

ATTACHMENT - 6

**HARTCROWSER**

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
FAX 206.328.5581
206.324.9530

Earth and Environmental Technologies

*Phase I-Remediation Services
Bremerton Bulk Plant
Bremerton, Washington*

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water from MW-11 was predominantly fresh water with little or no salt water influence. This is consistent with a groundwater flow direction from the site toward the Port of Washington Narrows.

GROUNDWATER AND FREE PHASE HYDROCARBON LEVEL MEASUREMENTS -
TASK 1.2

Measurements Taken

Groundwater and free phase hydrocarbon level measurements were made in all wells available on March 30, 1989. We observed that six out of nine wells had measurable free phase hydrocarbons. We then bailed off the hydrocarbons from four of the wells (MW-4, MW-6, MW-7, and MW-8) and measured groundwater levels and free phase hydrocarbon thicknesses again on April 4, 1989.

Our measurements are presented in Table 1. For comparison purposes, we have also included in Table 1 the groundwater level and product thickness measurements from the previous study in September and October 1988.

Table 1 - Water Levels and Free Phase Hydrocarbon Thickness

Well	Date 9/88, 10/88 (GeoEngineers)			3/29, 3/30/89			4/4/89		
	Product Level	Water Level	Product Thickness	Product Level	Water Level	Product Thickness	Product Level	Water Level	Product Thickness
MW-4	9.64	10.99	1.35	8.81	12.76	3.95	8.54	12.56	4.02
MW-5		10.05			8.56			8.22	
MW-6		11.08		8.47	12.76	4.29	8.40	12.21	3.81
MW-7		9.93		7.83	8.36	0.53	7.33	7.64	0.31
MW-8	7.16	7.18	0.02	7.54	8.28	0.74	12.63	13.33	0.70
MW-9		9.88		6.93	8.34	1.41	7.24	8.74	1.50
MW-10		9.37			6.54			6.51	
MW-11		8.45			6.03			6.47	
MW-12		17.62		14.91	15.10	0.19	14.71	14.97	0.26

All measurements in feet; product level and water level measured as depth below top of casing.

Table 2 - Results of Chemical Analyses of Soils

Sample Number	Depth in Feet	Concentrations in ppm			
		Fuel Gasoline	Hydrocarbons Diesel	TPH (418.1)	
TP-8	S-2	2 to 4	58	ND	
	S-4	6 to 8	17,000	ND	
TP-9	S-2	2 to 4	760	5,800	
	S-4	6 to 8	25,000	ND	
TP-10	S-2	2 to 4	30	ND	
	S-4	6 to 8&	400	ND	
TP-11	S-2	2 to 4	ND	ND	
	S-4	6 to 8	330	1,100	
TP-12	S-2	2 to 4	ND	ND	
	S-4	6 to 8	ND	210	
TP-13	S-2	2 to 4			700
	S-4	6 to 8	757	ND	
TP-14	S-2	2 to 4	ND	ND	
	S-5	8 to 10	ND	ND	
TP-15	S-3	4 to 6			1,900
	S-4	6 to 8			30
TP-16	S-2	2 to 4			1,300
	S-4	6 to 8			3

