	Arthur Jacobson	7/20/53	385	108	277	106	279	Domestic		DWR
26N	4E	7E4	Lewis Schloredt	7/20/53	360	52	308	50	310	Domestic		DWR
26N	4E	7E5	Pete Ramstead	7/22/53	360	58	302	56	304	Domestic		DWR
26N	4E	7H2	Jack Marckx	7/30/53	425	43	382	40	385	None		DWR
26N	4E	7H3	J.D. Francis	—	425	59	366	NR	—	Destroyed	Abandoned	DWR
26N	4E	7H4	C.J. Wilbur	7/30/53	380	17	363	16	364	None		DWR
26N	4E	7H5	D.V. Foreman	7/30/53	470	10	460	7	463	Domestic	High iron content	DWR
26N	4E	7J1	Dora Patton	7/29/53	400	40	360	36	364	Domestic		DWR
26N	4E	7J2	Ruth Cole	7/30/53	410	25	385	18	392	None		DWR
26N	4E	7J4	E.D. Corkrey	7/30/53	425	49	376	46	379	Domestic		DWR
26N	4E	7J5	F.J. McAvoy	7/30/53	375	12	363	7	368	Domestic		DWR
26N	4E	7J6	R.C. Rich	8/21/53	420	16	404	11	409	None		DWR
26N	4E	7K1	Don Westover	7/30/53	480	212	268	166	314	None		DWR
26N	4E	7K2	Vera Geffe	7/29/53	460	30	430	21	439	None		DWR
26N	4E	7Q1	Elizabeth MacDonald	7/29/53	450	141	309	134	316	None		DWR
26N	4E	7R1	Cassius Clark	7/29/53	380	40	340	45	335	Destroyed	Formerly domestic	DWR
26N	4E	7R2	Ben Howard	7/29/53	370	45	325	42	328	None	Aquifer overlain by till	DWR
26N	4E	7R3	A.L. Fyhn	7/29/53	380	13	367	8	372	Stock		DWR
26N	4E	8B	Tosco	10/3/97	445	105	340	NP	—	Monitoring	Abandoned	DOE
26N	4E	8E1	S.H. Cone	8/21/53	370	50	320	44	326	Soil Boring - Env. Monitoring		DWR
26N	4E	8M1	H.R. Fuller	7/29/53	380	23	357	19	361	None		DWR
26N	4E	8N	Shoreline Construction	9/6/89	NR	30	—	NR	—	Dewatering		DOE
26N	4E	8N1	W.A. Weaver	7/29/53	385	50	335	40	345	None		DWR
26N	4E	17E1	Carl Woods	8/28/53	345	30	315	20	325	Domestic		DWR
26N	4E	Texaco	Texaco	8/90	470	50	420	NP	—	Multiple soil borings - Env. Monitoring	No groundwater	DOE
26N	4E	Unocal	Tosco	1988	445	151	294	NP	---	13 soil borings - Env. Monitoring	No groundwater	DOE
26N	4E	EB-24	Chuck Olson Chev.	1998	475	32	443	NP	---	24 soil borings - Env. Monitoring	No groundwater	AESI

Notes:

1 Well completion date is assumed to be the date that static water was measured, as reported in USGS (1963)
2 Static water levels are measured from grade or near-grade (top of well casing or riser), and may not coincide with actual water depths where the well is completed in a confined aquifer
3 msl: mean sea level
4 bgs: below ground surface
5 DOE: Department of Ecology driller's well records
6 DWR: Geology and Ground-Water Resources of Northwestern King County, Washington (USGS Division of Water Resources (DWR), 1963)
7 NR: Not Reported
8 NP: Not Present
9 —: Not available or not applicable
10 Where multiple wells or borings present at one location, depths listed are the maximums for that location.

APPENDIX A

WATER WELL REPORTS AND SOIL BORING LOGS

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. W 35871
Water Right Permit No.

26/4/65

(1) OWNER: Name WA. NAT. GAS Address PO BOX 1869 SEATTLE, WA 98111-

(2) LOCATION OF WELL: County KING - NE 1/4 SE 1/4 Sec 6 T 26 N., R 4E WM
(2a) STREET ADDRESS OF WELL (or nearest address) 195TH ST & MERIDIAN SEATL

(3) PROPOSED USE: OTHER USE

(4) TYPE OF WORK: Owner's Number of well (if more than one)
NEW WELL Method: AIR ROTARY

(5) DIMENSIONS: Diameter of well 06 inches
Drilled 250 ft. Depth of completed well 250 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 06 " Dia. from 0 ft. to 250 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 22 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level N/A ft. below top of well Date
Artesian Pressure lbs. per square inch Date / /
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal/min with ft. drawdown after hrs.

Recovery data
Time Water Level Time Water Level Time Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Airlift test 0 gal/min. with stem set at 0 for hrs.
Artesian flow gpm Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	From	To
TOPSOIL	0	3
BROWN GRAVEL & CLAY	03	09
GREY GRAVEL & CLAY COBBLES	09	15
GRAVEL & CLAY COBBLES BOULDERS	15	30
GREY GRAVEL & CLAY	30	44
GREY CLAY & SAND AND GRAVEL	44	64
BROWN GRAVEL & CLAY	64	93
BROWN SANDY CLAY	93	152
GREY SANDY CLAY	152	220
GREY STICKY CLAY	220	250

RECEIVED
MAR 31 1994
DEPT. OF ECOLOGY

Work started 02/22/94 Completed 02/24/94

WELL CONTRACTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

KENT RICHARDSON WELL DRILLING
Name of individual or firm, or corporation (Type or print)

ADDRESS PO BOX 44427 TAC WA 98444

Signed: [signature] License No. 2017

Contractor's Registration No. RICHAW*921CB Date 03/15/94

Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

ENTERED

Water Right Permit No. _____ UNIQUE WELL I.D. # 26N/4E/8B

(1) OWNER: Name TOSCO Address _____

(2) LOCATION OF WELL: County King NW 1/4 NE 1/4 Sec. 8 26N N. R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 16032 AURORA AVE N

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned ☑ New well ☐ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well _____ inches.
Drilled _____ feet. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:
Casing installed: _____" Diam. from _____ ft. to _____ ft.
Welded ☐ _____" Diam. from _____ ft. to _____ ft.
Liner installed ☐
Threaded ☐ _____" Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☐
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☐
Manufacturer's Name _____
Type _____ Model No. _____
Diam. ____ Slot size _____ from _____ ft. to _____ ft.
Diam. ____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☐ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☐ No ☐ To what depth? _____ ft.
Material used in seal _____
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level _____ ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

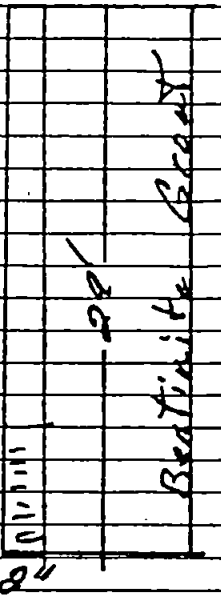
Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
1-Well 2" Vapor		



RECEIVED
OCT 0 3 1997
Department of Ecology

Work Started _____ 19. Completed _____ 19 ____

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Environmental Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10918-159th Ave SE

(Signed) Bruce D. Mc Neil (WELL DRILLER) License No. 1712

Contractor's Registration No. ENVIRDI093ML Date 9-16 19 98

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)(*)f

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 62429

UNIQUE WELL I.D. #

Water Right Permit No. 26N/4E/8B

ENTERED

(1) OWNER: Name Tosco Address

(2) LOCATION OF WELL: County King NW 1/4 NE 1/4 Sec 8 26N N. R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 16032 AURORA AVE N

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)

Abandoned ☑ New well ☐ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well inches. Drilled feet. Depth of completed well ft.

(6) CONSTRUCTION DETAILS:

Casing installed: " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.
Liner installed ☐
Threaded ☐ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☐
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☐
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☐ Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes ☐ No ☐ To what depth? ft.
Material used in seal
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level ft. below top of well Date
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest gal./min. with stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
4 Wells 2" Vapor		
60' Bentonite Grout		
2"		

RECEIVED
OCT 0 3 1997
Department of Ecology

Work Started 19 Completed 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Environmental Driving Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10918-15th Ave SE

(Signed) (WELL DRILLER) License No. 1712

Contractor's Registration No. ENVIRD109311C Date 7-16 19 98

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

Second Copy — Owner's Copy
Third Copy — Driller's Copy

STATE OF WASHINGTON

ENTERED

Water Right Permit No. 26/4E/18B

(1) OWNER: Name Tosco Address

(2) LOCATION OF WELL: County King NW 1/4 NE 1/4 Sec. 8 T. 26 N, R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 16032 Aurora Ave N.

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (If more than one) ____

Abandoned ☑ New well ☐ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well ____ inches. Drilled ____ feet. Depth of completed well ____ ft.

(6) CONSTRUCTION DETAILS:

Casing Installed: ____" Diam. from ____ ft. to ____ ft.
Welded ☐ ____" Diam. from ____ ft. to ____ ft.
Liner installed ☐
Threaded ☐ ____" Diam. from ____ ft. to ____ ft.

Perforations: Yes ☐ No ☐
Type of perforator used ____
SIZE of perforations ____ in. by ____ in.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes ☐ No ☐
Manufacturer's Name ____
Type ____ Model No. ____
Diam. ____ Slot size ____ from ____ ft. to ____ ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ☐ No ☐ Size of gravel ____
Gravel placed from ____ ft. to ____ ft.

Surface seal: Yes ☐ No ☐ To what depth? ____ ft.
Material used in seal ____
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ____ Depth of strata ____
Method of sealing strata off ____

(7) PUMP: Manufacturer's Name ____
Type: ____ H.P. ____

(8) WATER LEVELS: Land-surface elevation above mean sea level ____ ft.
Static level ____ ft. below top of well Date ____
Artesian pressure ____ lbs. per square inch Date ____
Artesian water is controlled by ____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? ____
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.

"	"	"	"
"	"	"	"

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ____
Bailer test ____ gal./min. with ____ ft. drawdown after ____ hrs.
Airtest ____ gal./min. with stem set at ____ ft. for ____ hrs.
Artesian flow ____ g.p.m. Date ____
Temperature of water ____ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
1 - well 105' 2" PVC.		

RECEIVED
OCT 03 1997
Department of Ecology

Work Started 9/19/97 19 Completed OCT 03 1997 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Environmental Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10918 - 53rd Ave SE

(Signed) Bruce D McCall (WELL DRILLER) License No. 1712

Contractor's Registration No. ENVIRD1093ML Date 7-16 19 98

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

ENTERED STATE OF WASHINGTON

Start Card No. 62429

UNIQUE WELL I.D.

Water Right Permit No. 26/4E/8B

(1) OWNER: Name TOSCO Address

(2) LOCATION OF WELL: County King NW 1/4 NE 1/4 Sec. 8 T. 26 N. R. 4E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 16032 AURORA AVE N.

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)

Abandoned ☑ New well ☐ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well inches.

Drilled feet. Depth of completed well ft.

(6) CONSTRUCTION DETAILS:

Casing installed: ☐ Welded ☐ Liner installed ☐ Threaded ☐ " Diam. from ft. to ft.

" Diam. from ft. to ft.

" Diam. from ft. to ft.

Perforations: Yes ☐ No ☐

Type of perforator used

SIZE of perforations in. by in.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

Screens: Yes ☐ No ☐

Manufacturer's Name

Type Model No.

Diam. Slot size from ft. to ft.

Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☐ Size of gravel

Gravel placed from ft. to ft.

Surface seal: Yes ☐ No ☐ To what depth? ft.

Material used in seal

Did any strata contain unusable water? Yes ☐ No ☐

Type of water? Depth of strata

Method of sealing strata off

(7) PUMP: Manufacturer's Name

Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.

Static level ft. below top of well Date

Artesian pressure lbs. per square inch Date

Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom?

Yield: gal./min. with ft. drawdown after hrs.

" " " "

" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test

Bailer test gal./min. with ft. drawdown after hrs.

Airtest gal./min. with stem set at ft. for hrs.

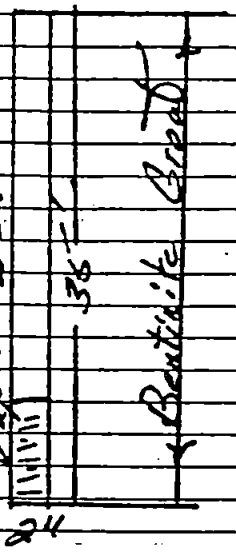
Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
1 Well 2" Vapor		



RECEIVED

OCT 0 3 1997

Department of Ecology

Work Started 19. Completed 19

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Environmental Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10918-59E Ave S Ste

(Signed) (WELL DRILLER) License No. 1712

Contractor's Registration No. ENVIRD109711A Date 9-16 19 98

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ANDERSON DEWATERING
WATER WELL REPORT
STATE OF WASHINGTON

8N

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

Application No. ....

Permit No. ....

(1) OWNER: Name SHORELINE CONST Address 19545 WOODINVILLE SNOHOMISH HWY WOOD

(2) LOCATION OF WELL: County KING SW ¼ SW ¼ Sec. 8 T 26 N. R 4E W.M.

Bearing and distance from section or subdivision corner 1165 ft + I-5 METRO BUS FACILITY PROJECT

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ■

(4) TYPE OF WORK: Owner's number of well (If more than one).... 3 EACH
New well ■ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ■ Jetted ☐

(5) DIMENSIONS: Diameter of well 36 inches.
Drilled 30 ft. Depth of completed well 30 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: ____" Diam. from ____ ft. to ____ ft.
Threaded ☐ ____" Diam. from ____ ft. to ____ ft.
Welded ☐ ____" Diam. from ____ ft. to ____ ft.

Perforations: Yes ☐ No ☐
Type of perforator used ____
SIZE of perforations ____ in. by ____ in.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes ■ No ☐ Manufacturer's Name HOMEMADE STEEL
Type STEEL Model No. ____
Diam. 22 Slot size APPROX 1/8 from 10 ft. to 30 ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ■ No ☐ Size of gravel: PEA 3/8
Gravel placed from 30 ft. to 0 ft.

Surface seal: Yes ☐ No ■ To what depth? ____ ft.
Material used in seal ____
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ____ Depth of strata ____
Method of sealing strata off ____

(7) PUMP: Manufacturer's Name FLYGT
Type: DEWATERING SUBMERSIBLE H.P. 4.6

(8) WATER LEVELS: Land-surface elevation above mean sea level.... ____ ft.
Static level 3 ft. below top of well Date SEPT 6
Artesian pressure ____ lbs. per square inch Date ____
Artesian water is controlled by ____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? ____
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ____
Bailer test ____ gal./min. with ____ ft. drawdown after ____ hrs.
Artesian flow ____ g.p.m. Date ____
Temperature of water ____ Was a chemical analysis made? Yes ☐ No ■

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
BROWN SILTY SAND AND SANDY SILT	0	30
INSTALLED 3 EACH TEMPORARY DEWATERING WELLS FOR SEWER LINE INSTALLATION		

RECEIVED
SEP 12 1989
DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Work started SEPT 6, 1989 Completed SEPT 6, 1989

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME ANDERSON DEWATERING
(Person, firm, or corporation) (Type or print)

Address PO BOX 3093 FEDERAL WAY

[Signed] William H Anderson
(Well Driller)

License No. 1522 Date SEPT 7, 1989

Table 5. -- Records of wells. -- Continued

Well No.	Owner or tenant	Altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Character of water-bearing material	Water level: Below land surface (feet)	Water level: Date	Pump: Type	Pump: Horsepower	Use of water	Remarks
					T. 26 N., R. 4 E.--Continued								
4G2	R. F. Redford	285	Dg	26	36	7	----------	20.90	8-4-53	J	½	D,Irr	
4H1	T. W. Rouse	215	Dg	18	30	----	----------	6.90	8-18-53	J	1	D	
4H2	R. W. Putnam	190	Dg	9	36	9	----------	5.06	8-18-53	P	¼	D	
4H3	O. A. Shanahan	200	Dg, Dr	72	48-6	----	----------	11.39	8-18-53	J	1	D,Irr	Adequate for irrigating about 2 acres of nursery.
5A1	Gerald Inglehart	300	Dg	16	24	16	Sand	15.62	7-28-53	C	½	D	
5A2	G. W. Salty	260	Dg	7	36	7	----------	1.82	7-28-53	P	½	D	
5A3	Peter Oakland	275	Dg	16	36	16	----------	12.55	7-28-53	J	¼	D	
5C1	Holyrood Cemetery	300	Dr	369	12-6	369	Sand and gravel	175	2-14-58	T	---	Irr	Dd 55 ft pumping 225 gpm; temp 51°F; L.
5E1	-----Do-----	430	Dr	565	10-8	520	Gravel	165	10-27-54	T	20	D,Irr	Dd 155 ft after pumping 24 hr at 150 gpm; C, L.
5H1	G. W. Benson	300	Dg	16	24	15	Sand	14.07	7-28-53	C	½	D	
5H2	W. O. McLean	280	Dg	4	30	4	----------	1.05	7-28-53	N	---	N	
5H3	W. J. Rother	275	Dg	7	36	----	----------	5.19	7-28-53	P	---	N	
5J1	C. H. Love	290	Dg	7	36	7	Sand	2.43	7-28-53	P	½	D,Irr	
5N1	G. A. Brown	440	Dg	8	36	----	----------	2.98	7-23-53	N	---	N	
5N2	Minnie Anderson	435	Dg	22	48	----	Till	10	7-23-53	N	---	De	Formerly domestic.
5N3	Andrew Nicholson	440	Dg	22	42	----	----Do----	10	7-23-53	N	---	N	
6G1	Echo Lake Mutual Water Co.	420	Dr	275	8	----	Sand	112.00	7-23-53	N	---	N	Formerly supplied 40 families. Yields 165 gpm; L.
6H1	Carol Hendron	435	Dg, Bd	160	36	----	----------	135	7-27-53	P	1	D	
6M1	Seattle Water Dept.	505	Dr	224	12	----	----------	215.40	7-13-53	T	30	N	
6M2	-----Do-----	505	Dr	443	8	----	----------	218	6- -53	N	---	N	
6P1	T. Bjornstad	420	Dr	300	7	----	----------	118.50	7-23-53	N	---	N	
6R1	R. H. Van Dyke	440	Dg	16	54-48	14	----------	8	7-23-53	N	---	De	Formerly domestic.
7E1	E. B. Derricott	370	Dg	81	42	3	----------	77.08	7-15-53	P	5	D	
[illegible]	D. D[illegible]	[illegible]	Dg, Dr	[illegible]	[illegible]	10[illegible]	----------	82[illegible]	7-15[illegible]	P	3/[illegible]	[illegible]	

COPY

5J1	[illegible]. Lov	29			36	7	S	19	-53			N		
5N1	G. A. Brown	440	Dg	8	36	----	----------	43	-53			D,...		
5N2	Minnie Anderson	435	Dg	22	48	----	Till	2.98	7-23-53	N	---	N		
5N3	Andrew Nicholson	440	Dg	22	42	----	----Do----	10	7-23-53	N	---	De	Formerly domestic.	
6G1	Echo Lake Mutual Water Co.	420	Dr	275	8	----	Sand	10	7-23-53	N	---	N		
6H1	Carol Hendron	435	Dg, Bd	160	36	----	----------	112.00	7-23-53	N	---	N	Formerly supplied 40 families. Yields 165 gpm; L.	

