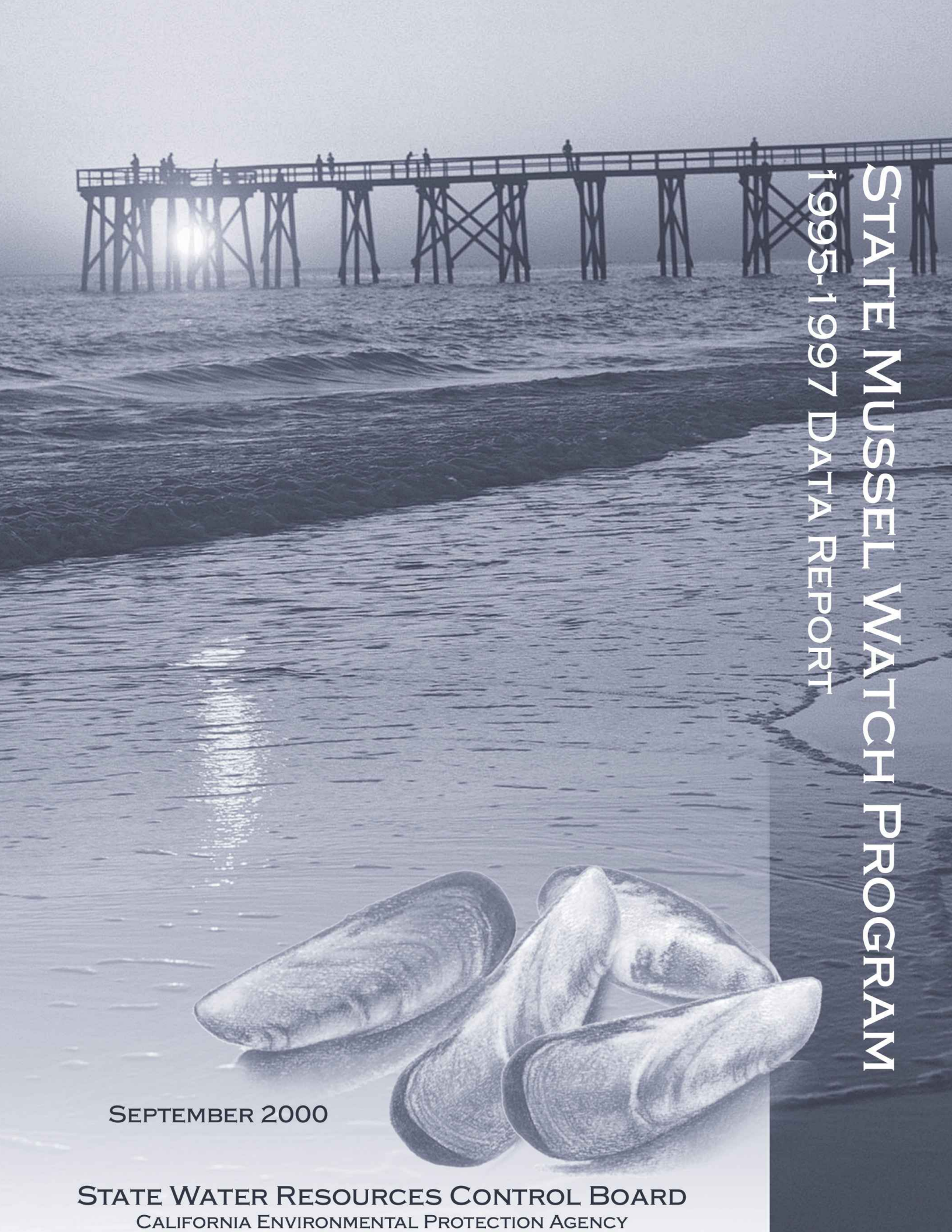
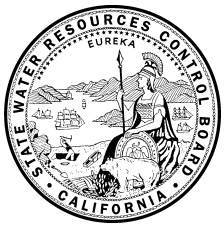


State Mussel Watch Program

1995-1997 Data Report

September 2000

State Water Resources Control Board
California Environmental Protection Agency



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STATE MUSSEL WATCH PROGRAM

1995-97

DATA REPORT

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California Environmental Protection Agency

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LIST OF ABBREVIATIONS

DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DDMS	Dichlorodiphenylmonochlorosaturatedethane
DDMU	Dichlorodiphenylmonochlorounsaturatedethane
DFG	Department of Fish and Game, California
EDL(s)	Elevated Data Level(s)
USFDA or FDA	United States Food and Drug Administration
HCH	Hexachlorocyclohexane
MIS(s)	Median International Standard(s)
MTRL(s)	Maximum Tissue Residue Level(s)
NAS	National Academy of Sciences
PAH(s)	Polynuclear Aromatic Hydrocarbon(s)
PCB(s)	Polychlorinated Biphenyl(s)
PCP	Pentachlorophenol
PCT	Polychlorinated Terphenyl
ppb	Parts Per Billion (ng/g)
ppm	Parts Per Million (µg/g)
RWQCB(s)	Regional Water Quality Control Board(s)
SMWP	State Mussel Watch Program
SWRCB	State Water Resources Control Board
TCP	Tetrachlorophenol
TBT	Tributyltin
USEPA	United States Environmental Protection Agency

1. STATE MUSSEL WATCH PROGRAM 1995 - 1997

Introduction

The California State Mussel Watch Program (SMWP), initiated in 1977 by the State Water Resources Control Board (SWRCB), was organized to provide a uniform statewide approach to the detection and evaluation of toxic substances in the waters of California's bays, harbors, and estuaries. This is accomplished through the analysis of resident and transplanted mussels and clams. The SMWP primarily targets areas with known or suspected impaired water quality and is not intended to give an overall water quality assessment. The SWRCB provides funding to the California Department of Fish and Game (DFG) under an ongoing interagency agreement for the collection and analysis of SMWP samples. Sampling stations are selected primarily by the six coastal Regional Water Quality Control Boards (RWQCBs), which are identified on the inside back cover.

The DFG reports sampling results to the SWRCB, which distributes the information to the coastal RWQCBs and to other federal, State, and local agencies through annual preliminary data reports. These preliminary data reports are also routinely transmitted to the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency, which has responsibility for issuing sport fish and shellfish consumption advisories if needed. This is the formal report presenting the results of the 1995-96 and 1996-97 sampling and analysis programs. Some 1994-95 data not previously reported are also included in this report.

Information collected in the SMWP is used by the SWRCB, RWQCBs, and other agencies to identify waters impacted by toxic pollutants. Through the SWRCB's statewide Water Quality Assessment, SMWP results are used to help classify water bodies from good to impaired water quality relative to each other. SMWP results are also used in the normal regulatory activities of the RWQCBs and other State agencies such as the Department of Pesticide Regulation.

Summary

Appendix A shows map locations for sampling stations included in this report. Appendix B contains station location information such as latitude and

longitude, county, and the region. A total of 51 samples (44 stations) were collected and analyzed in 1995-96, and 57 samples (54 stations) were collected and analyzed in 1996-97 (Appendix C). Six archive samples (5 stations) collected from San Francisco Bay in 1981 and 1982 were analyzed in 1996-97 (Appendix C). Also included in this report are PAH data from 16 samples (7 stations) collected in 1994-95 and not previously reported (Appendix C). These 16 samples from 1994-95 and 18 PAH samples from 1995-96 were analyzed under the SWRCB's Bay Protection and Toxic Cleanup Program (BPTCP). Samples analyzed under the BPTCP, from Regions 1 and 2, are identified in Appendix C. Sample analysis includes trace elements (metals), organic chemicals (pesticides and PCBs), and polynuclear aromatic hydrocarbons (PAHs).

Of the 130 samples included in this report 87 are California mussel (*Mytilus californianus*) samples, 67 transplanted and 20 resident mussel samples. Ten samples were resident bay mussels (*Mytilus edulis*) from Regions 1, 2, 4, and 9. Freshwater clams (*Corbicula fluminea*) were analyzed from four waterbodies (seven samples) from Region 2. One oyster sample (*Crassostrea gigas*) was analyzed from the Mad River Slough in Region 1. Three new sample types were analyzed under the BPTCP in Region 1. Five shore crab samples (*Pachygrapsus crassipes*) were collected from Arcata Bay and Humboldt Bay. Three Sand Worm samples (*Glycera spp.*) and one Abalone Jingle (*Pododesmus cepio*) were also collected from Humboldt Bay. In addition to tissue analysis, sixteen sediment samples were analyzed from Region 1 and 2. A complete station sampling history of the SMWP from 1978 to 1997 is provided in Appendix D.

Wet weight tissue results were compared to the following criteria: U.S. Food and Drug Administration (FDA) criteria, Maximum Tissue Residue Levels (MTRLs), Median International Standards (MISs), and Elevated Data Levels (EDLs). Data were not compared to the National Academy of Sciences (NAS) recommended guidelines for predator protection since freshwater clams were only analyzed for trace metals not included in the NAS guidelines for shellfish. A discussion of each criterion can be found in Section 3, Administrative and Comparative Criteria, on Page 6. The MTRL criterion was developed from water quality objectives from the 1997 *California Ocean Plan* (SWRCB 1997) and the from the California Toxic Rule (40 CFR Part 131, May 18, 2000) as established in the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SWRCB 2000).

Only one sample exceeded FDA criteria (Appendix E). Transplanted California mussels collected in 1997 from San Diego Bay/Harbor Island/East Basin/Storm Drain contained 6,741 ppb PCBs, which exceeded the FDA tolerance level of 2,000 ppb for PCBs. This station has periodically exceeded the FDA level for PCBs since 1982. The 1997 PCB concentration is by far the highest level found at this station at more than 1.5 times higher than the previous high of 3,792 ppb found in 1982. MTRL criteria for ocean waters were exceeded in 17 samples from 11 stations (Appendix F). MTRLs for enclosed bays and estuaries were exceeded in 59 samples from 45 stations (Appendix G) including all six archive samples from five stations in Region 2. The MIS for trace elements were exceeded in 59 samples from 51 stations (Appendix H). Samples exceeding EDLs for trace elements and organic chemicals can be found in Appendices I and E.

Tabular summaries of all chemistry data are provided in Appendices J through T. Summaries of all trace element data in tissue are provided in Appendix J (wet weight) and Appendix K (dry weight). Trace element data in sediment are contained in Appendix L (dry weight). Summaries of all organic chemical data in tissue are provided in Appendix M (wet weight), Appendix N (dry weight), and Appendix O (lipid weight). Organic chemical data in sediment are contained in Appendix P (dry weight). PAH data summaries in tissue can be found in Appendix Q (wet weight), Appendix R (dry weight), and Appendix S (lipid weight). PAH data in sediment are contained in Appendix T (dry weight).

2. FIELD AND LABORATORY OPERATIONS

The presence of many toxic substances in the State's waters is determined by analyzing tissues from aquatic organisms. Concentrations of these substances in water are often too low or transitory to be reliably detected through the more traditional methods of analysis of water samples. Also, many toxic substances are not water soluble, but can be found associated with sediment or organic matter. Aquatic organisms are sampled because they bioaccumulate and bioconcentrate toxic substances to levels which may be many hundreds of times the levels actually in the water. This concentration factor facilitates detection of toxic pollutants. Mussels are excellent subjects for this purpose because they (1) are sessile, (2) are long-lived, (3) can be successfully transplanted to and maintained in areas where they do not naturally occur, and (4) readily concentrate toxic pollutants from the water. The following is a general overall discussion of field and laboratory procedures. A detailed discussion is provided in Appendix U.

Substances Measured

Samples are regularly analyzed for up to 13 trace elements (Table U-1) and approximately 45 synthetic organic chemicals including pesticides and PCBs (Table U-4). Not every sample is analyzed for all trace elements or organic chemicals. Each sample at each station is handled individually. The RWQCBs will specify the type of analysis for each sample. The following are analyzed on a request basis only: arsenic, nickel, selenium, polynuclear aromatic hydrocarbons (PAHs), pentachlorophenol (PCP), and tetrachlorophenol (TCP), and tributyltin (TBT).

Sample Size and Collection

Forty-five mussels or clams are composited and analyzed for organic chemicals. Three analytical replicates of 15 individuals each of mussels or clams are analyzed for trace elements (trace element results reported herein are mean values). Concentrations in bivalves of certain trace elements and organic chemicals can be directly correlated with several variables such as size of the animal, location of habitation within the tidal zone, and season of collection (Stephenson et al. 1987). In the SMWP, mussels of 55 to 65 mm in length are collected whenever possible in order to reduce size-related effects. In an attempt to minimize variability introduced by location of

collection within the intertidal zone, mussels are collected from the highest point in the zone where adequate numbers occur.

Mussels are transplanted where a suitable resident population does not exist and where sampling can be accomplished using scuba equipment. One of the following three mussel transplant systems is used in the SMWP; 1) A bottom anchored submerged buoy system in an area of deep water and no structures; 2) A polypropylene line which may be tied between two pilings or a line hung beneath a dock in areas with structures (i.e. pilings, floating docks, etc.); 3) Samples may be placed on PVC or wooden stakes that are pounded into the substrate in areas of shallow water. A two month transplant period is adequate in most cases where pollutant uptake rates are expected to be high, but for trace elements in less contaminated environments a six month interval may be necessary for an adequate sample (Stephenson et al. 1980). A four to six month transplant interval is used for organic chemicals to be consistent with transplant periods for trace elements. Transplanted mussels (M. californianus) were collected from Trinidad Head and Bodega Head.

Dry, Wet, and Lipid Weight Measurements

Metal data are presented in parts per million (ppm) while organic chemical data are presented in parts per billion (ppb). Tissue concentrations of trace elements and organic chemicals are measured on a dry weight basis to reduce data variability due to moisture content. Wet and lipid weight basis data are back calculated from dry weight and lipid measurements. Wet weight basis data are used to compare to wet weight or fresh weight criteria listed in this report (see Section 3, Administrative and Comparative Criteria). In addition, organic chemicals are expressed on a lipid weight basis. Lipid weight measurements offer several advantages. Because chlorinated hydrocarbons are much more soluble in lipids (fat tissues) than in water, they partition into lipid-rich tissues of aquatic organisms (Stout and Beezhold 1981). Animals with higher proportions of lipid in their tissue usually have higher concentrations of chlorinated hydrocarbon pollutants (Phillips 1980). Factors such as season, water temperature, health of the organism, stress on the organism, and type of species can affect the lipid levels of samples collected for analysis and can, therefore, cause variability in results. Use of lipid weight basis measurements may reduce this source of variability, although disadvantages have also been noted (Phillips 1980). As a result, lipid weight based values may represent a more realistic measure of environmental availability of chlorinated hydrocarbons

than wet weight based values. Wet weight based measures, however, remain the preferred data for most readers because all criteria for human health and for predator protection are based on wet weight based measures. Also, wet weight based measures better reflect the exposure of predators or humans to the actual concentration in fresh mussels or clams.

3. ADMINISTRATIVE AND COMPARATIVE CRITERIA

In this report the term "criteria" is used to refer to the criteria against which a particular trace element or organic chemical is being compared. More than one criterion may apply to any one metal or organic compound. Human health-related criteria, FDA action levels, Maximum Tissue Residue Levels (MTRLs), and Median International Standards (MISs) are considered more important or critical. Following human health criteria are NAS guidelines for predator protection and Elevated Data Levels (EDLs). All five criteria are discussed below.

In interpreting the SMWP data by any of the criteria provided, it is important to note that there is no simple relationship between concentrations of toxic substances observed in tissue samples and actual concentrations in water. Different aquatic organisms tend to bioaccumulate a given toxic substance in water to different levels; however, these differences usually do not prevent a general interpretation of the data. It should also be noted that the limited number of samples obtained and analyzed at each station in a single year is generally too small to provide a statistically sound basis for making absolute statements on toxic substance concentrations. The values reported herein should be accepted as indicators of relative levels of toxic pollution in water, and not as absolute values. In this sense, trends over time and ranking values of a toxic substance provide only an indication of areas where mussels are evidently accumulating toxicants at concentrations which are above normal.

FDA Action Levels and NAS Guidelines

The FDA has established maximum concentration levels for some toxic substances in human foods (USFDA 1985). The levels are based on specific assumptions of the quantities of food consumed by humans and the frequency of their consumption. The FDA limits are intended to protect humans from the chronic effects of toxic substances consumed in foodstuffs. The National Academy of Sciences (NAS) has established recommended maximum concentrations of toxic substances in animals (NAS 1973). They were established not only to protect the organisms containing the toxic compounds, but also to protect the species that consume these contaminated organisms. The NAS has set guidelines for marine fish but not for marine shellfish. Only two guidelines apply to freshwater clams. The FDA limits and NAS guidelines are shown in Table 1.

Maximum Tissue Residue Levels (MTRLs)

The MTRLs were developed by SWRCB staff from human health water quality objectives in the 1997 *California Ocean Plan* (SWRCB 1997) and from the California Toxic Rule (40 CFR Part 131, May 18, 2000) as established in the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SWRCB 2000). The objectives represent levels that protect human health from consumption of fish, shellfish, and water (freshwater only) that contain substances at levels which could result in significant human health problems. The MTRLs are used as alert levels or guidelines indicating water bodies with potential human health concerns and are an assessment tool and not compliance or enforcement criteria. Tables 2 and 3 list MTRLs for those substances monitored in ocean waters and enclosed bays and estuaries. The MTRLs for a number of substances listed as carcinogens in the MTRL tables are below the current tissue detection limit for those substances. Detection limits can be found in Tables U-1, U-4, and U-13 in Appendix U.

The MTRLs were calculated by multiplying the human health water quality objectives by the bioconcentration factor (BCF) for each substance as recommended in the USEPA Draft Assessment and Control of Bioconcentratable Contaminants in Surface Waters (USEPA 1991). BCFs were taken from the USEPA 1980 Ambient Water Quality Criteria Documents for the priority pollutants. MTRLs were not calculated for objectives that are based on drinking water Maximum Contaminant levels (MCLs) or taste and odor criteria.

Median International Standards (MISs) for Trace Elements

The MIS is an in-house criterion developed from a United Nations Food and Agriculture Organization publication of a survey of health protection criteria used by member nations (Nauen 1983). A description of how the MISs were compiled by SWRCB staff is provided in Appendix V. These criteria vary somewhat in the tissues to be analyzed or the level of protection desired but may be compared qualitatively. Table 4 summarizes these standards as an indication of what other countries have determined to be unsafe levels of trace elements. Though the standards do not apply within the United States, they provide an indication of what other nations consider to be an elevated concentration of trace elements in shellfish.

Elevated Data Levels

The "elevated data level" (EDL) was introduced by SWRCB staff in 1983 as an internal comparative measure which ranks a given concentration of a particular substance with previous SMWP data. The EDL is calculated by ranking all of the results for a species and exposure condition (resident or transplant) and a given chemical from the highest concentration measured down to and including those records where the chemical was not detected. From this, a cumulative distribution is constructed and percentile rankings are calculated. For example, the 50th percentile corresponds to the median or "middle" value rather than to the mean. With a large number of records, the median can be approximately compared to the mean.

The 85th percentile (EDL 85) was chosen as an indication that a chemical is markedly elevated from the median. The 85th percentile corresponds to measures used by the U.S. Fish and Wildlife Service in its National Contaminant Biomonitoring Program and would represent approximately one and one-half standard deviations from the mean, if the data were normally distributed. The 95th percentile (EDL 95) was chosen to indicate values that are highly elevated above the median. The 95th percentile would represent two standard deviations from the mean, if the data were normally distributed. When used along with other information, these measures provide a useful guideline to determine if a chemical has been found in unusually high concentrations. A more detailed description of EDL rankings is provided in Appendix W. It should be noted that EDLs are not directly related to potentially adverse human or animal health effects; they are only a way to compare findings in a particular area with the larger data base of findings from all over the state. The 1977-97 EDLs and the number of data points used to calculate each EDL are provided in Tables 5 through 12.

TABLE 1

NAS Guidelines and FDA Action Levels for Toxic Chemicals in Shellfish (wet weight)

Chemical	NAS[a] Recommended Guideline for Freshwater Shellfish µg/g (ppm)	ng/g (ppb)	FDA[b] Action Level for Freshwater and Marine Shellfish µg/g (ppm)	ng/g (ppb)
Mercury	-	-	1.0[c]	1,000
DDT (total)	1.0	1,000	-	-
PCB (total)	0.5	500	2.0[d]	2,000
Aldrin	-	-	0.3	300
Dieldrin	-	-	0.3	300
Endrin	-	-	0.3	300
Heptachlor	-	-	0.3	300
Heptachlor epoxide	-	-	0.3	300

a National Academy of Sciences-National Academy of Engineering. 1973. Water Quality Criteria, 1972 (Blue Book). U.S. Environmental Protection Agency, Ecological Research Series.

b U. S. Food and Drug Administration. 1984. Shellfish Sanitation Interpretation: Action Levels for Chemical and Poisonous Substances, June 21, 1984. U.S.F.D.A., Shellfish Sanitation Branch, Washington, D.C.

c As methyl mercury.

d A tolerance, rather than an action level, has been established for PCBs (21CFR 109, published May 29, 1984). An action level is revoked when a regulation establishes a tolerance for the same substance and use.

TABLE 2

Maximum Tissue Residue Levels (MTRLs) in Ocean Waters

Carcinogens [a]

Chemical	Water Quality Objective [b] (µg/l)	BCF [c] (l/kg)	MTRL [d] (µg/kg) (ppb, wet weight)
Aldrin	0.000022	**e**	0.1
Chlordane (total)	0.000023	14100	0.32
DDT (total)	0.00017	53600	9.1
Dieldrin	0.00004	4670	0.2
Heptachlor	0.00072	11200	8.1
Hexachlorobenzene (HCB)	0.00021	8690	2.0
PAHs (total)	0.0088	30	0.26
PCBs (total)	0.000019	31200	0.6
Toxaphene	0.00021	13100	2.75

a. The SMWP does not analyze for any of the non-carcinogens listed in the human health section of Table B of the 1997 Ocean Plan.
b. From Table B, Objectives for Human Health, "*California Ocean Plan*" (SWRCB 1997).
c. Bioconcentration Factors taken from the USEPA 1980 Ambient Water Quality Criteria Documents for each substance.
d. MTRLs were calculated by multiplying the Water Quality Objective by the BCF, except for aldrin.
e. Aldrin MTRL is derived from a combination of aldrin and dieldrin risk factors and BCFs as recommended in the USEPA 1980 "*Ambient Water Quality Criteria for Aldrin/Dieldrin*" (USEPA 1980).

TABLE 3

Maximum Tissue Residue Levels (MTRLs) in Enclosed Bays and Estuaries

Carcinogens

Chemical	Water Quality Objective [a] (µg/l)	BCF [b] (l/kg)	MTRL [c] (µg/kg) (ppb, wet weight)
Aldrin	0.00014	**d**	0.33
Chlordane (total)	0.00059	14100	8.3
p,p′ DDT	0.00059	53600	32.0
p,p′ DDE	0.00059	53600	32.0
p,p′ DDD	0.00084	53600	45.0
Dieldrin	0.00014	4670	0.7
Heptachlor	0.00021	11200	2.3
Heptachlor epoxide	0.00011	11200	1.2
Hexachlorobenzene (HCB)	0.00077	8690	6.7
Hexachlorocyclohexane (HCH), alpha	0.0013	130	1.7
Hexachlorocyclohexane (HCH), beta	0.046	130	6.0
Hexachlorocyclohexane (HCH), gamma	0.063	130	8.2
PCBs (total)	0.00017	31200	5.3
Pentachlorophenol (PCP)	8.2	11	90.0
Toxaphene	0.00075	13100	9.8

Non-carcinogens

Chemical	Water Quality Objective [a] (mg/l)	BCF [b] (l/kg)	MTRL [c] (mg/kg) (ppm, wet weight)
endosulfan I	0.240	270	64.8 (64,800 ppb)
endosulfan II	0.240	270	64.8 (64,800 ppb)
endosulfan sulfate	0.240	270	64.8 (64,800 ppb)
Endrin	0.00081	3970	3.2 (3,200 ppb)
Mercury	0.000051	7342 [e]	0.37
Nickel	4.6	47	220.0

a. From the California Toxic Rule (40 CFR Part 131, May 18, 2000) as established in the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SWRCB 2000).

b. Bioconcentration Factors taken from the USEPA 1980 Ambient Water Quality Criteria Documents for each substance.

c. MTRLs were calculated by multiplying the Water Quality Objective by the BCF, except for aldrin.

d. Aldrin MTRL is derived from a combination of aldrin and dieldrin risk factors and BCFs as recommended in the USEPA 1980 "*Ambient Water Quality Criteria for Aldrin/Dieldrin*" (USEPA 1980).

e. Weighted Average Practical BCF as calculated in the California Toxic Rule.

TABLE 4

Median International Standards for Trace Elements[a]
(edible portion, ppm, wet weight)

Element	Freshwater Fish	Shellfish	Range	Number of Countries with Standards
Arsenic	1.5	1.4	0.1 to 5.0	11
Cadmium	0.3	1.0	0.05 to 2.0	10
Chromium	1.0	1.0	1.0	1
Copper	20.0	20.0	10 to 100	8
Lead	2.0	2.0	0.5 to 10.0	19
Mercury	0.5	0.5	0.1 to 1.0	28
Selenium	2.0	0.3	0.3 to 2.0	3
Zinc	45.0	70.0	40 to 100	6

a. Based on: Nauen, C. E., Compilation of Legal Limits for Hazardous Substances in Fish and Fishery Products, Food and Agriculture Organization of the United Nations, 1983.

TABLE 5

State Mussel Watch Program
EDL 85 and EDL 95 for Trace Elements in
California Mussels *(Mytilus californianus)*
Calculated Using 1977 - 1997 Data
(ppm, wet weight)

Resident

Element	EDL 85	EDL 95	Number of Samples
Aluminum	80.23	130.00	605
Arsenic	3.74	4.94	137
Cadmium	1.50	2.03	605
Chromium	0.55	1.04	604
Copper	1.59	2.12	605
Lead	0.92	2.42	604
Manganese	2.11	2.90	605
Mercury	0.06	0.11	602
Nickel	0.63	0.82	281
Selenium	0.53	0.82	55
Silver	0.44	1.45	605
Titanium	5.71	9.95	167
Zinc	33.64	38.87	605

Transplanted

Element	EDL 85	EDL 95	Number of Samples
Aluminum	138.43	240.00	952
Arsenic	2.20	3.26	239
Cadmium	1.59	1.91	952
Chromium	0.73	1.70	951
Copper	5.30	11.93	952
Lead	1.57	2.79	964
Manganese	4.60	6.24	952
Mercury	0.06	0.08	942
Nickel	0.83	1.10	238
Selenium	0.59	0.85	159
Silver	0.09	0.19	952
Titanium	7.55	14.65	139
Zinc	55.78	77.84	952

TABLE 6

State Mussel Watch Program
EDL 85 and EDL 95 for Trace Elements in Bay Mussels *(Mytilus edulis)*
Calculated Using 1977 - 1997 Data
(ppm, wet weight)

Resident

Element	EDL 85	EDL 95	Number of Samples
Aluminum	170.00	220.00	95
Arsenic	IS	IS	8
Cadmium	0.99	1.24	95
Chromium	0.73	1.60	95
Copper	2.28	4.28	95
Lead	1.61	4.26	95
Manganese	5.11	6.98	95
Mercury	0.05	0.09	94
Nickel	0.78	1.06	24
Selenium	IS	IS	9
Silver	0.05	0.16	95
Titanium	IS	IS	1
Zinc	42.92	52.60	95

IS = Insufficient number of samples to calculate an EDL.