ND = not detected in sample

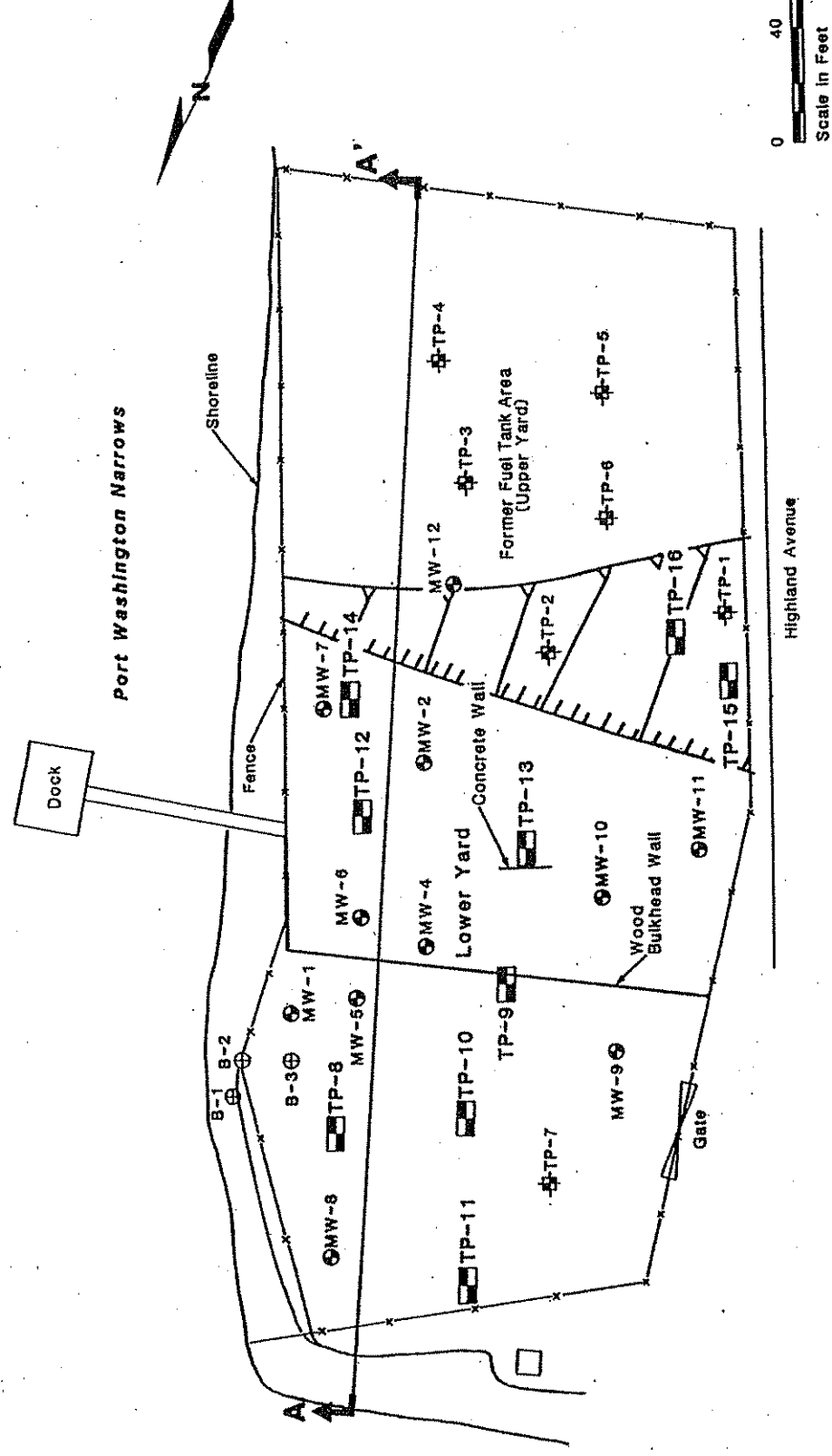
Soil hydrocarbon concentration results summarized. Soil hydrocarbon concentrations are summarized on Figure 5 for soils within 6 feet of the ground surface and on Figure 6 for deeper soils. Also included on these figures are the results of chemical analyses performed in the previous study.

Soil hydrocarbon concentration - upper yard. Soil hydrocarbon concentrations in the upper yard area appears to be:

- predominantly diesel fuel;
- generally restricted to a relatively small area around TP-1;
- less than 2,000 ppm concentration; and
- highest in the upper 6 feet of soil.

Soil hydrocarbon concentration - lower yard. Soil hydrocarbon concentration in the lower yard can be considered in two separate zones: shallow soils less than 6 feet deep, and deeper

Site and Exploration Plan



TP-11 [Symbol] Test Pit Location and Number (Current Study)

MW-1 [Symbol] Monitoring Well Location and Number (Previous Study)

B-1 [Symbol] Boring Location and Number (Previous Study)

