

04/12/1995

Unocal CERT - Northern Region
P.O. Box 76
Seattle, Washington 98111

Attention: Mr. Leigh Carlson

2180

DEPARTMENT OF ECOLOGY
NWRO/TCP TANK UNIT

INTERIM CLEANUP REPORT
E CHARACTERIZATION
AL CLEANUP REPORT

HER _____

ECTED MEDIA: SOIL ☒
OTHER _____ GW ☒

INSPECTOR (INIT.) WGM DATE 6-19-95

date (4/12/95)

Geotechnical,
Geoenvironmental and
Geologic Services

Description of Shaft Abandonment
Former Unocal Service Station 0355
Seattle, Washington
File No. 0161-363-R04

INTRODUCTION

This letter summarizes the abandonment of an unused vertical shaft at the site of former Unocal Service Station 0355 located at 159 Denny Way in Seattle, Washington. The site is identified as site number 008421 in Ecology's (Washington State Department of Ecology) March 1994 list of registered USTs (underground storage tanks). The site, the locations of former facilities, and the location of the shaft are shown in Figure 1.

BACKGROUND

A previously unknown, 3-foot-square, wood-lined vertical shaft was encountered in the base of the fuel UST excavation in the central portion of the site during UST removal activities in 1992. The upper portion of the shaft contained pea gravel, and wood and metal debris. The native soil around the shaft consisted of hard, comparatively impermeable sandy silt.

A test pit was excavated from the base of the UST excavation to a depth of 35 feet in an attempt to remove the shaft. The base of the shaft was not reached. Free product was observed seeping rapidly into the test pit from the surrounding soil. A 2-foot-diameter slotted CMP (corrugated metal pipe) was installed in the test pit, and the test pit and excavation were backfilled around the CMP. Free product was pumped until it no longer entered the CMP.

In April 1993, a boring was drilled through the interior of the CMP and the shaft backfill in an attempt to determine the depth of the shaft. The base of the shaft was encountered at a depth of approximately 71 feet. The boring was extended to a depth of 82 feet and a 4-inch-diameter monitoring well (DW-1) was installed to monitor water quality beneath the base

GeoEngineers, Inc.
8410 154th Avenue N.E.
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of the shaft. A bentonite seal was installed from a depth of 27 feet to a depth of 75 feet to preclude downward migration of contaminants through the annular space of the boring. A cross section of the fuel USTs excavation, the test pit, the CMP, the shaft and the monitoring well, as they existed in 1993, is shown in Figure 2.

In our opinion, the shaft provided a potential route of downward migration for petroleum-related contaminants through the comparatively impermeable native soil. We recommended to Unocal that the shaft be drilled out using a large-diameter drill rig, and that the resulting boring be backfilled with a concrete/bentonite mixture in accordance with WAC 173-160-455. Our proposed procedure for abandoning the shaft was summarized in our draft "Work Plan; Shaft Removal and Abandonment."

On May 12, 1994 GeoEngineers met with Mr. Rod Thompson and Mr. Wally Moon of Ecology seeking informal approval of our draft work plan. Mr. Thompson and Mr. Moon stated that they found our proposed approach acceptable. The work plan was finalized on August 15, 1994.

SHAFT AND WELL ABANDONMENT

Malcolm (Malcolm Drilling Co., Inc.) abandoned the 4-inch-diameter monitoring well casing of DW-1 on October 26, 1994 under the supervision of a licensed driller on GeoEngineers' staff. The monitoring well was abandoned by filling it with a mixture consisting of Portland cement (90% of the total solids), powdered bentonite (10% of the total solids) and water (5½ gallons per sack of Portland cement).

Malcolm drilled out the shaft on October 30 and 31, 1994 under the supervision of a licensed driller on GeoEngineers' staff. The completed boring extended to a depth of 77 feet, was approximately 8 feet in diameter near the surface, and was approximately 6 feet in diameter near the base. The circumference of the boring was observed to be in native soil, indicating that the shaft had been effectively removed. The upper 40 feet of the boring was cased with steel pipe to avoid caving of the UST excavation and test pit backfill. On October 31, the boring was backfilled with a concrete/bentonite mixture consisting of coarse aggregate (1,800 pounds per cubic yard), fine aggregate (1,500 pounds per cubic yard), Portland cement (450 pounds per cubic yard), powdered bentonite (20 pounds per cubic yard) and water (315 pounds per cubic yard). The steel casing was removed as the boring was backfilled. A cross section of the abandoned boring and well is shown in Figure 3.