TABLE 7

State Mussel Watch Program
EDL 85 and EDL 95 for Trace Elements in
Freshwater Clams *(Corbicula fluminea)*
Calculated Using 1977 - 1997 Data
(ppm, wet weight)

Resident

Element	EDL 85	EDL 95	Number of Samples
Aluminum	56.29	78.17	18
Arsenic	IS	IS	4
Cadmium	1.26	1.74	18
Chromium	0.99	1.51	18
Copper	8.61	10.68	18
Lead	0.12	0.21	18
Manganese	6.68	9.35	18
Mercury	0.04	0.04	18
Nickel	IS	IS	2
Selenium	IS	IS	7
Silver	0.03	0.04	18
Titanium	IS	IS	1
Zinc	17.05	18.17	18

Transplanted

Element	EDL 85	EDL 95	Number of Samples
Aluminum	206.33	446.00	84
Arsenic	0.90	0.93	28
Cadmium	0.92	1.26	84
Chromium	2.00	3.07	84
Copper	8.78	15.00	84
Lead	0.21	0.39	84
Manganese	9.55	16.90	84
Mercury	0.04	0.10	88
Nickel	1.00	1.40	20
Selenium	0.43	0.46	28
Silver	0.03	0.04	84
Titanium	IS	IS	5
Zinc	19.39	25.12	84

IS = Insufficient number of samples to calculate an EDL.

TABLE 8

State Mussel Watch Program
EDL 85 and EDL 95 for Organic Chemicals in
Resident California Mussels *(Mytilus californianus)*
Calculated Using 1977 - 1997 Data
(ppb, wet weight)

Chemical	EDL 85	EDL 95	Number of Samples
Aldrin	ND	ND	184
Chlordene, alpha	ND	ND	155
Chlordene, gamma	ND	ND	154
cis-Chlordane	1.5	3.0	184
cis-Nonachlor	0.3	0.7	160
Oxychlordane	0.2	0.3	184
trans-Chlordane	1.3	2.2	184
trans-Nonachlor	1.3	2.3	184
Total Chlordane	4.4	7.2	194
Chlorbenside	ND	0.5	130
Chlordene	ND	ND	64
Chlorpyrifos	ND	ND	183
Dacthal	ND	0.4	183
DDD, o,p'	1.2	2.2	306
DDD, p,p'	3.3	7.5	306
DDE, o,p'	5.8	12.4	187
DDE, p,p'	31.4	105.5	306
DDT, o,p'	0.4	1.1	306
DDT, p,p'	1.8	3.3	306
DDMS, p,p'	ND	2.4	153
DDMU, p,p'	4.6	9.0	187
Total DDT	48.8	129.0	316
Diazinon	ND	ND	157
Dichlorobenzophenone, p,p'	ND	ND	99
Dicofol	ND	ND	61
Dieldrin	1.6	2.5	183
Endosulfan I	0.3	1.2	184
Endosulfan II	ND	ND	88
Endosulfan Sulfate	ND	ND	82
Total Endosulfan	0.3	1.3	194
Endrin	ND	ND	184
Ethion	ND	ND	99
HCH, alpha	1.2	1.7	184
HCH, beta	ND	1.1	183
HCH, delta	ND	ND	183
HCH, gamma	0.2	0.3	183
Heptachlor	ND	ND	184
Heptachlor Epoxide	ND	ND	183
Hexachlorobenzene	ND	0.03	184
Methoxychlor	ND	ND	183
Oxadiazon	ND	ND	74
Parathion, ethyl	ND	ND	156
Parathion, methyl	ND	ND	156
Phenol	0.3	0.4	14
Pentachlorophenol	1.2	2.7	14
PCB 1248	ND	ND	410
PCB 1254	14.7	33.3	410
PCB 1260	ND	ND	410
Total PCB	15.1	35.2	410
PCT 5460	ND	ND	69
Ronel	ND	ND	69
Tetrachlorophenol	1.1	3.0	14
Tetradifon	ND	ND	156
Toxaphene	ND	ND	184
Tributyltin	ND	ND	23

ND = EDL lies below the detection limit.

TABLE 9

State Mussel Watch Program
EDL 85 and EDL 95 for Organic Chemicals in
Transplanted California Mussels *(Mytilus californianus)*
Calculated Using 1977 - 1997 Data
(ppb, wet weight)

Chemical	EDL 85	EDL 95	Number of Samples
Aldrin	ND	ND	584
Chlordene, alpha	0.4	1.0	530
Chlordene, gamma	0.2	0.4	530
cis-Chlordane	6.9	13.0	587
cis-Nonachlor	2.1	3.7	537
Oxychlordane	0.4	0.8	587
trans-Chlordane	5.6	9.5	587
trans-Nonachlor	4.9	9.4	587
Total Chlordane	20.0	34.5	596
Chlorbenside	ND	1.7	437
Chlordene	ND	ND	240
Chlorpyrifos	0.6	1.5	582
Dacthal	0.6	6.2	563
DDD, o,p'	5.7	12.4	608
DDD, p,p'	22.7	65.3	608
DDE, o,p'	5.9	10.2	608
DDE, p,p'	94.7	170.1	608
DDT, o,p'	2.1	8.6	608
DDT, p,p'	7.6	33.8	608
DDMS, p,p'	3.4	6.2	533
DDMU, p,p'	6.4	10.2	608
Total DDT	145.1	308.5	617
Diazinon	ND	ND	482
Dichlorobenzophenone, p,p'	ND	ND	323
Dicofol	ND	ND	215
Dieldrin	5.7	18.2	564
Endosulfan I	1.0	20.0	568
Endosulfan II	ND	13.4	314
Endosulfan Sulfate	1.3	26.6	297
Total Endosulfan	1.3	40.9	577
Endrin	ND	1.4	561
Ethion	ND	ND	323
HCH, alpha	0.6	1.0	579
HCH, beta	ND	ND	563
HCH, delta	ND	ND	562
HCH, gamma	0.4	0.6	562
Heptachlor	ND	ND	579
Heptachlor Epoxide	0.1	0.4	579
Hexachlorobenzene	ND	0.1	579
Methoxychlor	ND	ND	564
Oxadiazon	1.2	2.7	225
Parathion, ethyl	ND	ND	461
Parathion, methyl	ND	ND	461
Phenol	0.5	0.9	37
Pentachlorophenol	22.6	34.0	90
PCB 1248	ND	28.2	748
PCB 1254	161.9	368.4	748
PCB 1260	ND	2.1	748
Total PCB	171.3	420.0	748
PCT 5460	ND	ND	189
Ronel	ND	0.3	134
Tetradifon	ND	ND	467
Toxaphene	ND	83.2	587
Tributyltin	1474.5	2639.3	150
Tetrachlorophenol	2.0	5.4	90

ND = EDL lies below the detection limit.

TABLE 10

State Mussel Watch Program
EDL 85 and EDL 95 for Organic Chemicals in
Resident Bay Mussels *(Mytilus edulis)*
Calculated Using 1977 - 1997 Data
(ppb, wet weight)

Chemical	EDL 85	EDL 95	Number of Samples
Aldrin	ND	0.3	69
Chlordene, alpha	0.4	1.1	48
Chlordene, gamma	0.4	1.2	48
cis-Chlordane	11.8	17.6	70
cis-Nonachlor	2.5	4.1	59
Oxychlordane	0.5	0.8	70
trans-Chlordane	12.3	17.0	70
trans-Nonachlor	10.6	15.9	70
Total Chlordane	37.7	55.9	70
Chlorbenside	ND	5.8	55
Chlordene	ND	ND	27
Chlorpyrifos	ND	0.9	70
Dacthal	7.4	20.2	68
DDD, o,p'	11.7	21.8	89
DDD, p,p'	44.2	79.5	89
DDE, o,p'	7.4	14.8	82
DDE, p,p'	167.0	295.7	89
DDT, o,p'	7.0	22.6	89
DDT, p,p'	31.8	96.0	89
DDMS, p,p'	3.1	5.3	74
DDMU, p,p'	7.0	11.2	82
Total DDT	263.6	487.6	89
Diazinon	ND	ND	59
Dichlorobenzophenone, p,p'	ND	ND	22
Dicofol	ND	ND	11
Dieldrin	10.5	21.8	67
Endosulfan I	89.8	124.5	70
Endosulfan II	48.2	73.3	33
Endosulfan Sulfate	46.8	68.2	30
Total Endosulfan	102.5	230.6	70
Endrin	2.2	4.0	67
Ethion	ND	ND	22
HCH, alpha	0.4	0.5	69
HCH, beta	ND	0.3	68
HCH, delta	ND	ND	68
HCH, gamma	0.3	0.4	68
Heptachlor	0.1	0.6	69
Heptachlor Epoxide	0.2	0.5	69
Hexachlorobenzene	0.1	0.2	69
Methoxychlor	ND	ND	68
Oxadiazon	0.5	1.5	17
Parathion, ethyl	ND	ND	59
Parathion, methyl	ND	ND	59
Phenol	IS	IS	0
Pentachlorophenol	IS	IS	1
PCB 1248	ND	13.6	94
PCB 1254	127.0	188.8	94
PCB 1260	ND	ND	94
Total PCB	128.7	188.8	94
PCT 5460	ND	ND	13
Ronel	ND	0.6	34
Tetrachlorophenol	IS	IS	1
Tetradifon	ND	ND	58
Toxaphene	82.1	226.7	72
Tributyltin	IS	IS	5

ND = EDL lies below the detection limit.
IS = Insufficient number of samples to calculate an EDL.

TABLE 11

State Mussel Watch Program
EDL 85 and EDL 95 for Organic Chemicals in
Resident Freshwater Clams *(Corbicula fluminea)*
Calculated Using 1977 - 1997 Data
(ppb, wet weight)

Chemical	EDL 85	EDL 95	Number of Samples
Aldrin	ND	ND	17
Chlordene, alpha	ND	ND	17
Chlordene, gamma	ND	ND	17
cis-Chlordane	1.6	3.2	17
cis-Nonachlor	ND	0.4	17
Oxychlordane	ND	ND	17
trans-Chlordane	1.3	2.8	17
trans-Nonachlor	0.8	3.6	17
Total Chlordane	4.3	9.4	17
Chlorbenside	ND	ND	16
Chlordene	ND	ND	11
Chlorpyrifos	ND	ND	17
Dacthal	1.9	3.3	17
DDD, o,p'	1.7	13.4	17
DDD, p,p'	7.5	51.7	17
DDE, o,p'	0.7	6.4	17
DDE, p,p'	14.2	110.5	17
DDT, o,p'	ND	4.8	17
DDT, p,p'	4.2	39.8	17
DDMS, p,p'	ND	ND	17
DDMU, p,p'	1.1	6.0	17
Total DDT	26.6	250.4	17
Diazinon	ND	ND	16
Dichlorobenzophenone, p,p'	IS	IS	9
Dicofol	IS	IS	8
Dieldrin	1.2	1.5	17
Endosulfan I	ND	6.0	17
Endosulfan II	ND	ND	15
Endosulfan Sulfate	ND	ND	15
Total Endosulfan	0.5	14.1	17
Endrin	ND	ND	17
Ethion	IS	IS	9
HCH, alpha	0.3	0.5	17
HCH, beta	ND	ND	17
HCH, delta	ND	ND	17
HCH, gamma	ND	0.4	17
Heptachlor	ND	ND	17
Heptachlor Epoxide	ND	ND	17
Hexachlorobenzene	0.2	0.3	17
Methoxychlor	ND	ND	17
Oxadiazon	IS	IS	1
Parathion, ethyl	ND	ND	16
Parathion, methyl	ND	ND	16
Phenol	IS	IS	0
Pentachlorophenol	IS	IS	0
PCB 1248	ND	ND	19
PCB 1254	13.7	63.3	19
PCB 1260	ND	ND	19
Total PCB	13.7	63.3	19
PCT 5460	IS	IS	3
Ronel	IS	IS	4
Tetrachlorophenol	IS	IS	0
Tetradifon	ND	ND	16
Toxaphene	ND	ND	17
Tributyltin	IS	IS	0

ND = EDL lies below the detection limit.
IS = Insufficient number of samples to calculate an EDL.

TABLE 12

State Mussel Watch Program
EDL 85 and EDL 95 for Organic Chemicals in
Transplanted Freshwater Clams *(Corbicula fluminea)*
Calculated Using 1977 - 1997 Data
(ppb, wet weight)

Chemical	EDL 85	EDL 95	Number of Samples
Aldrin	0.7	1.5	111
Chlordene, alpha	1.5	2.8	111
Chlordene, gamma	1.1	3.1	111
cis-Chlordane	13.0	26.7	111
cis-Nonachlor	2.8	12.2	111
Oxychlordane	0.7	1.7	111
trans-Chlordane	9.5	18.4	111
trans-Nonachlor	9.2	18.5	111
Total Chlordane	35.1	79.0	111
Chlorbenside	ND	ND	80
Chlordene	ND	ND	49
Chlorpyrifos	4IS	72.0	111
Dacthal	137.5	378.0	111
DDD, o,p'	46.0	120.6	111
DDD, p,p'	165.0	396.4	111
DDE, o,p'	9.2	20.8	111
DDE, p,p'	376.9	1019.8	111
DDT, o,p'	41.9	126.2	111
DDT, p,p'	217.4	665.1	111
DDMS, p,p'	ND	7.8	111
DDMU, p,p'	15.1	34.4	111
Total DDT	911.0	2493.7	111
Diazinon	ND	23.2	80
Dichlorobenzophenone, p,p'	ND	4.6	67
Dicofol	40.1	107.4	37
Dieldrin	110.4	196.9	111
Endosulfan I	22.7	190.5	111
Endosulfan II	24.9	111.4	94
Endosulfan Sulfate	37.8	88.3	94
Total Endosulfan	74.6	294.4	111
Endrin	17.0	29.3	111
Ethion	ND	ND	66
HCH, alpha	0.1	0.4	111
HCH, beta	ND	ND	107
HCH, delta	ND	ND	107
HCH, gamma	0.6	0.9	107
Heptachlor	ND	0.3	111
Heptachlor Epoxide	0.6	2.6	111
Hexachlorobenzene	1.3	2.9	111
Methoxychlor	ND	ND	107
Oxadiazon	26.2	61.6	44
Parathion, ethyl	ND	ND	76
Parathion, methyl	ND	ND	76
Phenol	IS	IS	3
Pentachlorophenol	IS	IS	0
PCB 1248	4.1	13.4	111
PCB 1254	59.8	151.6	111
PCB 1260	ND	9.4	111
Total PCB	78.0	151.6	111
PCT 5460	ND	ND	41
Ronel	ND	ND	11
Tetrachlorophenol	IS	IS	0
Tetradifon	ND	ND	77
Toxaphene	603.2	2374.4	111
Tributyltin	IS	IS	0

ND = EDL lies below the detection limit.
IS = Insufficient number of samples to calculate an EDL.

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APPENDIX B

1995-97 Sampling Stations - Latitude and Longitude

APPENDIX B

State Mussel Watch Program

1995-97 Sampling Stations - Latitude and Longitude

Station Number	Station Name	Region	County	Latitude (o ' ")	Longitude (o ' ")
1.0	Crescent City Harbor	1	Del Norte	41 44 55	124 10 57
2.0	Crescent City/STP Outfall	1	Del Norte	41 44 38	124 12 10
2.2	Crescent City Harbor/Inner Jetty	1	Del Norte	41 44 40	124 11 52
3.0	Crescent City/Control	1	Del Norte	41 45 03	124 12 51
100.0	Mad River Slough	1	Humboldt	40 51 56	124 08 53
101.4	Arcata Bay/Jolly Giant Slough	1	Humboldt	40 51 22	124 05 26
101.5	Humboldt Bay/Eureka SM.22	1	Humboldt	40 48 10	124 10 45
101.8	Humboldt Bay/Halberson Shoreline	1	Humboldt	40 48 34	124 09 10
102.6	Humboldt Bay/J Street	1	Humboldt	40 48 23	124 09 44
102.7	Humboldt Bay/H Street	1	Humboldt	40 48 23	124 09 52
102.8	Humboldt Bay/Davenport Mar. C St	1	Humboldt	40 48 21	124 10 13
103.3	Humboldt Bay/E Street	1	Humboldt	40 48 23	124 10 05
103.5	Humboldt Bay/Clark Slough	1	Humboldt	40 48 10	124 10 41
104.1	Humboldt Bay/Union Oil Plant	1	Humboldt	40 47 44	124 11 13
104.2	Humboldt Bay/Coal Oil Gas Plant	1	Humboldt	40 47 39	124 11 17
104.3	Humboldt Bay/Old Pac. Lumber	1	Humboldt	40 47 11	124 11 18
202.0	Bodega Head	1	Sonoma	38 18 39	123 04 07
203.0	Tomales Bay	2	Marin	38 08 56	123 54 09
203.1	Tomales Bay/Vincent Landing	2	Marin	38 13 06	122 56 51
203.3	Tomales Bay/Walker Creek Mouth 1	2	Marin	38 12 21	122 55 39
203.5	Tomales Bay/Walker Creek Mouth 2	2	Marin	38 12 30	122 55 51
203.7	Tomales Bay/Walker Creek Mouth 3	2	Marin	38 12 37	122 56 01
203.9	Tomales Bay/Nicks Cove	2	Marin	38 11 57	122 55 16
205.0	Bodega Harbor/Spud Point Marina	1	Sonoma	38 19 53	123 03 34
205.1	Bodega Bay/Porto Bodega	1	Sonoma	38 20 04	123 03 02
205.3	Bodega Bay/Mason's Marina	1	Sonoma	38 19 56	123 03 30
205.5	Bodega Bay/Back Marsh	1	Sonoma	38 19 21	123 02 26
210.1	Walker Creek/Mine Creek	2	Marin	38 10 56	122 47 09
210.3	Walker Creek/mid stream	2	Marin	38 10 45	122 47 35
211.1	Lagunitas Creek/Bridge 1	2	Marin	38 03 23	122 48 49
211.3	Lagunitas Creek/Bridge 2	2	Marin	38 02 45	122 48 20
280.0	Russian River/S Goat Rock	1	Sonoma	38 26 58	123 07 30
299.1	Selby Slag 4	2	Contra Costa	38 03 25	122 14 52
302.6	Paradise Cove	2	Marin	37 53 58	122 27 52
306.1	Gashouse Cove/Laguna Street	2	San Francisco	37 48 23	122 25 57
306.2	Sansome Street/Pier 31	2	San Francisco	37 48 23	122 24 10
306.3	Howard Street/Pier 14	2	San Francisco	37 47 35	122 23 26
306.4	Central Basin/Outer	2	San Francisco	37 45 47	122 23 05
307.0	San Francisco Bay/Treasure Is	2	San Francisco	37 48 53	122 20 20
308.0	San Francisco Bay/Hunter's Point	2	San Francisco	37 41 42	122 20 27
309.0	San Mateo Bridge/8B	2	San Mateo	37 36 21	122 17 20
311.4	North South Bay	2	Alameda	37 34 16	122 08 59
313.0	San Francisco Bay/near Redwood Cr	2	San Mateo	37 33 09	122 11 45
321.0	Dumbarton Bridge/Channel Marker 14	2	San Mateo	37 30 50	122 07 58
329.0	Guadalupe Creek/Almaden Expressway	2	Santa Clara	37 16 31	121 52 33
329.2	Guadalupe Creek/Hicks Road	2	Santa Clara	37 13 22	121 54 16
329.4	Alamitos Creek/Almaden Road	2	Santa Clara	37 10 44	121 48 57
400.6	Santa Cruz/Natural Bridges	3	Santa Cruz	37 55 02	122 03 50

APPENDIX B

State Mussel Watch Program

1995-97 Sampling Stations - Latitude and Longitude

Station Number	Station Name	Region	County	Latitude (o ' ")	Longitude (o ' ")
400.7	Santa Cruz Harbor/Inner	3	Santa Cruz	36 58 15	122 00 03
401.0	Santa Cruz Harbor	3	Santa Cruz	36 57 52	122 00 03
403.0	Elkhorn Slough/Highway 1 Bridge	3	Monterey	36 48 35	121 47 00
404.0	Sandholdt Bridge	3	Monterey	36 48 01	121 47 12
414.0	Pacific Grove	3	Monterey	36 38 18	121 55 46
420.3	Monterey Harbor/C G Jetty/Inner	3	Monterey	36 36 30	121 53 31
420.4	Monterey Harbor/C G Jetty/Inner 2	3	Monterey	36 36 30	121 53 28
420.5	Monterey Harbor/C G Jetty/Inner 3	3	Monterey	36 36 28	121 53 25
421.0	Monterey Harbor/Slag Pile	3	Monterey	36 36 23	121 53 24
601.0	LA Harbor/National Steel	4	Los Angeles	33 45 41	118 15 07
605.0	LA Harbor/Cabrillo Pier	4	Los Angeles	33 42 29	118 16 31
616.0	LA Harbor/Consolidated Slip	4	Los Angeles	33 46 36	118 14 30
618.0	LA Harbor/Angels Gate	4	Los Angeles	33 42 30	118 15 00
648.0	Malibu	4	Los Angeles	34 01 48	118 40 48
650.0	Santa Monica	4	Los Angeles	34 00 48	118 30 18
662.0	Royal Palms	4	Los Angeles	33 43 00	118 19 15
664.0	Cabrillo Beach	4	Los Angeles	33 42 22	118 17 11
708.0	Anaheim Bay/Navy Marsh	8	Orange	33 43 21	118 04 46
713.0	Huntington Harbour/Edinger Street	8	Orange	33 44 00	118 04 12
715.0	Huntington Harbour/Warner Ave Brdg	8	Orange	33 42 40	118 03 35
723.4	Newport Bay/Turning Basin	8	Orange	33 37 13	117 55 38
724.0	Newport Bay/Highway 1 Bridge	8	Orange	33 36 57	117 54 19
725.0	Newport Bay/Crows Nest	8	Orange	33 36 43	117 55 38
726.4	Newport Bay/Rhine Channel/End	8	Orange	33 36 54	117 55 33
726.6	Newport Bay/Mariners Drive	8	Orange	33 38 56	117 53 24
740.0	Dana Point Harbor/Boat Yard	9	Orange	33 27 17	117 41 30
742.0	San Juan Creek	9	San Diego	33 27 46	117 42 14
750.0	Oceanside	9	San Diego	33 11 35	117 23 15
882.2	24Th St Maritime Terminal/North	9	San Diego	32 39 24	117 07 18
882.7	San Diego Bay/Sampson Street Pier	9	San Diego	32 41 26	117 08 45
883.1	San Diego Bay/Chollas Creek	9	San Diego	32 41 16	117 07 58
883.2	San Diego Bay/Chollas Creek/Mouth	9	San Diego	32 41 15	117 07 45
883.3	San Diego Bay/Chollas Creek/End	9	San Diego	32 41 04	117 08 06
883.5	San Diego Bay/Tuna Docks	9	San Diego	32 42 06	117 09 37
883.6	San Diego Bay/7th Street Channel	9	San Diego	32 40 21	117 06 56
883.8	San Diego Bay/Switzer Creek	9	San Diego	32 42 07	117 09 29
885.1	San Diego Bay/Paleta Creek/End	9	San Diego	32 40 27	117 06 56
885.3	San Diego Bay/7th Street Ch/Mid	9	San Diego	32 40 21	117 07 07
886.0	San Diego Bay/NASSCO	9	San Diego	32 41 23	117 08 35
888.0	San Diego Bay/Coronado Bridge	9	San Diego	32 41 30	117 09 04
893.0	San Diego Bay/Laurel Street	9	San Diego	32 43 37	117 10 38
893.5	San Diego Bay/B Street Pier	9	San Diego	32 43 02	117 10 37
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	9	San Diego	32 43 38	117 11 05

APPENDIX C

1995-97 Sample Information

APPENDIX C
State Mussel Watch Program
1995-97 Sample Information

Station Number	Station Name	Sample Type*	Sample Date	Transplant Duration (months)	Percent Water E/SO	Percent Lipid	Length (mm) E/SO	Sample Analysis Type**	Bay Protection Samples***
1.0	Crescent City Harbor	RCM	04/09/97	NA	87.5/86.9	1.19	42.0/49.8	EO	
2.0	Crescent City/STP Outfall	RCM	04/09/97	NA	86.7/86.2	0.89	41.7/53.9	EO	
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	NA	83.4/82.8	1.31	49.6/47.3	EO	
3.0	Crescent City/Control	RCM	04/10/97	NA	84.8/84.6	1.06	52.7/49.1	EO	
100.0	Mad River Slough	OYS	04/10/97	NA	85.0/84.9	1.32	41.3/41.5	EO	
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	NA	67.0/70.0	0.64	NA/NA	EO	X
101.5	Humboldt Bay/Eureka SM.22	SED	02/15/95	NA	NA/45.5	NA	NA/NA	O	X
101.5	Humboldt Bay/Eureka SM.22	TCM	02/15/95	3.5	NA/83.3	0.86	NA/52.6	O	X
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	NA	88.5/88.6	1.34	NA/NA	EO	X
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	NA	69.5/71.2	0.53	NA/NA	EO	X
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	NA	88.4/84.7	1.03	24.5/24.5	EO	X
102.6	Humboldt Bay/J Street	POD	02/15/95	NA	NA/81.3	1.61	NA/NA	O	X
102.6	Humboldt Bay/J Street	PAC	02/15/95	NA	NA/79.3	4.81	NA/NA	O	X
102.6	Humboldt Bay/J Street	RCM	02/15/95	NA	NA/91.5	0.30	NA/65.1	O	X
102.6	Humboldt Bay/J Street	SED	02/15/95	NA	NA/43.6	NA	NA/NA	O	X
102.6	Humboldt Bay/J Street	TCM	02/15/95	3.5	NA/84.0	0.87	NA/65.5	O	X
102.6	Humboldt Bay/J Street	GLY	04/17/96	NA	86.7/86.3	0.65	NA/NA	EO	X
102.6	Humboldt Bay/J Street	PAC	04/17/96	NA	64.6/67.1	1.22	NA/NA	EO	X
102.6	Humboldt Bay/J Street	RBM	04/17/96	NA	90.6/89.4	0.73	78.2/78.2	EO	X
102.6	Humboldt Bay/J Street	RBM-s	04/17/96	NA	87.7/NA	NA	28.1/NA	E	X
102.6	Humboldt Bay/J Street	TCM	04/10/97	4.1	82.5/80.7	1.57	50.3/49.6	EO	
102.7	Humboldt Bay/H Street	SED	02/15/95	NA	NA/47.7	NA	NA/NA	O	X
102.7	Humboldt Bay/H Street	TCM	02/15/95	3.5	NA/82.2	1.02	NA/58.2	O	X
102.7	Humboldt Bay/H Street	GLY	04/17/96	NA	81.9/82.7	3.23	NA/NA	EO	X
102.7	Humboldt Bay/H Street	PAC	04/17/96	NA	66.4/66.7	0.99	NA/NA	EO	X
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	NA	88.1/87.2	0.86	23.1/23.1	EO	X
102.8	Humboldt Bay/Davenport Mar. C St	SED	02/15/95	NA	NA/41.2	NA	NA/NA	O	X
103.3	Humboldt Bay/E Street	TCM	04/10/97	4.1	82.1/81.9	1.66	45.4/49.9	EO	
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	4.1	83.7/81.4	1.46	48.5/49.1	EO	
104.1	Humboldt Bay/Union Oil Plant	SED	02/15/95	NA	NA/47.1	NA	NA/NA	O	X
104.1	Humboldt Bay/Union Oil Plant	TCM	02/15/95	3.5	NA/84.0	0.81	NA/57.5	O	X
104.2	Humboldt Bay/Coal Oil Gas Plant	SED	02/15/95	NA	NA/40.0	NA	NA/NA	O	X

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TCM = Transplanted California Mussel (a = archive)
OYS = Oyster (Crassostrea gigas)
SED = Sediment
POD = Abalone Jingle (Pododesmus cepio)
PAC = Shore Crab (Pachygrapsus crassipes)
GLY = Sand Worm (Glycera spp.)