Cas

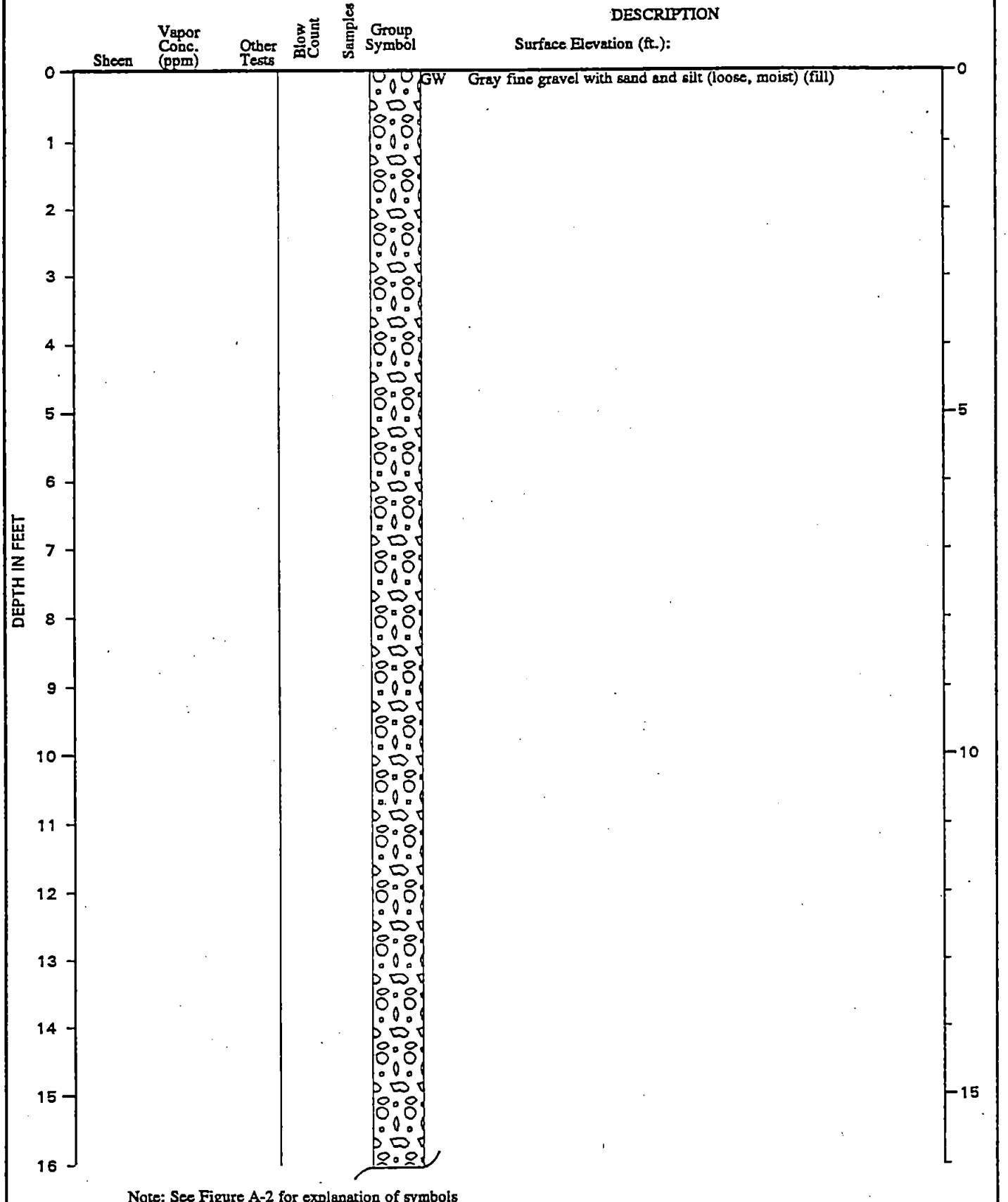
6M1	Seattle Water Dept.	505	Dr	224	12	----	----------	215.40	7-13-53	T	30	N	
6M2	-----Do-----	505	Dr	443	8	----	----------	218	6- -53	N	---	N	
6P1	T. Bjornstad	420	Dr	300	7	----	----------	118.50	7-23-53	N	---	N	
6R1	R. H. Van Dyke	440	Dg	16	54-48	14	----------	8	7-23-53	N	---	De	Formerly domestic.
7E1	E. B. Derricott	370	Dg	81	42	3	----------	77.08	7-15-53	P	5	D	
7E2	D. D. Graham	390	Dg, Dr	102	60-6	102	----------	82.30	7-15-53	P	3/4	D	
7E3	Arthur Jacobsen	385	Dg	108	42	3	----------	106.00	7-20-53	P	1	D,Irr	
7E4	Lewis Schloredt	360	Dg	52	36	----	----------	49.63	7-20-53	J	½	D	
7E5	Pete Ramstead	360	Dg	58	42	----	----------	56.25	7-22-53	P	½	D	
7H2	Jack Marckx	425	Dg	43	36	----	----------	40.21	7-30-53	N	---	N	Temp 49°F.
7H3	J. D. Francis	425	Dg	59	48-36	59	----------	-----	--------	N	---	De	Penetrates till only. Abandoned because of inadequate yield.
7H4	C. J. Wilbur	380	Dg	17	32	17	Sand	16.42	7-30-53	J	½	N	
7H5	D. V. Foreman	470	Dg	10	24	9	----------	7.04	7-30-53	P	½	D	Iron content objectionable.
7J1	Dora Patton	400	Dg	40	42-36	----	----------	35.91	7-29-53	J	½	D	
7J2	Ruth Cole	410	Dg	25	48	6	----------	18.45	7-30-53	N	---	N	
7J4	E. D. Corkrey	425	Dg	49	48-42	----	Till	45.73	7-30-53	P	2	D	Penetrates till only.
7J5	F. J. McAvoy	375	Dg	12	36	12	----------	7.11	7-30-53	J	½	D	
7J6	R. C. Rich	420	Dg	16	48	----	Gravel and sand	11	8-21-53	P	½	N	
7K1	Don Westover	480	Dg, Dr	212	54-6	----	----------	165.70	7-30-53	P	2	N	
7K2	Vera Geffe	460	Dg	30	72	6	----------	21.21	7-29-53	N	---	N	
7M1	Robert Pine	380	Dg	40	6	40	----------	30	7-21-53	J	½	D	
7Q1	Elizabeth Mac-Donald	450	Dg	141	42	141	----------	134.43	7-29-53	N	---	N	Iron content objectionable.
7R1	Cassius Clark	380	Dg	40	48	8	Sand	45	7-29-53	N	---	De	Formerly domestic.
7R2	Ben Howard	370	Dg	45	60	-----	----Do----	41.60	7-29-53	N	---	N	Aquifer overlain by till.
7R3	A. L. Fyhn	380	Dg	13	48	12	----Do----	8.04	7-29-53	J	½	S	
8E1	S. H. Cone	370	Dg	50	36	50	----------	43.75	8-21-53	J	1	D	Slight dd after pumping 1 week continuously at 18 gpm.
8M1	H. R. Fuller	380	Dg	23	48	22	Sand	19.19	7-29-53	J	¼	D	
8N1	W. A. Weaver	385	Dg	50	-----	----	----Do----	40	7-29-53	--	---	N	
9A1	Carl Stafford	180	Dg	32	42	32	Sand and peat	9	4- -53	N	---	De	Well never used.
9B1	K. M. Willman	220	Dg	10	30	----	----------	7.89	8-25-53	P	¼	D	Yields 1 gpm.

	Survey observation well							9.48	8-17-59					
10E1	M. B. Hartzell	100	Dr	113	6	113	Gravel	32	8-13-53	C	1	D		
10F1	W. L. Steele	90	Dr	88	6	----	Sand	25	1940	N	---	De	Yield inadequate in summer. Formerly domestic	
10J1	Oscar Hoganson	20	Dr	65	6	----	Sand and gravel	Flows	10-14-53	N	---	N	L.	
12D1	F. H. Ellis	45	Dn	31	1½	31	Sand	26	6-8-51	P	1/3	D	Iron content objectionable. Penetrates sand and gravel only.	

12F1	P. Swenson	35	Dr	32	6	----	----------	------	--------	J	1	D	Supplies 3 families, cafe, and tavern.
12J1	E. M. Jones	20	Dr	40	6	40	Sand and gravel	1	9- -52	C	½	D	Dd 10 ft pumping 15 gpm; L.
12M1	State Flower Nursery	20	Dg	12	96	----	----------	5.44	6-4-51	C	25	D,Irr	Supplied 78 families; L.
12Q1	E. V. Cooper	180	Dg	30	48	30	----------	23	6-4-51	J	½	D	Yield inadequate.
13A1	C. O. Wintermute	250	Dg	15	30	1	----------	8.07	6-4-51	P	¼	D	-----Do------
13A2	R. Underwood	230	Dg	15	30	15	Till	------	--------	P	¼	De	Formerly domestic.
13F1	I. K. Schlamp	395	Dr	299	6	----	Gravel	------	--------	P	3/4	D	
13G1	R. M. Metheny	430	Dg	62	30	62	Sand	60	6-1-51	P	1/3	D	L.
13J1	H. Gagne	485	Dg	62	30	58	----------	56.53	5-31-51	P	---	D	
13J2	F. Watkins	480	Dg	50	32	50	Sand and gravel	38	6-1-51	J	½	D	
13L1	F. L. Gochanour	400	Dg, Bd	31	30	15	Sand	Flows	1958	J	½	N	Penetrates clay and sand; temp 50°F; Cp.
13M1	M. Augustine	335	Dg	49	40	6	Gravel	34.44	5-31-51	J	---	D	Supplies 1 family, cafe, and grocery. Penetrates 51 ft of clay.
13Q1	C. Dod	430	Bd	26	30	26	----------	9.37	6-1-51	J	½	D,Irr	Supplies 2 families.
13R1	P. W. Rough	480	Dg	22	34	21	Gravel	6.71	5-31-51	J	¼	D,S	--------Do--------- Penetrates till above aquifer.
16Q1	Acacia Memorial Park	250	Dr	287	10	287	Sand and gravel	Flows	3-12-44	T	25	Irr	Dd 88 ft pumping 350 gpm; C, L.
17E1	Carl Woods	345	Dg	30	30	30	----------	20	8-28-53	J	½	D	
17H1	Dewey Stutsman	375	Dg	20	42	20	Sand and gravel	12.85	8-27-53	P	¼	D	Aquifer overlain by till.
17H2	Kay Hutchinson	355	Dg	18	48	----	----------	14	8-28-53	P	---	N	
17M1	E. E. Koppen	315	Dg	14	30	14	----------	8	1947	J	¼	D	
18J1	-----Do-----	320	Dg	12	30	----	----------	5.31	8-27-53	P	¼	D,S	
18J2	John Carlson	325	Dg	12	48	----	----------	8	8-27-53	C	¼	D	
18N1	--- Salo	510	Dg	60	36	----	----------	39	5-13-53	P	---	N	Penetrates till only.
24A1	C. A. Palmer	430	Dg	14	48	----	Till	5	5-31-51	P	¼	D	
24A2	E. H. Good	445	Dg	11	48	----	----Do----	4.79	5-31-51	J	½	D	
24B1	E. Snyder	420	Dr	101	----	----	----------	------	--------	J	3/4	D	Supplies 2 families.
24C1	A. J. Menard	450	Dr	91	6	90	Sand	------	--------	P	1½	D	Yields 16 gpm; L.
24G1	H. Lister	405	Dg	70	36-30	70	Gravel and sand	62.97	6-1-51	J	½	D,S	L.
24H1	W. Beckman	395	Dr	118	5	118	Sand	105	6-1-51	P	1/3	D	L.
24M1	L. B. Walls	420	Dg	69	30	69	----------	60.72	5-29-51	J	1	D	Supplies 2 families; temp 52°F; Cp.
24Q1	G. R. Dempsey	330	Dg	15	72-60	8	Till	5.15	5-29-51	P	1/3	D,S	Inadequate in late summer.