A total of 283 tons of soil and debris were generated by the drilling process. The soil and debris was removed from the site on November 7, 1994 and transported to Regional Disposal Company's Roosevelt Regional Landfill. The landfills records of receipt are included in Appendix A.

CONCLUSIONS

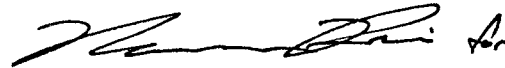
In our opinion, the vertical shaft at former Unocal Service Station 0355 has been removed and abandoned in a manner which will eliminate downward migration of petroleum-related contaminants into deeper soil and ground water zones, and which is in accordance with WAC 173-160.

————— ◀ ◊ ▶ —————

Please contact us at 861-6000 if you have any questions regarding this submittal.

Yours very truly,

GeoEngineers, Inc.



Jon C. Koloski
Technician
Well Drilling License # 1710



Norman L. Puri, P.E.
Environmental Engineer



James A. Miller, P.E.
Principal

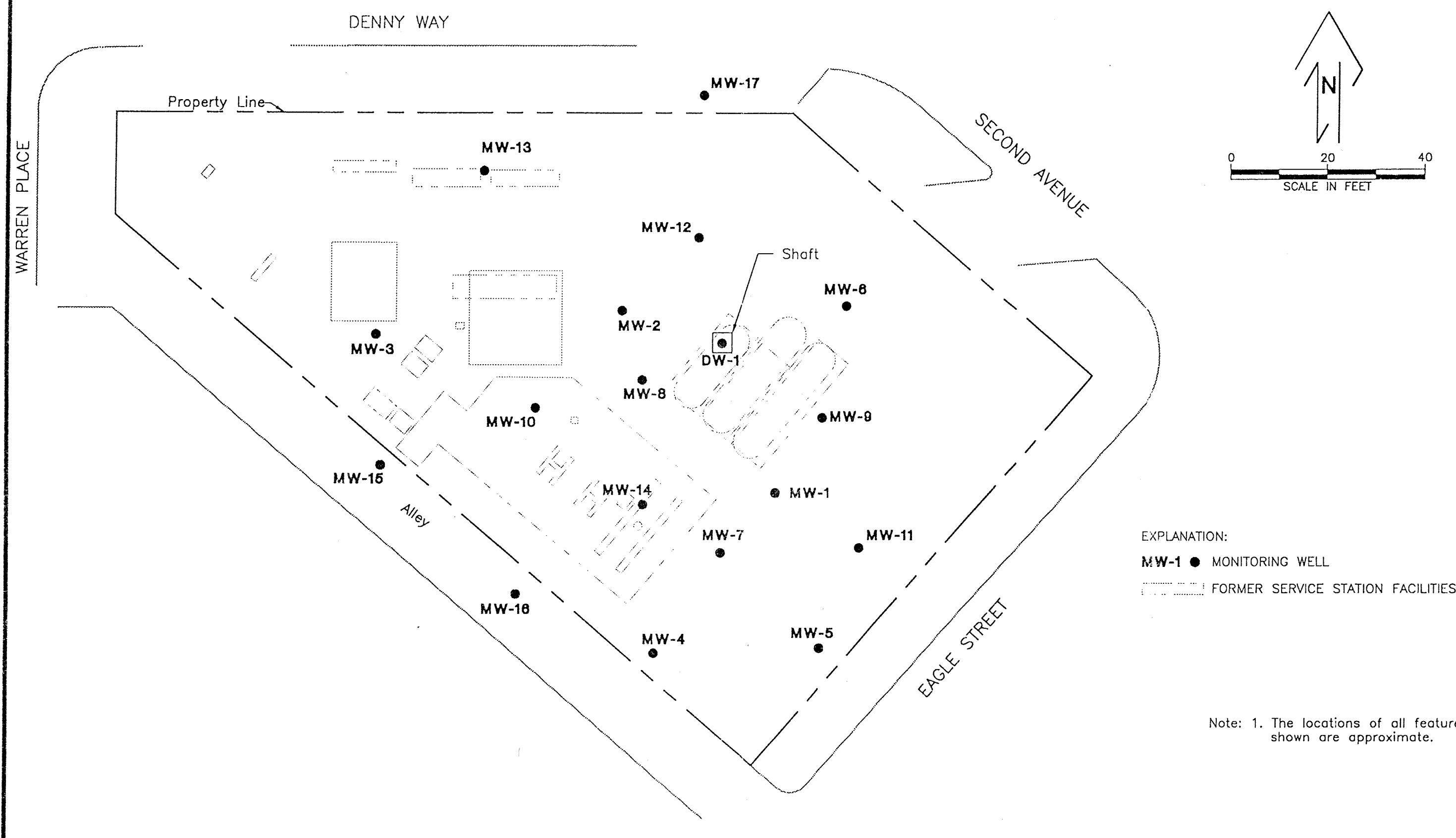
NLP:JAM:wd
Document ID: 0161363L.ABN

Attachments

Two copies submitted

cc: ✓ Mr. Rod Thompson
Mr. Wally Moon
Washington State Dept. of Ecology
Northwest Regional Office
3190 - 160th Ave. S.E.
Bellevue, WA 98008-5452

