

Potential Sources of Pesticides and Other Organic Compounds Within the Range of the Eastern North Pacific Southern Resident Killer Whales



The National Oceanic and Atmospheric Administration (NOAA) has determined that one of the primary potential risk factors for the Southern Residents is pollution in their habitat. To address this risk, NOAA gathered and analyzed marine sediment quality data from the Sediment Quality Information System (SEDQUAL) managed by the Washington State Department of Ecology and Marine Sediment Data for the Middle and Hylebos Waterways in Commencement Bay, Tacoma, Washington, and Harbor Island Site, Seattle, Washington, managed by the U.S. Environmental Protection Agency, Region

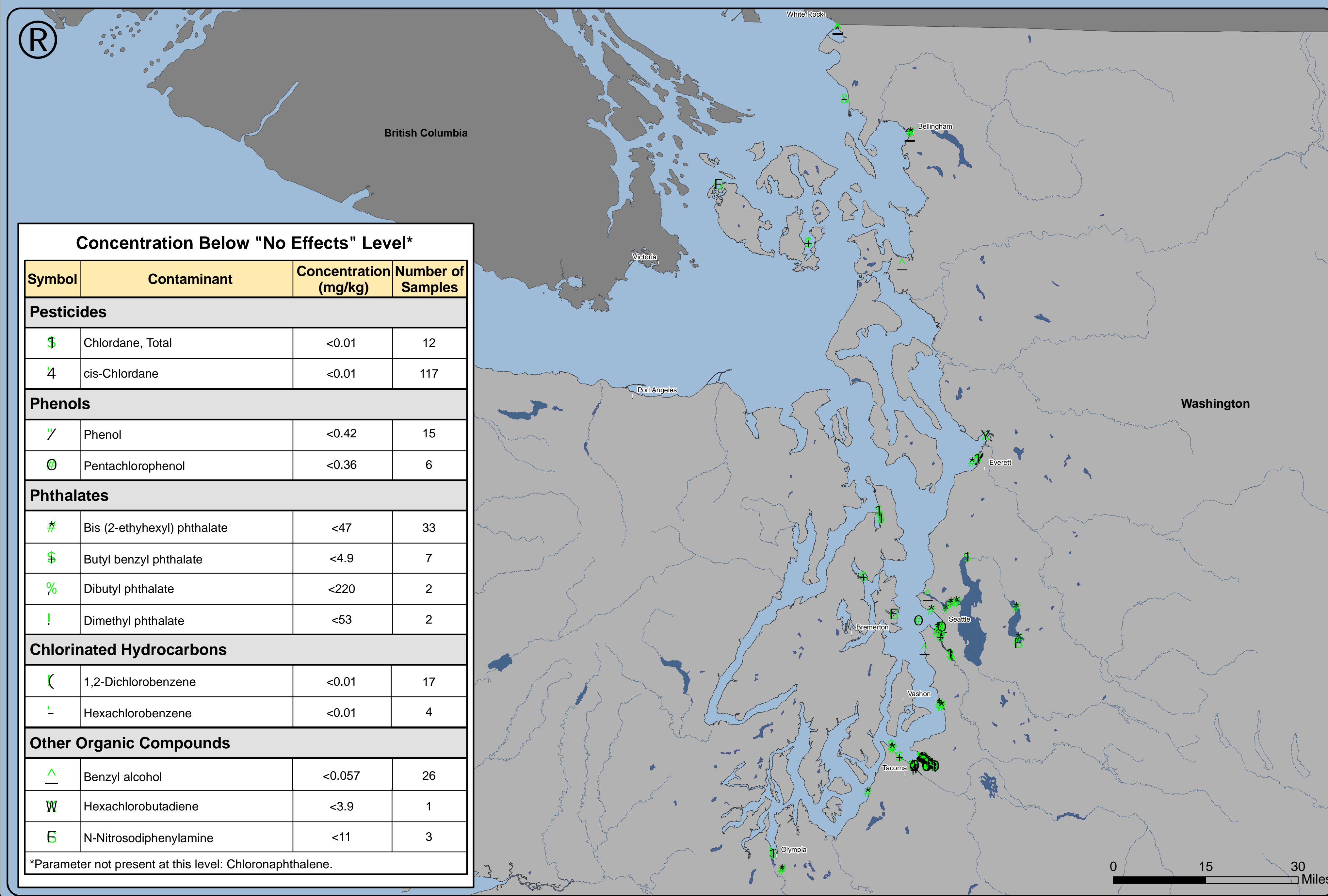
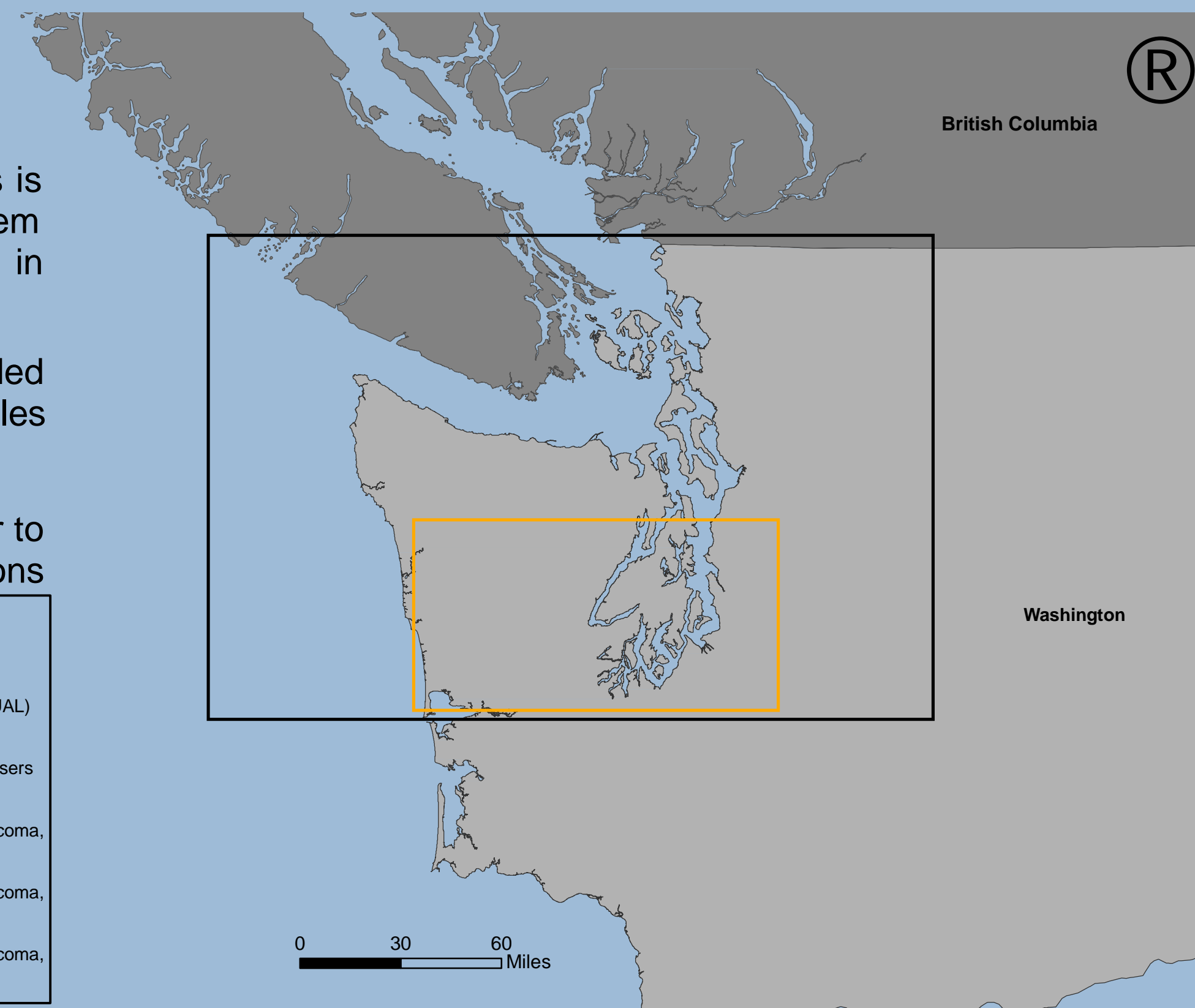
NOAA integrated the marine sediment quality data from these sources into a geodatabase. In some instances, the data from these datasets were excluded from subsequent analysis because no sampling location information was available (e.g., latitude and longitude), the data did not address sediment samples or contaminants of interest, or the data could not be integrated readily into the geodatabase.