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APPENDIX C
State Mussel Watch Program
1995-97 Sample Information

Station Number	Station Name	Sample Type*	Sample Date	Transplant Duration (months)	Percent Water E/SO	Percent Lipid	Length (mm) E/SO	Sample Analysis Type**	Bay Protection Samples***
104.2	Humboldt Bay/Coal Oil Gas Plant	TCM	02/15/95	3.5	NA/83.3	0.83	NA/63.3	O	X
104.3	Humboldt Bay/Old Pac. Lumber	SED	02/15/95	NA	NA/50.1	NA	NA/NA	O	X
104.3	Humboldt Bay/Old Pac. Lumber	TCM	02/15/95	3.5	NA/83.7	0.73	NA/56.3	O	X
202.0	Bodega Head	RCM	09/11/95	NA	82.8/82.5	0.29	46.2/43.8	EO	
202.0	Bodega Head	RCM	08/29/96	NA	82.9/83.5	0.95	54.9/53.4	EO	
203.0	Tomales Bay	RBM	04/14/97	NA	89.3/NA	NA	50.1/NA	E	
203.0	Tomales Bay	TCM	04/14/97	3.7	80.2/NA	NA	55.5/NA	E	
203.1	Tomales Bay/Vincent Landing	SED	04/14/97	NA	79.2/NA	NA	NA/NA	E	
203.1	Tomales Bay/Vincent Landing	TCM	04/14/97	3.7	82.9/NA	NA	47.9/NA	E	
203.3	Tomales Bay/Walker Creek Mouth 1	TCM	04/14/97	3.7	82.7/NA	NA	46.6/NA	E	
203.5	Tomales Bay/Walker Creek Mouth 2	TCM	04/14/97	3.7	83.5/NA	NA	48.7/NA	E	
203.7	Tomales Bay/Walker Creek Mouth 3	SED	04/14/97	NA	53.9/NA	NA	NA/NA	E	
203.7	Tomales Bay/Walker Creek Mouth 3	TCM	04/14/97	3.7	83.2/NA	NA	47.8/NA	E	
203.9	Tomales Bay/Nicks Cove	TCM	04/14/97	3.7	81.9/NA	NA	47.1/NA	E	
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	3.5	85.3/85.6	1.19	54.3/61.5	EO	
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	NA	87.1/87.2	0.90	62.9/59.3	EO	
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	3.5	84.1/82.6	1.34	56.0/53.2	EO	
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	NA	84.7/90.1	0.68	44.7/47.8	EO	
210.1	Walker Creek/Mine Creek	TFC	01/17/97	2.2	86.1/NA	NA	29.4/NA	E	
210.3	Walker Creek/mid stream	TFC	01/17/97	2.2	85.6/NA	NA	29.5/NA	E	
211.1	Lagunitas Creek/Bridge 1	TFC	01/17/97	2.2	82.1/NA	NA	29.6/NA	E	
211.3	Lagunitas Creek/Bridge 2	TFC	01/17/97	2.2	82.1/NA	NA	28.2/NA	E	
280.0	Russian River/S Goat Rock	RCM	03/21/97	NA	85.5/85.2	0.89	43.0/43.1	EO	
299.1	Selby Slag 4	SED	10/27/95	NA	39.0/37.9	NA	NA/NA	EO	X
302.6	Paradise Cove	SED	10/26/95	NA	53.5/53.5	NA	NA/NA	EO	X
306.1	Gashouse Cove/Laguna Street	SED	12/07/95	NA	62.6/61.7	NA	NA/NA	EO	X
306.2	Sansome Street/Pier 31	SED	12/06/95	NA	56.3/57.0	NA	NA/NA	EO	X
306.3	Howard Street/Pier 14	SED	12/06/95	NA	42.4/40.3	NA	NA/NA	EO	X
306.4	Central Basin/Outer	SED	12/06/95	NA	60.0/63.7	NA	NA/NA	EO	X
307.0	San Francisco Bay/Treasure Is	TCM-a	01/26/81	5.4	NA/85.6	1.19	NA/57.9	O	
307.0	San Francisco Bay/Treasure Is	TCM-a	02/02/82	5.8	NA/86.7	1.03	NA/68.5	O	
308.0	San Francisco Bay/Hunter's Point	TCM-a	01/26/81	5.4	NA/85.9	1.02	NA/54.6	O	

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OYS = Oyster (Crassostrea gigas)
SED = Sediment
PAC = Shore Crab (Pachygrapsus crassipes)
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APPENDIX C
State Mussel Watch Program
1995-97 Sample Information

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309.0	San Mateo Bridge/8B	TCM-a	02/09/81	5.8	NA/86.6	1.09	NA/52.7	O	
311.4	North South Bay	SED	12/06/95	NA	35.1/36.3	NA	NA/NA	EO	X
313.0	San Francisco Bay/near Redwood Cr	TCM-a	01/26/81	5.4	NA/83.4	1.89	NA/55.1	O	
321.0	Dumbarton Bridge/Channel Marker 14	TCM-a	02/09/81	5.8	NA/84.2	1.65	NA/62.7	O	
329.0	Guadalupe Creek/Almaden Expressway	TFC	12/16/96	0.9	87.3/NA	NA	27.9/NA	E	
329.2	Guadalupe Creek/Hicks Road	TFC	12/16/96	0.9	85.6/NA	NA	30.2/NA	E	
329.4	Alamitos Creek/Almaden Road	TFC	12/16/96	0.9	87.4/NA	NA	29.3/NA	E	
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	NA	82.6/81.5	1.35	51.6/52.4	EO	
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96	4.8	89.9/89.6	0.24	50.7/55.3	EO	
401.0	Santa Cruz Harbor	TCM	03/25/96	4.8	88.7/89.0	0.35	48.4/52.7	EO	
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	4.4	83.2/83.9	1.33	52.7/55.3	EO	
404.0	Sandholdt Bridge	TCM	02/16/96	3.8	85.2/86.1	0.92	54.1/52.3	EO	
404.0	Sandholdt Bridge	TCM	03/04/97	4.1	86.2/88.4	0.84	48.7/50.4	EO	
414.0	Pacific Grove	RCM	03/07/96	NA	84.0/83.2	0.44	68.7/61.2	EO	
414.0	Pacific Grove	RCM	04/25/97	NA	86.7/87.2	0.76	66.2/67.3	EO	
420.3	Monterey Harbor/C G Jetty/Inner	TCM	02/13/96	3.7	82.1/NA	NA	60.3/NA	E	
420.4	Monterey Harbor/C G Jetty/Inner 2	TCM	02/13/96	3.7	81.6/NA	NA	59.9/NA	E	
420.5	Monterey Harbor/C G Jetty/Inner 3	TCM	02/13/96	3.7	81.2/NA	NA	59.4/NA	E	
421.0	Monterey Harbor/Slag Pile	TCM	02/13/96	3.7	85.1/NA	NA	52.7/NA	E	
601.0	LA Harbor/National Steel	TCM	01/18/96	3.6	87.6/86.6	0.28	55.9/56.2	EO	
601.0	LA Harbor/National Steel	TCM	01/28/97	4.0	87.6/88.0	0.74	45.3/60.1	EO	
605.0	LA Harbor/Cabrillo Pier	TCM	01/18/96	3.5	NA/83.0	0.68	NA/57.4	O	
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96	3.6	89.2/88.1	0.24	53.2/56.1	EO	
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	4.0	88.2/87.5	0.82	44.5/55.6	EO	
618.0	LA Harbor/Angels Gate	RCM	01/18/96	NA	NA/85.0	0.87	NA/62.3	O	
648.0	Malibu	RBM	01/17/96	NA	83.0/82.2	1.58	59.3/52.9	EO	
648.0	Malibu	RCM	11/25/96	NA	79.6/80.0	1.70	66.1/65.3	EO	
650.0	Santa Monica	RBM	01/17/96	NA	79.7/79.8	1.74	44.6/46.1	EO	
650.0	Santa Monica	RCM	11/25/96	NA	79.9/79.3	1.28	63.9/65.9	EO	
662.0	Royal Palms	RCM	01/18/96	NA	82.9/82.7	0.24	45.6/47.1	EO	
662.0	Royal Palms	RCM	11/25/96	NA	85.0/86.6	0.78	62.5/63.7	EO	
664.0	Cabrillo Beach	RCM	01/18/96	NA	85.7/85.5	0.45	51.1/50.7	EO	
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97	4.0	84.6/82.3	1.70	58.1/57.3	EO	

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APPENDIX C
State Mussel Watch Program
1995-97 Sample Information

Station Number	Station Name	Sample Type*	Sample Date	Transplant Duration (months)	Percent Water E/SO	Percent Lipid	Length (mm) E/SO	Sample Analysis Type**	Bay Protection Samples***
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96	3.6	88.7/87.0	0.56	52.6/53.7	EO	
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97	4.0	86.6/89.0	0.73	51.9/49.1	EO	
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96	3.6	87.1/87.9	0.46	54.0/59.0	EO	
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97	4.0	85.7/88.7	0.69	54.7/59.1	EO	
723.4	Newport Bay/Turning Basin	TCM	01/17/96	3.6	88.4/90.3	0.29	54.5/53.7	EO	
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96	3.6	87.0/88.8	0.37	48.5/51.6	EO	
725.0	Newport Bay/Crows Nest	TCM	01/17/96	3.6	86.9/87.2	0.59	51.5/49.5	EO	
725.0	Newport Bay/Crows Nest	TCM	01/27/97	4.0	87.3/87.7	0.74	45.7/55.9	EO	
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96	3.6	88.2/90.9	0.24	53.1/52.4	EO	
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97	4.0	87.6/90.4	0.51	52.0/61.3	EO	
726.6	Newport Bay/Mariners Drive	TCM	01/27/97	4.0	89.1/90.0	0.66	52.3/61.9	EO	
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	3.9	87.2/86.7	0.91	55.0/50.2	EO	
742.0	San Juan Creek	RCM	01/18/96	NA	NA/88.2	0.53	NA/42.9	O	
750.0	Oceanside	RCM	01/18/96	NA	NA/80.3	0.42	NA/50.6	O	
750.0	Oceanside	RCM	09/30/96	NA	82.7/82.9	1.05	56.5/53.9	EO	
882.2	24Th St Maritime Erminal/North	TCM	01/18/96	3.6	84.3/NA	NA	54.7/NA	E	
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96	3.6	88.1/88.9	0.28	43.8/53.4	EO	
883.1	San Diego Bay/Chollas Creek	TCM	01/18/96	3.5	NA/89.4	0.29	NA/52.0	O	
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	4.0	87.1/89.6	0.50	55.2/55.9	EO	
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	4.0	87.5/87.6	0.85	48.8/56.1	EO	
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	4.0	86.6/87.3	0.89	46.7/43.8	EO	
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	4.0	86.0/86.6	0.99	54.2/50.3	EO	
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96	3.6	87.2/86.6	1.88	52.2/51.2	EO	
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	4.0	86.8/87.3	0.78	53.7/57.8	EO	
883.8	San Diego Bay/Switzer Creek	TCM	01/18/96	3.5	NA/88.4	0.26	NA/54.3	O	
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	4.0	89.9/90.6	0.47	47.9/52.5	EO	
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	4.0	86.6/87.0	0.96	48.9/51.8	EO	
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	4.0	86.1/87.5	0.84	49.7/55.4	EO	
886.0	San Diego Bay/NASSCO	TCM	01/18/96	3.6	87.5/87.4	0.41	54.7/54.9	EO	
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	NA	89.3/91.7	0.65	57.3/56.7	EO	
893.0	San Diego Bay/Laurel Street	TCM	01/18/96	3.5	NA/87.9	0.27	NA/51.3	O	
893.5	San Diego Bay/B Street Pier	TCM	01/18/96	3.5	NA/85.8	0.52	NA/57.7	O	
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	4.0	87.4/87.6	0.61	46.7/62.8	EO	

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APPENDIX D

Station Sampling History

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State Mussel Watch Program
Station Sampling History

Station Number	Station Name	Sample Year* 78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
1.0	Crescent City Harbor	--	--	E	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	EO
2.0	Crescent City/STP Outfall	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	EO
2.1	Crescent City Harbor Jetty	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
2.2	Crescent City Harbor/Inner Jetty	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
3.0	Crescent City/Control	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	EO
5.0	Redwoods/North	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7.0	Redwoods/South	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10.0	Trinidad Head	EO	EO	O	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--
95.0	McDaniel Slough	--	--	--	--	--	--	--	--	--	--	--	--	O	O	O	--	--	--	--	--
99.0	Mad River/Oyster Docks	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--
100.0	Mad River Slough	--	--	--	--	--	EO	EO	EO	EO	EO	O	O	O	O	EO	--	EO	--	--	EO
100.5	Arcata Dock	--	--	--	--	--	--	EO	O	O	O	--	--	--	O	O	--	--	--	--	--
100.6	Mad River/Oyster Bed	--	--	--	--	--	--	O	--	--	--	--	--	O	--	--	--	--	--	--	--
100.8	Bird Island	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
101.0	Samoa Bridge/West	--	--	EO	EO	EO	EO	EO	EO	--	EO	O	--	--	EO	--	--	E	--	--	--
101.2	Arcata Bay/Channel Marker	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--
101.4	Arcata Bay/Jolly Giant Slough	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
101.5	Humboldt Bay/Eureka SM.22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--
101.8	Humboldt Bay/Halberson Shoreline	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
102.0	Samoa Bridge/East	--	O	EO	EO	EO	--	--	--	--	--	--	EO	--	O	EO	--	--	--	--	--
102.5	Woodley Island	--	--	--	--	--	--	EO	EO	EO	EO	O	--	--	--	--	--	--	--	--	--
102.6	Humboldt Bay/J Street	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	EO	EO
102.7	Humboldt Bay/H Street	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	EO	--
102.8	Humboldt Bay/Davenport Mar. C St	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--
103.0	Eureka Channel	--	--	EO	EO	EO	EO	--	--	--	--	--	EO	O	O	EO	EO	EO	--	--	--
103.2	Louisiana Pacific Dock	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--	--	--	--	--
103.3	Humboldt Bay/E Street	--	--	--	--	--	--	--	--	--	--	--	--	--	O	EO	--	--	--	--	EO
103.4	Humboldt Del Norte Pier	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--
103.5	Humboldt Bay/Clark Slough	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
103.6	Simpson Dock	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--	--	--	--	--	--	--
103.7	Eda Dock	--	--	--	--	--	--	--	--	--	--	--	--	--	O	E	--	--	--	--	--
104.0	Eureka STP/Outfall	--	--	--	--	--	--	EO	EO	--	EO	EO	--	EO	EO	EO	--	--	--	--	--
104.1	Humboldt Bay/Union Oil Plant	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--
104.2	Humboldt Bay/Coal Oil Gas Plant	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--
104.3	Humboldt Bay/Old Pac. Lumber	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--

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APPENDIX D

State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
104.5	Eureka STP/Control	--	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--
105.0	Humboldt Bay/Entrance	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
106.0	Fields Landing	--	--	--	--	EO	--	--	EO	E	E	--	--	--	O	EO	--	--	--	--	--
130.0	Shelter Cove	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
150.0	Glass Beach	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
150.4	Noyo Harbor	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	EO	--	--	--	--
151.0	Shell Beach	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
152.0	Pudding Creek	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
153.0	Pygmy Forest	EO	EO	O	O	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
155.1	Lake Pillsbury 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
155.3	Lake Pillsbury 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
159.0	Russian River West Fork	--	--	--	--	--	--	--	--	--	--	--	--	E	E	EO	EO	--	--	--	--
160.0	Lake Mendocino	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--
165.0	Russian River Below Ukiah	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	EO	EO	--	--	--	--
170.0	Gerstle Cove	EO	EO	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
175.0	Big Sulfur Creek	--	--	--	--	--	--	--	--	--	--	--	--	E	E	--	EO	--	--	--	--
176.0	Lake Sonoma	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
190.0	Estero Americano	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--
200.0	Russian River/N Goat Rock	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--
201.0	Bodega Bay	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
202.0	Bodega Head	EO	EO	E	EO	EO	EO	E	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO
203.0	Tomales Bay	--	O	EO	EO	EO	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	E
203.1	Tomales Bay/Vincent Landing	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
203.3	Tomales Bay/Walker Creek Mouth 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
203.5	Tomales Bay/Walker Creek Mouth 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
203.7	Tomales Bay/Walker Creek Mouth 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
203.9	Tomales Bay/Nicks Cove	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
204.0	Estero De San Antonio	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
205.0	Bodega Harbor/Spud Point Marina	--	--	--	--	--	--	--	--	--	--	--	EO	O	EO	EO	EO	--	--	--	EO
205.1	Bodega Bay/Porto Bodega	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
205.3	Bodega Bay/Mason's Marina	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
205.5	Bodega Bay/Back Marsh	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
207.0	Point Reyes	EO	EO	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
208.0	Bolinas	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
210.1	Walker Creek/Mine Creek	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E

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APPENDIX D

State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
210.3	Walker Creek/mid stream	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
211.1	Lagunitas Creek/Bridge 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
211.3	Lagunitas Creek/Bridge 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
280.0	Russian River/S Goat Rock	--	--	--	--	--	--	--	--	--	E	E	E	--	--	--	EO	--	--	--	EO
290.0	Russian River/near Moscow	--	--	--	--	--	--	--	--	EO	E	E	--	--	--	--	EO	--	--	--	--
292.0	Gualala River/Twin Bridge	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--
294.1	Mark West Creek/Slusser Road	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--
294.2	Windsor Creek/Mark West Station Rd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--
294.5	Green Valley Creek 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
294.6	Green Valley Creek 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
295.1	Santa Rosa Fl Con Ch/Willowside Rd	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--	--	--
295.2	Laguna de Santa Rosa/Stony Point	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	E	--	--	--	--	--
295.3	Mark West Creek/Wholer Road	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	EO	--	--	--	--	--
295.4	Russian River/Wholer Bridge	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--
295.5	Russian River/Hacienda Bridge	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	EO	--	--	--	--	--
297.0	Putah Creek	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
298.0	Brannan Island	--	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--	--	--	--	--
298.3	Concord Naval/Pier 4	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--
298.4	Concord Naval/Seal Island	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
299.1	Selby Slag 4	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	EO	--
299.2	Selby Slag 5	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--
299.3	Selby Slag 6	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--
299.4	Selby Slag 7	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--
300.2	Mare Island	--	--	--	--	--	--	--	EO	EO	EO	EO	EO	--	--	--	--	--	--	--	--
301.0	Davis Point	--	--	E	--	--	EO	--	--	--	--	E	--	--	--	--	--	--	--	--	--
301.4	Union Oil Outfall	--	--	--	--	--	--	--	--	--	--	E	E	--	--	--	--	--	--	--	--
302.0	Point Pinole	--	--	E	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	O	--	--
302.4	Castro Cove Bridge	--	--	--	--	--	--	--	--	--	--	EO	EO	O	--	--	--	--	--	--	--
302.6	Paradise Cove	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
303.0	Richmond/San Rafael Bridge	--	--	EO	EO	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
303.1	Santa Fe Channel/Mouth	--	--	--	--	--	--	--	--	EO	--	--	--	--	EO	--	--	--	--	--	--
303.2	Lauritzen Canal/Mouth	--	--	--	--	--	--	--	O	O	O	O	--	--	--	--	--	--	--	--	--
303.3	Lauritzen Canal/End	--	--	--	--	--	--	--	--	O	O	O	--	--	EO	--	--	--	--	--	--
303.4	Santa Fe Channel/End	--	--	--	--	--	--	--	O	O	O	--	--	--	EO	--	--	--	--	--	--
303.6	Richmond Inner Harbor Basin	--	--	--	--	--	--	--	E	O	EO	EO	EO	--	--	--	--	--	--	--	--

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APPENDIX D

State Mussel Watch Program
Station Sampling History

Station Number	Station Name	Sample Year*																			
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
304.0	Staufer's	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
304.4	Serl Intake	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
304.6	Point Isabel	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--
305.0	San Francisco Bay/Angel Island	--	--	EO	EO	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
306.0	San Francisco Bay/Fort Baker	--	--	--	EO	--	EO	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--
306.1	Gashouse Cove/Laguna Street	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
306.2	Sansome Street/Pier 31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
306.3	Howard Street/Pier 14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
306.4	Central Basin/Outer	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
306.5	Alcatraz Island	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
307.0	San Francisco Bay/Treasure Is	--	O	EO	EO	EO	EO	EO	EO	E	EO	EO	EO	EO	EO	EO	EO	--	--	--	O
307.2	Alameda Yacht Harbor	--	--	--	--	--	--	--	E	EO	EO	EO	EO	--	--	--	--	--	--	--	--
307.3	Oakland Inner Harbor/West	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--
307.4	Oakland Inner Hbr/Embarcadero Cove	--	--	--	--	--	--	--	O	EO	EO	EO	EO	--	EO	EO	EO	--	--	--	--
307.5	Lake Merritt	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--
307.6	Oakland Back Harbor	--	--	--	--	--	--	--	O	EO	EO	EO	--	--	--	--	--	--	--	--	--
307.8	San Francisco Outfall	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
307.9	San Francisco/Islais Channel	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--
308.0	San Francisco Bay/Hunter's Point	--	--	--	EO	EO	EO	--	--	--	--	--	--	--	EO	EO	EO	--	EO	--	O
308.2	Hunter's Point/Shipyard	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--
309.0	San Mateo Bridge/8B	--	--	E	EO	EO	EO	EO	E	E	E	--	--	E	EO	EO	EO	--	EO	--	O
310.0	San Mateo Bridge/8A	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
311.0	San Mateo Old Bridge	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
311.4	North South Bay	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
312.0	Belmont Slough	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
313.0	San Francisco Bay/near Redwood Cr	--	--	--	EO	EO	EO	EO	E	--	--	--	--	--	EO	EO	EO	--	EO	--	O
314.0	Redwood Creek/Channel Marker 10	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
315.0	Redwood Creek/Towers	--	--	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
316.0	Redwood Creek/Tradewinds	--	--	EO	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
317.0	Redwood City/STP Outfall	ns	ns	ns	ns	ns	E	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
318.0	Redwood Creek/Pete's Marina	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
318.4	Redwood Creek/Bair Island	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
319.0	Redwood Creek/Pulgas	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
320.0	San Francisco Airport	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
321.0	Dumbarton Bridge/Channel Marker 14	--	--	E	EO	EO	E	EO	E	E	E	E	EO	--	EO	EO	--	--	EO	--	O

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State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																			
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
323.3	Palo Alto Outfall	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--
324.0	Newark Slough	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
325.0	Channel Marker 17	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
326.0	Palo Alto/Channel Marker 8	--	--	--	--	E	E	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--
327.0	Palo Alto/Yacht Club	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
328.0	Alviso Slough	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
329.0	Guadalupe Creek/Almaden Expressway	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
329.2	Guadalupe Creek/Hicks Road	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
329.4	Alamitos Creek/Almaden Road	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E
330.0	Duxbury Reef	--	--	EO	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
331.0	Muir Beach	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
332.0	Point Bonita	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
333.0	Farallon Islands	EO	EO	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
334.0	Cliff House	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
335.0	Pacifica	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
336.0	J. Fitzgerald	EO	EO	O	O	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
399.2	Pescadero Creek	--	--	--	--	--	--	--	--	--	--	O	O	--	--	--	--	--	--	--	--
399.3	Waddell Creek	--	--	--	--	--	--	--	--	--	--	O	O	--	--	--	--	--	--	--	--
399.5	San Lorenzo River	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
399.7	San Lorenzo River/Felton	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
400.0	Ano Nuevo Island	EO	EO	E	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
400.2	Younger Lagoon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
400.5	Santa Cruz/Long Marine Laboratory	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
400.6	Santa Cruz/Natural Bridges	--	--	--	--	--	--	--	--	--	E	E	E	--	--	--	--	--	--	--	EO
400.7	Santa Cruz Harbor/Inner	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
400.8	Aptos Creek	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--	--
401.0	Santa Cruz Harbor	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
401.1	Santa Cruz/T Dock	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
401.2	Watsonville Slough/Mouth	--	--	--	--	--	O	O	--	O	--	--	--	--	--	--	--	--	--	--	--
401.3	Moss Landing/Yacht Harbor	--	--	--	--	--	--	EO	--	--	EO	--	O	--	--	--	--	--	--	--	--
401.4	Elkhorn Slough	--	--	--	--	--	O	O	--	--	--	--	--	--	--	--	--	--	--	--	--
401.5	Watsonville Slough/Bridge	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	O	--	--	--	--
401.6	Harkins Slough Bridge	--	--	--	--	--	--	--	--	--	O	O	--	--	--	--	--	--	--	--	--
401.8	San Andreas Road	--	--	--	--	--	--	--	--	O	O	O	--	--	--	--	--	--	--	--	--
401.9	Pajaro River Estuary	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--