7-11-94



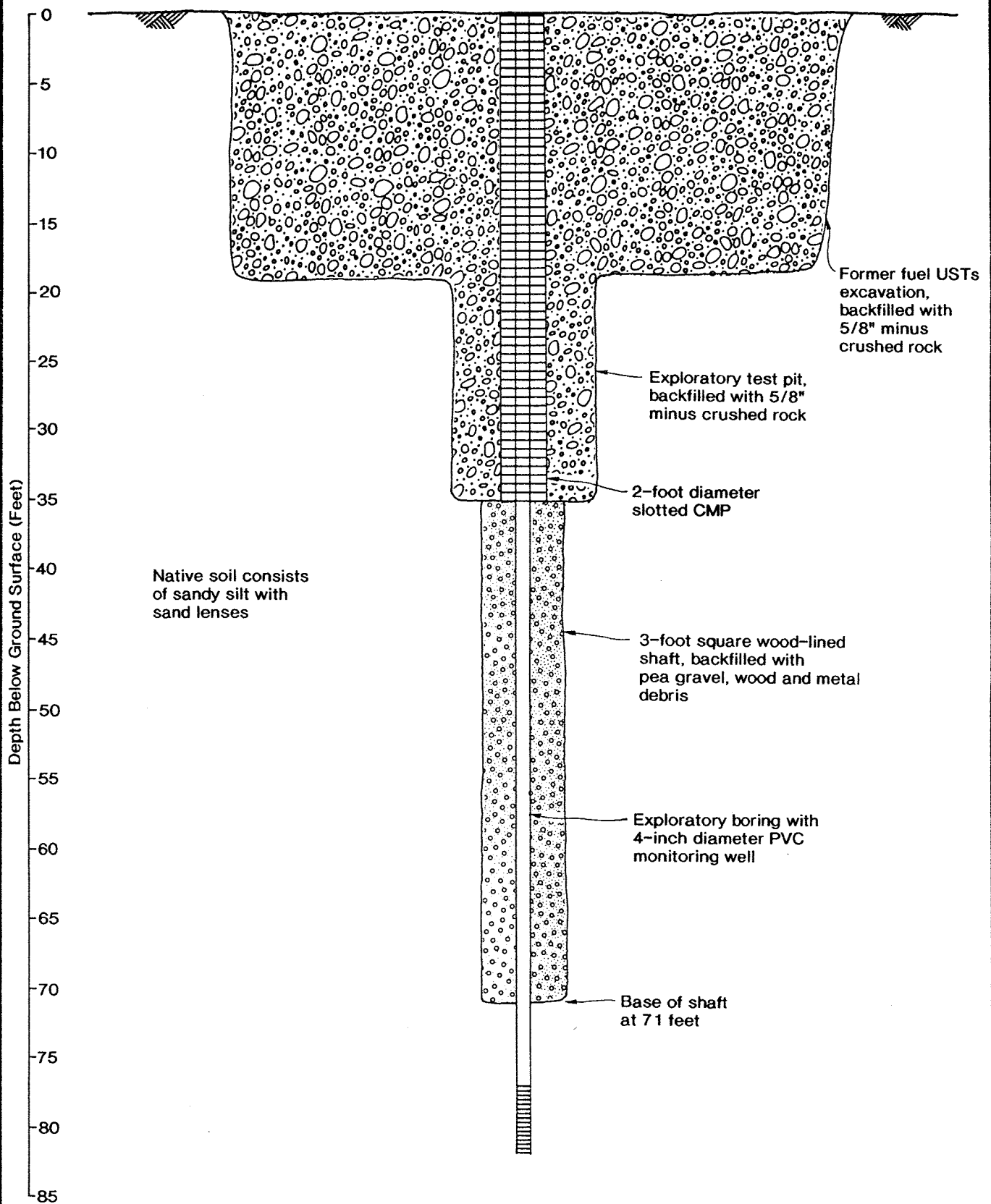
EXPLANATION:
MW-1 ● MONITORING WELL
FORMER SERVICE STATION FACILITIES

Note: 1. The locations of all features shown are approximate.

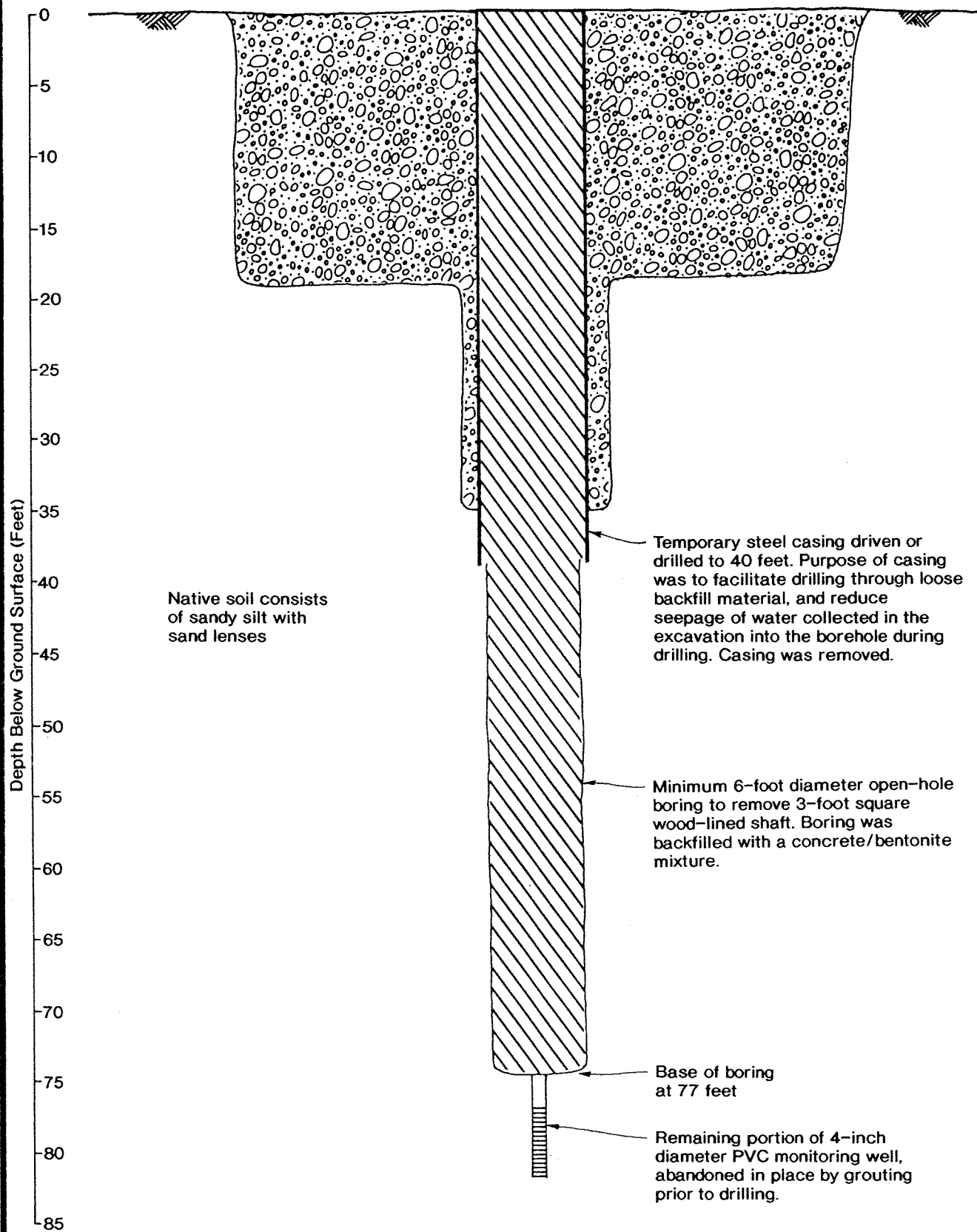
Reference: Drawings entitled "Survey, Service Station 355, 2nd Ave. & Denny Way, Seattle, Washington," by Arthur Hitchings & Asso., Land Surveyors, dated 04/62, "General Arrangement, Service Station 355, Second Ave. & Denny Way, Seattle, Washington," by Union Oil, revision 09/25/78, 09/11/84 and 12/21/89.