NOAA then used the data in the geodatabase to identify locations where sediment samples have been analyzed for contaminants of interest. This information was analyzed further to identify locations where sediment sample analysis indicated that elevated levels of these contaminants were detected. When applicable, NOAA identified those sampling locations where these metals were detected at concentrations below and above the "No Effects" and the "Minor Adverse Effects" levels of the Washington State Sediment Quality Standards (WAC 173-204). In some instances, no sediment quality standard exists. When this occurred, NOAA either used the U.S. Army Corps of Engineers Puget Sound Dredged Material Evaluation and Disposal Procedures screening levels to identify locations of interest or simply identified locations where samples have been analyzed for a compound and that compound was detected or not detected.

The following pesticides and other organic compounds were included in this analysis: Pesticides (total chlordane, cis-chlordane); Chlorinated Hydrocarbons (hexachlorobenzene; 1,2-dichlorobenzene; and 2-chloronaphthalene); Phthalates (dimethyl phthalate, dibutyl phthalate, butyl benzyl phthalate, and bis(2-ethylhexyl)phthalate); Phenols (phenol and pentachlorophenol); and other organic compounds (benzyl alcohol, hexachlorobutadiene, and N-nitrosodiphenylamine).

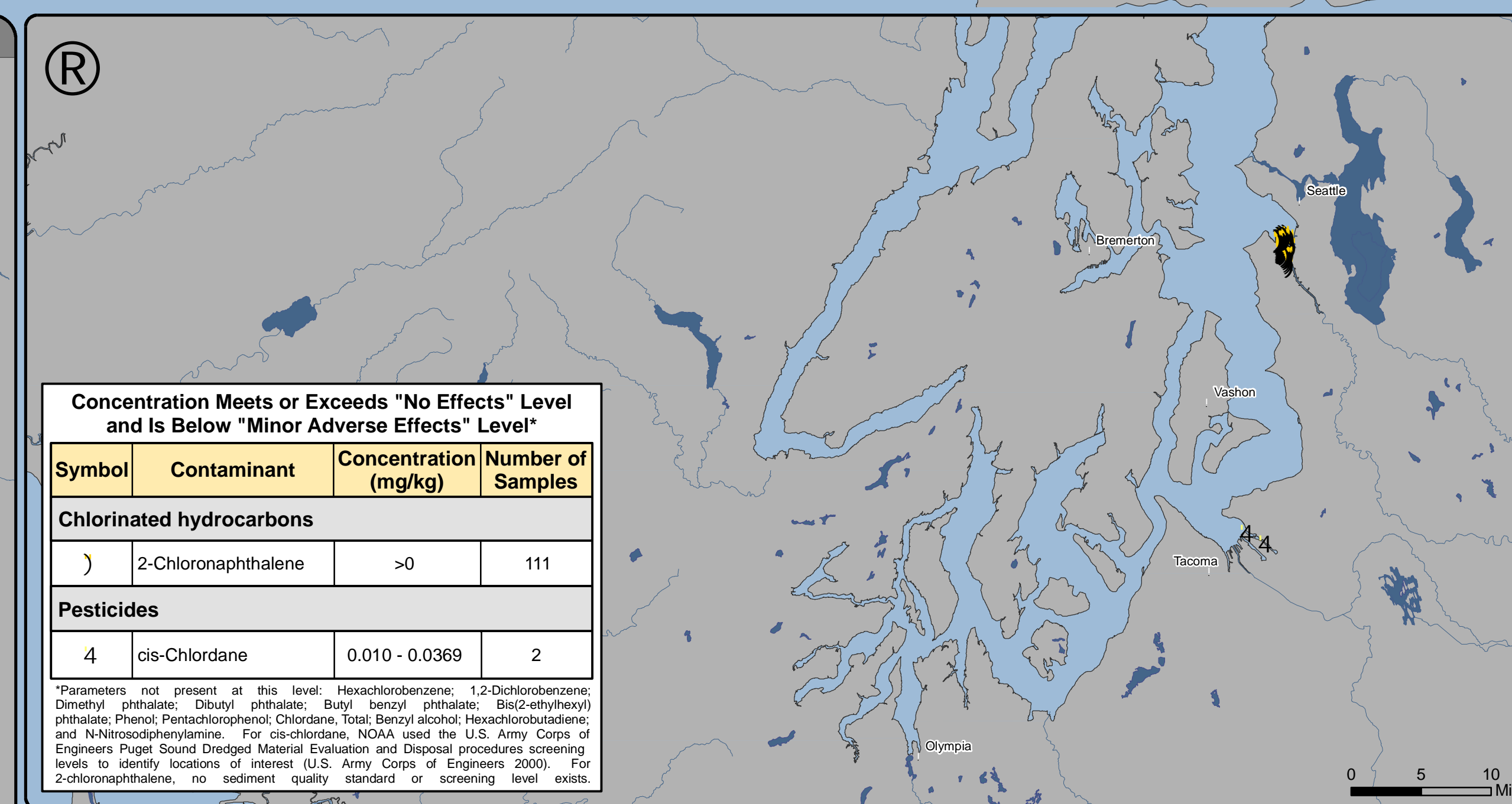
References:

- Washington Administrative Code (WAC). Chapter 173-204.
- Washington State Department of Ecology. Sediment Quality Information System (SEDQUAL) Release 5. October 2004.
- U.S. Army Corps of Engineers. Dredged Material Evaluation and Disposal Procedures (Users Manual). February 2000.
- U.S. Environmental Protection Agency. Marine Sediment Data: Commencement Bay, Tacoma, Washington: Harbor Island. <http://www.epa.gov/>. Accessed May 17, 2005.
- U.S. Environmental Protection Agency. Marine Sediment Data: Commencement Bay, Tacoma, Washington: Hylebos Waterway. <http://www.epa.gov/>. Accessed May 17, 2005.
- U.S. Environmental Protection Agency. Marine Sediment Data: Commencement Bay, Tacoma, Washington: Middle Waterway. <http://www.epa.gov/>. Accessed January 13, 2005.



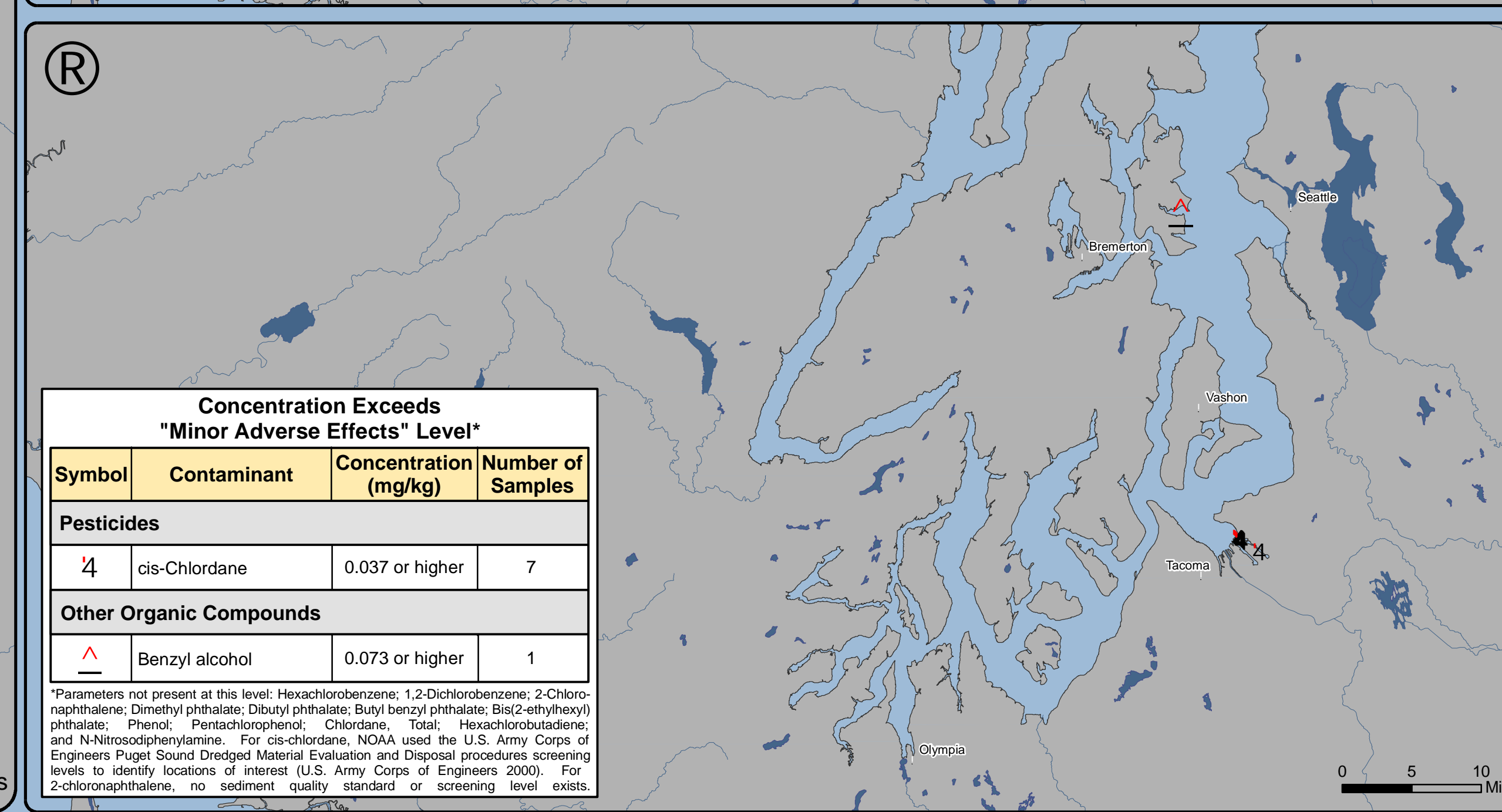
Concentration Below "No Effects" Level*			
Symbol	Contaminant	Concentration (mg/kg)	Number of Samples
Pesticides			
Ⓢ	Chlordane, Total	<0.01	12
4	cis-Chlordane	<0.01	117
Phenols			
∇	Phenol	<0.42	15
⊕	Pentachlorophenol	<0.36	6
Phthalates			
#	Bis (2-ethylhexyl) phthalate	<47	33
Ⓢ	Butyl benzyl phthalate	<4.9	7
%	Dibutyl phthalate	<220	2
!	Dimethyl phthalate	<53	2
Chlorinated Hydrocarbons			
(1,2-Dichlorobenzene	<0.01	17
-	Hexachlorobenzene	<0.01	4
Other Organic Compounds			
^	Benzyl alcohol	<0.057	26
W	Hexachlorobutadiene	<3.9	1
E	N-Nitrosodiphenylamine	<11	3