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APPENDIX D

State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
402.0	Elkhorn Slough/Duck Club	--	--	--	--	O	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--
402.1	Azevedo Pond	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
402.2	Parson's Slough	--	--	--	--	--	O	O	O	O	O	O	O	--	--	--	EO	--	--	--	--
402.3	Elkhorn Slough/Pacific Mariculture	--	O	E	O	--	--	O	O	--	--	--	O	--	--	--	--	--	--	--	--
402.4	Elkhorn Slough/PG & E	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--
402.5	Elkhorn Slough/Tidal Pond	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
402.8	Elkhorn Slough/Skippers	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--
403.0	Elkhorn Slough/Highway 1 Bridge	--	--	EO	EO	--	--	--	O	O	O	O	O	--	--	--	--	--	--	--	EO
403.2	Moro Cojo	--	--	--	--	--	O	--	--	--	--	--	O	--	--	--	--	--	--	--	--
403.5	Moss Landing/South Harbor	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--
403.6	Moro Cojo Slough	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--
404.0	Sandholdt Bridge	--	--	--	--	O	O	O	O	O	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO
405.0	Espinosa Slough	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--
405.2	Old Salinas River 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	O	--	--	--	--
405.3	Old Salinas River 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	O	--	--	--	--
405.4	Old Salinas River Channel 1	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--
405.6	Salinas River Lag 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	O	--	--	--	--
405.7	Salinas River Lag 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--
405.8	Salinas River Lagoon	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--
406.0	Westley Station	--	--	--	--	--	--	O	--	--	--	--	O	--	--	--	--	--	--	--	--
406.5	Tembladero Slough	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--
407.1	Moss Landing/Ag Drain/Old River	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--
407.2	Moss Landing/Ag Drain/Espinosa	--	--	--	--	--	--	--	EO	--	O	--	--	--	--	--	--	--	--	--	--
407.3	Moss Landing/Ag Drain/Davis Rd	--	--	--	--	--	--	--	--	O	O	--	--	--	--	--	--	--	--	--	--
407.4	Blanco Pump/West	--	--	--	--	--	--	--	EO	O	--	--	--	--	--	--	O	--	--	--	--
407.5	Blanco Pump/East	--	--	--	--	--	--	--	EO	O	O	--	--	--	--	--	--	--	--	--	--
407.6	Moss Landing/Ag Drain/Blanco dstrm	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--
407.8	Blanco/Hitchcock	--	--	--	--	--	--	--	--	O	O	--	--	--	--	--	--	--	--	--	--
407.9	Salinas Sewage Treatment Plant	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--
408.0	Pacific Grove/Offshore	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
408.1	Canal Airport	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--
408.2	Produce Wash/Downstream/West	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--
408.3	Produce Wash/Downstream/East	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--
408.5	Associated Chemicals	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--
408.8	Salinas/Reclamation Canal 2	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--

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APPENDIX D

State Mussel Watch Program
Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
408.9	Salinas/Reclamation Canal 3	--	--	--	--	--	--	--	--	O	O	O	--	--	--	--	--	--	--	--	--
409.0	Salinas/Reclamation Canal 4	--	--	--	--	--	--	--	--	O	O	O	--	--	--	--	--	--	--	--	--
410.0	Monterey Bay/Point Pinos/Shallow	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--
411.0	Monterey Bay/Point Pinos	--	--	E	E	E	EO	E	--	E	E	--	--	--	--	--	--	--	--	--	--
413.0	Monterey Bay/Asilomar	--	--	--	E	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
414.0	Pacific Grove	EO	EO	EO	EO	E	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO
415.0	Lover's Point	--	--	--	--	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
416.0	Monterey Bay/Hopkins Marine Lab	--	--	E	E	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
417.0	Monterey Bay/Aquarium	--	--	--	--	--	--	--	E	--	E	--	--	--	--	--	--	--	--	--	--
418.0	Pacific Grove/Outrigger	--	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
418.8	Monterey Bay/Charthouse	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
419.0	Coast Guard Jetty/South Rocks	--	--	--	E	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
420.0	Monterey Harbor/Coast Guard Jetty	--	--	--	E	--	--	E	--	--	--	--	--	--	--	--	--	EO	--	--	--
420.2	Monterey/Coast Guard Jetty/Outer	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
420.3	Monterey Harbor/C G Jetty/Inner	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E	--	E	--
420.4	Monterey Harbor/C G Jetty/Inner 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E	--
420.5	Monterey Harbor/C G Jetty/Inner 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E	--
421.0	Monterey Harbor/Slag Pile	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	E	--	E	--
421.1	Monterey Harbor/Slag Heap	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
421.3	Monterey Harbor/Restaurant Wharf	--	--	--	--	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--
421.4	Monterey Harbor/Commercial Wharf	--	--	--	--	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--
421.5	Monterey/Coast Guard Jetty/Docks	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
421.6	Monterey/Coast Guard Jetty/End	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
421.7	Monterey Harbor/Marina	--	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--	--	--	--	--
421.8	Monterey Harbor/Marina/Pier B	--	--	--	--	--	--	--	--	--	--	O	O	--	--	--	--	--	--	--	--
422.0	Monterey Bay/Holiday Inn	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
422.5	Cypress Point	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
423.0	Carmel Bay	EO	EO	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
423.1	Carmel Bay/New Control	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--
423.2	Carmel STP/Control	--	--	--	--	--	--	EO	E	E	E	E	E	--	--	--	--	--	--	--	--
423.3	Carmel River	--	--	--	--	--	--	--	E	E	E	--	E	--	--	--	--	--	--	--	--
423.4	Carmel STP/10m North	--	--	--	--	--	--	EO	E	E	E	E	E	--	--	--	--	--	--	--	--
423.5	Carmel STP/30m South	--	--	--	--	--	--	--	--	--	--	--	--	--	E	E	--	--	--	--	--
423.6	Carmel STP/10m South	--	--	--	--	--	--	EO	E	--	E	E	E	--	--	--	--	--	--	--	--
423.7	Carmel STP/100m South	--	--	--	--	--	--	--	--	--	--	--	--	--	E	E	--	--	--	--	--
423.8	Carmel River/Upstream	--	--	--	--	--	--	--	--	E	E	--	--	--	--	--	--	--	--	--	--

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APPENDIX D

State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
423.9	Carmel STP/300m South	--	--	--	--	--	--	--	--	--	--	--	--	--	E	E	--	--	--	--	--
424.0	Soberanes Point	EO	EO	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
424.5	Granite Canyon/Control	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--
425.0	J.P. Burns	EO	EO	O	O	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
425.4	Lake San Antonio/Buoy	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--	--	--	--	--
425.6	Lake San Antonio	--	--	--	--	--	--	--	EO	EO	EO	EO	EO	EO	--	EO	--	--	--	--	--
425.7	Nacimiento/East	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
425.8	Nacimiento/West	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
426.0	Salmon Creek	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
426.5	Cayucos Pier	--	--	--	--	--	--	E	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--	--
427.0	Morro Bay/Upper	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
428.0	Cayucos	--	--	--	--	--	--	E	E	E	E	E	E	E	E	E	--	--	--	--	--
428.5	Morro Bay/Virg's	--	O	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
429.0	Morro Rock	--	--	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
429.2	Morro Bay/Boat Works	--	--	--	--	--	--	--	--	--	E	EO	EO	EO	--	--	E	--	--	--	--
430.0	Montana De Oro	--	--	E	--	E	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--
430.1	Montana De Oro/South	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
430.2	Montana De Oro 1	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--
430.4	Montana De Oro 2	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--
431.0	Lion Rock	--	--	--	--	E	E	E	E	E	E	E	E	E	--	--	--	--	--	--	--
432.0	Pup Rock	--	--	--	--	E	E	E	E	E	E	E	E	E	--	--	--	--	--	--	--
433.0	Diablo Cove/North	--	--	--	--	E	EO	E	E	E	E	E	E	E	E	E	--	--	--	--	--
434.0	Diablo Cove/South	--	--	--	--	E	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--
435.0	Intake Cove	--	--	--	--	E	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--
436.0	Pecho Rock	--	--	--	--	E	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--	--	--
437.0	Point San Luis	--	--	--	--	E	E	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--
438.0	Avila	--	--	--	--	E	EO	E	EO	EO	EO	E	E	E	E	E	--	--	--	--	--
440.0	Lion Rock/Transplant	--	--	--	--	--	EO	E	EO	EO	EO	E	EO	EO	E	E	--	--	--	--	--
441.0	Lion/Diablo/Transplant	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	E	E	--	--	--	--	--
442.0	Diablo Cove/North/Transplant	--	--	--	--	--	--	E	EO	EO	E	EO	EO	EO	E	E	--	--	--	--	--
442.1	Diablo Cove/N/Transplant/Shallow	--	--	--	--	--	--	--	--	--	--	--	--	--	E	E	--	--	--	--	--
443.0	Diablo Cove/South/Transplant	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--
443.1	Diablo Cove/S/Transplant/Shallow	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--
444.0	Intake Cove/Transplant	--	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--
445.0	San Luis Harbor/Transplant	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--

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APPENDIX D

State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
446.0	San Luis Obispo Creek 1	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
446.1	San Luis Obispo/Creek 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--
446.2	San Luis Obispo Creek 3	--	--	--	--	--	--	--	--	--	--	--	--	--	E	EO	--	--	--	--	--
446.4	San Luis Obispo/Creek 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--
449.0	Point Arguello	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
450.0	Point Conception	EO	EO	--	--	--	--	--	--	--	--	--	E	E	EO	--	--	--	--	--	--
455.0	Gaviota	--	--	--	--	--	--	--	--	--	--	EO	EO	E	--	--	--	--	--	--	--
460.0	Goleta Slough 1	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--	--	--
460.1	Goleta Slough 2	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--
460.2	Goleta Slough 3	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
460.3	Goleta Slough 4	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
470.0	Santa Barbara Harbor	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--
471.0	Mission Creek	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
472.0	Waste Slough/Laguna Drainage	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
475.0	Carpinteria Marsh	--	--	--	--	--	--	--	--	--	--	O	O	--	--	--	--	--	--	--	--
480.0	Lake Isabella	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
485.0	Ventura Marina	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
485.2	Ventura River Estuary	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--
487.1	Santa Clara River Estuary 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--
487.3	Santa Clara River Estuary 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--
500.0	San Miguel Island/West	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
501.0	San Miguel Island/East	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
502.0	Santa Cruz Island	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
503.0	Anacapa Island	EO	EO	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
504.0	Santa Barbara Island	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
505.0	Channel Island Harbor	--	--	E	EO	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
505.2	Channel Island Harbor/North	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
506.0	Port Hueneme	--	--	EO	EO	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
506.1	Port Hueneme/Wharf B	--	--	--	--	--	--	--	--	O	O	EO	O	--	--	--	--	--	--	--	--
506.2	Port Hueneme/Wharf 1	--	--	--	--	--	--	--	--	O	EO	EO	O	--	--	--	--	--	--	--	--
506.3	Port Hueneme/Entrance	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
507.0	Point Mugu	EO	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
507.1	Mugu Lagoon/L Street	--	--	--	--	--	--	--	--	--	EO	--	--	--	O	--	--	--	--	--	--
507.2	Mugu Lagoon/Laguna Road	--	--	--	--	--	--	--	--	O	EO	--	--	--	O	--	--	--	--	--	--
507.3	Mugu Lagoon/Calleguas Creek	--	--	--	--	--	--	--	--	O	EO	--	EO	O	O	O	O	EO	--	--	--

* Sample Year = State Fiscal Year (July 1 - June 30). For example, Sample Year 78 = 1977-78 Fiscal Year.

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APPENDIX D

State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
507.4	Ag Drain/Etting Road	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--
507.6	Ag Drain/Pleasant Valley Road	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--
507.7	Revolon Slough/Las Posas Rd	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--
507.8	Revolon Slough	--	--	--	--	--	--	--	--	--	EO	O	O	O	O	--	--	--	--	--	--
508.1	Mugu Drainage 1	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	E	--	--
508.2	Mugu Drainage 2	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
508.3	Mugu Drainage 3	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
508.4	Mugu Drainage 4	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
508.5	Mugu Drainage 5	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
508.6	Mugu Drainage 6	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
508.7	Mugu Drainage 7	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
509.0	Calleguas	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--
553.0	Marina Del Rey/Entrance	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
554.0	Marina Del Rey/Harbor Patrol Docks	--	--	--	--	--	--	--	--	EO	--	EO	EO	--	--	--	--	--	--	--	--
555.0	Marina Del Rey/Basin G	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--	--	--	--
555.2	Marina Del Rey/Basin D	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
556.0	Marina Del Rey/Basin E	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--	--	--	--
557.0	Marina Del Rey/Ballona Creek	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--	--	--	--	--	--
559.0	King Harbor	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
601.0	LA Harbor/National Steel	--	--	--	--	EO	--	EO	EO	EO	EO	EO	EO	O	O	EO	EO	EO	EO	EO	EO
602.0	LA Harbor/West Basin	--	--	--	--	EO	--	E	EO	EO	EO	EO	--	--	--	--	--	EO	--	--	--
602.5	LA Harbor/Todd Shipyards	--	--	--	--	--	--	--	EO	EO	--	EO	EO	O	O	--	--	--	--	--	--
602.6	LA Harbor/Berth 50	--	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--
602.7	LA Harbor/Pacific Ave/Storm Drain	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
602.8	LA Harbor/Berth 49	--	--	--	--	--	--	--	--	--	EO	EO	E	E	E	--	--	--	--	--	--
602.9	LA Harbor/Berth 51	--	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--
603.0	LA Harbor/Berth 151	--	--	--	--	EO	--	EO	EO	EO	--	EO	O	--	--	--	--	--	--	--	--
603.6	LA Harbor/Slip 240	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--
603.8	LA Harbor/West Channel	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--
604.0	LA Harbor/GATX Terminal	--	--	--	O	EO	O	--	--	EO	--	--	--	--	--	--	--	--	--	--	--
604.5	LA Harbor/Berth 212	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--
605.0	LA Harbor/Cabrillo Pier	--	O	O	--	EO	--	EO	--	--	--	--	EO	--	--	O	O	EO	EO	O	--
606.0	LA Harbor/Fish Harbor/Outer	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
606.2	LA Harbor/Fish Harbor	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--
606.3	LA Harbor/Watchorn Basin	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--

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APPENDIX D

State Mussel Watch Program
Station Sampling History

Station Number	Station Name	Sample Year*																			
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
607.0	LA Harbor/Terminal Island	--	--	--	O	EO	--	E	--	EO	--	--	--	--	--	--	--	--	--	--	--
607.4	LB Harbor/Berth 214	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
607.6	LB Harbor/Channel 2	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
607.7	LB Harbor/Navy Mole Jetty	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--
607.8	LB Harbor/Pier J	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
608.0	LB Harbor/Navy Mole	--	--	--	EO	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--
609.0	LB Harbor/Tide Gauge	--	--	EO	EO	EO	O	EO	--	EO	--	O	--	--	--	--	--	--	--	--	--
609.4	Long Beach/Queensway Bay	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
610.0	LA River/Mouth	--	--	--	O	--	O	--	EO	--	--	--	--	--	--	--	--	--	--	--	--
611.0	LB Harbor/Pier F	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
611.5	LB Harbor/LAPD Ramp	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
612.0	LB Harbor/Navy Channel	--	--	--	O	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--
613.0	LB Harbor/Southern Calif Edison	--	--	--	--	EO	--	EO	--	EO	--	--	--	--	--	--	--	--	--	--	--
614.0	LB Harbor/Channel 3	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
615.0	LB Harbor/Henry Ford Bridge	--	--	--	--	EO	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--
616.0	LA Harbor/Consolidated Slip	--	--	--	--	EO	O	O	EO	EO	EO	EO	EO	O	O	EO	EO	EO	EO	EO	EO
617.0	White's Point	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
617.6	Point Fermin	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--
617.9	Cabrillo Beach/Ocean Side	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--
618.0	LA Harbor/Angels Gate	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	O	O	EO	EO	O	--
619.0	LA Harbor/San Pedro Boatworks	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
619.2	San Pedro Breakwater	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--
620.0	LB Harbor/JH Baxter 80	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--
620.5	LA River/Upstream	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--
621.0	LA Harbor/Berth 120	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--
622.0	LA Harbor/Commer Marine	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
625.0	Alamitos Bay/West 2nd Street	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--
626.0	Alamitos Bay/Cerritos Channel	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--
627.0	Alamitos Bay/Marine Stadium	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--
627.4	Alamitos Bay/Marine Stadium/North	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
647.0	Point Dume	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
648.0	Malibu	--	--	--	E	--	--	--	--	--	--	--	--	--	EO	--	EO	EO	EO	EO	EO
648.1	Malibu Lagoon/Channel A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--
648.3	Malibu Lagoon/Channel C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--
648.5	Malibu Lagoon/PCH	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--

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APPENDIX D

State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																			
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
649.0	Big Rock Beach	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
650.0	Santa Monica	--	--	--	E	--	--	--	--	--	--	--	E	--	EO	--	EO	EO	EO	EO	EO
651.0	Marina Del Rey/North Docks	--	--	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
652.0	Marina Del Rey/North Docks Jetty	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
653.0	Marina Del Rey/South Docks Jetty	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
654.0	Playa Del Rey	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
655.0	El Segundo/Grand Avenue	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
656.0	Manhattan Beach	--	--	--	E	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--
657.0	Hermosa Beach	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
658.0	Redondo Beach	--	--	--	E	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--
659.0	Palos Verdes Point	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
660.0	Point Vicente	--	--	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
661.0	Royal Palms/North	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
662.0	Royal Palms	EO	EO	EO	O	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO
663.0	Royal Palms/South	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
664.0	Cabrillo Beach	--	--	E	O	--	--	--	--	--	--	--	--	--	--	O	--	--	EO	EO	--
664.2	Cabrillo Beach Buoy	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--
680.0	Catalina Island/East	--	EO	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
681.0	Catalina Island/West	EO	EO	E	E	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--
682.0	Catalina Island/Ribbon Rock	--	--	--	E	--	--	--	--	--	--	--	--	--	E	--	EO	EO	--	--	--
683.0	Catalina Island/Ben Weston	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
684.0	Catalina Island/Silver Canyon	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
685.0	Catalina Island/Church Rock	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
701.0	Colorado Lagoon/West	--	--	--	--	EO	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--	--
701.2	Colorado Lagoon/East	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
703.0	Alamitos Bay/Pier 22	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
707.0	Anaheim Bay/Navy Harbor	--	--	--	--	--	--	EO	--	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--
708.0	Anaheim Bay/Navy Marsh	--	--	--	--	--	--	EO	--	--	EO	EO	--	EO	EO	EO	--	--	--	--	EO
708.5	Anaheim Bay/Navy Marsh 2	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--
709.0	Anaheim Bay/Entrance	--	--	--	E	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
710.0	Anaheim Bay/Fuel Docks/North	--	--	EO	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
710.2	Anaheim Bay/Fuel Docks/South	--	--	--	--	--	--	--	EO	EO	EO	EO	EO	EO	--	--	--	--	--	--	--
711.0	Huntington Harbour/Launch Ramp Dks	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
712.0	Huntington Harbour/Peter's Landing	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
713.0	Huntington Harbour/Edinger Street	--	--	--	--	--	--	EO	--	EO	EO	EO	--	EO	EO	EO	--	EO	EO	EO	EO

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APPENDIX D

State Mussel Watch Program
Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
715.0	Huntington Harbour/Warner Ave Brdg	--	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO
717.0	Huntington Harbour/Harbor Lane	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	EO	--	--	--	--	--
719.1	Santa Ana River/Prado Dam	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--
719.8	Temescal Creek/Nichols Road	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--
720.0	Newport Pier	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--
720.5	Newport Bay/Offshore Ref	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
721.0	Newport Bay/Entrance	--	--	--	--	E	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--	--
722.0	Newport Bay/Police Docks	--	--	EO	EO	E	EO	--	--	O	--	--	--	--	--	--	--	--	--	--	--
722.4	Newport Bay/El Paseo Drive	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
723.0	Newport Bay/Bay Island	--	--	--	--	EO	EO	O	EO	EO	EO	EO	--	EO	EO	EO	--	--	--	--	--
723.4	Newport Bay/Turning Basin	--	--	--	--	--	--	--	--	--	EO	EO	EO	EO	EO	EO	--	--	EO	EO	--
724.0	Newport Bay/Highway 1 Bridge	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--
724.4	Newport Bay/Dunes Dock	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
725.0	Newport Bay/Crows Nest	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO
726.0	Newport Bay/Rhine Channel/Upper	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	--	--	--	--	--	--	--	--
726.2	Newport Bay/Rhine Channel/26th Ave	--	--	--	--	--	--	--	--	--	EO	--	EO	--	--	--	--	--	--	--	--
726.4	Newport Bay/Rhine Channel/End	--	--	--	--	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO
726.6	Newport Bay/Mariners Drive	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
727.0	Garden Grove/Wintersburg Channel	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	EO	--	--	--	--
728.4	Upper Newport Bay/MacArthur	--	--	--	--	--	--	--	EO	EO	EO	EO	EO	EO	EO	--	EO	--	--	--	--
728.5	Upper Newport Bay/Drain 2	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--
728.6	Upper Newport Bay/San Diego Cr 1	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
728.7	Upper Newport Bay/Drain 4	--	--	--	--	--	--	--	--	--	--	--	--	E	EO	--	EO	--	--	--	--
728.8	Upper Newport Bay/San Diego Cr 2	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
728.9	Upper Newport Bay/Drain 5	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--
730.0	Huntington Beach Pier	--	--	E	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--
731.0	Newport Beach Pier	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
732.0	Newport Bay/Entrance/West Jetty	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
733.0	Newport Bay/Entrance/W Jetty/End	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
734.0	Newport Bay/Entrance/East Jetty	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
735.0	Corona Del Mar	EO	EO	EO	O	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--
736.0	Little Corona City Beach	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
737.0	Crescent Bay Beach	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
740.0	Dana Point Harbor/Boat Yard	--	--	--	--	--	--	--	--	E	--	--	--	--	EO	EO	EO	--	--	--	EO
742.0	San Juan Creek	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--

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APPENDIX D

State Mussel Watch Program
Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
744.0	San Onofre Nuclear Plant Outfall	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--
744.1	San Onofre 1	--	--	--	--	--	--	--	--	--	--	--	EO	--	EO	EO	--	--	--	--	--
744.2	San Onofre 2	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--
744.3	San Onofre 3	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--	--
744.4	San Onofre 4	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--
744.5	San Onofre 5	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--
744.6	San Onofre 6	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	EO	--	--	--	--	--
748.0	Oceanside/Harbor	--	--	--	--	--	--	--	E	E	E	E	--	--	--	--	EO	--	--	--	--
750.0	Oceanside	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO	--	EO	O	EO
751.0	Oceanside/Transplant	--	--	--	E	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--
753.0	Inner Agua Hedionda	--	--	--	--	--	--	--	--	--	EO	O	--	--	--	--	--	--	--	--	--
800.0	Ingraham Street/North	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
830.0	Torrey Pines	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
831.0	Scripps Oceanographic Inst Pier	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
832.0	La Jolla	EO	EO	EO	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--
833.0	Boomers Point	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
834.0	Bird Rock	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
835.0	Pacific Beach	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
836.0	Mission Bay/North Jetty	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
837.0	Mission Bay/South Jetty	--	--	--	E	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
838.0	Crystal Pier	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
838.2	Point Loma/Sunset Cliffs	--	--	--	--	--	--	--	--	E	E	E	E	E	EO	E	E	--	--	--	--
839.0	Point Loma/Pink House	--	--	--	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
839.2	Point Loma/STP Outfall	--	--	--	--	--	--	--	--	E	E	--	--	--	--	--	--	--	--	--	--
840.0	Naval Ocean Sys Cntr/Dolphin Tanks	--	--	--	E	E	EO	--	EO	E	--	--	E	--	--	--	E	--	--	--	--
840.2	Point Loma/Coast Guard Station	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--
841.0	Coronado Hotel	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
842.0	Imperial Beach	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
849.0	Point Loma/A9d	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
849.5	Point Loma/A9s	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
850.0	Point Loma/STP/A8s	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
850.5	Point Loma	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
852.0	Point Loma/A10s	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
864.0	Mission Bay/Yacht Club	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--
865.0	Mission Bay/Hilton Docks	--	--	--	--	E	--	EO	--	--	--	--	--	EO	--	--	--	--	--	--	--

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APPENDIX D

State Mussel Watch Program
Station Sampling History

Station Number	Station Name	Sample Year*																		
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
866.0	Fisherman Channel	--	--	--	--	E	--	E	--	E	--	--	--	--	EO	--	--	--	--	--	--
867.0	Ingraham Street	--	--	O	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
868.0	West Mission Bay Drive	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
868.5	Mission Bay/Landfill 1	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	EO	--	--	EO	--	--
868.6	Mission Bay/Landfill 2	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	EO	--	--
869.0	Mission Bay/Seaworld Tower	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--
870.0	Mission Bay/South Shore/Rock 1	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--
872.0	Mission Bay/South Shore/Rock 3	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--
872.2	Rose Creek	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--
872.4	Mission Bay/Kendall-Frost Reserve	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--
873.0	Mission Bay/Entrance	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
873.5	Mission Bay/Harbor Police	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	E	--	--	--	--
874.0	San Diego River/Channel	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--
874.2	Tecolote Creek	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--
874.5	San Diego River	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--
880.0	National City	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
881.0	San Diego Bay/Sweetwater Marsh	--	--	--	--	--	EO	--	--	--	--	--	E	--	--	--	--	--	--	--	--
881.1	San Diego Bay/California Crane	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
881.3	Sweetwater River/Mouth 1	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--
881.4	Sweetwater River/Mouth 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--
881.5	San Diego Bay/Rohr Channel Mouth	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	--
882.0	24th St Maritime Terminal/South	--	--	--	--	EO	E	E	E	E	E	E	--	--	--	E	--	E	EO	--	--
882.2	24Th St Maritime Terminal/North	--	--	--	--	--	E	--	--	--	--	--	E	E	--	--	E	--	--	E	--
882.4	San Diego Bay/Navy Pier 13	--	--	--	--	--	E	E	E	--	--	--	--	--	--	--	--	--	--	--	--
882.5	San Diego Bay/NASSCO Pier 12	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--
882.6	San Diego Bay/Sampson St Extension	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--
882.7	San Diego Bay/Sampson Street Pier	--	--	--	--	--	--	--	--	--	O	EO	EO	--	--	--	EO	--	--	EO	--
882.8	San Diego Bay/KELCO Pier	--	--	--	--	--	--	--	--	--	O	--	EO	--	--	EO	--	--	--	--	--
882.9	San Diego Bay/Coronado Brdg/East	--	--	--	--	--	--	--	--	--	O	--	EO	--	--	--	--	--	--	--	--
883.0	San Diego Bay/Navy Amphibious Base	--	--	--	O	O	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
883.1	San Diego Bay/Chollas Creek	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	EO	--	O	EO
883.2	San Diego Bay/Chollas Creek/Mouth	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
883.3	San Diego Bay/Chollas Creek/End	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
883.4	San Diego Bay/Continental Maritime	--	--	--	--	--	--	--	--	--	--	--	E	--	--	--	EO	EO	--	--	--
883.5	San Diego Bay/Tuna Docks	--	--	--	--	--	--	--	--	--	O	--	E	--	--	--	--	EO	--	--	EO