TEST DATA

BORING B-1



Note: See Figure A-2 for explanation of symbols

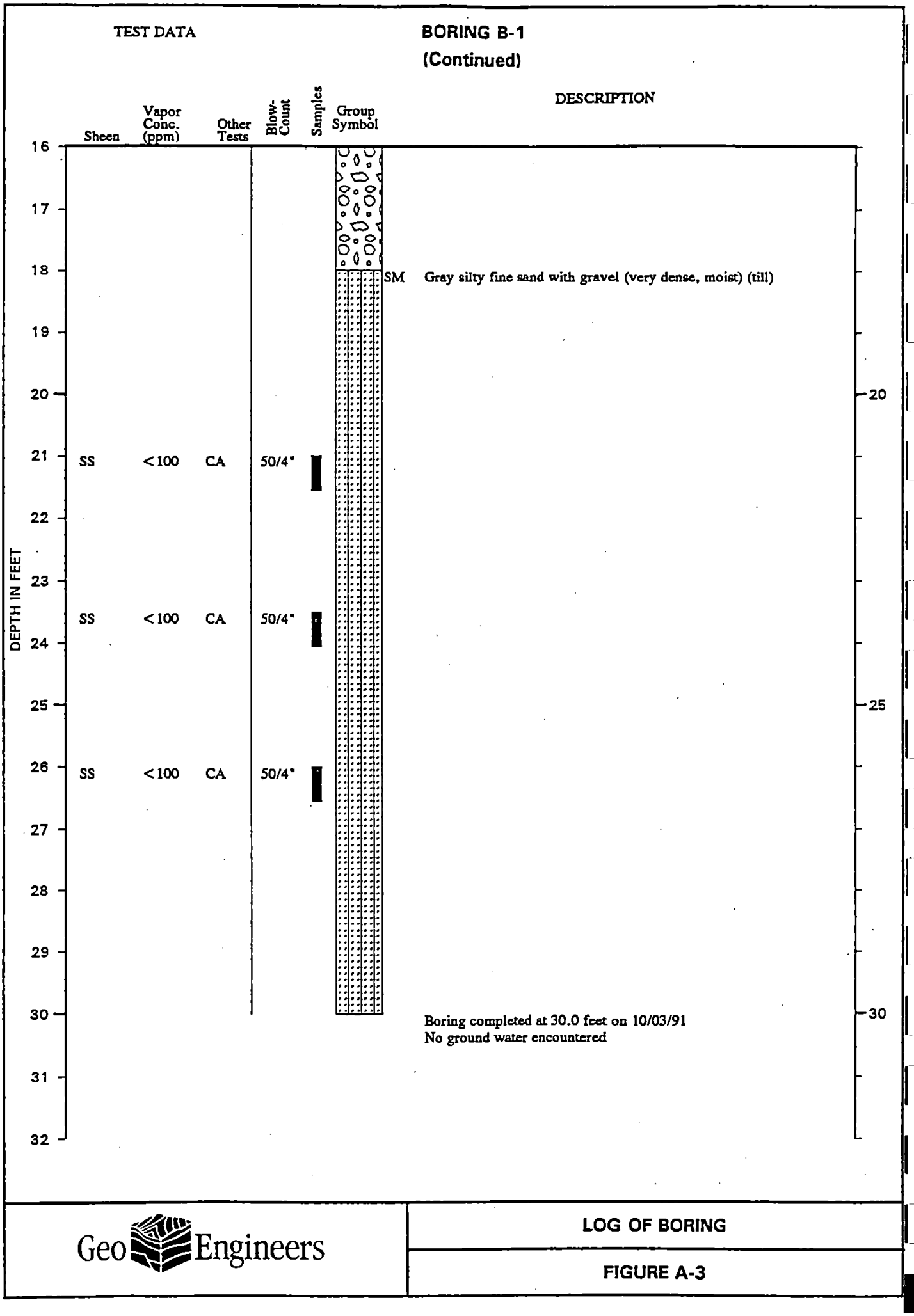
Geo Engineers

LOG OF BORING

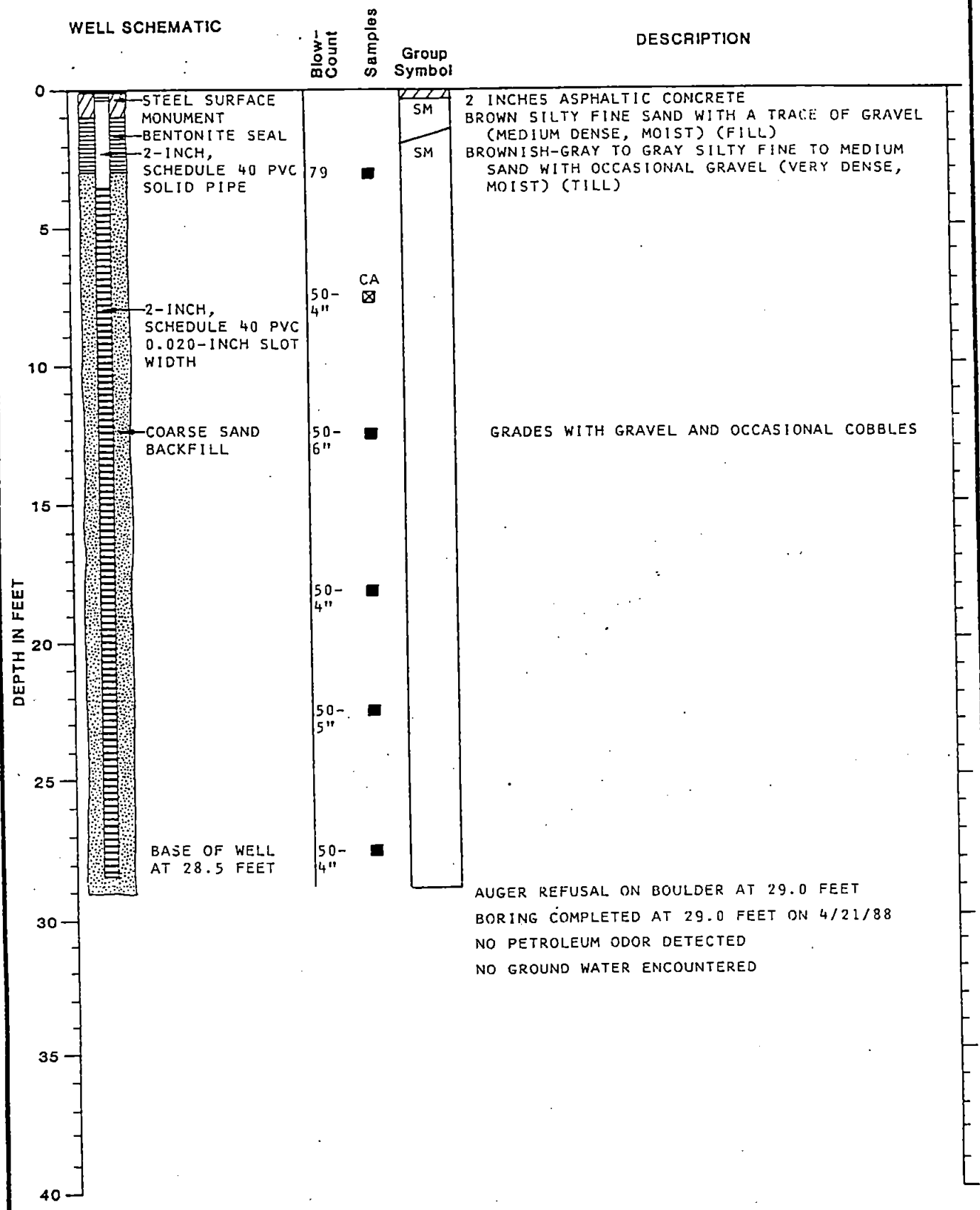
FIGURE A-3

:REJ:JKH:CMS 6/26/92

0161-105-R04



VAPOR PROBE NO. VP-1



Note: See Figure A-2 for Explanation of Symbols

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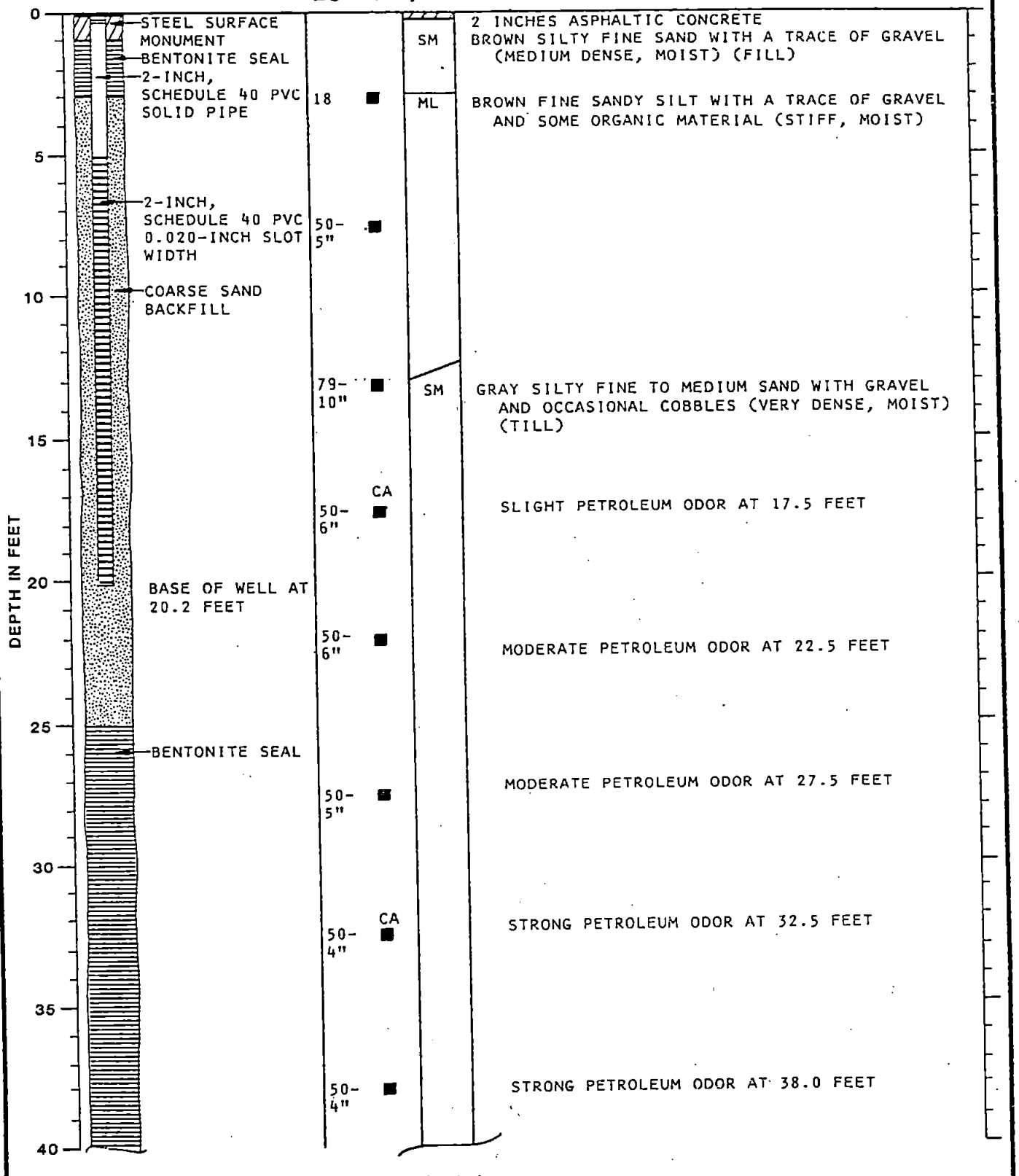
LOG OF VAPOR PROBE

FIGURE A-3

0161-105-4 WSL:KSK:KLF:EL 5-5-88

VAPOR PROBE NO. VP-2



Note: See Figure A-2 for Explanation of Symbols

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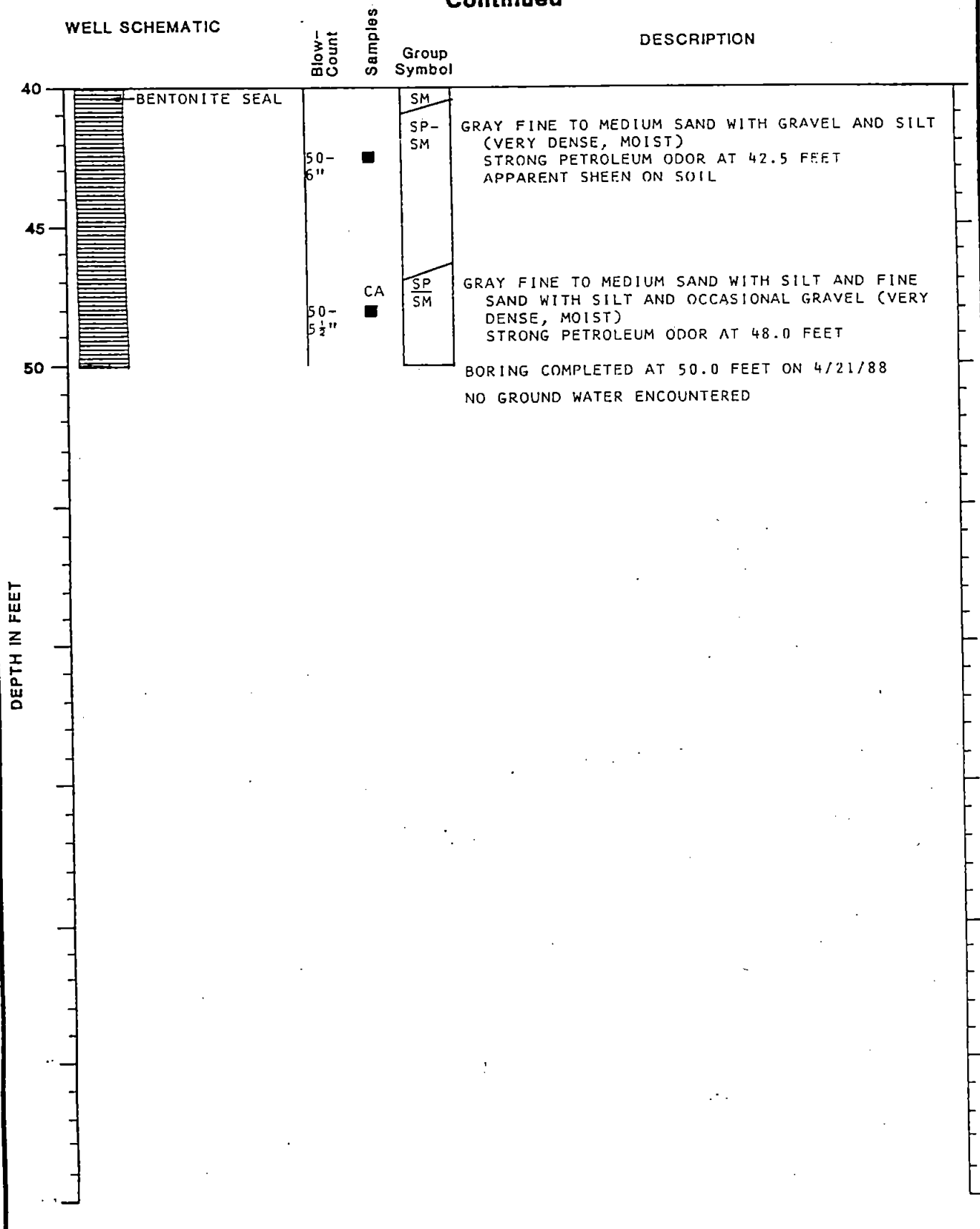
LOG OF VAPOR PROBE

FIGURE A-4

0161-165-4 WSL KSE:ELT:EL 5-5-88

VAPOR PROBE NO. VP-2
Continued



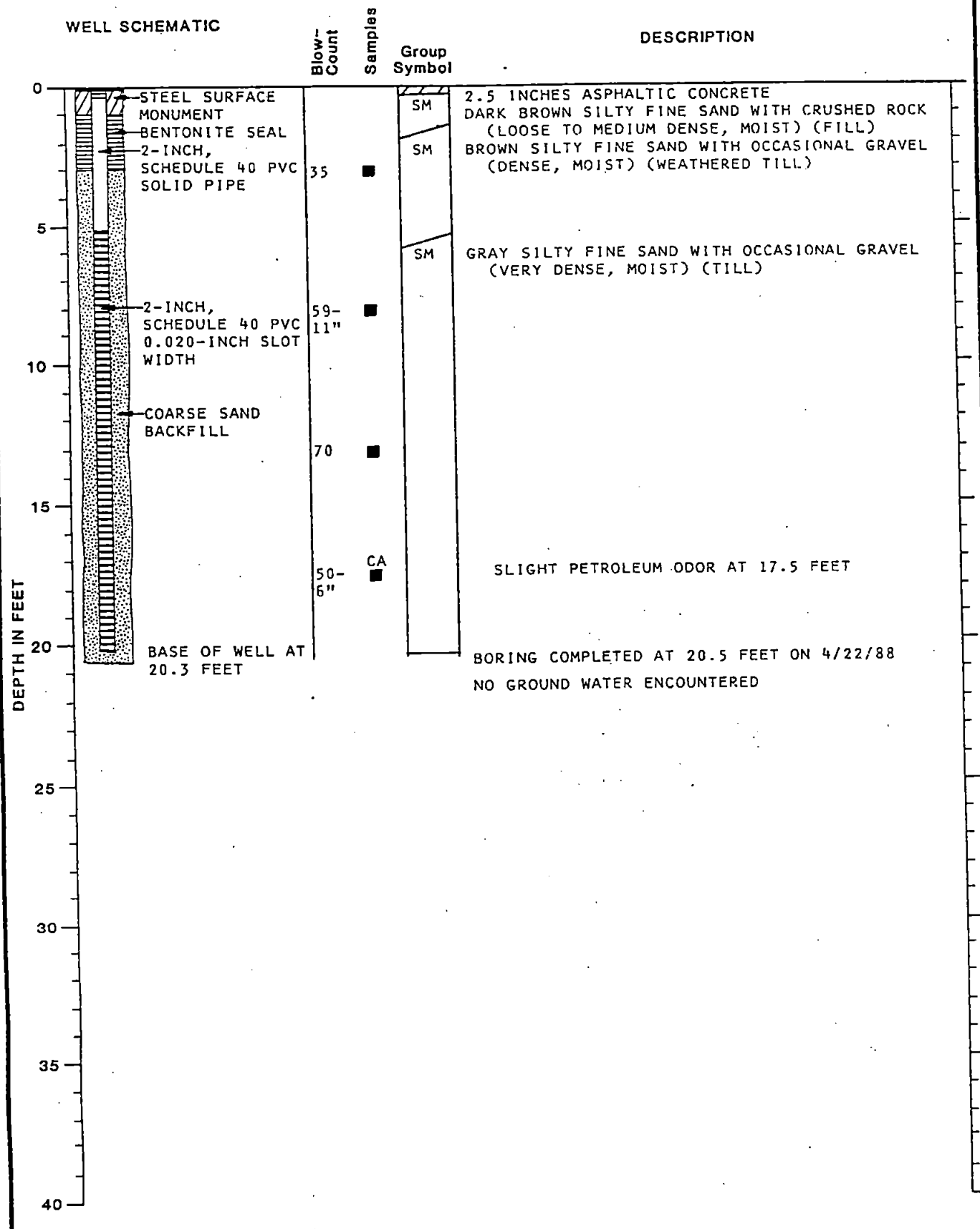
Note: See Figure A-2 for Explanation of Symbols

Geo Engineers

LOG OF VAPOR PROBE

FIGURE A-5

VAPOR PROBE NO. VP-3



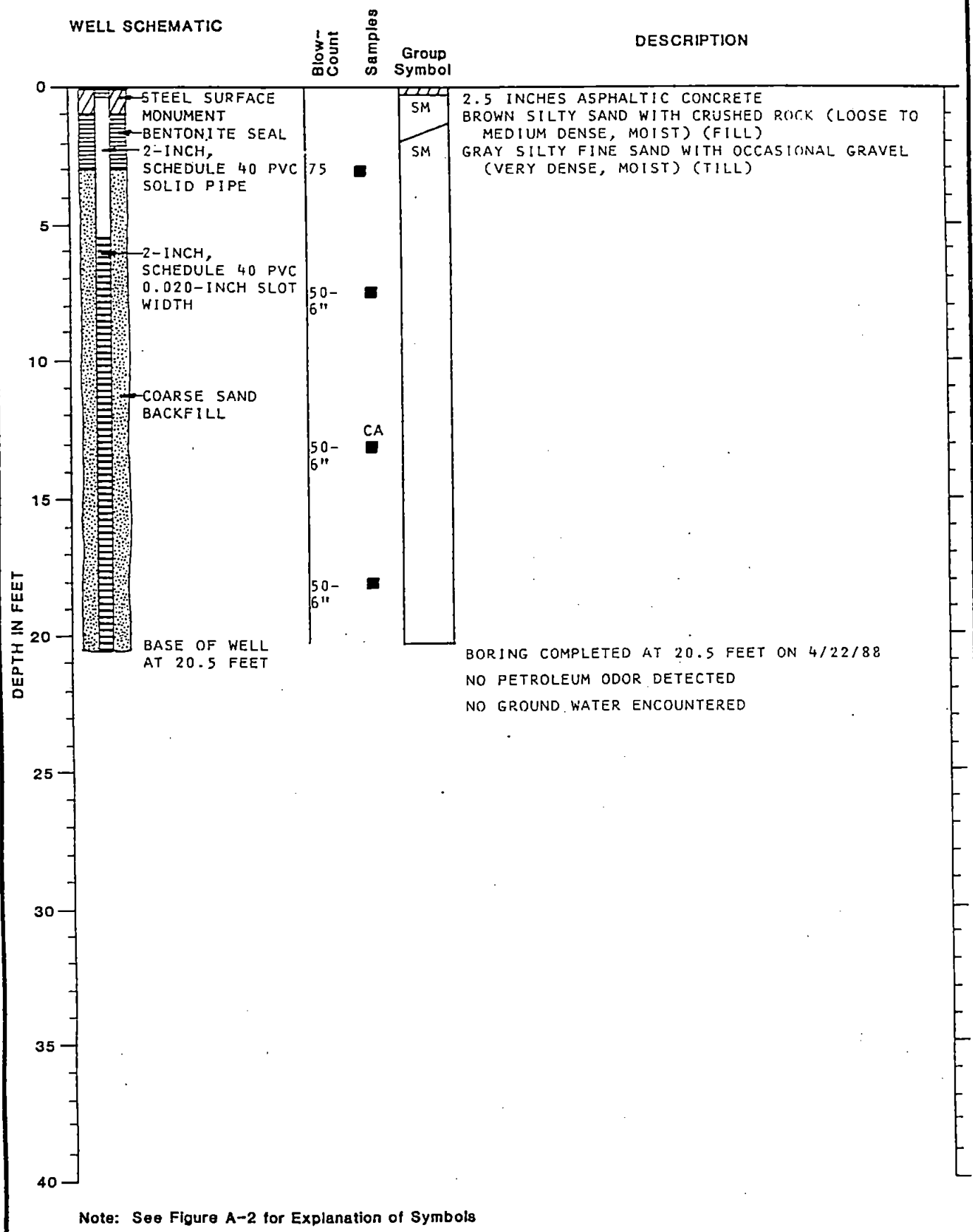
Note: See Figure A-2 for Explanation of Symbols