*Parameter not present at this level: Chloronaphthalene.



Concentration Meets or Exceeds "No Effects" Level and is Below "Minor Adverse Effects" Level*			
Symbol	Contaminant	Concentration (mg/kg)	Number of Samples
Chlorinated hydrocarbons			
)	2-Chloronaphthalene	>0	111
Pesticides			
4	cis-Chlordane	0.010 - 0.0369	2

*Parameters not present at this level: Hexachlorobenzene; 1,2-Dichlorobenzene; Dimethyl phthalate; Dibutyl phthalate; Butyl benzyl phthalate; Bis(2-ethylhexyl) phthalate; Phenol; Pentachlorophenol; Chlordane, Total; Benzyl alcohol; Hexachlorobutadiene; and N-Nitrosodiphenylamine. For cis-chlordane, NOAA used the U.S. Army Corps of Engineers Puget Sound Dredged Material Evaluation and Disposal procedures screening levels to identify locations of interest (U.S. Army Corps of Engineers 2000). For 2-chloronaphthalene, no sediment quality standard or screening level exists.



Concentration Exceeds "Minor Adverse Effects" Level*			
Symbol	Contaminant	Concentration (mg/kg)	Number of Samples
Pesticides			
4	cis-Chlordane	0.037 or higher	7
Other Organic Compounds			
^	Benzyl alcohol	0.073 or higher	1

*Parameters not present at this level: Hexachlorobenzene; 1,2-Dichlorobenzene; 2-Chloronaphthalene; Dimethyl phthalate; Dibutyl phthalate; Butyl benzyl phthalate; Bis(2-ethylhexyl) phthalate; Phenol; Pentachlorophenol; Chlordane, Total; Hexachlorobutadiene; and N-Nitrosodiphenylamine. For cis-chlordane, NOAA used the U.S. Army Corps of Engineers Puget Sound Dredged Material Evaluation and Disposal procedures screening levels to identify locations of interest (U.S. Army Corps of Engineers 2000). For 2-chloronaphthalene, no sediment quality standard or screening level exists.