	LOCATIONS OF FACILITIES
	FIGURE 1

06/15/94
0161-363-R04 NLP-BDH 4/25/94



06/15/14
0161-363-R04 NLP BOH 4/25/94



APPENDIX A

04/11/95 08:35:22

4139C

HAULER: 11474 - UNOCAL JOB: 94-1964

REGIONAL DISPOSAL COMPANY
RECAP OF WEIGHT TICKETS

PAGE: 1

TICKET #	TIME	TRK#	GROSS	TARE	NET POUNDS	NET TONS	TYPE	JOB ID	CUSTOMER	ORIGIN/DESTINATION
DATE: 11/07/94										
333858	10:22	18	75388	34780	40608	20.340	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
333867	10:22	15	81900	35820	46080	21.840	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
333903	11:11	18	76000	34720	41280	20.640	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
333905	11:13	15	84080	35880	48200	24.100	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
333947	11:53	18	83920	34780	49220	24.610	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
333962	12:07	15	82740	35840	46900	23.450	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
333990	12:35	18	86680	34780	51900	25.950	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
334005	12:55	15	89540	35840	53700	26.850	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
334027	13:24	18	85180	34720	50460	25.230	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
334041	13:39	15	83920	35920	48000	24.000	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
334068	14:12	18	83960	34780	49220	24.630	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE
334087	14:35	15	76780	35880	40900	20.450	PCS-Seattle (T/S)	94-1964	HARPER	A SEATTLE

566664 283.330

TOTAL FOR: 11/07/94

566664 283.330

TOTALS FOR: UNOCAL

566660 283.330

REPORT TOTALS:

566660 283.330

Post-It* Fax Note 7671		Date 4-11-95	# of pages 1
To Norm Puri		From Debbie Jones	
Co./Dept. Geo Engineers		Co. Regional Disp.	
Phone # 861-6000		Phone # 646-2505	
Fax # 861-6050		Fax # 646-2440	