Geo Engineers

LOG OF VAPOR PROBE

FIGURE A-6

VAPOR PROBE NO. VP-4



Note: See Figure A-2 for Explanation of Symbols

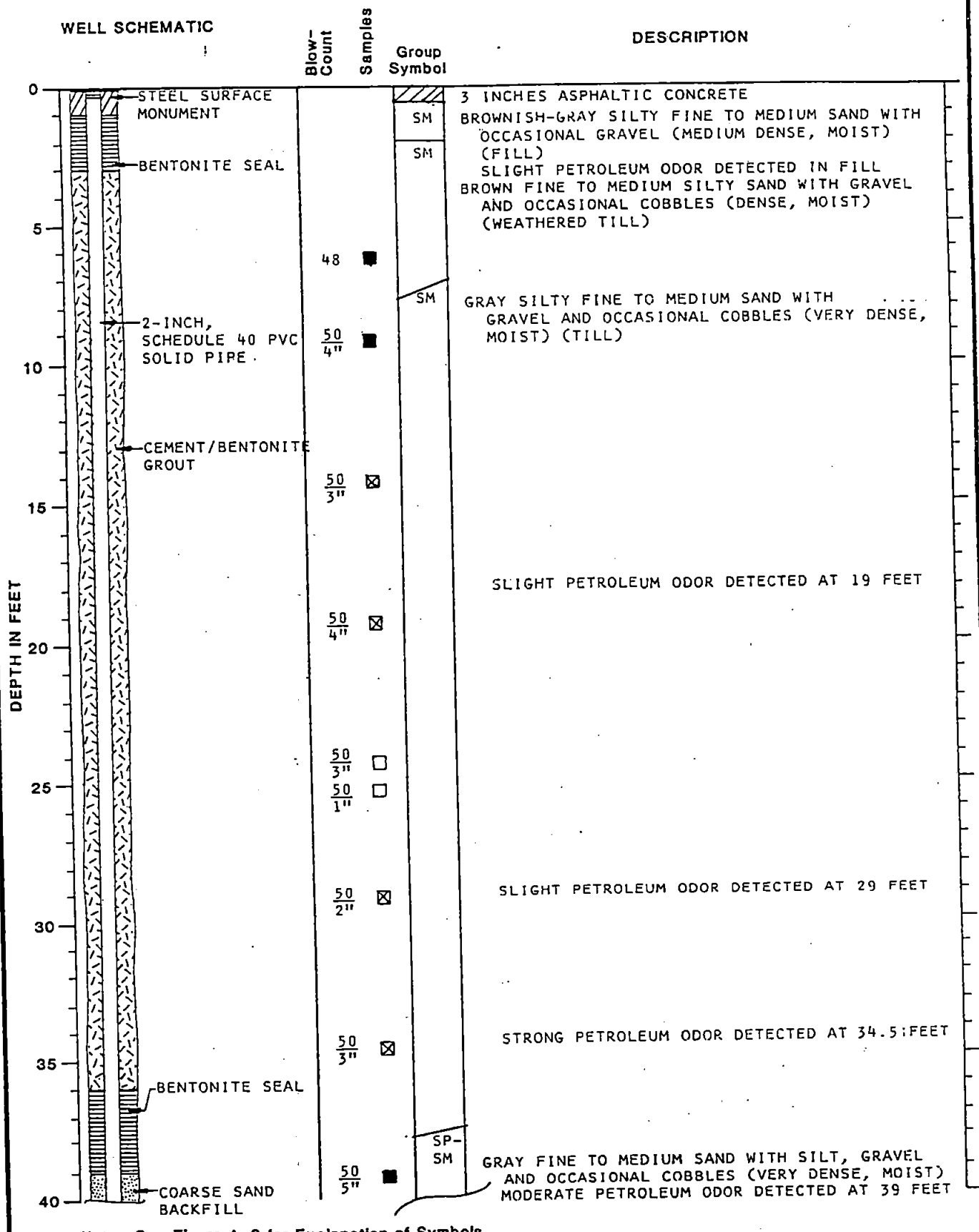
Geo Engineers

LOG OF VAPOR PROBE

FIGURE A-7

0161-105-4 WSL:KSK:KKT:EL 05/04/88

VAPOR PROBE VP-5



Note: See Figure A-2 for Explanation of Symbols

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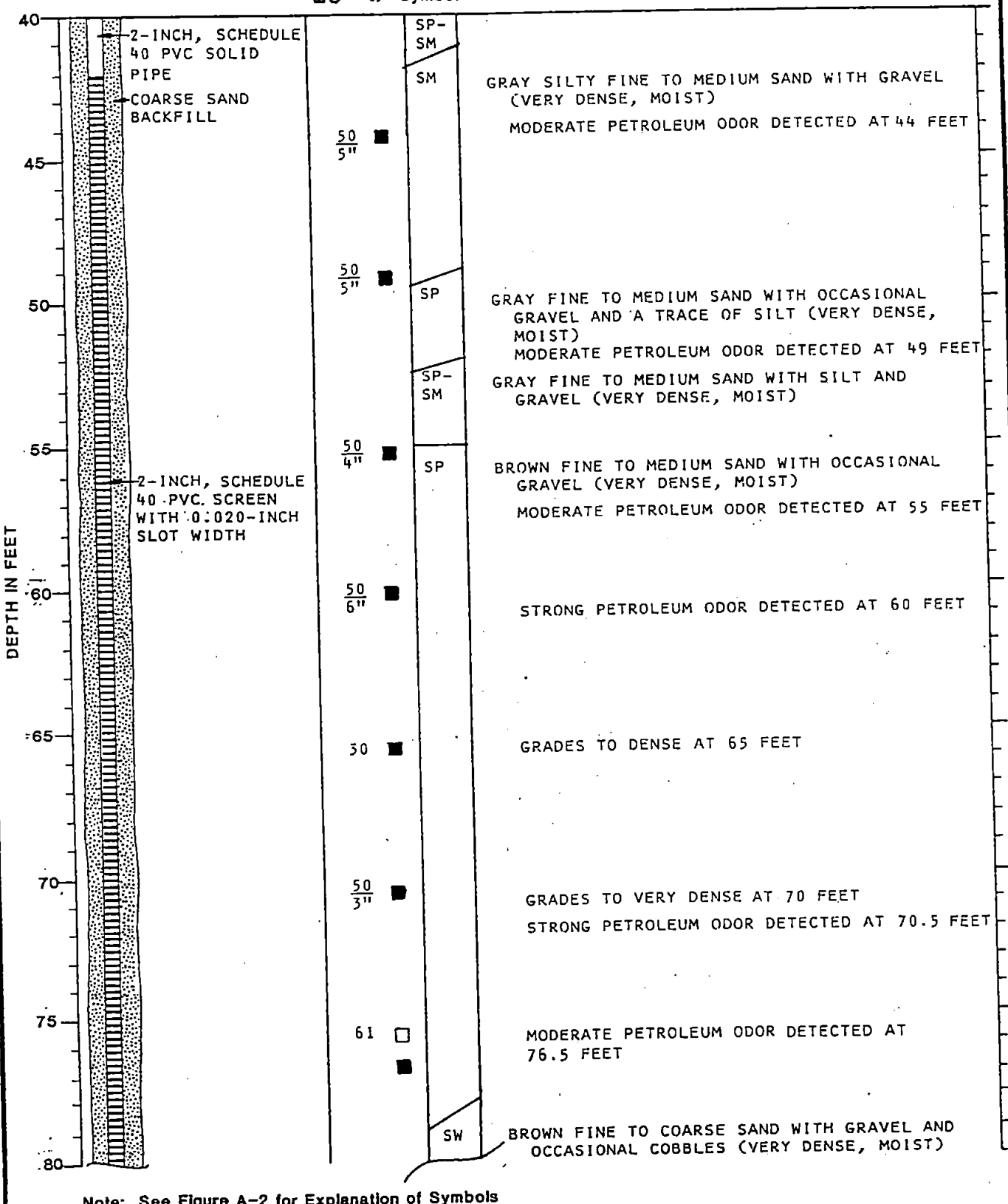
LOG OF VAPOR PROBE

FIGURE A-8

0161-105-4 KSC.KET 7-29-88

VAPOR PROBE VP-5
Continued



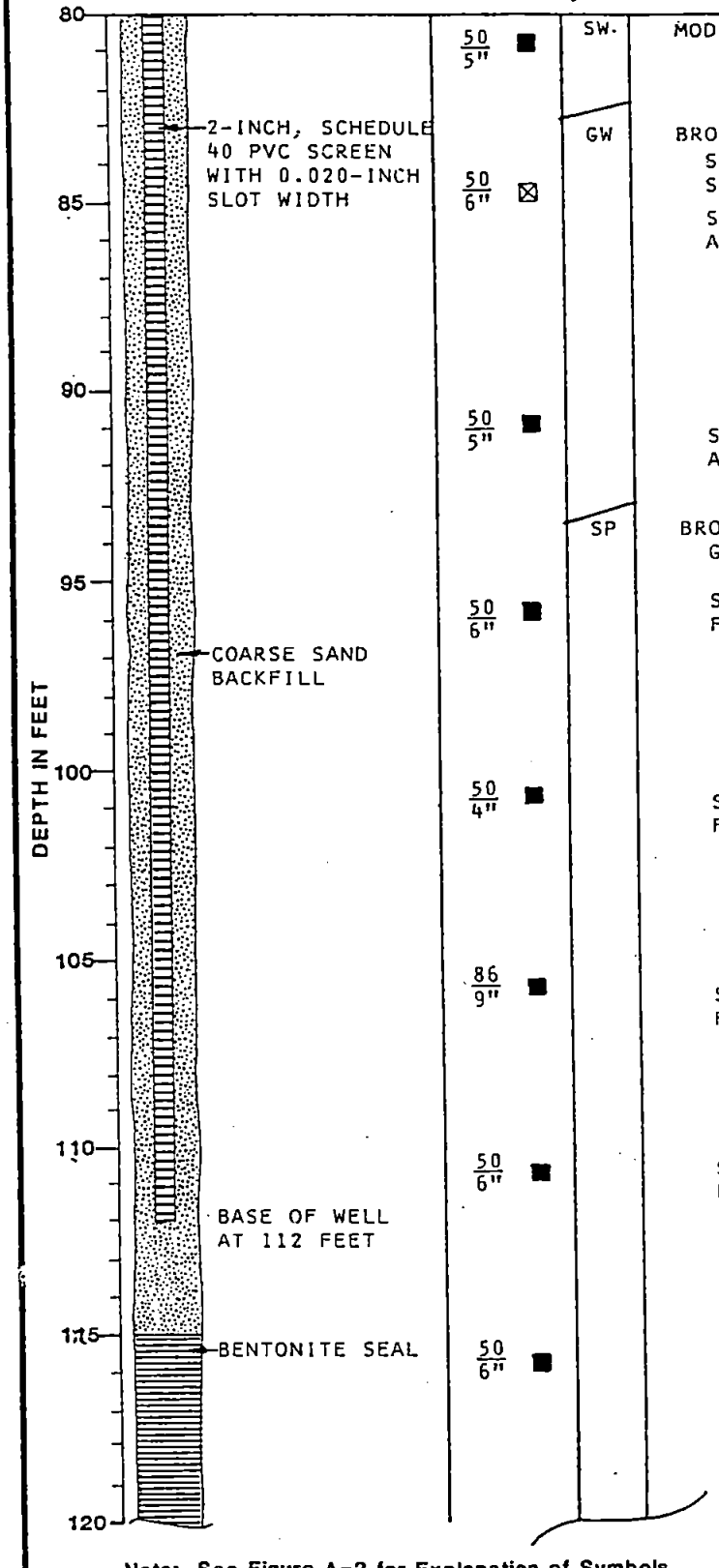
Note: See Figure A-2 for Explanation of Symbols

Geo Engineers

LOG OF VAPOR PROBE

FIGURE A-9

VAPOR PROBE VP-5
Continued



Note: See Figure A-2 for Explanation of Symbols

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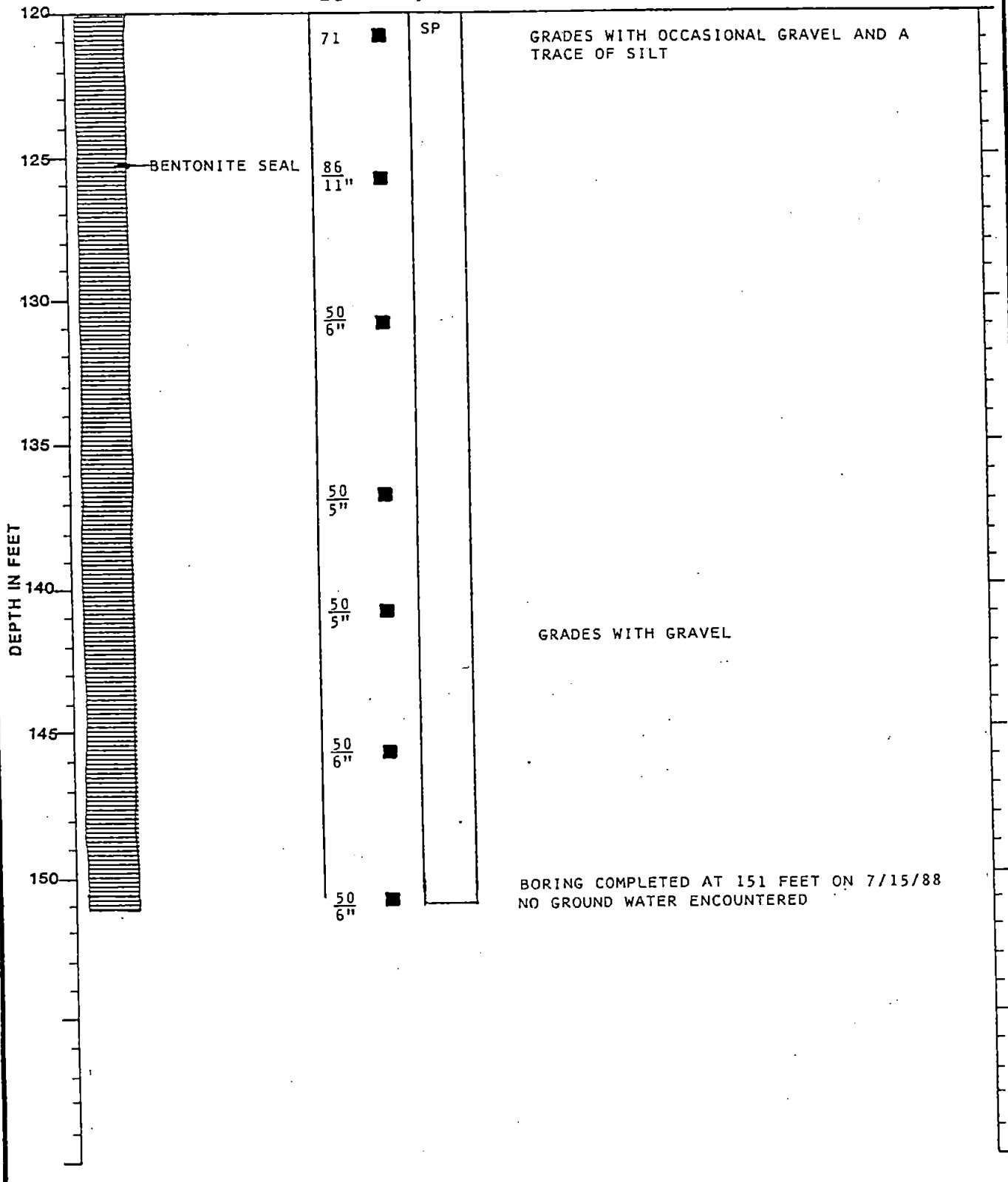
LOG OF VAPOR PROBE