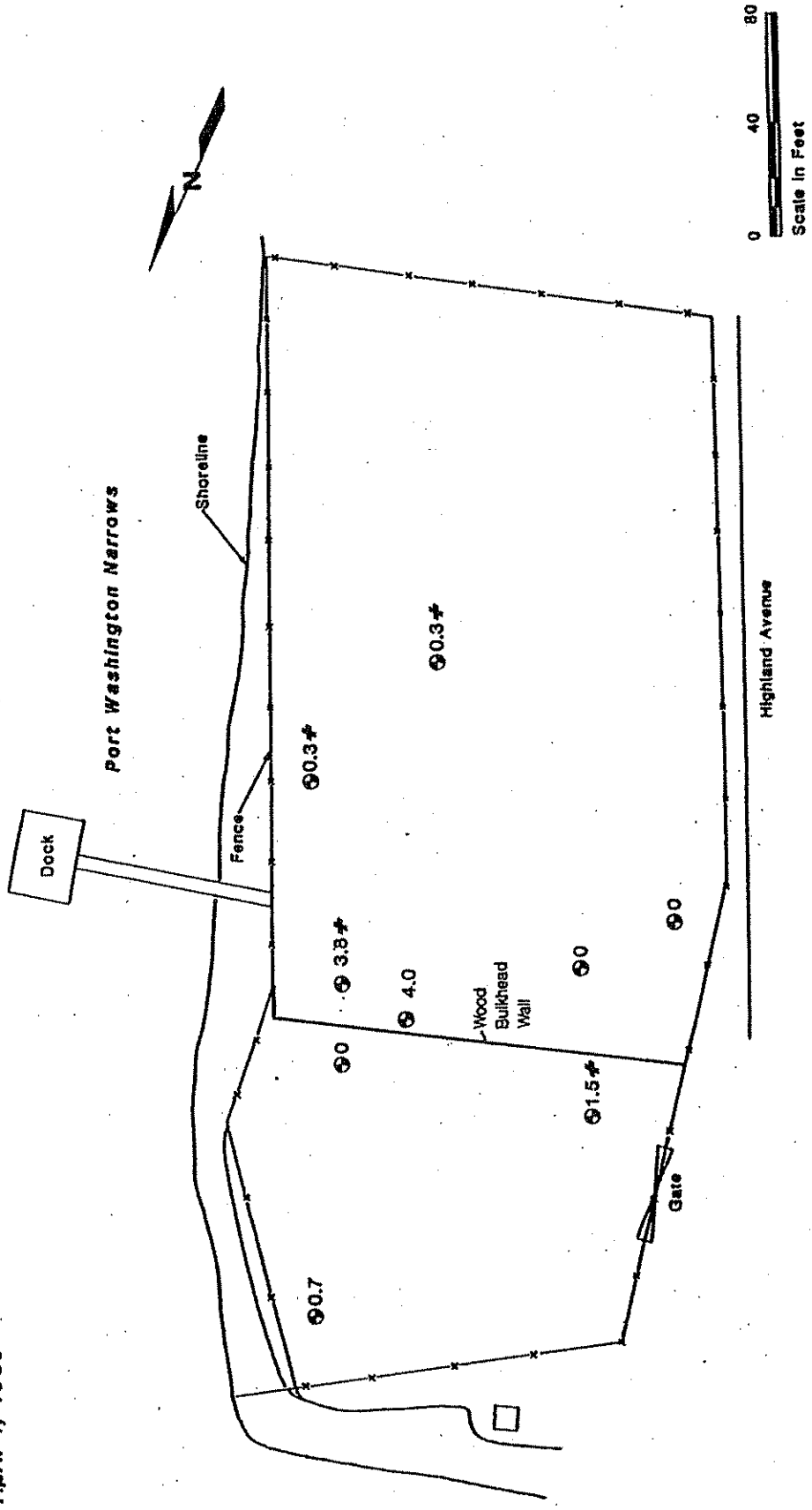
TP-1 [Symbol] Test Pit Location and Number (Previous Study)

A-A' [Symbol] Geologic Cross Section Location and Designation

B-B' [Symbol] Geologic Cross Section Location and Designation

Free Phase Hydrocarbon Thickness Measurements

April 4, 1989



- Monitoring Well Location
- 1.5 Free Phase Hydrocarbon Thickness in Feet Measured in Well
- # Indicates Well Not Previously Reported to Contain Free Phase Hydrocarbon

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Figure 4