ATTACHMENT - 5

SITE HAZARD ASSESSMENT

SUMMARY REPORT

FOR

CHEVRON TANK FARM

BREMERTON, WASHINGTON

JULY 1991

Prepared for:

Washington Department of Ecology
Mail Stop PU-7
Olympia, Washington 98504

Prepared By:

Parametrix, Inc.
13020 Northup Way
Bellevue, Washington 98005

&

SAIC
626 Columbia Street NW, Suite 1C
Olympia, Washington 98501

Contract Number: C0089006
Work Assignment No. 49

6.0 SAMPLING RESULTS AND DISCUSSION

6.1 Groundwater and Free Product Sampling Results

Semi-volatile organic compounds (carcinogenic and noncarcinogenic) were detected in the groundwater sample (monitoring well MW-4) at concentrations up to 152 parts-per-billion (ppb) (nitrobenzene) (Table 2).

The groundwater sample from MW-4 also contains 353 ppm total petroleum hydrocarbons (TPH, EPA Method 418.1), 5,660 ppb Benzene, 2,420 ppb Toluene, and 4,390 ppb Xylene (total). The free product sample from monitoring well MW-4 contains 90% diesel.

A water sample was not available from monitoring well MW-8 because of the lack of water in the well (see Section 4.1).

6.2 Sediment Sampling Results

Results from sediment sampling (SD-1, SD-2, and SD-3) are summarized in Table 3. As can be seen in this table, all compounds are below quantification limits, although concentrations of some compounds have been estimated (shown as a "J"). Laboratory data validation activities indicated that there were extremely low surrogate recoveries for all samples. The lab indicated that this was due to "matrix interferences". The lab did not elect to reanalyze or dilute these samples. Based on this information, it is not considered valid to attempt a comparison with sediment management standards. However, trends in the data are present. It is clear that at least the following compounds are present in the sediment samples:

- Acenaphthylene
- Fluorene
- Anthracene
- Fluoranthene
- Chrysene
- 2,6-Dinitrotoluene
- Di-n-Butyl Phthalate
- Bis(2-ethylhexyl) Phthalate
- Acenaphthene
- Phenanthrene
- 2-Methylnaphthalene
- Pyrene
- Dimethyl Phthalate
- Diethyl Phthalate
- Di-n-Octyl Phthalate
- Phenol

Based on the quantification limits utilized by the laboratory, it is expected that these compounds may be at or above the Marine Sediment Management Standards (WAC 173-204).

Sediment samples from the Chevron site also contain TPH (EPA Method 418.1) concentrations of 100, 145, and 412 ppm for SD-1, SD-2, and SD-3 respectively. Lead was also detected at concentrations of 11.3, 25.8, and 53.3 ppm for SD-1, SD-2, and SD-3 respectively. Xylene (total) was detected in SD-1 at 103 ppb and in SD-2 at 78 ppb.

Table 2.

Groundwater and Free Product
Semi-volatile and Volatile Organics, TPH, and Diesel Analysis Summary
Chevron Tank Farm, Bremerton, Washington

Analyte	Units	Sample Number	Carcinogen or Noncarcinogen[1]
Groundwater			
Semi-volatile Organics		MW-4	
Phenol	ug/L	24	NC
Bis(2-chloroethyl)ether	ug/L	22	C
4-Methylphenol	ug/L	34	UNK
Nitrobenzene	ug/L	152	NC
Isophorone	ug/L	22	NC
Bis(2-chloroethoxy)methane	ug/L	3 J	UNK
Naphthalene	ug/L	5 J	NC
4-Chloroanaline	ug/L	134	NC
4-Chloro-3-methylphenol	ug/L	22	UNK
2-Methylnaphthalene	ug/L	14	UNK
2-Nitroanaline	ug/L	4 J	UNK
Dimethylphthalate	ug/L	3 J	NC
Acenaphthylene	ug/L	6 J	NC
2,6-Dinitrotoluene	ug/L	9 J	C
3-Nitroanaline	ug/L	7 J	UNK
Acenaphthene	ug/L	5 J	NC
4-Nitrophenol	ug/L	11 J	UNK
Dibenzofuran	ug/L	2 J	NC
2,4-Dinitrotoluene	ug/L	15	C
Diethylphthalate	ug/L	3 J	NC
4-chlorophenyl-phenylether	ug/L	3 J	NC
Fluorene	ug/L	17	NC
N-Nitrosodiphenylamine	ug/L	3 J	C
4-Bromophenyl-phenylether	ug/L	3 J	UNK
Phenanthrene	ug/L	17	UNK
Anthracene	ug/L	17	NC
Di-n-butylphthalate	ug/L	4 J	NC
Fluoranthene	ug/L	5 J	NC
Pyrene	ug/L	9 J	NC
Bis(2-ethylhexyl)phthalate	ug/L	49	C

Table 2 continued.

Groundwater
Semi-volatile and Volatile Organics, TPH, and Diesel Analysis Summary
Chevron Tank Farm, Bremerton, Washington

Analyte	Units	Sample Number	Carcinogen or Noncarcinogen[1]
Groundwater			
Volatile Organics		MW-4	
Benzene	ug/L	5660	C
Toluene	ug/L	2420	NC
Xylene (total)	ug/L	4390	NC
TPH (418.1)	mg/L	353	UNK
Free Product			
Diesel	Percent	90	UNK

1 From the Health Effects Assessment Summary Tables, Third Quarter - FY-1990. U.S. Environmental Protection Agency, Washington, D.C. July 1990, as updated.

ug/L Micrograms per liter (parts-per-billion [ppb]).

NC Compound is a noncarcinogen.

C Compound is a carcinogen.

UNK Unknown whether compound is a carcinogen or a noncarcinogen.

J Indicates the compound was detected but at a level below the quantification limit. The number preceding J indicates the approximate concentration of the compound.

mg/L Milligrams per liter (parts-per-million [ppm]).