FIGURE A-10

VAPOR PROBE VP-5
Continued



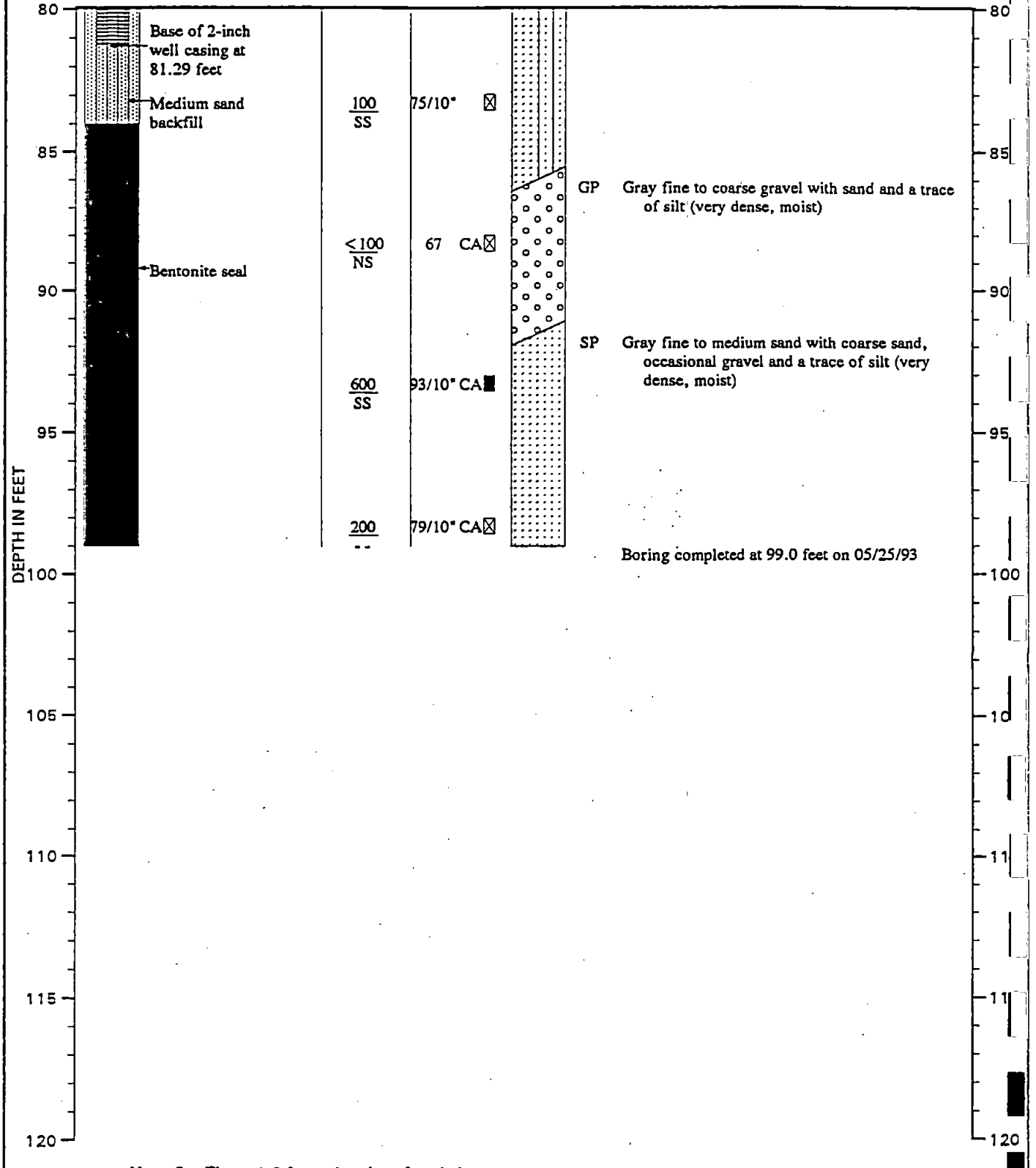
Note: See Figure A-2 for Explanation of Symbols

Geo Engineers

LOG OF VAPOR PROBE

FIGURE A-11

VAPOR PROBE NO. VP-6
(Continued)



Note: See Figure A-2 for explanation of symbols

Geo Engineers

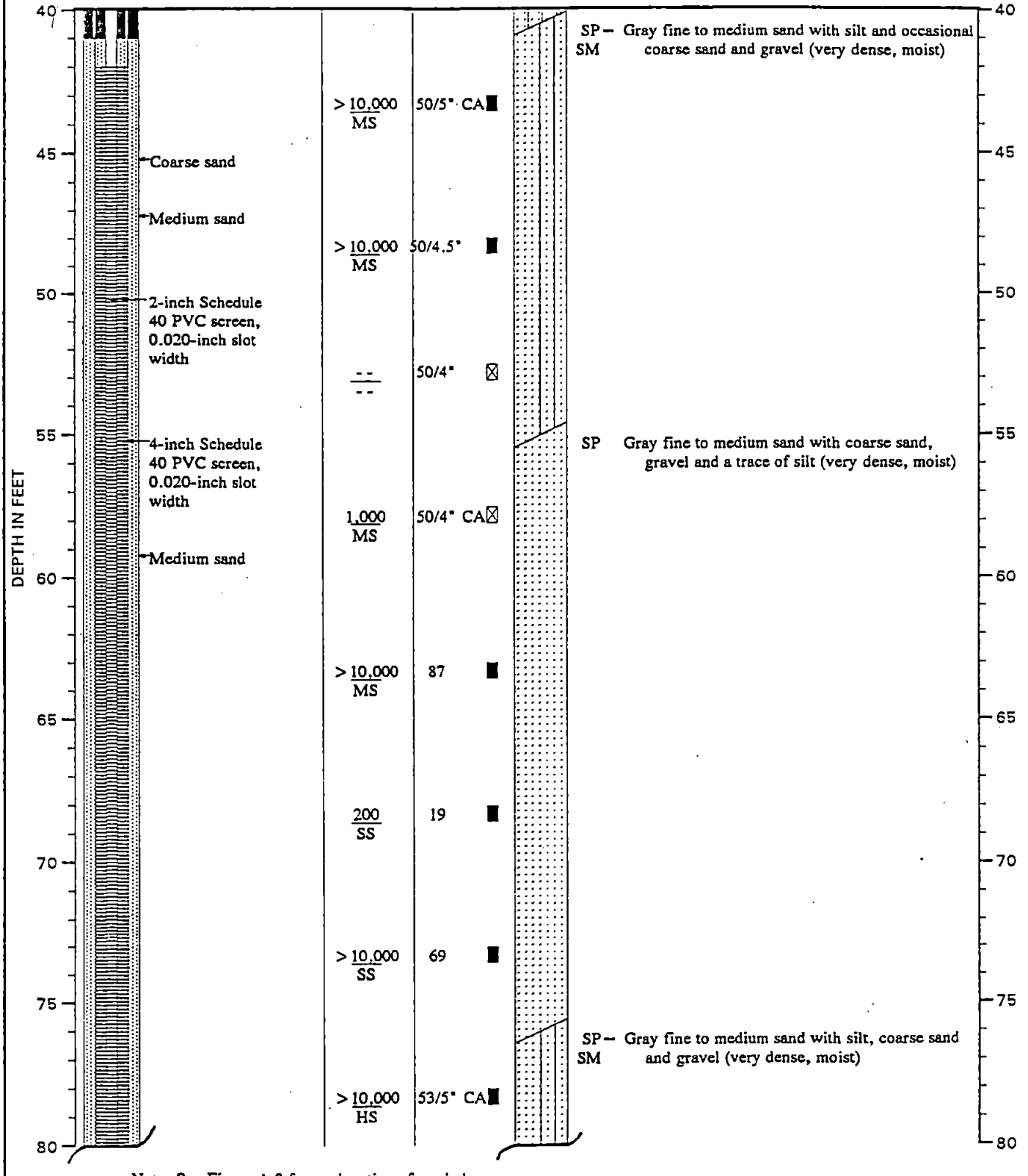
LOG OF VAPOR PROBE

FIGURE A-3

:MTW:CMS 10/7/93

0181-105-R62 Task5.4

VAPOR PROBE NO. VP-6
(Continued)



Note: See Figure A-2 for explanation of symbols

Geo Engineers

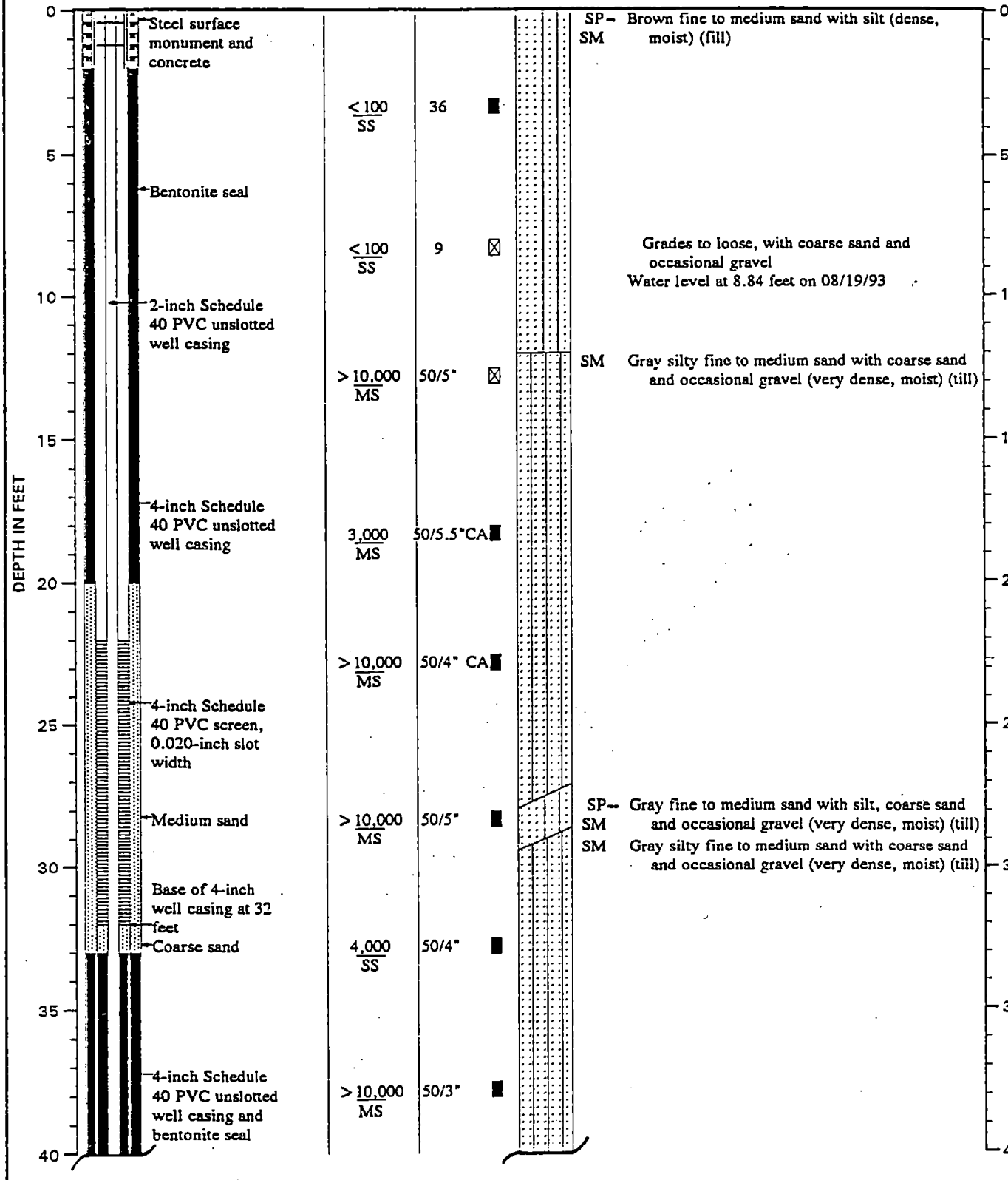
LOG OF VAPOR PROBE

FIGURE A-3

VAPOR PROBE NO. VP-6

WELL SCHEMATIC

Casing Elevation (ft.): 199.23
Casing Stickup (ft.): 0.54



Note: See Figure A-2 for explanation of symbols

Geo Engineers

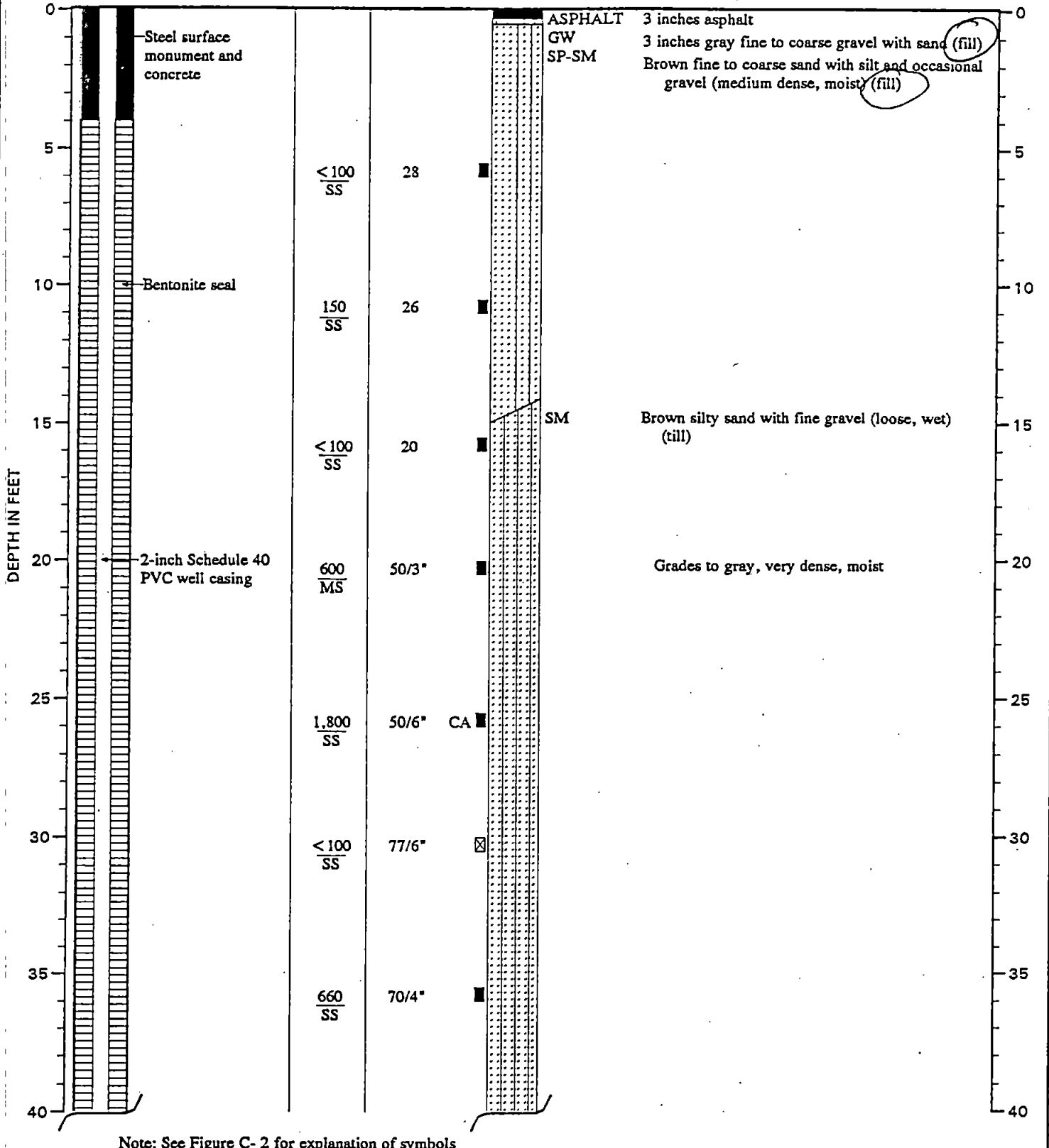
LOG OF VAPOR PROBE

FIGURE A-3

:MTW:CMS 10/7/93

0161-105-R02 Task5.4

VAPOR PROBE VP-7



Note: See Figure C- 2 for explanation of symbols

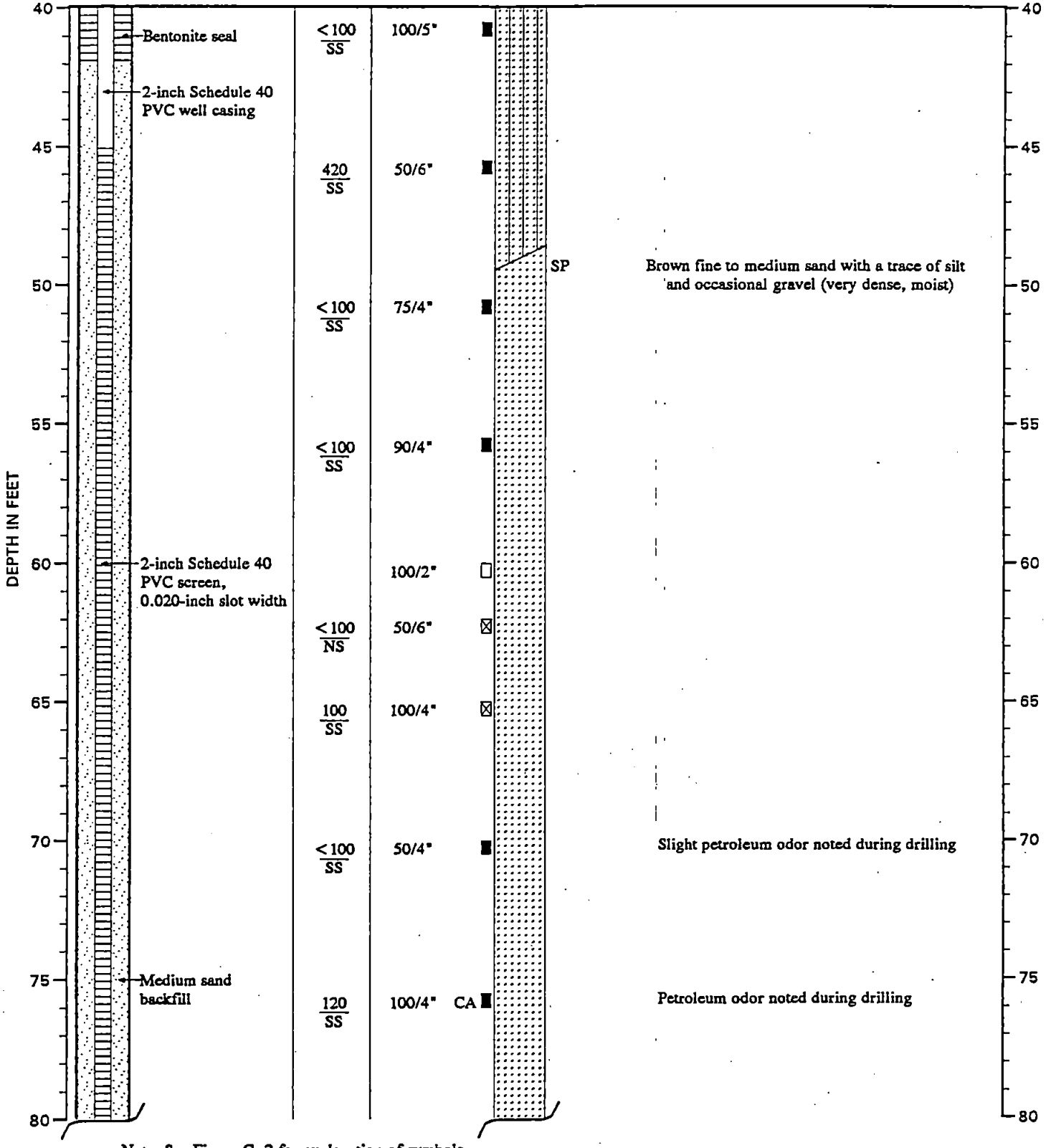
0161-105-fi04 Task7.3 :LCM:CMS 7/11/95

Geo Engineers

LOG OF VAPOR PROBE

FIGURE C-3

VAPOR PROBE VP-7
(Continued)