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APPENDIX D
State Mussel Watch Program
Station Sampling History

Station Number	Station Name	Sample Year*																			
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
883.6	San Diego Bay/7th Street Channel	--	--	--	--	--	--	--	--	--	--	EO	EO	--	EO	EO	--	--	--	EO	EO
883.7	San Diego Bay/Terminal S-10th St	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
883.8	San Diego Bay/Switzer Creek	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	O	EO
884.0	San Diego Bay/Glorietta Bay	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
885.0	San Diego Bay/Buoy 30	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
885.1	San Diego Bay/Paleta Creek/End	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
885.2	San Diego Bay/32nd Street	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
885.3	San Diego Bay/7th Street Ch/Mid	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO
885.4	San Diego Bay/NASSCO 28th St Pier	--	--	--	--	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	--
886.0	San Diego Bay/NASSCO	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	EO	--
886.2	San Diego Gas&Electric Silvergate	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
887.0	San Diego Bay/Evans Street	--	--	--	--	EO	EO	--	--	--	--	--	--	--	EO	EO	EO	--	--	--	--
888.0	San Diego Bay/Coronado Bridge	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	EO
889.0	San Diego Bay/Coronado Island	--	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
890.0	San Diego Bay/8th Avenue	--	--	--	--	O	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
891.0	San Diego Bay/G Street Pier	--	--	E	EO	EO	O	--	--	--	--	E	--	--	--	--	--	--	--	--	--
892.0	San Diego Bay/N Island/Boathouse	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--
893.0	San Diego Bay/Laurel Street	--	--	--	--	--	--	--	O	--	--	--	--	--	--	--	EO	--	--	O	--
893.5	San Diego Bay/B Street Pier	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	O	--
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	--	--	--	--	O	EO	--	O	EO	--	EO	EO	EO	EO	EO	EO	EO	EO	--	EO
894.1	SD Bay/Harbor Is/E Basin/Storm Dr2	--	--	--	--	--	--	EO	--	--	--	--	EO	--	--	--	--	--	--	--	--
894.2	SD Bay/Harbor Is/E Basin/E End Doc	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
894.3	SD Bay/Harbor Is/E Basin/Mid Chan	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
894.5	SD Bay/Harbor Is/E Basin/W End Doc	--	--	--	--	--	O	EO	--	--	--	--	--	--	--	--	--	--	--	--	--
894.6	SD Bay/Harbor Is/E Basin/W End	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--
894.8	Laurel Street Storm Drain	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--
895.0	Harbor Island Drive/East	--	--	--	--	E	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--
895.2	Harbor Island/West Bay/East	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
895.4	Harbor Island/West Bay/West	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
895.6	San Diego Bay/Grape St Storm Drain	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	EO	--	--	--	--
896.0	San Diego Bay/N Island/Runway 36	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--
896.2	San Diego Bay/N Is/DPDO Dumpsite	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--	--
897.0	San Diego Bay/Shelter Is/East	--	--	--	--	E	EO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
897.5	Commercial Basin/North Harbor Dr	--	--	--	--	--	O	--	--	EO	EO	EO	--	--	--	--	--	--	--	--	--

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APPENDIX D

State Mussel Watch Program

Station Sampling History

Station Number	Station Name	Sample Year*																			
		78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
898.0	Commercial Basin/Carlton Street	--	--	--	--	O	EO	--	--	--	--	--	EO	EO	--	--	EO	--	--	--	--
898.2	San Diego Bay/N Is/Launch Docks	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--
898.4	San Diego Bay/North Island Plat	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--
899.0	San Diego Bay/Shelter Is/Fshg Pier	--	O	EO	EO	--	--	--	--	--	--	--	E	E	--	EO	EO	--	EO	--	--
899.1	San Diego Bay/Shelter Is/Duffy's	--	--	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--
899.2	San Diego Bay/Shelter Island	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	EO	--	--	--	--
899.4	San Diego Bay/Shelter Is/Fuel Dock	--	--	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--
900.0	San Diego Bay/Range Marker	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
900.5	San Diego Bay/Bait Tanks	--	--	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--
901.0	San Diego Bay/Degausing Station	--	--	--	--	EO	EO	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--
901.2	San Diego Bay/N Island/Ammo Pier	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--
902.0	Zuniga Jetty/Buoy	--	--	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
903.0	Zuniga Jetty	--	--	--	--	--	--	EO	E	EO	--	--	--	--	--	--	--	--	--	--	--
904.0	Imperial Beach/Pier	--	--	--	--	--	--	E	--	--	--	--	--	--	EO	--	--	--	--	--	--
904.8	Tijuana River/Imperial Beach	--	--	--	--	--	--	--	EO	EO	--	--	--	--	--	--	--	--	--	--	--
905.0	Tijuana River	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--	--	--
906.0	Mexican Border	--	--	--	--	--	--	--	--	EO	--	--	--	--	--	--	--	--	--	--	--

* Sample Year = State Fiscal Year (July 1 - June 30). For example, Sample Year 78 = 1977-78 Fiscal Year.

-- = Not Sampled. O = Synthetic Organics Only. E = Trace Elements Only. EO = Trace Elements and Synthetic Organics.

APPENDIX E

Summary of 1995-97 Data
Organic Chemicals Exceeding Selected Criteria
(ppb, wet weight)

Appendix E

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals Exceeding Selected Criteria (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	Total Chlor-dane	Chlor-pyrifos	Dacthal	Diazinon
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97					
307.0	San Francisco Bay/Treasure Is	TCM-a	01/26/81					
307.0	San Francisco Bay/Treasure Is	TCM-a	02/02/82					
308.0	San Francisco Bay/Hunter's Point	TCM-a	01/26/81					
309.0	San Mateo Bridge/8B	TCM-a	02/09/81					
313.0	San Francisco Bay/near Redwood Cr	TCM-a	01/26/81					
321.0	Dumbarton Bridge/Channel Marker 14	TCM-a	02/09/81	0.9**			1.3*	
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97					
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97				0.7*	
404.0	Sandholdt Bridge	TCM	02/16/96			2.0**	6.6**	

Station Number	Total DDT	Dieldrin	Total Endo-sulfan	Endrin	beta-HCH	delta-HCH	Gamma-HCH	Heptachlor
205.0								
307.0							0.4*	
307.0		5.9*						
308.0		7.3*						
309.0		8.3*						
313.0		10.9*					0.5*	
321.0		10.4*		0.4*			1.1**	
400.6		2.5*						
403.0		7.0*						
404.0	441.8**	32.1**	1.9*	4.0**				

Station Number	Hepta-chlor-epoxide	Hexa-chloro-benzene	Methoxy-chlor	Ethyl-para-thion	Oxadiazon	Total PCB	Toxaphene
205.0		0.2**					
307.0	0.1*		0.24**				15.3*
307.0	0.3*						25.7*
308.0	0.2*						17.8*
309.0	0.3*		0.16**				14.9*
313.0	0.3*	0.2**	0.33**				17.6*
321.0	0.5**	0.2**	0.22**				19.0*
400.6							
403.0				1.6**			42.0*
404.0	0.5**						232.1**

* RCM = Resident California Mussel
RBM = Resident Bay Mussel
TCM = Transplanted California Mussel (a = archive)

* = Equals or exceeds EDL 85.
** = Equals or exceeds EDL 95.

= Equals or exceeds FDA Action Level.

Appendix E

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals Exceeding Selected Criteria (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	Total Chlor-dane	Chlor-pyrifos	Dacthal	Diazinon
404.0	Sandholdt Bridge	TCM	03/04/97			1.1*	2.8*	
414.0	Pacific Grove	RCM	03/07/96					
414.0	Pacific Grove	RCM	04/25/97				0.3*	
601.0	LA Harbor/National Steel	TCM	01/28/97					
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97					
618.0	LA Harbor/Angels Gate	RCM	01/18/96		5.0*			10.4**
650.0	Santa Monica	RCM	11/25/96		4.6*			
662.0	Royal Palms	RCM	01/18/96					
662.0	Royal Palms	RCM	11/25/96					
664.0	Cabrillo Beach	RCM	01/18/96					

Station Number	Total DDT	Dieldrin	Total Endo-sulfan	Endrin	beta-HCH	delta-HCH	Gamma-HCH	Heptachlor
404.0	415.8**	27.6**	1.6*	2.2**				
414.0		1.6*						
414.0								
601.0								
616.0								
618.0	178.4**							
650.0								
662.0	121.7*							
662.0	72.7*							
664.0	72.1*							

Station Number	Hepta-chlor-epoxide	Hexa-chloro-benzene	Methoxy-chlor	Ethyl-para-thion	Oxadiazon	Total PCB	Toxaphene
404.0							228.5**
414.0							
414.0							
601.0					1.2*		12.8*
616.0					3.2**		42.8*
618.0						96.6**	
650.0							
662.0						17.2*	
662.0						26.7*	
664.0							

* RCM = Resident California Mussel
RBM = Resident Bay Mussel
TCM = Transplanted California Mussel

* = Equals or exceeds EDL 85.
** = Equals or exceeds EDL 95.

= Equals or exceeds FDA Action Level.

Appendix E

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals Exceeding Selected Criteria (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	Total Chlor-dane	Chlor-pyrifos	Dacthal	Diazinon
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97			1.6**		
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96			0.7*		
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97			1.0*		
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97			1.7**		
725.0	Newport Bay/Crows Nest	TCM	01/17/96					
725.0	Newport Bay/Crows Nest	TCM	01/27/97			1.1*		
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97			0.9*		
726.6	Newport Bay/Mariners Drive	TCM	01/27/97			1.4*	1.0*	6.3**
750.0	Oceanside	RCM	01/18/96		5.1*			
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96					

Station Number	Total DDT	Dieldrin	Total Endo-sulfan	Endrin	beta-HCH	delta-HCH	Gamma-HCH	Heptachlor
708.0								
713.0								0.2**
713.0								
715.0								
725.0	159.1*							
725.0								
726.4								
726.6								
750.0								
882.7					0.5**	0.5*		

Station Number	Hepta-chlor-epoxide	Hexa-chloro-benzene	Methoxy-chlor	Ethyl-para-thion	Oxadiazon	Total PCB	Toxaphene
708.0							
713.0	0.3*						
713.0							
715.0							16.0*
725.0							
725.0					1.5*		23.3*
726.4					2.1*		23.5*
726.6					4.6**		31.9*
750.0							
882.7							

* RCM = Resident California Mussel
RBM = Resident Bay Mussel
TCM = Transplanted California Mussel

* = Equals or exceeds EDL 85.
** = Equals or exceeds EDL 95.

= Equals or exceeds FDA Action Level.

Appendix E

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals Exceeding Selected Criteria (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	Total Chlor-dane	Chlor-pyrifos	Dacthal	Diazinon
883.1	San Diego Bay/Chollas Creek	TCM	01/18/96					
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97			1.1*		
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96					
883.8	San Diego Bay/Switzer Creek	TCM	01/18/96					
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97					
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97					
886.0	San Diego Bay/NASSCO	TCM	01/18/96					
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97					
893.0	San Diego Bay/Laurel Street	TCM	01/18/96					
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97					

Station Number	Total DDT	Dieldrin	Total Endo-sulfan	Endrin	beta-HCH	delta-HCH	Gamma-HCH	Heptachlor
883.1					1.0**			
883.3								
883.6					0.9**			
883.8					0.4**			
885.1								
885.3								
886.0					0.5**			
888.0								
893.0								
894.0								

Station Number	Hepta-chlor-epoxide	Hexa-chloro-benzene	Methoxy-chlor	Ethyl-para-thion	Oxadiazon	Total PCB	Toxaphene
883.1							
883.3	0.2*						
883.6							
883.8							
885.1					3.8**		
885.3					2.6*		
886.0							
888.0					0.6*		
893.0					1.4*		
894.0		0.2**			2.7*	6741.6##	

* RCM = Resident California Mussel
RBM = Resident Bay Mussel
TCM = Transplanted California Mussel

* = Equals or exceeds EDL 85.
** = Equals or exceeds EDL 95.

= Equals or exceeds FDA Action Level.

APPENDIX F

Summary of 1995-97 Data
Organic Chemicals Exceeding
Maximum Tissue Residue levels (MTRLs) in
Ocean Waters
(ppb, wet weight)

APPENDIX F

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals Exceeding Maximum Tissue Residue Levels (MTRLs) In Ocean Waters

(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Total Chlor-dane	Total DDT	Dieldrin	Total PCB	Total PAH
2.0	Crescent City/STP Outfall	RCM	04/09/97	1.9		0.3	1.5	
3.0	Crescent City/Control	RCM	04/10/97	0.4		0.4		15.6
202.0	Bodega Head	RCM	09/11/95			0.4	2.1	
202.0	Bodega Head	RCM	08/29/96			0.6	4.8	
280.0	Russian River/S Goat Rock	RCM	03/21/97	1.0		0.9		20.8
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	2.3	13.6	2.5	3.5	17.2
414.0	Pacific Grove	RCM	03/07/96	1.5		1.6	2.7	
414.0	Pacific Grove	RCM	04/25/97	0.5		1.0	8.5	1.3
648.0	Malibu	RBM	01/17/96	7.4	41.7		13.0	
648.0	Malibu	RCM	11/25/96	2.7	16.1	0.4	8.7	
650.0	Santa Monica	RBM	01/17/96	9.1	57.8	0.4	22.2	
650.0	Santa Monica	RCM	11/25/96	4.6	15.0	0.8	13.1	38.9
662.0	Royal Palms	RCM	01/18/96	2.6	121.7	0.5	17.2	
662.0	Royal Palms	RCM	11/25/96	1.0	72.7	0.4	26.7	
664.0	Cabrillo Beach	RCM	01/18/96	1.5	72.1	0.3	11.2	
750.0	Oceanside	RCM	01/18/96	5.1	43.0	0.9	4.5	
750.0	Oceanside	RCM	09/30/96	1.0		0.4		8.2

* RCM = Resident California Mussel RBM = Resident Bay Mussel

APPENDIX G

Summary of 1995-97 Data
Organic Chemicals Exceeding
Maximum Tissue Residue levels (MTRLs) in
Enclosed Bays and Estuaries
(ppb, wet weight)

APPENDIX G

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals Exceeding Maximum Tissue Residue Levels (MTRLs) in Enclosed Bays and Estuaries

(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	Total Chlor-dane	p,p' DDT	p,p' DDE	Dieldrin	Total PCB	Toxa-phene
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97						5.8	
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96					0.8		
102.6	Humboldt Bay/J Street	RBM	04/17/96						9.0	
102.6	Humboldt Bay/J Street	TCM	04/10/97					0.8		
102.7	Humboldt Bay/H Street	GLY	04/17/96						84.8	
102.7	Humboldt Bay/H Street	PAC	04/17/96						63.3	
102.7	Humboldt Bay/H Street	RBM-s	04/17/96						73.0	
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97						5.5	
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97						10.7	
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97						13.4	
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97						5.4	
307.0	San Francisco Bay/Treasure Is	TCM-a	01/26/81		11.0			4.3	96.7	15.3
307.0	San Francisco Bay/Treasure Is	TCM-a	02/02/82		9.3			5.9	84.5	25.7
308.0	San Francisco Bay/Hunter's Point	TCM-a	01/26/81		10.7			7.3	71.4	17.8
309.0	San Mateo Bridge/8B	TCM-a	02/09/81		11.5			8.3	60.9	14.9
313.0	San Francisco Bay/near Redwood Cr	TCM-a	01/26/81		16.0			10.9	63.9	17.6
321.0	Dumbarton Bridge/Channel Marker 14	TCM-a	02/09/81	0.9	18.9			10.4	105.5	19.0
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96		9.9			2.6	5.3	
401.0	Santa Cruz Harbor	TCM	03/25/96					1.3	12.0	
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97				40.7	7.0	16.1	42.0
404.0	Sandholdt Bridge	TCM	02/16/96		15.1	105.1	259.9	32.1	34.2	232.1
404.0	Sandholdt Bridge	TCM	03/04/97		15.2	91.1	235.5	27.6	32.2	228.5
601.0	LA Harbor/National Steel	TCM	01/18/96				33.0		67.5	
601.0	LA Harbor/National Steel	TCM	01/28/97					0.8	144.0	12.8
605.0	LA Harbor/Cabrillo Pier	TCM	01/18/96				94.2	0.7	54.3	
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96						77.4	
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97		8.7		34.0	1.0	56.7	42.8
618.0	LA Harbor/Angels Gate	RCM	01/18/96				133.6		96.6	
664.0	Cabrillo Beach	RCM	01/18/96				52.9		11.2	
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97		9.0		49.7	1.4	35.8	
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96		16.2		33.8	1.5	25.2	
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97		8.5			1.3	12.9	
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96		13.8			1.0	22.1	
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97		9.7			1.4	32.3	16.0
723.4	Newport Bay/Turning Basin	TCM	01/17/96					0.8	19.0	
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96		9.3		57.6	1.2	18.5	

* RCM = Resident California Mussel
TCM = Transplanted California Mussel (a = archive)
RBM = Resident Bay Mussel (s = small size)
PAC = Shore Crab (pachygrapsus crassipes)
GYL = Sand Worm (Glycera spp.)

APPENDIX G

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals Exceeding Maximum Tissue Residue Levels (MTRLs) in Enclosed Bays and Estuaries

(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	Total Chlor-dane	p,p' DDT	p,p' DDE	Dieldrin	Total PCB	Toxa-phene
725.0	Newport Bay/Crows Nest	TCM	01/17/96		10.1	94.6	52.9	1.3	148.5	
725.0	Newport Bay/Crows Nest	TCM	01/27/97				47.2	2.1	131.7	23.3
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96					0.9	102.0	
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97					1.5	57.4	23.5
726.6	Newport Bay/Mariners Drive	TCM	01/27/97					1.8	10.4	31.9
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97						7.6	
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96						90.9	
883.1	San Diego Bay/Chollas Creek	TCM	01/18/96						38.7	
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97					0.8	31.3	
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97						74.3	
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97		14.5			1.5	65.7	
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97						74.1	
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96						92.5	
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97						54.9	
883.8	San Diego Bay/Switzer Creek	TCM	01/18/96						32.5	
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97						36.2	
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97		10.4			0.9	119.3	
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97		8.6			0.9	102.9	
886.0	San Diego Bay/NASSCO	TCM	01/18/96						59.5	
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97						48.7	
893.0	San Diego Bay/Laurel Street	TCM	01/18/96						111.1	
893.5	San Diego Bay/B Street Pier	TCM	01/18/96						60.8	
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97		9.3			0.7	6741.6	

* RCM = Resident California Mussel
TCM = Transplanted California Mussel (a = archive)
RBM = Resident Bay Mussel (s = small size)
PAC = Shore Crab (pachygrapsus crassipes)
GYL = Sand Worm (Glycera spp.)

APPENDIX H

Summary of 1995-97 Data
Trace Elements Exceeding the
Median International Standards (MIS)
(ppm, wet weight)

APPENDIX H

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements Excdeeding the Median International Standards (MIS)

(ppm, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Arsenic (1.4)	Cadmium (1.0)	Chromium (1.0)	Copper (20.0)	Mercury (0.5)	Lead (2.0)	Selenium (0.3)	Zinc (70.0)
1.0	Crescent City Harbor	RCM	04/09/97			1.1					
2.0	Crescent City/STP Outfall	RCM	04/09/97			2.3					
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97			1.2					
3.0	Crescent City/Control	RCM	04/10/97			1.5					
100.0	Mad River Slough	OYS	04/10/97				30.0				99.0
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96			2.0					
102.6	Humboldt Bay/J Street	RBM	04/17/96			4.9					
102.6	Humboldt Bay/J Street	RBM-s	04/17/96	1.7		4.1				0.31	
102.6	Humboldt Bay/J Street	TCM	04/10/97			1.3					
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	2.8		1.8			18.1	0.32	77.0
103.3	Humboldt Bay/E Street	TCM	04/10/97			2.3					
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97			1.2					
202.0	Bodega Head	RCM	09/11/95	1.6	1.5						
202.0	Bodega Head	RCM	08/29/96	1.6	1.4					0.38	
203.0	Tomales Bay	RBM	04/14/97			1.6					
203.0	Tomales Bay	TCM	04/14/97			1.1					
203.7	Tomales Bay/Walker Creek Mouth 3	TCM	04/14/97			1.0					
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97		1.6						
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97			1.1					
205.5	Bodega Bay/Back Marsh	RBM	03/21/97			1.1					
210.1	Walker Creek/Mine Creek	TFC	01/17/97					0.79			
280.0	Russian River/S Goat Rock	RCM	03/21/97		1.5	1.9					
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96		1.8	12.0					71.0
401.0	Santa Cruz Harbor	TCM	03/25/96		1.2	2.2					
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97		1.7	1.5					
404.0	Sandholdt Bridge	TCM	02/16/96		1.4						
404.0	Sandholdt Bridge	TCM	03/04/97		1.1	1.2					
414.0	Pacific Grove	RCM	03/07/96		1.2						
414.0	Pacific Grove	RCM	04/25/97	1.5							
420.3	Monterey Harbor/C G Jetty/Inner	TCM	02/13/96						6.9		
420.4	Monterey Harbor/C G Jetty/Inner 2	TCM	02/13/96						2.0		
421.0	Monterey Harbor/Slag Pile	TCM	02/13/96						10.0		
601.0	LA Harbor/National Steel	TCM	01/18/96		1.4	1.7					
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96		1.5	2.7					
648.0	Malibu	RBM	01/17/96			1.6					
662.0	Royal Palms	RCM	01/18/96			2.1					
664.0	Cabrillo Beach	RCM	01/18/96			2.0					

* RCM = Resident California Mussel
TCM = Transplanted California Mussel
RBM = Resident Bay Mussel (s = small size)
TFC = Transplanted Fresh Water Clam
OYS = Oyster (Crassostrea gigas)
( ) Median International Standard in Parentheses.

APPENDIX H

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements Excdeeding the Median International Standards (MIS)

(ppm, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Arsenic (1.4)	Cadmium (1.0)	Chromium (1.0)	Copper (20.0)	Mercury (0.5)	Lead (2.0)	Selenium (0.3)	Zinc (70.0)
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97	1.5		1.7					
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96		1.4						
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96	1.4	1.8	1.0					76.0
723.4	Newport Bay/Turning Basin	TCM	01/17/96		1.5	1.0					
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96	1.4	1.3						
725.0	Newport Bay/Crows Nest	TCM	01/17/96		1.4	2.2					84.0
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96		1.6	1.6					100.0
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97		1.2	2.0					77.0
726.6	Newport Bay/Mariners Drive	TCM	01/27/97		1.1						
750.0	Oceanside	RCM	09/30/96							0.36	
882.2	24Th St Maritime Terminal/North	TCM	01/18/96		1.4	1.1					85.0
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96		1.2	1.9					
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97		1.1						
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97		1.2	1.1					
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97			1.1					
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96		1.2	3.2					
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97			1.1				0.49	73.0
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97			1.3					
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97						2.8		87.0
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97			1.2			2.3		76.0
886.0	San Diego Bay/NASSCO	TCM	01/18/96		1.9	3.1					
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97		1.2	1.7			3.5	0.36	

* RCM = Resident California Mussel TFC = Transplanted Fresh Water Clam ( ) Median International Standard in Parentheses.
TCM = Transplanted California Mussel
RBM = Resident Bay Mussel

APPENDIX I

Summary of 1995-97 Data

Trace Elements Exceeding Elevated Data Levels (EDL)

(ppm, wet weight)

APPENDIX I

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements Exceeding Elevated Data Levels (EDL)

(ppm, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
1.0	Crescent City Harbor	RCM	04/09/97	120.0*			1.10**	6.60**		2.70*					58.0**
2.0	Crescent City/STP Outfall	RCM	04/09/97	160.0**			2.30**	2.00*		2.50*	0.085*				
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	120.0*			1.20**	2.30**		2.60*					
3.0	Crescent City/Control	RCM	04/10/97	110.0*			1.50**	2.00*		2.20*					
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	612.0**			1.98**			8.10**		1.48**			
102.6	Humboldt Bay/J Street	RBM	04/17/96	263.0**			4.94**					3.60**			
102.6	Humboldt Bay/J Street	RBM-s	04/17/96	599.0**			4.11**			8.00**		3.39**			43.0*
102.6	Humboldt Bay/J Street	TCM	04/10/97	280.0**			1.30*								
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	713.0**			1.84**	3.60*	18.09**	23.70**		1.52**			77.0**
103.3	Humboldt Bay/E Street	TCM	04/10/97	350.0**			2.30**								
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	290.0**			1.20*			4.90*					
202.0	Bodega Head	RCM	09/11/95			1.50*	0.60*	4.50**				0.76*			
203.0	Tomales Bay	RBM	04/14/97	310.0**			1.60**			11.00**					
203.0	Tomales Bay	TCM	04/14/97	240.0**			1.10*			30.00**					
203.3	Tomales Bay/Walker Creek Mouth 1	TCM	04/14/97	210.0*			0.87*								
203.5	Tomales Bay/Walker Creek Mouth 2	TCM	04/14/97	180.0*			0.82*								
203.7	Tomales Bay/Walker Creek Mouth 3	TCM	04/14/97	210.0*			1.00*								
203.9	Tomales Bay/Nicks Cove	TCM	04/14/97				0.81*								
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	210.0*		1.60*	0.80*								
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97					5.40**			0.054*				
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	250.0**			1.10*								
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	310.0**			1.10*								
210.1	Walker Creek/Mine Creek	TFC	01/17/97								0.790**				
210.3	Walker Creek/mid stream	TFC	01/17/97								0.220**				
211.1	Lagunitas Creek/Bridge 1	TFC	01/17/97								0.087*				
211.3	Lagunitas Creek/Bridge 2	TFC	01/17/97								0.082*				
280.0	Russian River/S Goat Rock	RCM	03/21/97	280.0**		1.50*	1.90**	1.70*		4.40**					
329.0	Guadalupe Creek/Almaden Expressway	TFC	12/16/96								0.090*				
329.2	Guadalupe Creek/Hicks Road	TFC	12/16/96								0.110**				
329.4	Alamitos Creek/Almaden Road	TFC	12/16/96								0.110**				
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	150.0**				2.60**							
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96	240.0**		1.80*	12.00**	9.70*			0.063*				71.0*
401.0	Santa Cruz Harbor	TCM	03/25/96	170.0*			2.20**	7.50*							
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	270.0**		1.70*	1.50*					1.50**			
404.0	Sandholdt Bridge	TCM	02/16/96	220.0*			0.90*			12.00**					
404.0	Sandholdt Bridge	TCM	03/04/97	330.0**			1.20*					1.10**			
414.0	Pacific Grove	RCM	03/07/96	82.0*			0.91*								
414.0	Pacific Grove	RCM	04/25/97					2.30**							
420.3	Monterey Harbor/C G Jetty/Inner	TCM	02/13/96						6.90**						

* RCM = Resident California Mussel
TCM = Transplanted California Mussel
RBM = Resident Bay Mussel (s = small size)

TFC = Transplanted Freshwater Clam

* = Equals or exceeds EDL 85.
** = Equals or exceeds EDL 95.