RECEIVED

APR 13 1995

DEPT. OF ECOLOGY

April 12, 1995

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Geoenvironmental and
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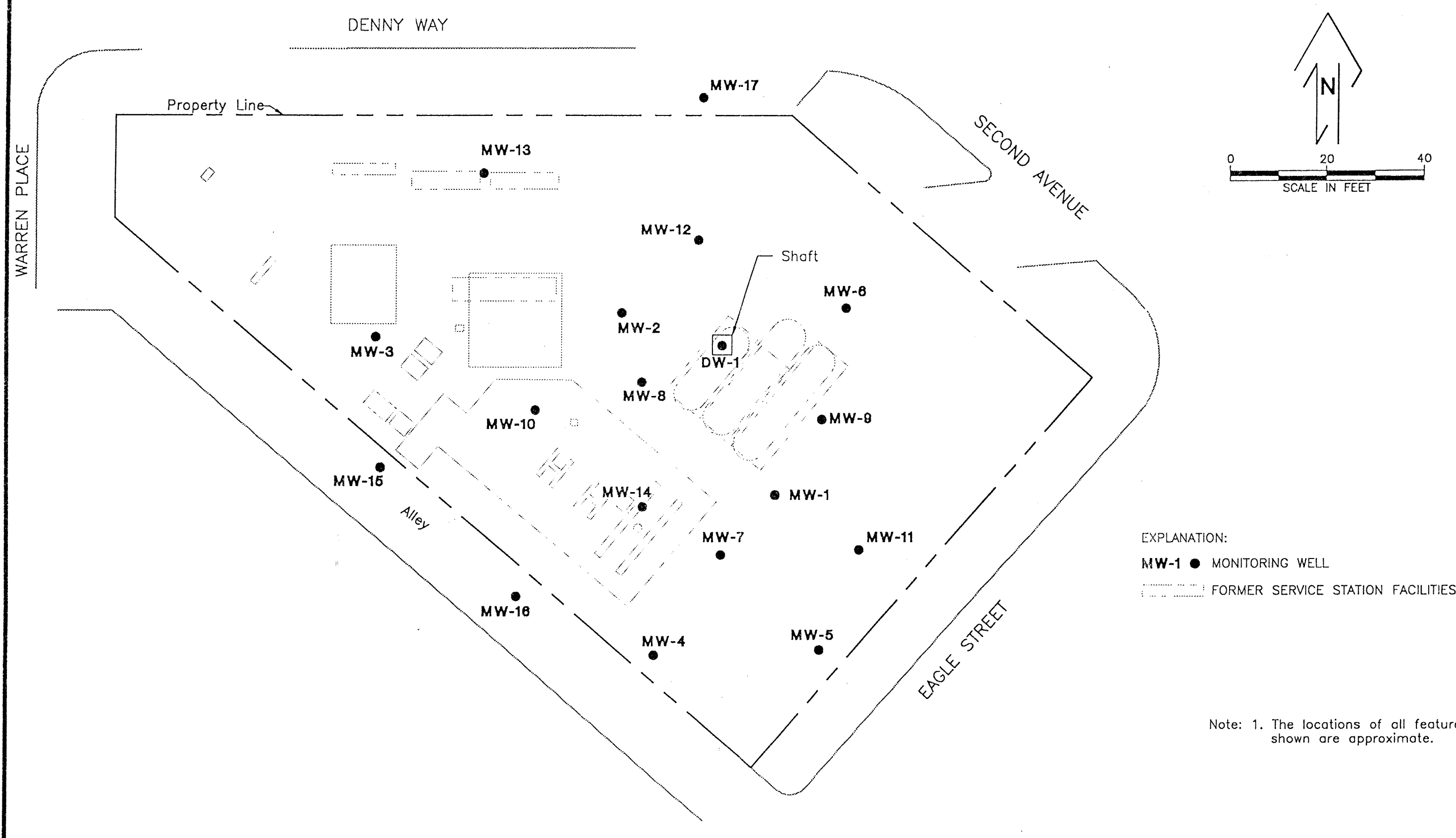
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LOCATIONS OF FACILITIES