Note: See Figure C- 2 for explanation of symbols

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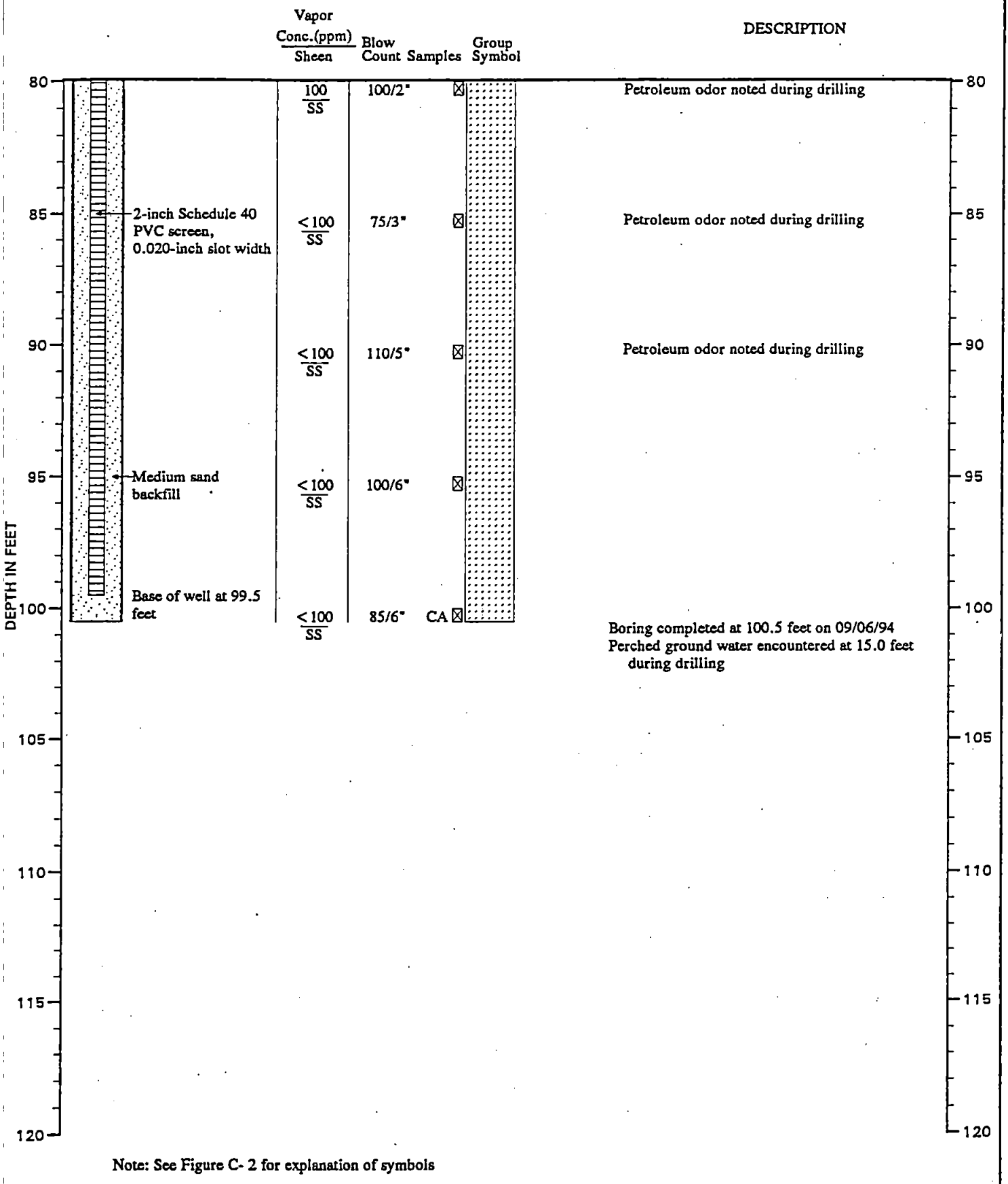
LOG OF VAPOR PROBE

FIGURE C-3

VAPOR PROBE VP-7
(Continued)



Note: See Figure C- 2 for explanation of symbols

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LOG OF VAPOR PROBE

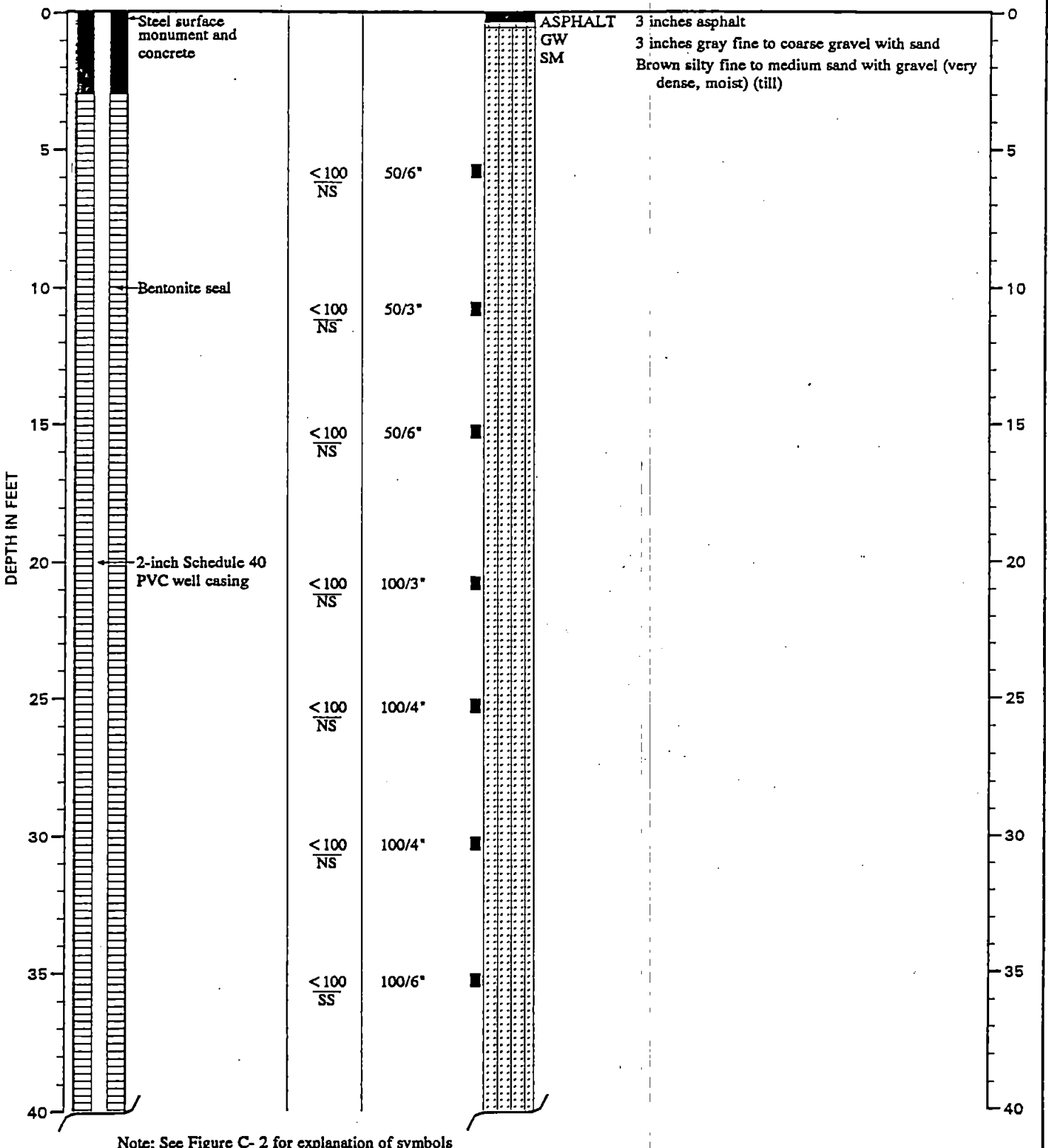
FIGURE C-3

VAPOR PROBE VP-8

WELL SCHEMATIC

Casing Elevation (ft.):

Casing Stickup (ft.):



Note: See Figure C- 2 for explanation of symbols

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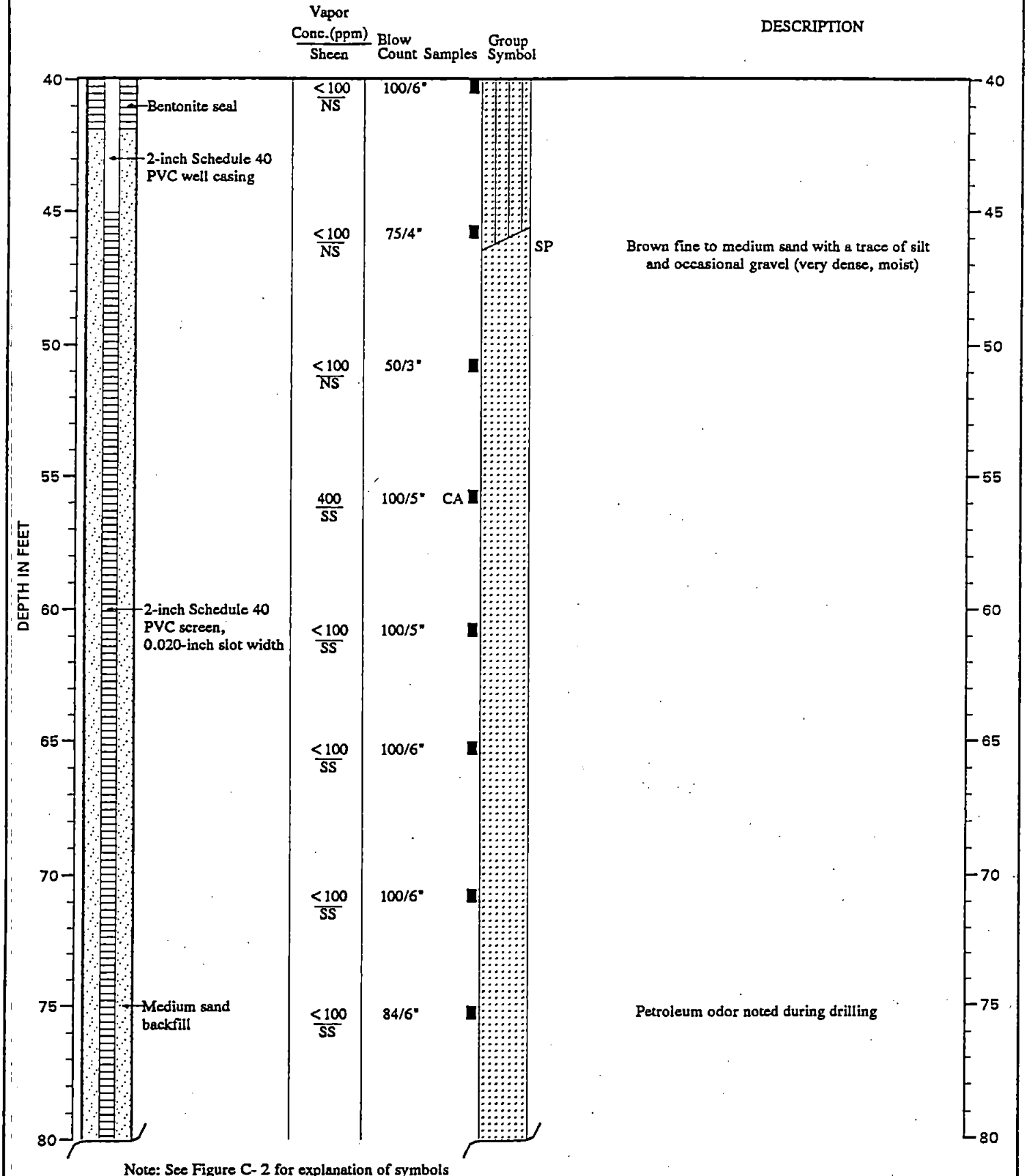
LOG OF VAPOR PROBE

FIGURE C-4

VAPOR PROBE VP-8
(Continued)



Note: See Figure C- 2 for explanation of symbols

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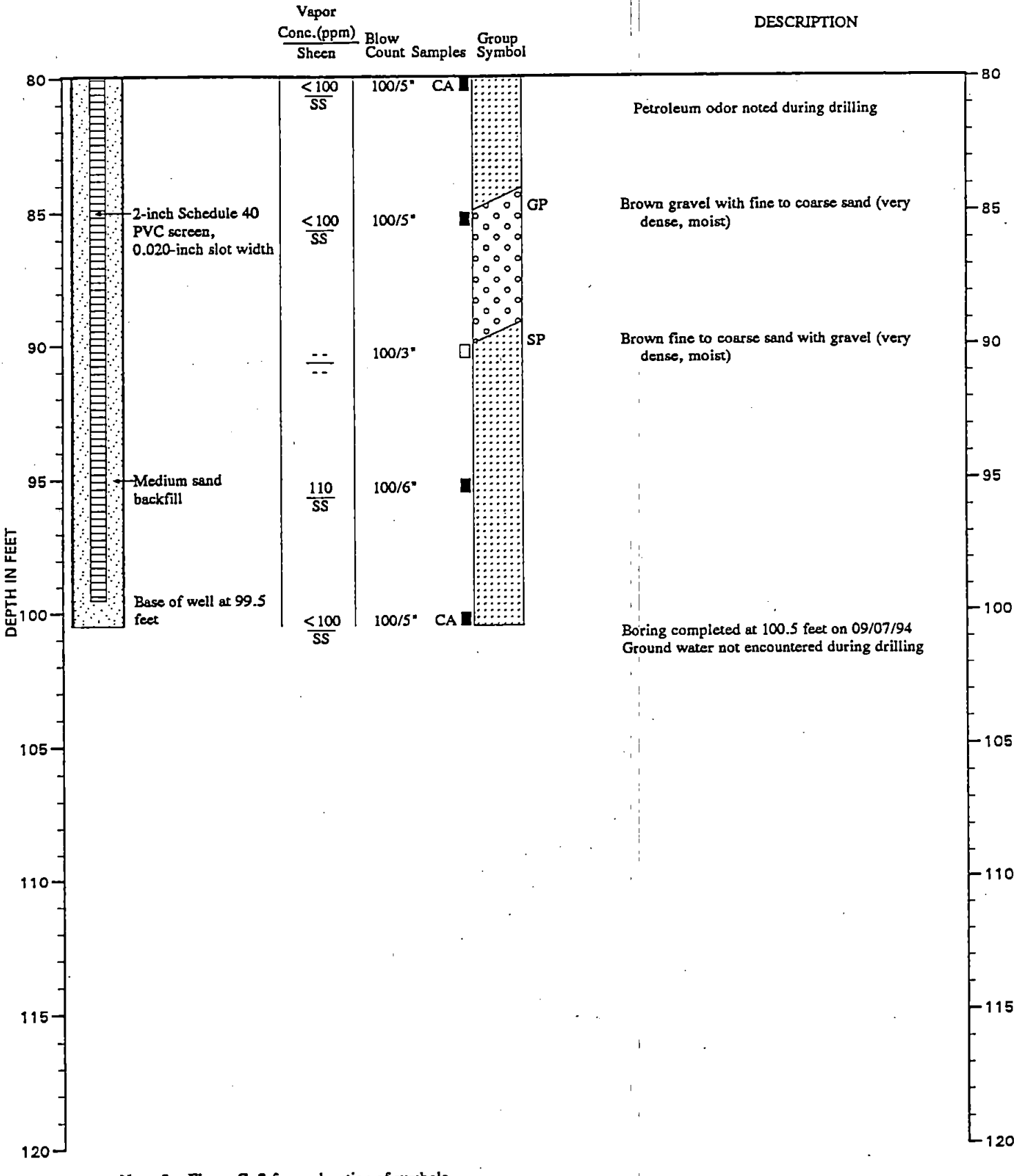
LOG OF VAPOR PROBE