APPENDIX I

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements Exceeding Elevated Data Levels (EDL)

(ppm, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
420.4	Monterey Harbor/C G Jetty/Inner 2	TCM	02/13/96						2.00*						
420.5	Monterey Harbor/C G Jetty/Inner 3	TCM	02/13/96						1.80*						
421.0	Monterey Harbor/Slag Pile	TCM	02/13/96						10.00**						
601.0	LA Harbor/National Steel	TCM	01/18/96				1.70**								
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96				2.70**								
648.0	Malibu	RBM	01/17/96	170.0*			1.60**								
648.0	Malibu	RCM	11/25/96	140.0**				1.60*		2.90**					
650.0	Santa Monica	RBM	01/17/96	190.0*			0.87*							0.081*	
650.0	Santa Monica	RCM	11/25/96	170.0**			0.70*	1.90*		3.10**					
662.0	Royal Palms	RCM	01/18/96				2.10**								
662.0	Royal Palms	RCM	11/25/96				0.99*								
664.0	Cabrillo Beach	RCM	01/18/96	82.0*			2.00**							0.720*	
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97	300.0**			1.70**					1.40**			
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96				0.89*					1.10**			
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97	170.0*											
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96			1.80*	1.00*					1.30**			76.0*
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97	180.0*						5.30*					62.0*
723.4	Newport Bay/Turning Basin	TCM	01/17/96				1.00*					1.00*			
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96	180.0*			0.95*				0.120**	0.92*			
725.0	Newport Bay/Crows Nest	TCM	01/17/96				2.20**	13.00**			0.076*	2.20**			84.0**
725.0	Newport Bay/Crows Nest	TCM	01/27/97					9.70*							64.0*
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96			1.60*	1.60*	15.00**		7.30**	0.078*	1.80**			100.0**
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97				2.00**	15.00**		6.00*	0.057	1.80**			77.0*
726.6	Newport Bay/Mariners Drive	TCM	01/27/97				0.73*					0.86*			
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	220.0*			0.87*	8.90*							
750.0	Oceanside	RCM	09/30/96	260.0**			0.89*	2.30**		3.30**		0.65*			
882.2	24Th St Maritime Terminal/North	TCM	01/18/96	220.0*			1.10*	9.10*		8.80**					85.0**
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96				1.90**	7.60*							60.0*
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97				0.91*								
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	160.0*			0.82*	5.80*		6.80**					58.0*
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97				1.10*					0.86*			68.0*
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97				1.10*								61.0*
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96	280.0**			3.20**	6.90*							67.0*
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	180.0*			1.10*	7.90*		5.60*					73.0*
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97				1.30*								
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	170.0*					2.80**	4.70*					87.0**
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	220.0*			1.20*	7.10*	2.30*	7.00**					76.0*
886.0	San Diego Bay/NASSCO	TCM	01/18/96			1.90*	3.10**	7.10*							66.0*
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97					2.30*		5.20*					
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	140.0*			1.70**	5.50*	3.50**						61.0*

* RCM = Resident California Mussel
TCM = Transplanted California Mussel
RBM = Resident Bay Mussel

* = Equals or exceeds EDL 85.
** = Equals or exceeds EDL 95.

APPENDIX J

Summary of 1995-97 Data
Trace Elements in Mussel, Clam, Oyster, Shore Crab, and Sand Worm
(ppm, wet weight)

APPENDIX J

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements in Mussel, Clam, Oyster, Shore Crab, and Sand Worm (ppm, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
1.0	Crescent City Harbor	RCM	04/09/97	120.0	NA	0.33	1.10	6.60	0.16	2.70	0.045	NA	NA	0.014	58.0
2.0	Crescent City/STP Outfall	RCM	04/09/97	160.0	NA	0.60	2.30	2.00	0.28	2.50	0.085	NA	NA	0.350	25.0
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	120.0	NA	0.37	1.20	2.30	0.18	2.60	0.029	NA	NA	0.013	30.0
3.0	Crescent City/Control	RCM	04/10/97	110.0	NA	0.87	1.50	2.00	0.10	2.20	0.039	NA	NA	0.004	27.0
100.0	Mad River Slough	OYS	04/10/97	340.0	NA	0.55	0.84	30.00	0.06	12.00	0.041	NA	NA	0.180	99.0
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	508.0	ND	0.03	2.38	21.60	0.43	51.20	0.057	1.61	ND	0.192	32.0
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	147.0	2.0	0.05	0.61	1.10	0.11	51.40	0.003	0.64	0.11	0.023	13.0
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	714.0	ND	0.03	2.44	17.10	2.96	48.20	0.019	2.27	ND	0.073	30.0
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	612.0	1.2	0.33	1.98	1.50	0.35	8.10	0.031	1.48	0.19	0.017	37.0
102.6	Humboldt Bay/J Street	GLY	04/17/96	423.0	0.1	0.06	2.81	1.90	0.64	7.50	0.018	2.25	0.12	0.019	23.0
102.6	Humboldt Bay/J Street	PAC	04/17/96	361.0	0.7	0.06	1.81	24.10	0.47	24.00	0.051	1.23	ND	0.089	31.0
102.6	Humboldt Bay/J Street	RBM	04/17/96	263.0	1.3	0.72	4.94	0.70	0.19	3.80	0.027	3.60	0.22	0.004	35.0
102.6	Humboldt Bay/J Street	RBM-s	04/17/96	599.0	1.7	0.33	4.11	1.00	0.44	8.00	0.047	3.39	0.31	0.013	43.0
102.6	Humboldt Bay/J Street	TCM	04/10/97	280.0	NA	0.75	1.30	2.60	0.27	4.10	0.034	NA	NA	0.005	18.0
102.7	Humboldt Bay/H Street	GLY	04/17/96	54.0	10.1	0.30	2.32	13.40	1.86	3.40	0.018	1.95	0.05	0.165	58.0
102.7	Humboldt Bay/H Street	PAC	04/17/96	457.0	0.5	0.16	2.55	38.30	11.73	46.40	0.037	1.63	ND	0.048	57.0
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	713.0	2.8	0.25	1.84	3.60	18.09	23.70	0.022	1.52	0.32	0.027	77.0
103.3	Humboldt Bay/E Street	TCM	04/10/97	350.0	NA	0.75	2.30	2.30	0.25	4.60	0.034	NA	NA	0.003	25.0
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	290.0	NA	0.68	1.20	2.60	0.23	4.90	0.028	NA	NA	0.014	24.0
202.0	Bodega Head	RCM	09/11/95	26.0	1.6	1.50	0.60	4.50	0.15	1.10	0.021	0.76	0.26	0.009	24.0
202.0	Bodega Head	RCM	08/29/96	28.0	1.6	1.40	0.40	0.94	0.14	1.00	0.025	0.39	0.38	0.005	22.0
203.0	Tomales Bay	RBM	04/14/97	310.0	NA	0.68	1.60	2.00	0.07	11.00	0.040	NA	NA	0.010	18.0
203.0	Tomales Bay	TCM	04/14/97	240.0	NA	0.60	1.10	1.40	0.20	30.00	0.036	NA	NA	0.015	29.0
203.1	Tomales Bay/Vincent Landing	TCM	04/14/97	48.0	NA	0.72	0.67	1.70	0.16	1.60	0.033	NA	NA	0.011	31.0
203.3	Tomales Bay/Walker Creek Mouth 1	TCM	04/14/97	210.0	NA	0.75	0.87	1.70	0.22	3.60	0.047	NA	NA	0.028	33.0
203.5	Tomales Bay/Walker Creek Mouth 2	TCM	04/14/97	180.0	NA	0.73	0.82	1.70	0.22	3.40	0.044	NA	NA	0.011	34.0
203.7	Tomales Bay/Walker Creek Mouth 3	TCM	04/14/97	210.0	NA	0.70	1.00	1.70	0.24	4.60	0.055	NA	NA	0.016	29.0
203.9	Tomales Bay/Nicks Cove	TCM	04/14/97	93.0	NA	0.80	0.81	2.00	0.22	2.00	0.036	NA	NA	0.011	31.0
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	210.0	NA	1.60	0.80	2.80	0.53	2.10	0.054	NA	NA	ND	50.0
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	150.0	NA	0.77	0.72	5.40	0.10	2.00	0.054	NA	NA	0.003	40.0
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	250.0	NA	0.89	1.10	2.50	0.37	2.50	0.048	NA	NA	0.004	38.0
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	310.0	NA	0.75	1.10	2.00	0.14	2.70	0.049	NA	NA	0.004	33.0
210.1	Walker Creek/Mine Creek	TFC	01/17/97	NA	NA	NA	NA	NA	NA	NA	0.790	NA	NA	NA	NA
210.3	Walker Creek/mid stream	TFC	01/17/97	NA	NA	NA	NA	NA	NA	NA	0.220	NA	NA	NA	NA
211.1	Lagunitas Creek/Bridge 1	TFC	01/17/97	NA	NA	NA	NA	NA	NA	NA	0.087	NA	NA	NA	NA
211.3	Lagunitas Creek/Bridge 2	TFC	01/17/97	NA	NA	NA	NA	NA	NA	NA	0.082	NA	NA	NA	NA
280.0	Russian River/S Goat Rock	RCM	03/21/97	280.0	NA	1.50	1.90	1.70	0.15	4.40	0.039	NA	NA	0.015	32.0
329.0	Guadalupe Creek/Almaden Expressway	TFC	12/16/96	NA	NA	NA	NA	NA	NA	NA	0.090	NA	NA	NA	NA
329.2	Guadalupe Creek/Hicks Road	TFC	12/16/96	NA	NA	NA	NA	NA	NA	NA	0.110	NA	NA	NA	NA
329.4	Alamitos Creek/Almaden Road	TFC	12/16/96	NA	NA	NA	NA	NA	NA	NA	0.110	NA	NA	NA	NA

* RCM = Resident California Mussel
TCM = Transplanted California Mussel
RBM = Resident Bay Mussel (s = small size)
TFC = Transplanted Freshwater Clam
OYS = Oyster (Crassostrea gigas)
PAC = Shore Crab (Pachygrapsus crassipes)
GYL = Sand Worm (Glycera spp.)
NA = Not Analyzed
ND = Not Detected

APPENDIX J

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements in Mussel, Clam, Oyster, Shore Crab, and Sand Worm (ppm, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	150.0	NA	0.77	0.53	2.60	0.13	1.80	0.015	NA	NA	0.021	27.0
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96	240.0	NA	1.80	12.00	9.70	0.62	3.30	0.063	NA	NA	0.012	71.0
401.0	Santa Cruz Harbor	TCM	03/25/96	170.0	NA	1.20	2.20	7.50	0.51	1.90	0.055	NA	NA	0.010	54.0
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	270.0	NA	1.70	1.50	2.60	0.33	2.70	0.046	1.50	NA	0.009	34.0
404.0	Sandholdt Bridge	TCM	02/16/96	220.0	NA	1.40	0.90	1.60	0.33	12.00	0.050	NA	NA	0.002	43.0
404.0	Sandholdt Bridge	TCM	03/04/97	330.0	0.8	1.10	1.20	2.30	0.42	3.60	0.046	1.10	0.29	0.005	34.0
414.0	Pacific Grove	RCM	03/07/96	82.0	NA	1.20	0.91	1.00	0.24	1.40	0.038	NA	NA	0.026	32.0
414.0	Pacific Grove	RCM	04/25/97	28.0	1.5	0.98	0.36	2.30	0.25	0.85	0.018	0.55	0.08	0.011	29.0
420.3	Monterey Harbor/C G Jetty/Inner	TCM	02/13/96	NA	NA	NA	NA	NA	6.90	NA	NA	NA	NA	NA	NA
420.4	Monterey Harbor/C G Jetty/Inner 2	TCM	02/13/96	NA	NA	NA	NA	NA	2.00	NA	NA	NA	NA	NA	NA
420.5	Monterey Harbor/C G Jetty/Inner 3	TCM	02/13/96	NA	NA	NA	NA	NA	1.80	NA	NA	NA	NA	NA	NA
421.0	Monterey Harbor/Slag Pile	TCM	02/13/96	NA	NA	NA	NA	NA	10.00	NA	NA	NA	NA	NA	NA
601.0	LA Harbor/National Steel	TCM	01/18/96	120.0	NA	1.40	1.70	3.30	0.91	3.30	0.037	NA	NA	0.012	46.0
601.0	LA Harbor/National Steel	TCM	01/28/97	120.0	1.2	0.75	0.39	2.70	0.97	3.10	0.029	NA	NA	0.008	51.0
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96	75.0	NA	1.50	2.70	3.70	1.10	3.10	0.032	NA	NA	0.016	44.0
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	90.0	1.1	0.80	0.60	2.10	1.00	2.60	0.023	NA	NA	0.007	43.0
648.0	Malibu	RBM	01/17/96	170.0	NA	0.46	1.60	1.10	0.09	3.60	0.011	NA	NA	0.016	17.0
648.0	Malibu	RCM	11/25/96	140.0	NA	0.33	0.37	1.60	0.11	2.90	0.009	NA	NA	0.023	22.0
650.0	Santa Monica	RBM	01/17/96	190.0	NA	0.17	0.87	1.10	0.22	3.00	0.015	NA	NA	0.081	19.0
650.0	Santa Monica	RCM	11/25/96	170.0	NA	0.09	0.70	1.90	0.55	3.10	0.012	NA	NA	0.410	26.0
662.0	Royal Palms	RCM	01/18/96	63.0	NA	0.56	2.10	1.30	0.29	1.90	0.024	NA	NA	0.310	29.0
662.0	Royal Palms	RCM	11/25/96	58.0	NA	0.34	0.99	1.20	0.31	1.90	0.025	NA	NA	0.270	29.0
664.0	Cabrillo Beach	RCM	01/18/96	82.0	NA	0.51	2.00	1.40	0.30	2.10	0.026	NA	NA	0.720	27.0
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97	300.0	1.5	0.69	1.70	1.90	0.82	4.50	0.018	1.40	0.28	0.008	37.0
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96	110.0	1.1	1.40	0.89	1.40	0.52	2.50	0.031	1.10	0.24	0.009	41.0
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97	170.0	1.3	0.93	0.55	2.10	0.89	3.90	0.036	0.57	0.25	0.007	49.0
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96	100.0	1.4	1.80	1.00	2.60	1.30	4.10	0.036	1.30	0.27	0.010	76.0
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97	180.0	1.3	0.74	0.65	2.90	1.50	5.30	0.025	0.63	0.29	0.008	62.0
723.4	Newport Bay/Turning Basin	TCM	01/17/96	81.0	1.2	1.50	1.00	3.00	0.58	2.80	0.038	1.00	0.20	0.006	50.0
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96	180.0	1.4	1.30	0.95	2.60	0.44	3.00	0.120	0.92	0.29	0.006	53.0
725.0	Newport Bay/Crows Nest	TCM	01/17/96	86.0	1.2	1.40	2.20	13.00	0.97	3.80	0.076	2.20	0.20	0.008	84.0
725.0	Newport Bay/Crows Nest	TCM	01/27/97	110.0	1.2	0.82	0.31	9.70	0.63	3.30	0.051	0.25	0.27	0.003	64.0
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96	52.0	1.3	1.60	1.60	15.00	0.81	7.30	0.078	1.80	0.24	0.007	100.0
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97	81.0	1.3	1.20	2.00	15.00	0.73	6.00	0.057	1.80	0.19	ND	77.0
726.6	Newport Bay/Mariners Drive	TCM	01/27/97	89.0	1.1	1.10	0.73	0.79	0.29	3.30	0.024	0.86	0.22	0.001	35.0
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	220.0	1.3	0.76	0.87	8.90	0.44	1.90	0.030	0.75	ND	ND	51.0
750.0	Oceanside	RCM	09/30/96	260.0	0.9	0.23	0.89	2.30	0.12	3.30	0.009	0.65	0.36	0.009	22.0
882.2	24Th St Maritime Terminal/North	TCM	01/18/96	220.0	NA	1.40	1.10	9.10	0.69	8.80	0.047	NA	NA	0.052	85.0
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96	89.0	NA	1.20	1.90	7.60	0.58	2.40	0.048	NA	NA	0.036	60.0
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	130.0	1.2	1.10	0.91	3.60	1.20	2.50	0.035	0.71	0.22	0.017	54.0

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PAC = Shore Crab (Pachygrapsus crassipes)
GYL = Sand Worm (Glycera spp.)
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APPENDIX J

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements in Mussel, Clam, Oyster, Shore Crab, and Sand Worm (ppm, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	160.0	1.0	0.73	0.82	5.80	0.81	6.80	0.028	0.74	ND	0.020	58.0
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	130.0	1.2	1.20	1.10	3.60	1.20	3.60	0.030	0.86	0.24	0.016	68.0
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	120.0	1.3	0.85	1.10	4.40	0.91	3.60	0.032	0.67	0.28	0.017	61.0
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96	280.0	NA	1.20	3.20	6.90	1.10	3.70	0.031	NA	NA	0.051	67.0
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	180.0	1.2	0.71	1.10	7.90	0.81	5.60	0.028	0.83	0.49	0.022	73.0
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	72.0	1.0	0.90	1.30	2.40	0.54	2.10	0.026	0.46	ND	0.009	41.0
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	170.0	1.1	0.88	0.56	5.20	2.80	4.70	0.024	0.45	0.29	0.022	87.0
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	220.0	1.0	0.82	1.20	7.10	2.30	7.00	0.029	0.79	0.26	0.021	76.0
886.0	San Diego Bay/NASSCO	TCM	01/18/96	110.0	NA	1.90	3.10	7.10	0.74	3.60	0.031	NA	NA	0.026	66.0
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	130.0	0.8	0.69	0.44	2.30	0.52	5.20	0.019	0.31	0.21	0.010	37.0
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	140.0	1.2	1.20	1.70	5.50	3.50	2.10	0.024	0.54	0.36	0.051	61.0

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APPENDIX K

Summary of 1995-97 Data
Trace Elements in Mussel, Clam, Oyster, Shore Crab, and Sand Worm
(ppm, dry weight)

APPENDIX K

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements in Mussel, Clam, Oyster, Shore Crab, and Sand Worm (ppm, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
1.0	Crescent City Harbor	RCM	04/09/97	967.0	NA	2.61	9.00	52.7	1.31	21.7	0.357	NA	NA	0.110	467.0
2.0	Crescent City/STP Outfall	RCM	04/09/97	1170.0	NA	4.50	17.40	14.9	2.13	18.8	0.636	NA	NA	2.650	185.0
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	736.0	NA	2.21	7.09	13.7	1.06	15.9	0.173	NA	NA	0.078	178.0
3.0	Crescent City/Control	RCM	04/10/97	748.0	NA	5.72	9.73	13.1	0.63	14.7	0.258	NA	NA	0.024	175.0
100.0	Mad River Slough	OYS	04/10/97	2260.0	NA	3.67	5.60	198.0	0.42	81.6	0.271	NA	NA	1.230	658.0
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	1540.0	ND	0.09	7.20	65.4	1.30	155.0	0.174	4.9	ND	0.582	96.0
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	1280.0	17.3	0.41	5.30	9.5	0.92	447.0	0.023	5.5	0.9	0.198	114.0
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	2340.0	ND	0.11	8.00	56.2	9.72	158.0	0.063	7.4	ND	0.238	99.0
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	5280.0	10.2	2.87	17.10	13.3	3.05	69.8	0.270	12.8	1.7	0.148	321.0
102.6	Humboldt Bay/J Street	GLY	04/17/96	3180.0	1.1	0.47	21.10	14.5	4.84	56.6	0.138	16.9	0.9	0.141	171.0
102.6	Humboldt Bay/J Street	PAC	04/17/96	1020.0	2.0	0.18	5.10	68.1	1.33	67.8	0.144	3.5	ND	0.252	88.0
102.6	Humboldt Bay/J Street	RBM	04/17/96	2800.0	14.3	7.65	52.60	7.6	1.98	40.7	0.288	38.3	2.3	0.043	374.0
102.6	Humboldt Bay/J Street	RBM-s	04/17/96	4870.0	13.8	2.67	33.40	8.4	3.60	65.0	0.386	27.6	2.5	0.107	348.0
102.6	Humboldt Bay/J Street	TCM	04/10/97	1570.0	NA	4.29	7.31	14.7	1.54	23.2	0.195	NA	NA	0.031	102.0
102.7	Humboldt Bay/H Street	GLY	04/17/96	296.0	55.9	1.64	12.80	74.2	10.30	18.8	0.099	10.8	0.3	0.914	321.0
102.7	Humboldt Bay/H Street	PAC	04/17/96	1360.0	1.6	0.49	7.60	114.0	34.90	138.0	0.109	4.8	ND	0.143	170.0
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	5990.0	23.7	2.14	15.50	30.2	152.00	199.0	0.188	12.8	2.7	0.225	651.0
103.3	Humboldt Bay/E Street	TCM	04/10/97	1940.0	NA	4.20	13.00	12.7	1.41	25.6	0.187	NA	NA	0.018	142.0
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	1770.0	NA	4.19	7.37	15.9	1.38	29.9	0.172	NA	NA	0.085	144.0
202.0	Bodega Head	RCM	09/11/95	150.0	9.4	8.70	3.50	26.0	0.90	6.6	0.120	4.4	1.5	0.054	140.0
202.0	Bodega Head	RCM	08/29/96	163.0	9.6	8.11	2.32	5.5	0.81	6.0	0.145	2.3	2.2	0.028	126.0
203.0	Tomales Bay	RBM	04/14/97	2850.0	NA	6.38	14.60	18.7	0.63	106.0	0.373	NA	NA	0.095	168.0
203.0	Tomales Bay	TCM	04/14/97	1190.0	NA	3.01	5.54	7.2	1.00	150.0	0.184	NA	NA	0.077	147.0
203.1	Tomales Bay/Vincent Landing	TCM	04/14/97	281.0	NA	4.19	3.90	10.0	0.94	9.0	0.192	NA	NA	0.062	179.0
203.3	Tomales Bay/Walker Creek Mouth 1	TCM	04/14/97	1230.0	NA	4.31	5.05	9.8	1.29	20.6	0.270	NA	NA	0.164	193.0
203.5	Tomales Bay/Walker Creek Mouth 2	TCM	04/14/97	1060.0	NA	4.45	4.98	10.3	1.32	20.7	0.267	NA	NA	0.066	203.0
203.7	Tomales Bay/Walker Creek Mouth 3	TCM	04/14/97	1270.0	NA	4.19	6.06	10.2	1.40	27.4	0.328	NA	NA	0.097	170.0
203.9	Tomales Bay/Nicks Cove	TCM	04/14/97	514.0	NA	4.42	4.48	11.0	1.23	11.0	0.200	NA	NA	0.061	173.0
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	1410.0	NA	10.70	5.44	19.1	3.57	14.4	0.364	NA	NA	ND	339.0
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	1130.0	NA	5.98	5.60	42.1	0.81	15.8	0.419	NA	NA	0.020	309.0
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	1600.0	NA	5.57	6.75	15.9	2.34	16.0	0.300	NA	NA	0.023	236.0
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	2000.0	NA	4.87	7.29	12.8	0.94	17.7	0.317	NA	NA	0.024	216.0
210.1	Walker Creek/Mine Creek	TFC	01/17/97	NA	NA	NA	NA	NA	NA	NA	5.690	NA	NA	NA	NA
210.3	Walker Creek/mid stream	TFC	01/17/97	NA	NA	NA	NA	NA	NA	NA	1.500	NA	NA	NA	NA
211.1	Lagunitas Creek/Bridge 1	TFC	01/17/97	NA	NA	NA	NA	NA	NA	NA	0.487	NA	NA	NA	NA
211.3	Lagunitas Creek/Bridge 2	TFC	01/17/97	NA	NA	NA	NA	NA	NA	NA	0.459	NA	NA	NA	NA
280.0	Russian River/S Goat Rock	RCM	03/21/97	1910.0	NA	10.10	13.20	11.6	1.03	30.6	0.266	NA	NA	0.100	222.0
329.0	Guadalupe Creek/Almaden Expressway	TFC	12/16/96	NA	NA	NA	NA	NA	NA	NA	0.705	NA	NA	NA	NA
329.2	Guadalupe Creek/Hicks Road	TFC	12/16/96	NA	NA	NA	NA	NA	NA	NA	0.748	NA	NA	NA	NA
329.4	Alamitos Creek/Almaden Road	TFC	12/16/96	NA	NA	NA	NA	NA	NA	NA	0.898	NA	NA	NA	NA