FIGURE 1

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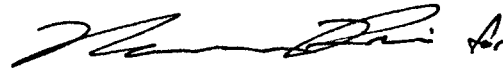
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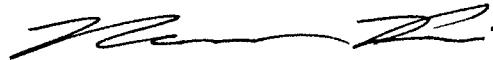
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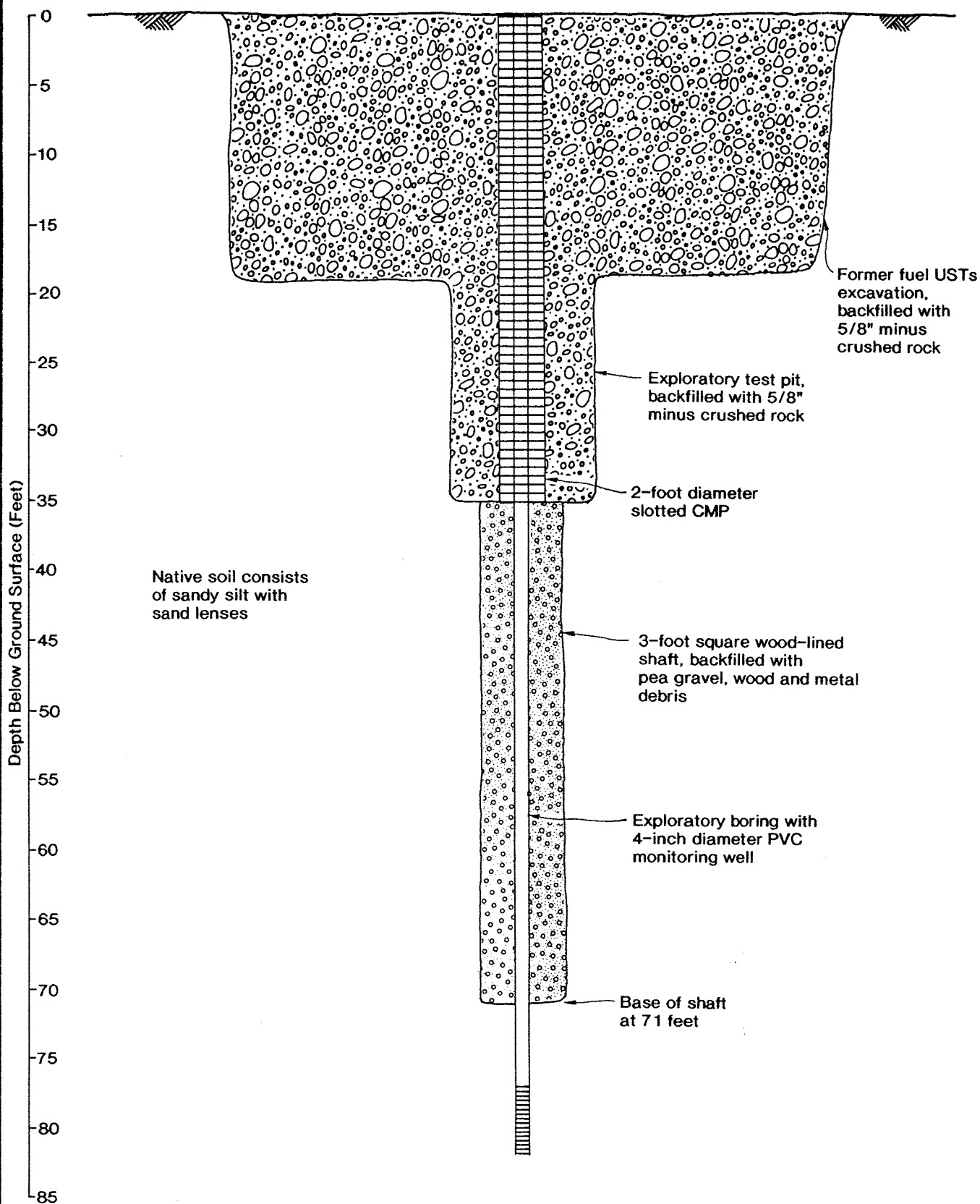
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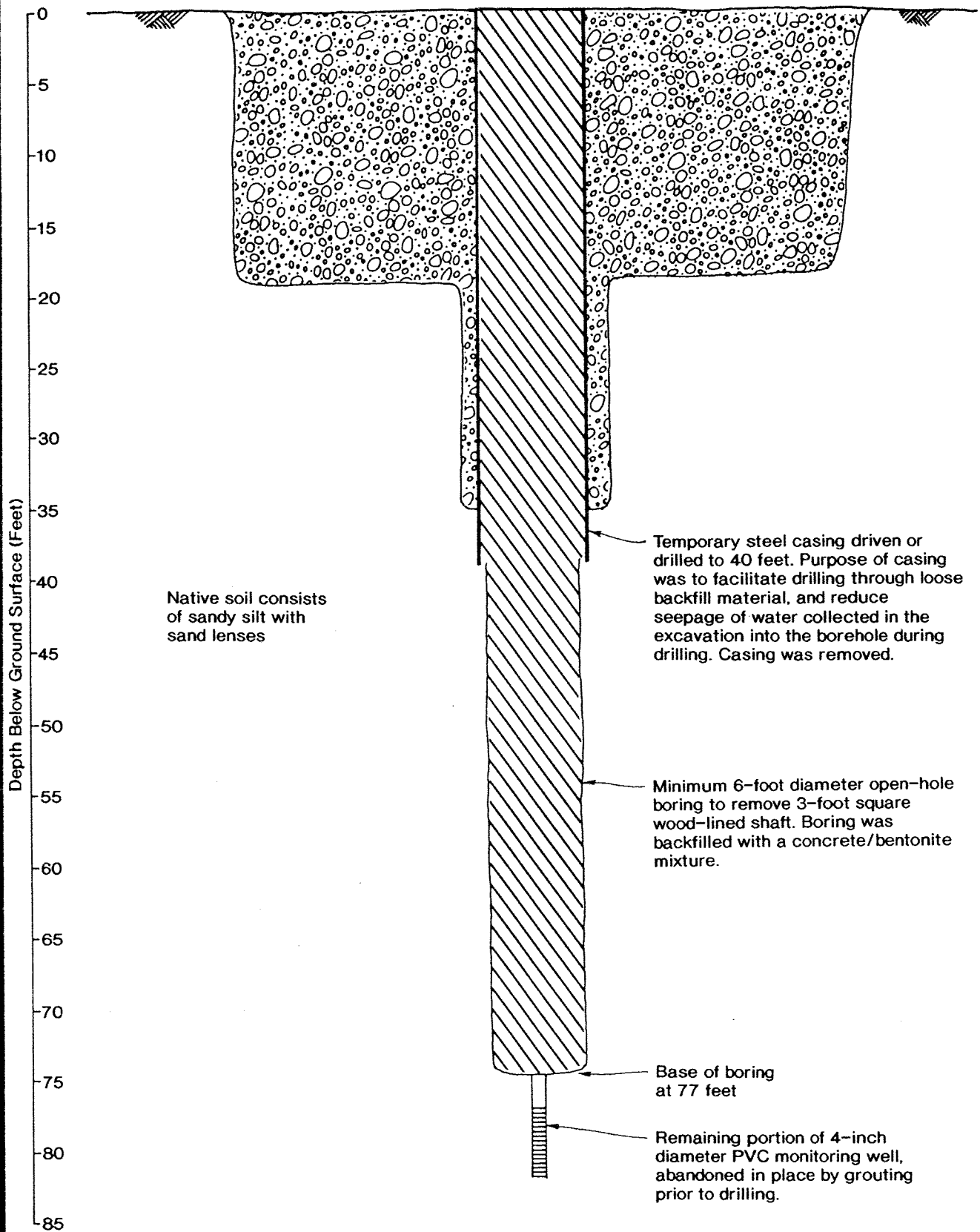
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✓ Mr. Wally Moon
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Northwest Regional Office
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Bellevue, WA 98008-5452

06/15/94
 0101 000 100 NLP-1421 4/25/94





06/15/14
0161-363-R04 NLP-BDH 4/25/94

APPENDIX A

04/11/95 08:35:22

413SC

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Post-it® Fax Note 7671

Date	4-11-95	# of pages	1
To	Norm Puri		
From	Debbie Jones		
Co./Dept.	Geo Engineers		
Co.	Regional Disp.		
Phone #	861-6000		
Phone #	646-2505		
Fax #	861-6050		
Fax #	646-2440		