FIGURE C-4

VAPOR PROBE VP-8
(Continued)



Note: See Figure C- 2 for explanation of symbols

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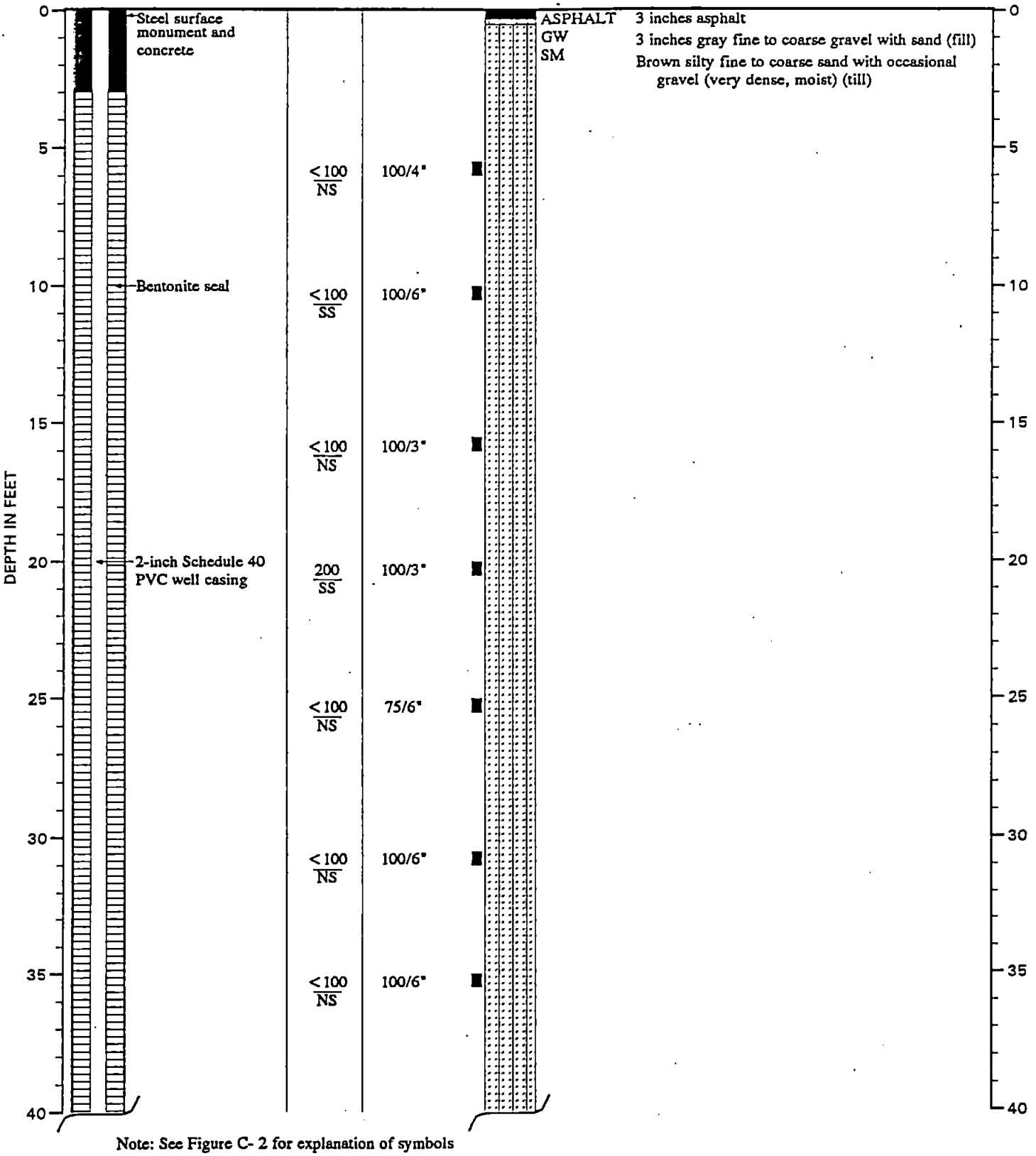
LOG OF VAPOR PROBE

FIGURE C-4

VAPOR PROBE VP-9



Note: See Figure C- 2 for explanation of symbols

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0101-105-R04 Task 3

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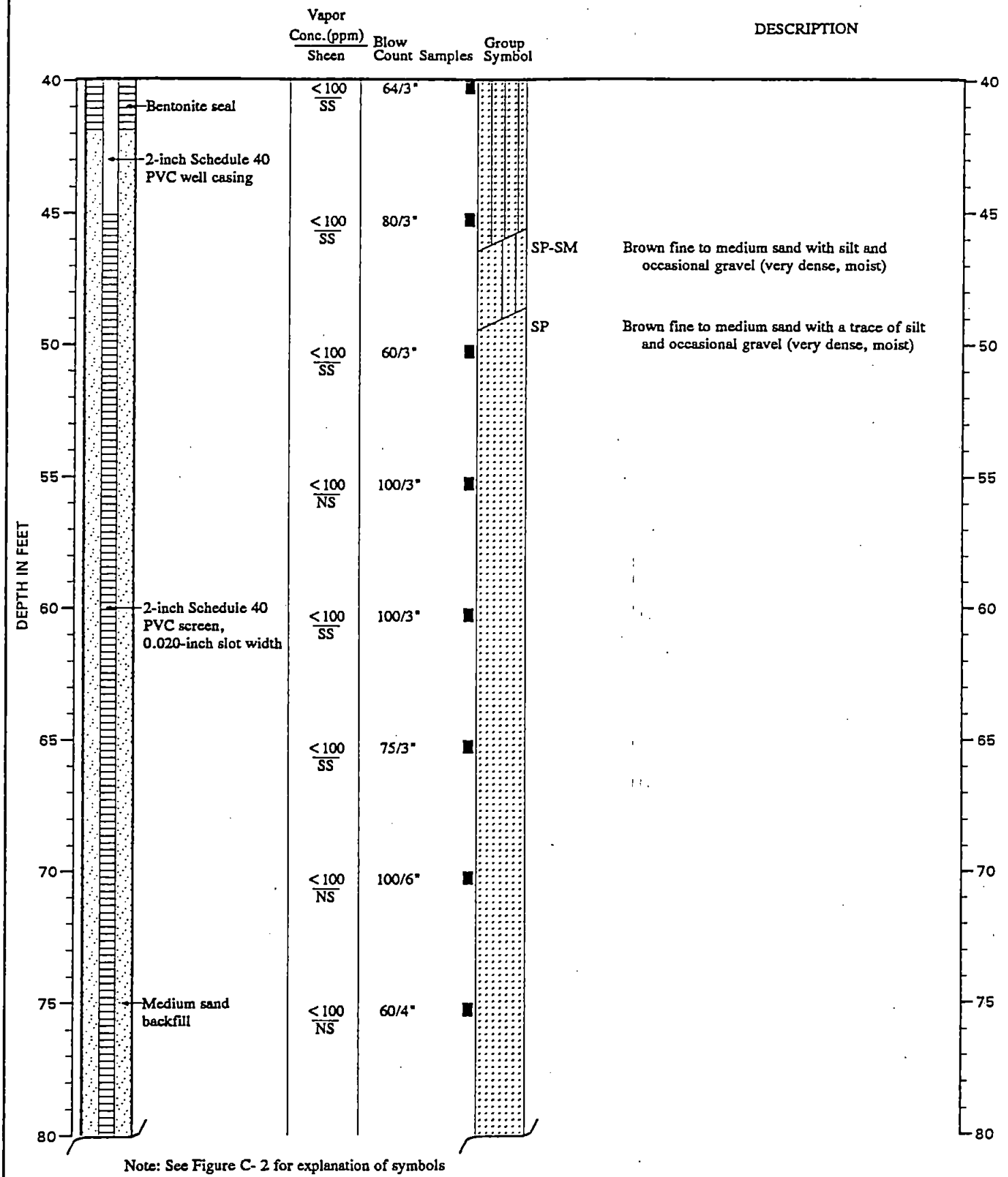
LOG OF VAPOR PROBE

FIGURE C-5

VAPOR PROBE VP-9
(Continued)



Note: See Figure C- 2 for explanation of symbols

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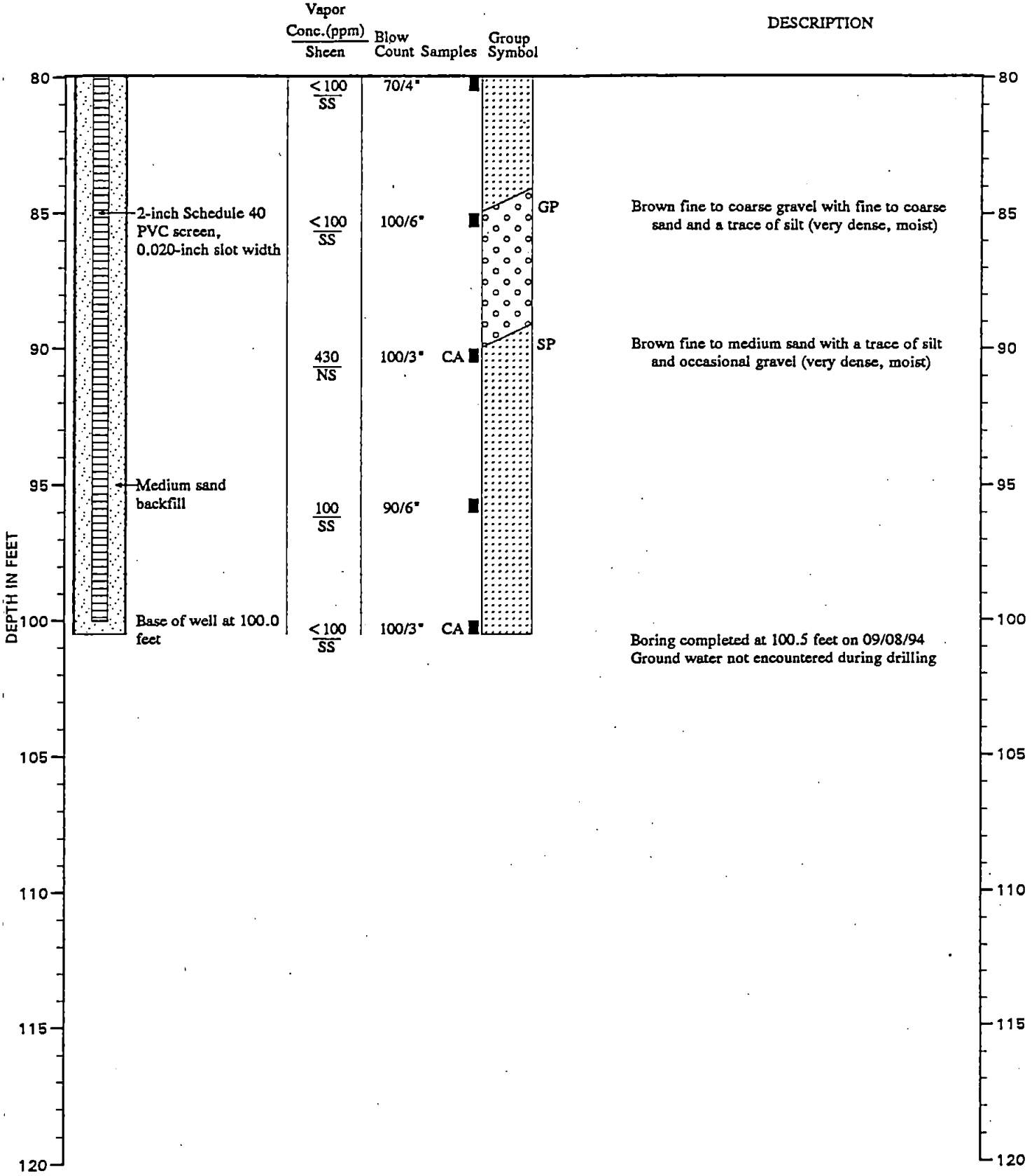
LOG OF VAPOR PROBE

FIGURE C-5

VAPOR PROBE VP-9
(Continued)



Note: See Figure C- 2 for explanation of symbols

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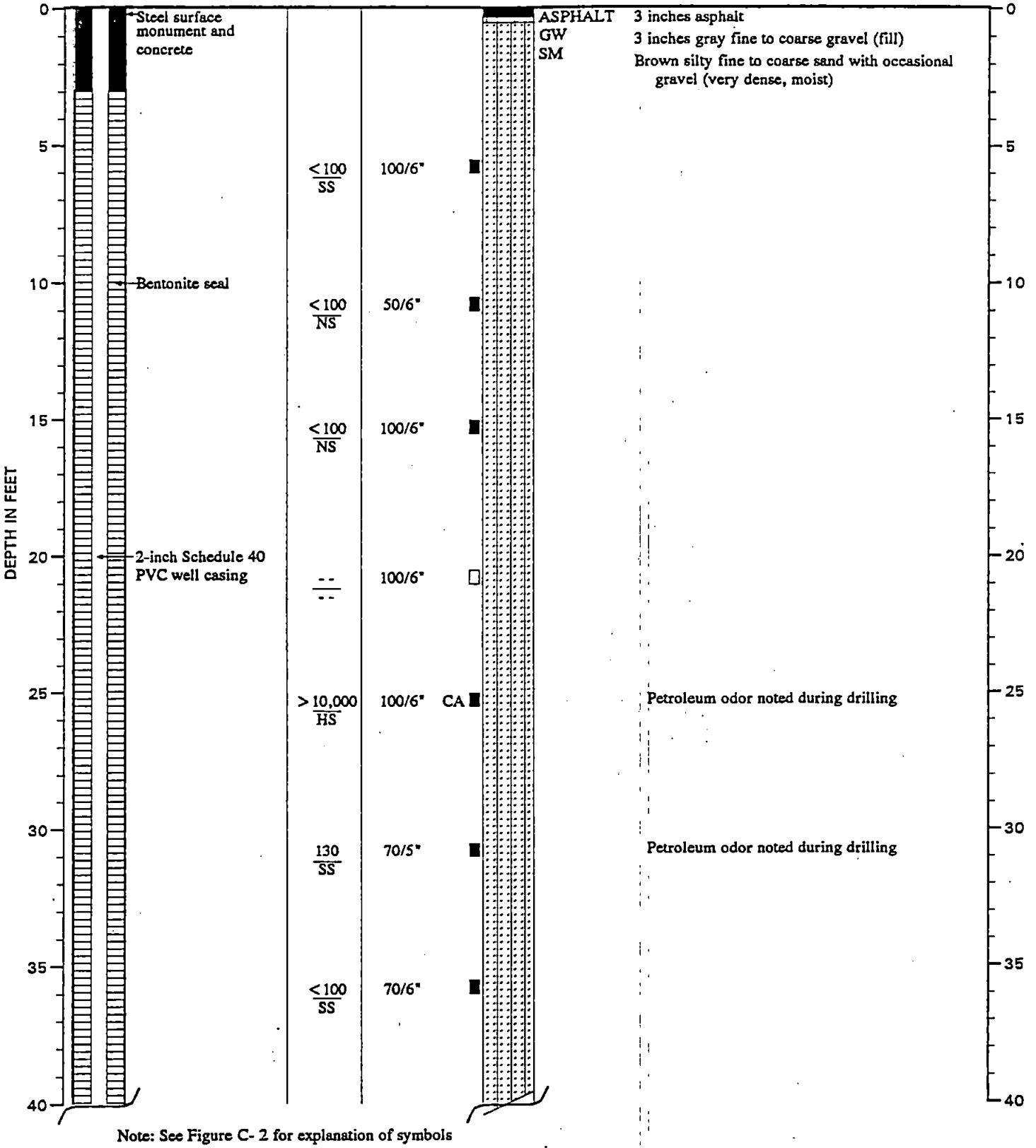
LOG OF VAPOR PROBE

FIGURE C-5

VAPOR PROBE VP-10



Note: See Figure C- 2 for explanation of symbols

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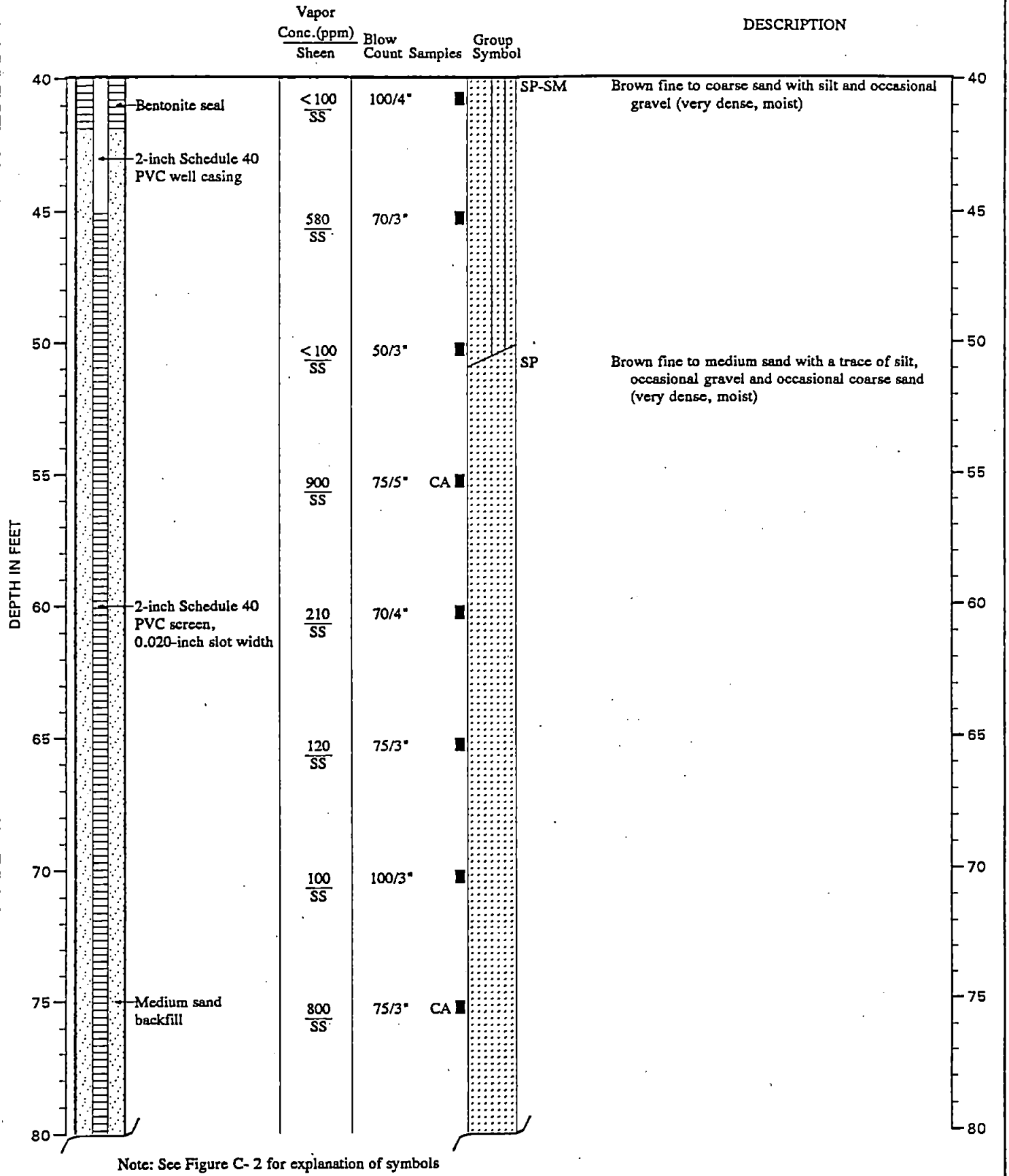
LOG OF VAPOR PROBE