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APPENDIX K

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements in Mussel, Clam, Oyster, Shore Crab, and Sand Worm (ppm, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	860.0	NA	4.45	3.06	14.7	0.75	10.6	0.085	NA	NA	0.120	155.0
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96	2400.0	NA	18.00	120.00	96.0	6.10	33.0	0.620	NA	NA	0.120	700.0
401.0	Santa Cruz Harbor	TCM	03/25/96	1500.0	NA	11.00	19.00	66.0	4.50	17.0	0.490	NA	NA	0.087	480.0
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	1620.0	NA	10.40	9.08	15.7	1.94	15.9	0.271	8.8	NA	0.053	205.0
404.0	Sandholdt Bridge	TCM	02/16/96	1500.0	NA	9.50	6.10	11.0	2.20	84.0	0.340	NA	NA	0.017	290.0
404.0	Sandholdt Bridge	TCM	03/04/97	2400.0	5.8	7.88	8.69	16.5	3.06	26.3	0.335	8.1	2.1	0.038	246.0
414.0	Pacific Grove	RCM	03/07/96	510.0	NA	7.30	5.70	6.5	1.50	8.5	0.240	NA	NA	0.160	200.0
414.0	Pacific Grove	RCM	04/25/97	213.0	11.6	7.35	2.71	17.0	1.85	6.4	0.133	4.1	0.6	0.080	218.0
420.3	Monterey Harbor/C G Jetty/Inner	TCM	02/13/96	NA	NA	NA	NA	NA	13.00	NA	NA	NA	NA	NA	NA
420.4	Monterey Harbor/C G Jetty/Inner 2	TCM	02/13/96	NA	NA	NA	NA	NA	11.00	NA	NA	NA	NA	NA	NA
420.5	Monterey Harbor/C G Jetty/Inner 3	TCM	02/13/96	NA	NA	NA	NA	NA	9.30	NA	NA	NA	NA	NA	NA
421.0	Monterey Harbor/Slag Pile	TCM	02/13/96	NA	NA	NA	NA	NA	28.00	NA	NA	NA	NA	NA	NA
601.0	LA Harbor/National Steel	TCM	01/18/96	970.0	NA	11.00	14.00	27.0	7.30	27.0	0.300	NA	NA	0.094	370.0
601.0	LA Harbor/National Steel	TCM	01/28/97	946.0	9.4	6.03	3.13	21.5	7.85	24.7	0.235	NA	NA	0.061	414.0
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96	690.0	NA	14.00	25.00	34.0	10.00	29.0	0.300	NA	NA	0.150	410.0
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	764.0	9.7	6.77	5.06	18.1	8.51	22.0	0.197	NA	NA	0.056	366.0
648.0	Malibu	RBM	01/17/96	1000.0	NA	2.70	9.10	6.3	0.54	21.0	0.066	NA	NA	0.097	100.0
648.0	Malibu	RCM	11/25/96	682.0	NA	1.61	1.81	7.8	0.53	14.2	0.042	NA	NA	0.113	108.0
650.0	Santa Monica	RBM	01/17/96	940.0	NA	0.82	4.30	5.6	1.10	15.0	0.073	NA	NA	0.400	93.0
650.0	Santa Monica	RCM	11/25/96	850.0	NA	0.44	3.49	9.2	2.71	15.2	0.059	NA	NA	2.040	131.0
662.0	Royal Palms	RCM	01/18/96	370.0	NA	3.30	12.00	7.7	1.70	11.0	0.140	NA	NA	1.800	170.0
662.0	Royal Palms	RCM	11/25/96	384.0	NA	2.24	6.61	8.0	2.04	12.5	0.165	NA	NA	1.820	196.0
664.0	Cabrillo Beach	RCM	01/18/96	570.0	NA	3.60	14.00	9.9	2.10	15.0	0.180	NA	NA	5.000	190.0
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97	1970.0	9.6	4.50	10.90	12.2	5.32	29.4	0.118	8.9	1.8	0.053	243.0
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96	980.0	10.0	12.00	7.90	12.0	4.60	22.0	0.270	9.6	2.1	0.084	360.0
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97	1240.0	9.4	6.90	4.12	15.8	6.62	29.0	0.272	4.3	1.9	0.049	367.0
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96	810.0	11.0	14.00	7.80	20.0	9.90	32.0	0.280	9.8	2.1	0.077	590.0
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97	1250.0	9.3	5.19	4.55	20.3	10.80	36.7	0.171	4.4	2.0	0.055	435.0
723.4	Newport Bay/Turning Basin	TCM	01/17/96	700.0	10.0	13.00	8.80	26.0	5.00	24.0	0.330	9.0	1.7	0.049	430.0
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96	1400.0	11.0	10.00	7.30	20.0	3.40	23.0	0.930	7.1	2.2	0.049	410.0
725.0	Newport Bay/Crows Nest	TCM	01/17/96	660.0	8.9	11.00	17.00	100.0	7.40	29.0	0.580	17.2	1.5	0.062	640.0
725.0	Newport Bay/Crows Nest	TCM	01/27/97	845.0	9.6	6.46	2.44	76.2	4.99	26.0	0.399	2.0	2.1	0.024	501.0
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96	440.0	11.0	14.00	14.00	130.0	6.90	62.0	0.660	15.0	2.0	0.063	870.0
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97	656.0	10.6	9.59	15.80	117.0	5.89	48.6	0.463	14.2	1.6	ND	618.0
726.6	Newport Bay/Mariners Drive	TCM	01/27/97	816.0	10.5	10.20	6.74	7.3	2.63	29.9	0.217	7.9	2.0	0.012	321.0
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	1720.0	9.8	5.94	6.78	69.3	3.45	14.6	0.231	5.9	ND	ND	396.0
750.0	Oceanside	RCM	09/30/96	1510.0	5.4	1.32	5.16	13.2	0.69	19.3	0.051	3.7	2.1	0.051	127.0
882.2	24Th St Maritime Terminal/North	TCM	01/18/96	1400.0	NA	9.10	6.70	58.0	4.40	56.0	0.300	NA	NA	0.330	540.0
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96	750.0	NA	10.00	15.00	64.0	4.90	20.0	0.400	NA	NA	0.300	500.0
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	983.0	9.1	8.82	7.02	27.8	9.06	19.5	0.273	5.5	1.7	0.129	420.0

* RCM = Resident California Mussel
TCM = Transplanted California Mussel
RBM = Resident Bay Mussel (s = small size)
TFC = Transplanted Freshwater Clam
OYS = Oyster (Crassostrea gigas)
PAC = Shore Crab (Pachygrapsus crassipes)
GLY = Sand Worm (Glycera spp.)
NA = Not Analyzed
ND = Not Detected

APPENDIX K

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements in Mussel, Clam, Oyster, Shore Crab, and Sand Worm (ppm, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	1270.0	8.2	5.84	6.59	46.7	6.46	54.1	0.224	5.9	ND	0.162	466.0
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	957.0	9.1	8.84	8.36	26.8	8.92	27.2	0.220	6.4	1.8	0.121	506.0
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	828.0	9.2	6.10	7.79	31.5	6.47	25.6	0.230	4.8	2.0	0.119	432.0
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96	2200.0	NA	9.30	25.00	54.0	8.70	29.0	0.240	NA	NA	0.400	520.0
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	1350.0	9.1	5.36	8.11	59.7	6.14	42.1	0.211	6.3	3.7	0.170	552.0
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	710.0	10.2	8.93	12.50	23.4	5.34	20.3	0.260	4.6	ND	0.085	406.0
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	1240.0	8.5	6.59	4.15	38.9	20.80	35.3	0.180	3.4	2.2	0.162	651.0
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	1550.0	7.0	5.93	8.80	50.9	16.80	50.0	0.206	5.7	1.9	0.150	547.0
886.0	San Diego Bay/NASSCO	TCM	01/18/96	870.0	NA	15.00	25.00	57.0	5.90	29.0	0.250	NA	NA	0.210	530.0
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	1250.0	7.8	6.46	4.15	21.3	4.84	48.1	0.178	2.9	1.9	0.091	346.0
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	1110.0	9.2	9.34	13.20	43.4	27.60	16.9	0.194	4.3	2.8	0.402	480.0

* RCM = Resident California Mussel
TCM = Transplanted California Mussel
RBM = Resident Bay Mussel (s = small size)
TFC = Transplanted Freshwater Clam
OYS = Oyster (Crassostrea gigas)
PAC = Shore Crab (Pachygrapsus crassipes)
GLY = Sand Worm (Glycera spp.)
NA = Not Analyzed
ND = Not Detected

APPENDIX L

Summary of 1995-97 Data
Trace Elements in Sediment
(ppm, dry weight)

APPENDIX L

State Mussel Watch Program

Summary of 1995-97 Data: Trace Elements in Sediment (ppm, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
203.1	Tomales Bay/Vincent Landing	SED	04/14/97	99300.0	NA	0.32	183.00	23.1	8.08	574.0	0.723	NA	NA	0.044	81.3
203.7	Tomales Bay/Walker Creek Mouth 3	SED	04/14/97	112000.0	NA	3.56	202.00	29.5	7.25	416.0	2.930	NA	NA	0.029	102.0
299.1	Selby Slag 4	SED	10/27/95	63500.0	17.3	0.64	229.00	42.6	144.00	542.0	0.317	86.8	0.3	0.273	177.0
302.6	Paradise Cove	SED	10/26/95	71700.0	12.8	0.32	249.00	48.3	19.70	303.0	0.327	104.0	0.3	0.298	150.0
306.1	Gashouse Cove/Laguna Street	SED	12/07/95	71000.0	16.5	0.30	233.00	67.9	26.00	302.0	0.315	120.0	0.5	0.323	168.0
306.2	Sansome Street/Pier 31	SED	12/06/95	68000.0	12.5	0.29	218.00	48.7	15.10	313.0	0.271	96.6	0.4	0.303	155.0
306.3	Howard Street/Pier 14	SED	12/06/95	58700.0	10.4	0.47	257.00	48.6	41.30	220.0	0.338	77.4	0.3	1.690	133.0
306.4	Central Basin/Outer	SED	12/06/95	66400.0	17.3	0.25	188.00	73.1	32.90	473.0	0.265	82.2	0.4	0.316	143.0
311.4	North South Bay	SED	12/06/95	59400.0	6.3	0.13	196.00	20.8	11.40	277.0	0.164	98.6	0.2	0.159	103.0

* SED = Sediments NA = Not Analyzed

APPENDIX M

Summary of 1995-97 Data

Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm

(ppb, wet weight)

APPENDIX M

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
1.0	Crescent City Harbor	RCM	04/09/97	ND	ND	0.5	0.3	0.3	ND	0.3	ND	1.4	ND	ND
2.0	Crescent City/STP Outfall	RCM	04/09/97	ND	ND	0.6	ND	0.9	ND	0.3	ND	1.9	ND	ND
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	ND	ND	0.6	0.3	0.5	ND	0.3	ND	1.6	ND	ND
3.0	Crescent City/Control	RCM	04/10/97	ND	ND	0.2	ND	0.2	ND	ND	ND	0.4	ND	ND
100.0	Mad River Slough	OYS	04/10/97	ND	ND	0.3	ND	0.3	ND	ND	ND	0.5	ND	0.3
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	ND	ND	ND	ND	ND	ND	0.8	0.6	1.4	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	ND	ND	ND	ND	ND	ND	0.9	0.8	1.7	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	ND	ND	0.2	ND	0.1	ND	0.3	ND	0.7	ND	ND
102.6	Humboldt Bay/J Street	GLY	04/17/96	ND	ND	0.1	ND	ND	0.5	0.8	ND	1.4	0.8	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
1.0	ND	ND	ND	ND	1.2	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND
2.0	ND	ND	ND	ND	2.0	ND	0.4	ND	2.4	ND	0.3	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	ND	0.9	ND	ND	ND	0.9	ND	0.6	ND	ND	ND	ND	ND	ND
3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND	ND	ND	ND
100.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	ND	ND	ND	ND	ND	ND
101.4	NA	ND	ND	ND	0.4	ND	ND	ND	0.4	ND	0.8	ND	ND	ND	ND	NA	ND
101.8	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND
101.8	NA	ND	ND	ND	0.5	ND	ND	ND	0.5	ND	ND	ND	ND	ND	ND	NA	ND
101.8	NA	ND	ND	ND	0.2	ND	ND	ND	0.2	ND	0.3	ND	ND	ND	ND	NA	ND
102.6	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	ND	ND	ND	ND	NA	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.3	ND	4.3	NA	ND	ND
2.0	0.2	ND	ND	0.2	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	1.5	NA	ND	ND
2.2	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.8	ND	5.8	NA	ND	ND
3.0	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
100.0	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND	3.5	NA	ND	ND
101.4	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
102.6	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND

* RCM = Resident California Mussel
RBM = Resident Bay Mussel (s = small size)
TCM = Transplanted California Mussel (a = archive)
OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)
NA = Not Analyzed
ND = Not Detected

APPENDIX M

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
102.6	Humboldt Bay/J Street	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND	1.9	1.9	ND	ND
102.6	Humboldt Bay/J Street	RBM	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
102.6	Humboldt Bay/J Street	TCM	04/10/97	ND	ND	0.5	0.3	0.4	ND	0.3	ND	1.4	ND	ND
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
102.7	Humboldt Bay/H Street	GLY	04/17/96	ND	ND	0.5	ND	ND	0.5	1.4	ND	2.4	ND	ND
102.7	Humboldt Bay/H Street	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND	0.6	0.6	ND	ND
103.3	Humboldt Bay/E Street	TCM	04/10/97	ND	ND	0.4	ND	0.3	ND	ND	ND	0.7	ND	ND
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	ND	ND	0.4	ND	0.4	ND	0.2	ND	1.1	ND	ND
202.0	Bodega Head	RCM	09/11/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
202.0	Bodega Head	RCM	08/29/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
102.6	NA	ND	ND	ND	2.5	ND	ND	ND	2.5	ND	0.6	ND	ND	ND	ND	NA	ND
102.6	NA	ND	ND	ND	0.5	ND	ND	ND	0.5	ND	ND	ND	ND	ND	ND	NA	ND
102.6	ND	ND	ND	ND	0.7	ND	ND	ND	0.7	ND	0.8	ND	ND	ND	ND	ND	ND
102.7	NA	ND	ND	ND	0.4	ND	ND	ND	0.4	ND	ND	ND	ND	ND	ND	NA	ND
102.7	NA	ND	1.3	ND	10.9	ND	ND	ND	12.2	ND	0.4	ND	ND	ND	ND	NA	ND
102.7	NA	ND	ND	ND	3.6	ND	ND	ND	3.6	ND	0.5	ND	ND	ND	ND	NA	ND
103.3	ND	ND	ND	ND	0.8	ND	0.2	ND	1.0	ND	0.6	ND	ND	ND	ND	ND	ND
103.5	ND	ND	ND	ND	0.6	ND	ND	ND	0.6	ND	0.5	ND	ND	ND	ND	ND	ND
202.0	ND	ND	ND	ND	1.3	ND	ND	ND	1.3	ND	0.4	ND	ND	NA	ND	ND	ND
202.0	ND	ND	ND	ND	0.9	ND	ND	ND	0.9	ND	0.6	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
102.6	ND	ND	ND	ND	ND	ND	0.8	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
102.6	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	9.0	ND	9.0	ND	NA	ND
102.6	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.2	ND	4.2	NA	ND	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	73.0	ND	73.0	ND	NA	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	55.4	29.4	84.8	ND	NA	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	63.3	63.3	ND	NA	ND
103.3	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.7	ND	4.7	NA	ND	ND
103.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5	ND	5.5	NA	ND	ND
202.0	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.1	ND	2.1	NA	ND	ND
202.0	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.8	ND	4.8	NA	ND	ND

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APPENDIX M

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	ND	0.2	0.6	0.2	0.4	ND	0.3	ND	1.6	ND	ND
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	ND	ND	0.3	ND	0.3	ND	0.2	ND	0.8	ND	0.3
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	ND	ND	0.3	ND	0.2	ND	ND	ND	0.5	ND	ND
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	ND	ND	0.1	ND	0.1	ND	ND	ND	0.2	ND	ND
280.0	Russian River/S Goat Rock	RCM	03/21/97	ND	ND	0.5	ND	0.3	ND	0.2	ND	1.0	ND	ND
307.0	San Francisco Bay/Treasure Is	TCM-a	01/26/81	ND	0.3	3.4	0.4	3.2	1.3	2.5	ND	11.0	ND	0.3
307.0	San Francisco Bay/Treasure Is	TCM-a	02/02/82	ND	0.3	3.0	0.3	2.5	1.1	2.0	ND	9.3	ND	ND
308.0	San Francisco Bay/Hunter's Point	TCM-a	01/26/81	ND	0.2	3.7	0.3	3.2	1.3	1.9	0.2	10.7	ND	ND
309.0	San Mateo Bridge/8B	TCM-a	02/09/81	ND	0.2	3.8	0.3	3.1	1.4	2.6	0.2	11.5	ND	0.6
313.0	San Francisco Bay/near Redwood Cr	TCM-a	01/26/81	ND	0.3	5.4	0.2	4.7	1.8	3.3	0.3	16.0	ND	0.5

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
205.0	ND	ND	ND	ND	1.5	ND	ND	ND	1.5	ND	0.4	ND	ND	ND	ND	ND	ND
205.1	ND	ND	ND	ND	2.1	ND	ND	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND
205.3	ND	ND	ND	ND	1.6	ND	ND	ND	1.6	ND	0.5	ND	ND	ND	ND	ND	ND
205.5	ND	ND	ND	ND	0.5	ND	ND	ND	0.5	ND	ND	ND	ND	ND	ND	ND	ND
280.0	ND	ND	ND	ND	1.7	ND	0.8	ND	2.4	ND	0.9	ND	ND	ND	ND	ND	ND
307.0	ND	2.6	8.7	0.6	8.4	0.6	1.4	1.8	24.1	ND	4.3	0.1	ND	ND	0.1	ND	ND
307.0	ND	2.0	6.2	0.5	6.2	0.8	1.7	1.5	18.8	ND	5.9	ND	0.5	ND	0.5	ND	ND
308.0	ND	2.0	5.5	ND	7.5	ND	1.5	1.4	18.0	ND	7.3	0.3	ND	ND	0.3	ND	ND
309.0	ND	1.3	3.7	ND	5.8	ND	1.5	0.9	13.2	ND	8.3	0.3	ND	ND	0.3	ND	ND
313.0	ND	1.4	3.6	ND	6.2	ND	1.7	1.2	14.1	ND	10.9	0.4	ND	ND	0.4	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
205.0	ND	ND	ND	ND	ND	ND	0.2	ND	ND	ND	ND	ND	8.6	2.1	10.7	NA	ND	ND
205.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.4	ND	13.4	NA	ND	ND
205.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	ND	5.4	NA	ND	ND
205.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
280.0	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
307.0	0.4	ND	ND	0.4	ND	0.1	ND	0.2	ND	ND	ND	17.9	75.2	3.7	96.7	NA	ND	15.3
307.0	0.5	ND	ND	0.4	ND	0.3	ND	ND	ND	ND	ND	16.9	64.6	2.9	84.5	NA	ND	25.7
308.0	0.3	ND	ND	ND	ND	0.2	ND	ND	ND	ND	ND	10.1	57.0	4.3	71.4	NA	ND	17.8
309.0	0.3	ND	ND	0.4	ND	0.3	ND	0.2	ND	ND	ND	9.3	47.3	4.3	60.9	NA	ND	14.9
313.0	0.3	ND	ND	0.5	ND	0.3	0.2	0.3	ND	ND	ND	9.1	51.1	3.7	63.9	NA	ND	17.6

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APPENDIX M

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
321.0	Dumbarton Bridge/Channel Marker 14	TCM-a	02/09/81	0.9	0.5	6.3	0.6	5.0	2.3	4.0	0.2	18.9	ND	1.3
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	ND	ND	0.8	ND	0.7	0.2	0.7	ND	2.3	ND	ND
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96	ND	ND	3.3	ND	2.6	1.4	2.4	0.2	9.9	0.2	ND
401.0	Santa Cruz Harbor	TCM	03/25/96	ND	ND	2.4	ND	2.0	1.1	2.0	0.2	7.7	ND	ND
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	ND	ND	1.3	ND	1.2	0.4	0.8	ND	3.8	ND	0.7
404.0	Sandholdt Bridge	TCM	02/16/96	ND	ND	4.7	ND	4.0	2.3	4.1	ND	15.1	2.0	6.6
404.0	Sandholdt Bridge	TCM	03/04/97	ND	0.3	4.4	ND	3.8	2.2	4.5	ND	15.2	1.1	2.8
414.0	Pacific Grove	RCM	03/07/96	ND	ND	0.6	ND	0.5	ND	0.3	ND	1.5	ND	ND
414.0	Pacific Grove	RCM	04/25/97	ND	ND	0.3	ND	ND	ND	0.2	ND	0.5	ND	0.3
601.0	LA Harbor/National Steel	TCM	01/18/96	ND	ND	2.0	ND	1.9	1.2	1.8	ND	6.9	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
321.0	ND	1.7	4.5	ND	8.2	ND	1.8	1.3	17.5	ND	10.4	0.7	ND	0.4	1.1	0.4	ND
400.6	ND	ND	1.2	ND	9.4	ND	3.0	ND	13.6	ND	2.5	ND	ND	ND	ND	ND	ND
400.7	ND	ND	0.7	ND	3.2	ND	1.7	ND	5.6	ND	2.6	ND	ND	NA	ND	ND	ND
401.0	ND	ND	1.2	ND	5.4	ND	2.3	ND	8.9	ND	1.3	ND	ND	NA	ND	ND	ND
403.0	ND	1.9	5.5	0.6	40.7	4.0	12.6	1.0	66.4	ND	7.0	ND	ND	ND	ND	ND	ND
404.0	ND	12.4	36.7	6.3	259.9	13.7	105.1	7.7	441.8	ND	32.1	0.5	1.4	ND	1.9	4.0	ND
404.0	ND	10.4	44.5	4.4	235.5	24.8	91.1	5.1	415.8	ND	27.6	0.3	1.3	ND	1.6	2.2	ND
414.0	ND	ND	0.9	ND	6.3	ND	1.8	ND	9.0	ND	1.6	ND	ND	NA	ND	ND	ND
414.0	ND	ND	ND	ND	2.9	ND	0.8	ND	3.7	ND	1.0	ND	ND	ND	ND	ND	ND
601.0	ND	2.3	8.4	4.0	33.0	ND	1.9	2.6	52.2	ND	0.6	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
321.0	0.4	ND	ND	1.1	ND	0.5	0.2	0.2	ND	ND	0.4	26.7	75.1	3.8	105.5	NA	ND	19.0
400.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND	3.5	NA	ND	ND
400.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	ND	5.3	ND	5.3	NA	ND	ND
401.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.0	ND	12.0	NA	ND	ND
403.0	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	14.4	1.7	16.1	NA	ND	42.0
404.0	ND	ND	ND	ND	ND	0.5	ND	ND	ND	ND	1.0	ND	34.2	ND	34.2	NA	ND	232.1
404.0	ND	ND	ND	ND	ND	0.1	ND	ND	ND	ND	ND	ND	28.2	4.0	32.2	NA	ND	228.5
414.0	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.7	ND	2.7	NA	ND	ND
414.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.5	ND	ND	8.5	NA	ND	ND
601.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.1	58.4	ND	67.5	NA	ND	ND

* RCM = Resident California Mussel
RBM = Resident Bay Mussel (s = small size)
TCM = Transplanted California Mussel (a = archive)
OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)
NA = Not Analyzed
ND = Not Detected

APPENDIX M

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
601.0	LA Harbor/National Steel	TCM	01/28/97	ND	0.2	1.8	ND	1.4	0.7	0.9	ND	4.9	ND	ND
605.0	LA Harbor/Cabrillo Pier	TCM	01/18/96	ND	ND	1.6	ND	1.5	0.7	1.2	ND	5.0	ND	ND
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96	ND	0.1	2.2	0.2	2.1	1.2	2.2	0.1	8.1	ND	ND
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	ND	0.2	2.9	ND	2.4	1.3	1.9	ND	8.7	ND	0.3
618.0	LA Harbor/Angels Gate	RCM	01/18/96	ND	ND	1.5	ND	1.5	0.7	1.4	ND	5.0	ND	ND
648.0	Malibu	RBM	01/17/96	ND	ND	2.4	0.2	2.2	0.6	2.0	ND	7.4	ND	ND
648.0	Malibu	RCM	11/25/96	ND	ND	0.8	ND	0.7	0.3	1.0	ND	2.7	ND	ND
650.0	Santa Monica	RBM	01/17/96	ND	ND	2.5	0.3	2.9	ND	3.4	ND	9.1	ND	ND
650.0	Santa Monica	RCM	11/25/96	ND	ND	1.5	ND	1.3	0.6	1.2	ND	4.6	ND	ND
662.0	Royal Palms	RCM	01/18/96	ND	ND	0.9	ND	0.9	0.2	0.5	ND	2.6	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
601.0	ND	1.6	5.4	2.1	31.0	0.6	2.8	2.3	45.8	ND	0.8	ND	ND	ND	ND	ND	ND
605.0	ND	2.2	6.6	13.6	94.2	ND	2.0	8.7	127.2	ND	0.7	ND	ND	NA	ND	ND	ND
616.0	ND	2.6	9.5	2.2	23.6	ND	2.3	1.4	41.6	ND	0.4	ND	ND	NA	ND	ND	ND
616.0	ND	2.5	7.9	1.0	34.0	0.5	4.9	2.0	52.8	ND	1.0	ND	ND	ND	ND	ND	ND
618.0	10.4	3.1	8.4	15.1	133.6	ND	3.0	15.1	178.4	ND	0.2	ND	ND	NA	ND	ND	ND
648.0	ND	1.3	3.2	3.0	28.8	ND	1.2	4.2	41.7	ND	0.2	ND	ND	NA	ND	ND	ND
648.0	ND	ND	1.0	1.3	11.7	ND	ND	2.0	16.1	ND	0.4	ND	ND	ND	ND	ND	ND
650.0	ND	1.7	4.4	4.1	40.4	ND	0.8	6.3	57.8	ND	0.4	ND	ND	NA	ND	ND	ND
650.0	ND	ND	1.4	0.9	10.9	ND	ND	1.8	15.0	ND	0.8	ND	ND	ND	ND	ND	ND
662.0	ND	2.3	6.9	9.5	91.7	ND	1.9	9.4	121.7	ND	0.5	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
601.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	32.6	107.2	4.2	144.0	NA	ND	12.8
605.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.3	44.0	ND	54.3	NA	ND	ND
616.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	8.8	68.5	ND	77.4	NA	ND	ND
616.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2	6.9	46.5	3.3	56.7	NA	ND	42.8
618.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.0	87.6	ND	96.6	NA	ND	ND
648.0	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.0	ND	13.0	NA	ND	ND
648.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.7	ND	8.7	NA	ND	ND
650.0	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	ND	22.2	ND	22.2	NA	ND	ND
650.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.7	2.3	13.1	NA	ND	ND
662.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.2	ND	17.2	NA	ND	ND