FIGURE C-6

VAPOR PROBE VP-10
(Continued)



Note: See Figure C- 2 for explanation of symbols

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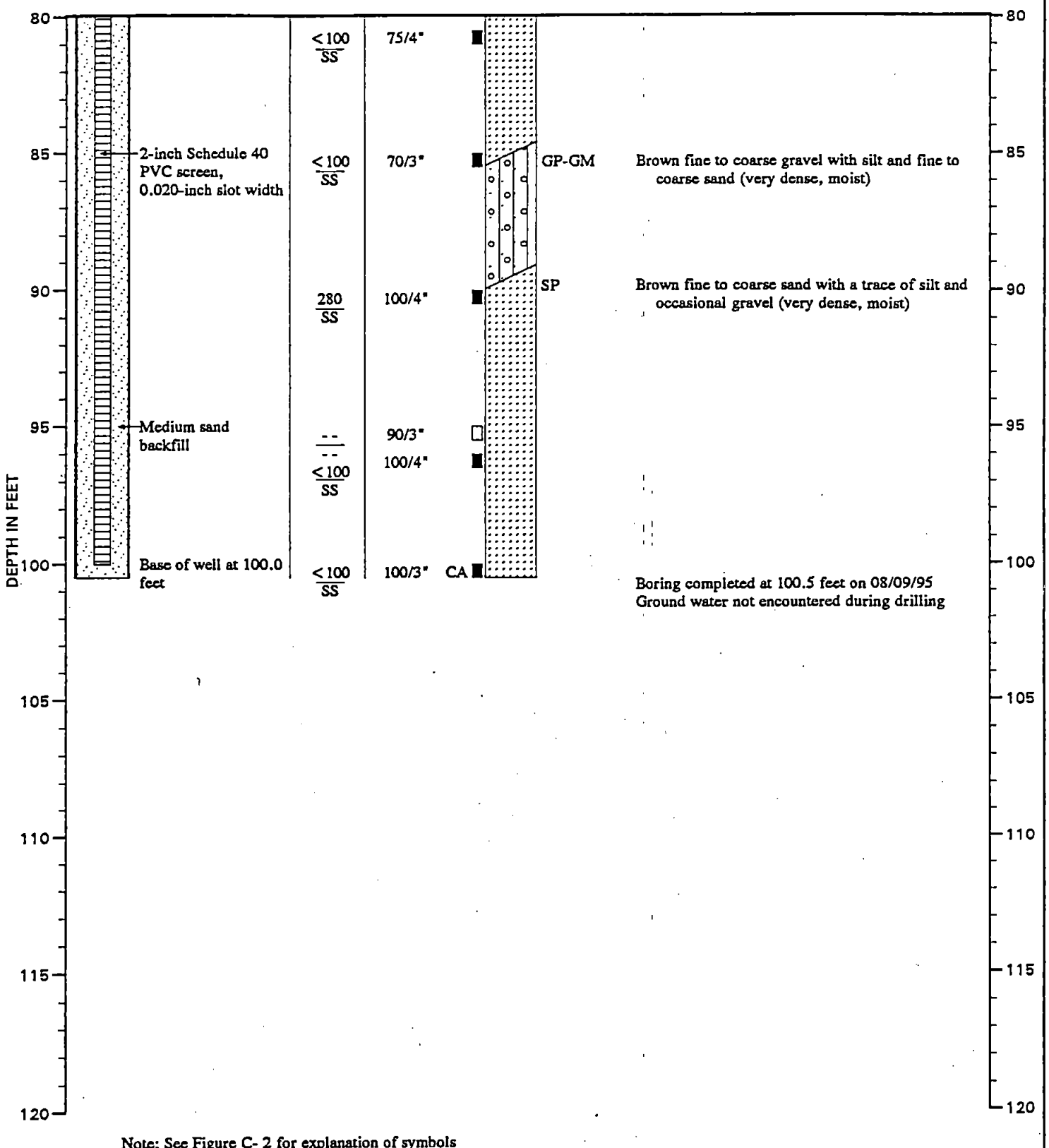
LOG OF VAPOR PROBE

FIGURE C-6

VAPOR PROBE VP-10
(Continued)



Note: See Figure C- 2 for explanation of symbols

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0161-105-R04 Task7.3

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LOG OF VAPOR PROBE

FIGURE C-6

VAPOR PROBE VP-11

WELL SCHEMATIC

Casing Elevation (ft.):
Casing Stickup (ft.):

Vapor Conc.(ppm) / Sheen	Blow Count	Samples	Group Symbol	DESCRIPTION (Surface Elevation (ft.):)
			ASPHALT	3 inches asphalt
			GW	3 inches gray fine to coarse gravel with sand (fill)
			SM	Brown silty fine to medium sand with occasional gravel (very dense, moist)
< 100 / SS	50/6"			
< 100 / SS	60/6"			
< 100 / SS	50/5"			Grades to gray
< 100 / SS	100/6"			
350 / SS	100/3"	CA		
< 100 / NS	100/3"			
< 100 / NS	100/6"			

Steel surface monument and concrete

Bentonite seal

2-inch Schedule 40 PVC well casing

DEPTH IN FEET

0, 5, 10, 15, 20, 25, 30, 35, 40

Note: See Figure C-2 for explanation of symbols

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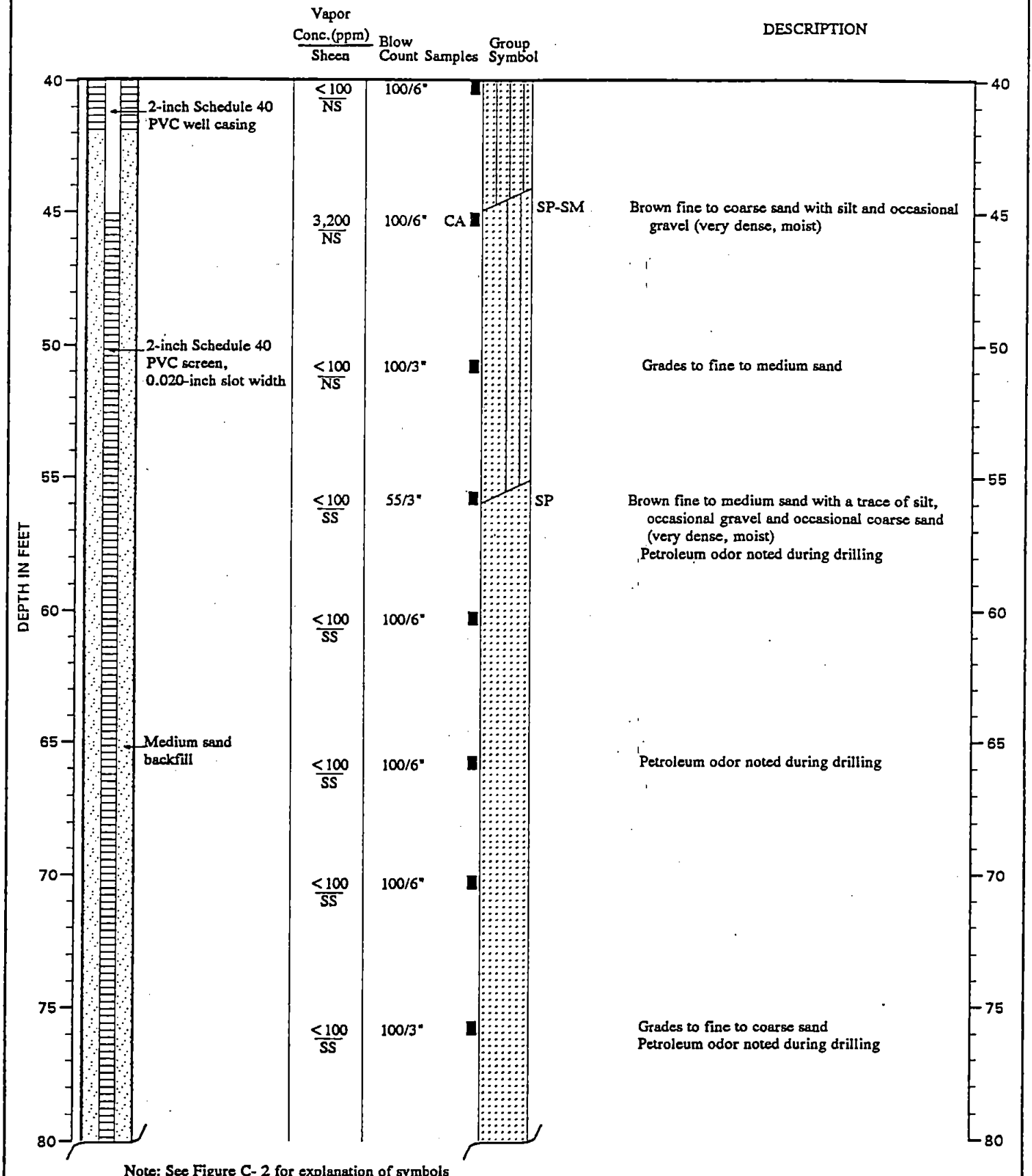
LOG OF VAPOR PROBE

FIGURE C-7

VAPOR PROBE VP-11
(Continued)



Note: See Figure C- 2 for explanation of symbols

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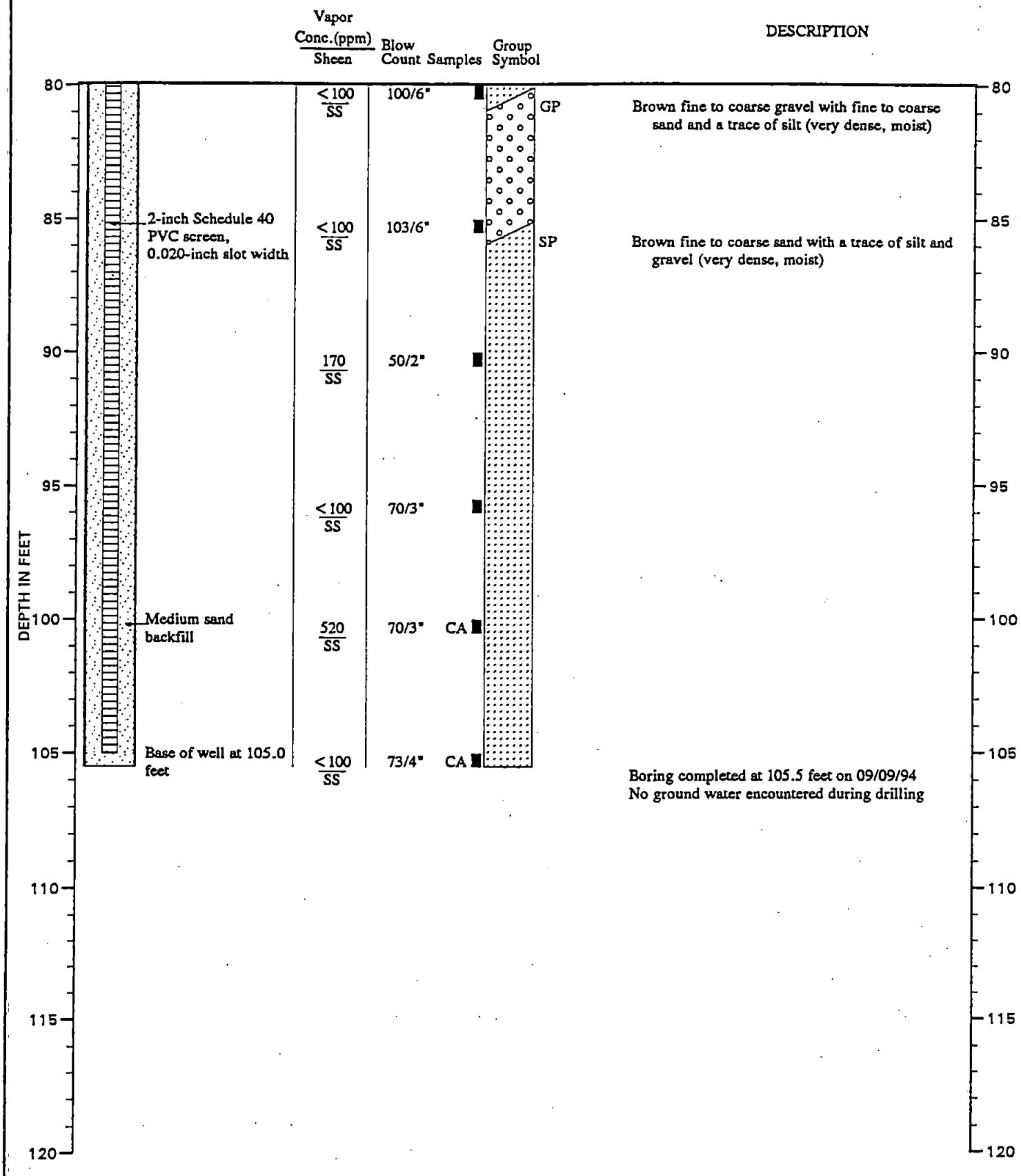
LOG OF VAPOR PROBE

FIGURE C-7

VAPOR PROBE VP-11
(Continued)



Note: See Figure C- 2 for explanation of symbols

:LCM:CMS 7/11/95

0181-105-R04 Task7.3

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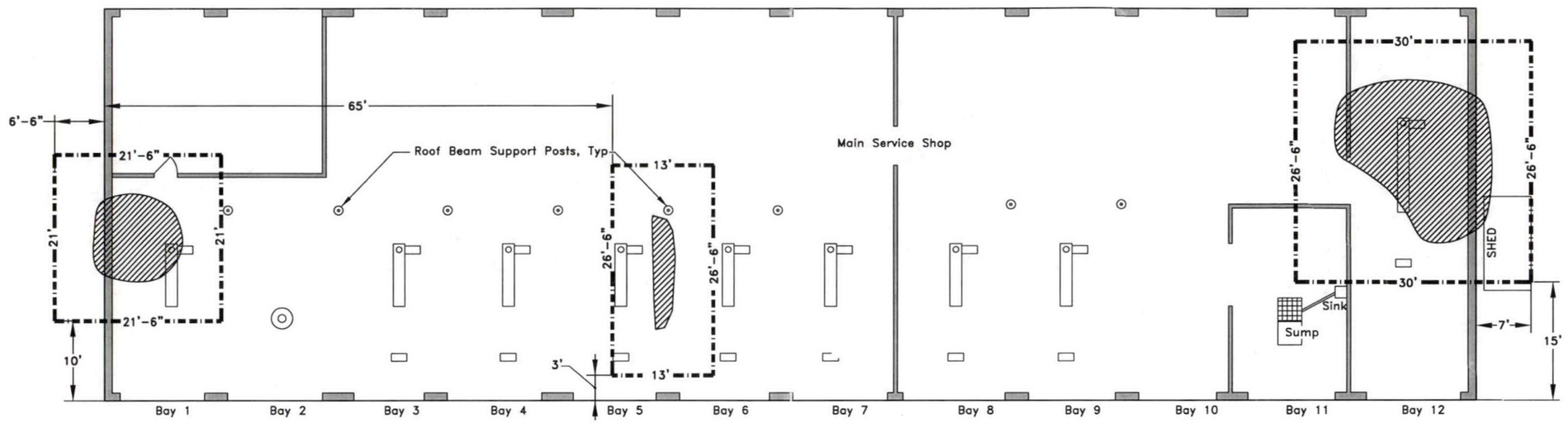
LOG OF VAPOR PROBE

FIGURE C-7



APPROXIMATE SCALE: 1/16" = 1'-0"

LEGEND

- Decommisioned Main Hydraulic Lift Vault
- Decommisioned "Satellite" Hydraulic Lift Cylinder
- Lateral Extents of Post-Remediation TPH-Impacted Soil
- "Restriction Zone"

ASSOCIATED EARTH SCIENCES, INC

"Restriction Zones" for TPH Impacted Soils

Former Chuck Olson Chevrolet Facility
Shoreline, Washington

EXHIBIT

A