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Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
662.0	Royal Palms	RCM	11/25/96	ND	ND	0.3	ND	0.4	ND	0.3	ND	1.0	ND	ND
664.0	Cabrillo Beach	RCM	01/18/96	ND	ND	0.6	ND	0.6	ND	0.4	ND	1.5	ND	ND
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97	ND	0.3	2.7	0.2	1.9	1.4	2.6	ND	9.0	1.6	ND
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96	ND	0.3	4.6	0.2	4.5	2.1	4.2	0.2	16.2	0.7	ND
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97	ND	0.2	2.6	0.1	2.3	1.1	2.2	0.1	8.5	1.0	ND
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96	ND	0.2	3.7	0.2	3.7	2.2	3.6	0.2	13.8	0.6	ND
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97	ND	0.3	2.7	0.3	2.5	1.5	2.4	ND	9.7	1.7	0.3
723.4	Newport Bay/Turning Basin	TCM	01/17/96	ND	ND	1.9	ND	1.4	1.0	1.6	0.2	6.0	ND	ND
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96	ND	0.1	2.8	0.1	2.2	1.5	2.4	0.1	9.3	ND	0.3
725.0	Newport Bay/Crows Nest	TCM	01/17/96	ND	0.2	2.9	0.2	2.0	1.8	2.6	0.4	10.1	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
662.0	ND	0.8	2.5	4.5	59.2	ND	0.6	5.1	72.7	ND	0.4	ND	ND	ND	ND	ND	ND
664.0	ND	1.1	3.8	6.0	52.9	ND	1.2	7.0	72.1	ND	0.3	ND	ND	NA	ND	ND	ND
708.0	ND	2.1	4.5	3.0	49.7	0.7	3.0	3.9	66.9	ND	1.4	ND	ND	ND	ND	ND	ND
713.0	ND	4.4	8.0	1.7	33.8	0.6	2.5	2.1	53.0	ND	1.5	ND	ND	NA	ND	ND	ND
713.0	ND	1.4	3.1	0.6	21.5	0.6	4.7	1.2	33.1	ND	1.3	ND	ND	ND	ND	ND	ND
715.0	ND	2.3	4.8	0.7	29.9	ND	0.8	1.2	39.7	ND	1.0	ND	ND	NA	ND	ND	ND
715.0	ND	1.3	2.3	0.6	20.9	0.5	1.5	1.1	28.3	ND	1.4	ND	ND	ND	ND	ND	ND
723.4	ND	0.7	2.8	0.3	18.0	ND	0.4	0.6	22.8	ND	0.8	ND	ND	NA	ND	ND	ND
724.0	ND	1.9	8.1	1.5	57.6	ND	1.2	2.3	72.6	ND	1.2	ND	ND	NA	ND	ND	ND
725.0	ND	1.7	6.7	1.1	52.9	ND	94.6	2.2	159.1	ND	1.3	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
662.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.5	17.1	ND	26.7	NA	ND	ND
664.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.2	ND	11.2	NA	ND	ND
708.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	4.8	31.0	ND	35.8	NA	ND	ND
713.0	ND	ND	ND	ND	0.2	0.3	ND	ND	ND	ND	0.3	ND	25.2	ND	25.2	NA	ND	ND
713.0	ND	ND	ND	ND	ND	0.1	ND	ND	ND	ND	0.3	ND	12.9	ND	12.9	NA	ND	ND
715.0	ND	ND	ND	ND	ND	0.1	ND	ND	ND	ND	0.3	ND	22.1	ND	22.1	NA	ND	ND
715.0	ND	ND	ND	ND	ND	0.1	ND	ND	ND	ND	0.5	10.1	22.3	ND	32.3	NA	ND	16.0
723.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19.0	ND	19.0	NA	ND	ND
724.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.9	ND	18.5	ND	18.5	NA	ND	ND
725.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	17.9	130.6	ND	148.5	NA	ND	ND

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Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
725.0	Newport Bay/Crows Nest	TCM	01/27/97	ND	0.2	2.2	ND	1.7	1.6	1.8	0.2	7.8	1.1	0.3
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96	ND	ND	1.4	0.1	1.0	1.3	1.4	0.2	5.4	ND	ND
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97	ND	ND	1.5	0.1	1.2	1.0	1.2	ND	5.0	0.9	0.6
726.6	Newport Bay/Mariners Drive	TCM	01/27/97	ND	0.2	2.0	0.1	1.6	1.0	1.8	ND	6.7	1.4	1.0
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	ND	ND	0.6	ND	0.6	0.4	0.7	ND	2.3	ND	ND
742.0	San Juan Creek	RCM	01/18/96	ND	ND	0.9	ND	0.8	0.4	1.1	ND	3.3	ND	ND
750.0	Oceanside	RCM	01/18/96	ND	ND	1.5	ND	1.9	ND	1.7	ND	5.1	ND	ND
750.0	Oceanside	RCM	09/30/96	ND	ND	0.4	ND	0.3	ND	0.4	ND	1.0	ND	ND
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96	ND	ND	0.6	ND	0.6	0.7	0.6	ND	2.5	ND	ND
883.1	San Diego Bay/Chollas Creek	TCM	01/18/96	ND	ND	1.0	ND	1.2	1.0	1.3	ND	4.5	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
725.0	ND	1.6	5.3	0.9	47.2	0.9	3.0	2.0	60.8	ND	2.1	ND	ND	ND	ND	ND	ND
726.4	ND	0.7	3.0	ND	25.8	ND	0.4	ND	30.0	ND	0.9	ND	ND	NA	ND	ND	ND
726.4	ND	0.9	3.0	0.4	24.9	0.6	3.5	0.9	34.1	ND	1.5	ND	ND	ND	ND	ND	ND
726.6	6.3	1.7	5.5	0.8	31.9	1.5	6.7	1.4	49.4	ND	1.8	ND	ND	ND	ND	ND	ND
740.0	ND	ND	ND	ND	5.0	ND	0.6	ND	5.6	ND	0.3	1.0	ND	ND	1.0	ND	ND
742.0	ND	ND	0.8	ND	6.1	ND	0.5	ND	7.4	ND	ND	ND	ND	NA	ND	ND	ND
750.0	ND	1.8	5.1	1.2	31.3	ND	1.8	1.7	43.0	ND	0.9	ND	ND	ND	ND	ND	ND
750.0	ND	ND	0.7	ND	8.4	ND	ND	ND	9.1	ND	0.4	ND	ND	ND	ND	ND	ND
882.7	ND	ND	0.5	ND	2.4	ND	0.9	ND	3.8	ND	0.2	ND	ND	NA	ND	ND	ND
883.1	ND	ND	0.6	ND	2.4	ND	0.4	ND	3.4	ND	0.2	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
725.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	23.1	106.3	2.3	131.7	NA	ND	23.3
726.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	10.1	91.9	ND	102.0	NA	ND	ND
726.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.1	9.5	46.8	1.0	57.4	NA	ND	23.5
726.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6	ND	10.4	ND	10.4	NA	ND	31.9
740.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8	ND	7.6	ND	7.6	NA	ND	ND
742.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9	ND	4.9	NA	ND	ND
750.0	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.5	ND	4.5	NA	ND	ND
750.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
882.7	ND	0.5	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	90.9	ND	90.9	NA	ND	ND
883.1	ND	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	38.7	ND	38.7	NA	ND	ND

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State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	ND	0.2	2.2	0.1	2.0	1.1	1.6	ND	7.2	ND	0.3
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	ND	0.2	1.8	ND	1.4	1.1	1.4	ND	5.9	ND	ND
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	ND	0.4	4.4	0.3	3.6	2.1	3.6	0.1	14.5	1.1	ND
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	ND	ND	1.7	ND	1.5	1.3	1.0	ND	5.6	0.6	ND
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96	ND	ND	1.2	ND	1.2	0.1	1.8	ND	4.3	ND	ND
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	ND	0.1	1.5	ND	1.4	0.9	0.9	ND	4.8	ND	0.3
883.8	San Diego Bay/Switzer Creek	TCM	01/18/96	ND	ND	1.1	ND	1.0	0.8	1.1	ND	3.9	ND	ND
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	ND	0.2	1.7	0.4	1.6	0.7	0.9	ND	5.7	0.4	0.3
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	ND	0.4	2.7	0.3	2.7	1.6	2.7	ND	10.4	ND	ND
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	ND	0.4	2.3	0.2	2.3	1.5	2.0	ND	8.6	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
883.1	ND	ND	0.7	ND	2.9	ND	1.2	ND	4.8	ND	0.8	ND	ND	ND	ND	ND	ND
883.2	ND	ND	0.8	ND	4.4	ND	1.1	ND	6.3	ND	0.6	ND	ND	ND	ND	ND	ND
883.3	ND	ND	1.2	ND	4.5	0.5	2.7	ND	8.8	ND	1.5	ND	ND	ND	ND	ND	ND
883.5	ND	ND	1.1	ND	4.1	ND	1.1	ND	6.3	ND	0.5	ND	ND	ND	ND	ND	ND
883.6	ND	0.8	1.7	ND	6.9	ND	1.0	ND	10.4	ND	ND	ND	ND	NA	ND	ND	ND
883.6	ND	ND	0.8	ND	2.5	ND	0.8	ND	4.0	ND	0.5	ND	ND	ND	ND	ND	ND
883.8	ND	ND	0.5	ND	3.0	ND	ND	ND	3.5	ND	0.3	ND	ND	NA	ND	ND	ND
883.8	ND	ND	0.5	ND	1.5	ND	1.0	ND	3.1	ND	0.6	ND	ND	ND	ND	ND	ND
885.1	ND	1.5	3.2	ND	7.1	0.6	1.5	ND	13.9	ND	0.9	ND	ND	ND	ND	ND	ND
885.3	ND	1.3	2.2	ND	7.8	ND	1.1	0.7	13.2	ND	0.9	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
883.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND	30.0	1.3	31.3	NA	ND	ND
883.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.9	9.5	61.4	3.5	74.3	NA	ND	ND
883.3	ND	ND	ND	ND	ND	0.2	ND	ND	ND	ND	ND	17.5	46.4	1.8	65.7	NA	ND	ND
883.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.9	6.7	61.6	5.8	74.1	NA	ND	ND
883.6	ND	0.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	92.5	ND	92.5	NA	ND	ND
883.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ND	50.3	4.6	54.9	NA	ND	ND
883.8	ND	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32.5	ND	32.5	NA	ND	ND
883.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	8.8	25.6	1.8	36.2	NA	ND	ND
885.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.8	25.7	88.5	5.1	119.3	NA	ND	ND
885.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	20.8	80.9	1.3	102.9	NA	ND	ND

* RCM = Resident California Mussel
RBM = Resident Bay Mussel (s = small size)
TCM = Transplanted California Mussel (a = archive)
OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)
NA = Not Analyzed
ND = Not Detected

APPENDIX M

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
886.0	San Diego Bay/NASSCO	TCM	01/18/96	ND	ND	1.1	ND	0.9	0.9	1.0	ND	3.9	ND	ND
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	ND	ND	0.7	ND	0.6	0.6	0.7	ND	2.6	ND	0.2
893.0	San Diego Bay/Laurel Street	TCM	01/18/96	ND	ND	2.1	ND	2.0	1.3	1.9	ND	7.2	ND	ND
893.5	San Diego Bay/B Street Pier	TCM	01/18/96	ND	ND	1.2	ND	1.0	0.9	1.0	ND	4.1	ND	ND
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	ND	0.4	2.8	0.9	2.5	0.9	1.7	ND	9.3	ND	0.4

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
886.0	ND	ND	0.8	ND	3.4	ND	0.7	ND	4.9	ND	0.4	ND	ND	NA	ND	ND	ND
888.0	ND	ND	0.5	ND	2.2	ND	0.7	ND	3.4	ND	0.2	ND	ND	ND	ND	ND	ND
893.0	ND	ND	1.1	ND	3.7	ND	0.7	ND	5.5	ND	0.3	ND	ND	NA	ND	ND	ND
893.5	ND	ND	1.2	ND	4.9	ND	0.7	ND	6.8	ND	0.6	ND	ND	NA	ND	ND	ND
894.0	ND	7.3	22.9	ND	3.7	1.5	0.7	1.0	37.1	ND	0.7	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
886.0	ND	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	59.5	ND	59.5	NA	ND	ND
888.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	12.2	35.1	1.4	48.7	NA	ND	ND
893.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	14.4	96.7	ND	111.1	NA	ND	ND
893.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60.8	ND	60.8	NA	ND	ND
894.0	ND	ND	ND	ND	ND	ND	0.2	ND	ND	ND	2.7	5617.2	1082.5	41.9	6741.6	NA	ND	ND

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OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
ND = Not Detected

APPENDIX N

Summary of 1995-97 Data
Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm
(ppb, dry weight)

APPENDIX N

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
1.0	Crescent City Harbor	RCM	04/09/97	ND	ND	3.5	2.5	2.1	ND	2.2	ND	10.3	ND	ND
2.0	Crescent City/STP Outfall	RCM	04/09/97	ND	ND	4.2	ND	6.7	ND	2.6	ND	13.4	ND	ND
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	ND	ND	3.3	1.6	3.0	ND	1.6	ND	9.6	ND	ND
3.0	Crescent City/Control	RCM	04/10/97	ND	ND	1.4	ND	1.1	ND	ND	ND	2.5	ND	ND
100.0	Mad River Slough	OYS	04/10/97	ND	ND	1.8	ND	1.7	ND	ND	ND	3.5	ND	2.3
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	ND	ND	ND	ND	ND	ND	2.6	2.1	4.7	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	ND	ND	ND	ND	ND	ND	3.3	2.6	5.9	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	ND	ND	1.9	ND	1.3	ND	2.9	ND	6.1	ND	ND
102.6	Humboldt Bay/J Street	GLY	04/17/96	ND	ND	1.0	ND	ND	3.9	5.6	ND	10.5	5.8	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
1.0	ND	ND	ND	ND	9.1	ND	ND	ND	9.1	ND	ND	ND	ND	ND	ND	ND	ND
2.0	ND	ND	ND	ND	14.5	ND	3.1	ND	17.6	ND	2.5	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	ND	5.4	ND	ND	ND	5.4	ND	3.6	ND	ND	ND	ND	ND	ND
3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND	ND	ND	ND
100.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND
101.4	NA	ND	ND	ND	1.4	ND	ND	ND	1.4	ND	2.8	ND	ND	ND	ND	ND	NA
101.8	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
101.8	NA	ND	ND	ND	3.0	ND	ND	ND	3.0	ND	ND	ND	ND	ND	ND	ND	NA
101.8	NA	ND	ND	ND	1.6	ND	ND	ND	1.6	ND	2.6	ND	ND	ND	ND	ND	NA
102.6	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.1	ND	ND	ND	ND	ND	NA

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32.7	ND	32.7	NA	ND	ND
2.0	1.3	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	11.0	ND	11.0	NA	ND	ND
2.2	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33.5	ND	33.5	NA	ND	ND
3.0	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
100.0	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23.2	ND	23.2	NA	ND	ND
101.4	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
102.6	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND

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RBM = Resident Bay Mussel (s = small size)
TCM = Transplanted California Mussel (a = archive)

OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
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State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
102.6	Humboldt Bay/J Street	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND	5.7	5.7	ND	ND
102.6	Humboldt Bay/J Street	RBM	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
102.6	Humboldt Bay/J Street	TCM	04/10/97	ND	ND	2.5	1.3	2.1	ND	1.4	ND	7.2	ND	ND
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
102.7	Humboldt Bay/H Street	GLY	04/17/96	ND	ND	3.1	ND	ND	2.7	7.9	ND	13.7	ND	ND
102.7	Humboldt Bay/H Street	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND	1.8	1.8	ND	ND
103.3	Humboldt Bay/E Street	TCM	04/10/97	ND	ND	2.2	ND	1.5	ND	ND	ND	3.7	ND	ND
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	ND	ND	2.3	ND	2.2	ND	1.2	ND	5.7	ND	ND
202.0	Bodega Head	RCM	09/11/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
202.0	Bodega Head	RCM	08/29/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
102.6	NA	ND	ND	ND	7.5	ND	ND	ND	7.5	ND	1.7	ND	ND	ND	ND	ND	NA
102.6	NA	ND	ND	ND	4.5	ND	ND	ND	4.5	ND	ND	ND	ND	ND	ND	ND	NA
102.6	ND	ND	ND	ND	3.7	ND	ND	ND	3.7	ND	4.1	ND	ND	ND	ND	ND	ND
102.7	NA	ND	ND	ND	3.3	ND	ND	ND	3.3	ND	ND	ND	ND	ND	ND	ND	NA
102.7	NA	ND	7.5	ND	63.1	ND	ND	ND	70.6	ND	2.3	ND	ND	ND	ND	ND	NA
102.7	NA	ND	ND	ND	10.7	ND	ND	ND	10.7	ND	1.6	ND	ND	ND	ND	ND	NA
103.3	ND	ND	ND	ND	4.5	ND	1.0	ND	5.5	ND	3.4	ND	ND	ND	ND	ND	ND
103.5	ND	ND	ND	ND	3.0	ND	ND	ND	3.0	ND	2.5	ND	ND	ND	ND	ND	ND
202.0	ND	ND	ND	ND	7.5	ND	ND	ND	7.5	ND	2.1	ND	ND	NA	ND	ND	ND
202.0	ND	ND	ND	ND	5.5	ND	ND	ND	5.5	ND	3.9	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
102.6	ND	ND	ND	ND	ND	ND	2.5	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
102.6	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	85.0	ND	85.0	ND	NA	ND
102.6	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21.9	ND	21.9	NA	ND	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	570.0	ND	570.0	ND	NA	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	320.0	170.0	490.0	ND	NA	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	190.0	190.0	ND	NA	ND
103.3	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.9	ND	25.9	NA	ND	ND
103.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	29.5	ND	29.5	NA	ND	ND
202.0	3.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.8	ND	11.8	NA	ND	ND
202.0	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	29.3	ND	29.3	NA	ND	ND

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RBM = Resident Bay Mussel (s = small size)
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Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	ND	1.3	4.0	1.3	2.9	ND	2.0	ND	11.5	ND	ND
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	ND	ND	2.2	ND	2.2	ND	1.7	ND	6.2	ND	2.2
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	ND	ND	1.4	ND	1.3	ND	ND	ND	2.7	ND	ND
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	ND	ND	1.0	ND	1.0	ND	ND	ND	2.0	ND	ND
280.0	Russian River/S Goat Rock	RCM	03/21/97	ND	ND	3.4	ND	2.3	ND	1.4	ND	7.0	ND	ND
307.0	San Francisco Bay/Treasure Is	TCM-a	01/26/81	ND	2.1	23.4	3.1	22.3	8.6	17.0	ND	76.5	ND	2.3
307.0	San Francisco Bay/Treasure Is	TCM-a	02/02/82	ND	2.1	22.3	2.7	19.1	8.4	15.0	ND	69.6	ND	ND
308.0	San Francisco Bay/Hunter's Point	TCM-a	01/26/81	ND	1.3	25.9	1.8	22.9	9.4	13.6	1.2	76.0	ND	ND
309.0	San Mateo Bridge/8B	TCM-a	02/09/81	ND	1.6	28.2	2.5	22.8	10.4	19.1	1.4	86.0	ND	4.3
313.0	San Francisco Bay/near Redwood Cr	TCM-a	01/26/81	ND	1.7	32.8	1.5	28.2	10.8	19.9	1.6	96.5	ND	2.8

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
205.0	ND	ND	ND	ND	10.7	ND	ND	ND	10.7	ND	2.9	ND	ND	ND	ND	ND	ND
205.1	ND	ND	ND	ND	16.7	ND	ND	ND	16.7	ND	ND	ND	ND	ND	ND	ND	ND
205.3	ND	ND	ND	ND	9.4	ND	ND	ND	9.4	ND	2.9	ND	ND	ND	ND	ND	ND
205.5	ND	ND	ND	ND	5.2	ND	ND	ND	5.2	ND	ND	ND	ND	ND	ND	ND	ND
280.0	ND	ND	ND	ND	11.2	ND	5.3	ND	16.5	ND	6.4	ND	ND	ND	ND	ND	ND
307.0	ND	17.9	60.5	4.2	58.5	4.1	9.9	12.3	167.4	ND	30.0	0.7	ND	ND	0.7	ND	ND
307.0	ND	15.2	46.4	3.5	46.9	5.8	12.5	11.3	141.6	ND	44.5	ND	3.8	ND	3.8	ND	ND
308.0	ND	14.0	39.2	ND	53.5	ND	11.0	9.9	127.6	ND	51.5	2.3	ND	ND	2.3	ND	ND
309.0	ND	9.9	27.3	ND	43.3	ND	11.5	6.8	98.8	ND	62.1	2.5	ND	ND	2.5	ND	ND
313.0	ND	8.4	21.7	ND	37.3	ND	10.3	7.4	85.1	ND	65.9	2.6	ND	ND	2.6	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
205.0	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	ND	59.7	14.6	74.3	NA	ND	ND
205.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	105.0	ND	105.0	NA	ND	ND
205.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.2	ND	31.2	NA	ND	ND
205.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
280.0	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
307.0	3.0	ND	ND	2.9	ND	0.9	ND	1.7	ND	ND	ND	124.0	522.0	25.4	671.4	NA	ND	106.0
307.0	3.5	ND	ND	2.9	ND	1.9	ND	ND	ND	ND	ND	127.0	486.0	22.1	635.1	NA	ND	193.0
308.0	2.5	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	71.5	404.0	30.7	506.2	NA	ND	126.0
309.0	1.9	ND	ND	2.9	ND	2.0	ND	1.2	ND	ND	ND	69.4	353.0	32.0	454.4	NA	ND	111.0
313.0	1.7	ND	ND	3.1	ND	1.8	1.0	2.0	ND	ND	ND	54.8	308.0	22.1	384.9	NA	ND	106.0

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PAC = Shore Crab (Pachygrapsus crassipes)
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APPENDIX N

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
321.0	Dumbarton Bridge/Channel Marker 14	TCM-a	02/09/81	5.8	3.3	39.9	3.9	31.4	14.6	25.2	1.4	119.7	ND	8.3
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	ND	ND	4.3	ND	3.8	1.0	3.6	ND	12.7	ND	ND
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96	ND	ND	31.9	ND	25.2	13.1	23.2	2.1	95.5	1.4	ND
401.0	Santa Cruz Harbor	TCM	03/25/96	ND	ND	22.0	ND	18.3	10.0	18.4	1.6	70.3	ND	ND
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	ND	ND	8.2	ND	7.7	2.7	4.8	ND	23.4	ND	4.1
404.0	Sandholdt Bridge	TCM	02/16/96	ND	ND	33.8	ND	29.1	16.7	29.2	ND	108.8	14.1	47.4
404.0	Sandholdt Bridge	TCM	03/04/97	ND	2.2	38.2	ND	32.9	19.0	38.7	ND	131.0	9.5	23.8
414.0	Pacific Grove	RCM	03/07/96	ND	ND	3.6	ND	3.1	ND	1.9	ND	8.7	ND	ND
414.0	Pacific Grove	RCM	04/25/97	ND	ND	2.6	ND	ND	ND	1.5	ND	4.1	ND	2.6
601.0	LA Harbor/National Steel	TCM	01/18/96	ND	ND	15.1	ND	14.2	8.6	13.3	ND	51.2	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
321.0	ND	11.0	28.4	ND	51.8	ND	11.6	8.2	111.0	ND	65.8	4.6	ND	2.3	6.9	2.4	ND
400.6	ND	ND	6.7	ND	50.7	ND	16.2	ND	73.6	ND	13.4	ND	ND	ND	ND	ND	ND
400.7	ND	ND	7.1	ND	30.6	ND	16.1	ND	53.8	ND	25.2	ND	ND	NA	ND	ND	ND
401.0	ND	ND	11.3	ND	48.9	ND	20.7	ND	80.9	ND	12.0	ND	ND	NA	ND	ND	ND
403.0	ND	11.7	34.2	3.9	253.0	25.1	78.4	6.3	412.6	ND	43.6	ND	ND	ND	ND	ND	ND
404.0	ND	88.9	264.0	45.0	1870.0	98.8	756.0	55.5	3178.2	ND	231.0	3.7	10.2	ND	13.9	28.7	ND
404.0	ND	89.8	384.0	38.2	2030.0	214.0	785.0	43.8	3584.8	ND	238.0	2.8	10.9	ND	13.7	18.7	ND
414.0	ND	ND	5.5	ND	37.4	ND	10.9	ND	53.8	ND	9.6	ND	ND	NA	ND	ND	ND
414.0	ND	ND	ND	ND	22.4	ND	6.4	ND	28.8	ND	7.7	ND	ND	ND	ND	ND	ND
601.0	ND	17.4	62.6	30.0	246.0	ND	14.1	19.6	389.7	ND	4.1	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
321.0	2.5	ND	ND	6.8	ND	2.9	1.4	1.4	ND	ND	2.7	169.0	475.0	24.0	668.0	NA	ND	120.0
400.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18.7	ND	18.7	NA	ND	ND
400.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	ND	50.7	ND	50.7	NA	ND	ND
401.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	109.0	ND	109.0	NA	ND	ND
403.0	ND	ND	ND	ND	ND	ND	ND	ND	10.0	ND	ND	ND	89.3	10.5	99.8	NA	ND	261.0
404.0	ND	ND	ND	ND	ND	3.4	ND	ND	ND	ND	7.2	ND	246.0	ND	246.0	NA	ND	1670.0
404.0	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	243.0	34.4	277.4	NA	ND	1970.0
414.0	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15.9	ND	15.9	NA	ND	ND
414.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	66.4	ND	ND	66.4	NA	ND	ND
601.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	67.5	436.0	ND	503.5	NA	ND	ND

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State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
601.0	LA Harbor/National Steel	TCM	01/28/97	ND	1.3	14.6	ND	11.6	5.9	7.4	ND	40.8	ND	ND
605.0	LA Harbor/Cabrillo Pier	TCM	01/18/96	ND	ND	9.6	ND	8.7	3.9	7.0	ND	29.2	ND	ND
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96	ND	1.0	18.1	1.3	18.0	9.9	18.8	1.1	68.1	ND	ND
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	ND	1.3	23.3	ND	19.2	10.4	15.5	ND	69.7	ND	2.6
618.0	LA Harbor/Angels Gate	RCM	01/18/96	ND	ND	9.8	ND	10.1	4.6	9.2	ND	33.6	ND	ND
648.0	Malibu	RBM	01/17/96	ND	ND	13.7	1.3	12.1	3.6	11.1	ND	41.8	ND	ND
648.0	Malibu	RCM	11/25/96	ND	ND	3.8	ND	3.3	1.6	4.8	ND	13.6	ND	ND
650.0	Santa Monica	RBM	01/17/96	ND	ND	12.3	1.4	14.5	ND	16.7	ND	44.9	ND	ND
650.0	Santa Monica	RCM	11/25/96	ND	ND	7.1	ND	6.4	2.7	5.8	ND	22.1	ND	ND
662.0	Royal Palms	RCM	01/18/96	ND	ND	5.5	ND	5.3	1.1	3.1	ND	15.0	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
601.0	ND	13.3	45.2	17.8	258.0	5.3	23.3	18.9	381.8	ND	6.6	ND	ND	ND	ND	ND	ND
605.0	ND	12.8	38.7	80.1	554.0	ND	11.5	51.4	748.5	ND	4.3	ND	ND	NA	ND	ND	ND
616.0	ND	22.0	80.0	18.4	198.0	ND	19.5	11.7	349.6	ND	3.6	ND	ND	NA	ND	ND	ND
616.0	ND	20.0	63.0	8.2	272.0	4.2	39.6	15.8	422.8	ND	7.7	ND	ND	ND	ND	ND	ND
618.0	69.0	20.4	56.0	101.0	891.0	ND	19.7	101.0	1189.1	ND	1.7	ND	ND	NA	ND	ND	ND
648.0	ND	7.1	17.8	16.8	162.0	ND	6.9	23.6	234.2	ND	1.0	ND	ND	NA	ND	ND	ND
648.0	ND	ND	5.3	6.7	58.7	ND	ND	9.8	80.4	ND	1.9	ND	ND	ND	ND	ND	ND
650.0	ND	8.4	22.0	20.5	200.0	ND	4.1	31.1	286.0	ND	2.1	ND	ND	NA	ND	ND	ND
650.0	ND	ND	6.6	4.3	52.7	ND	ND	8.8	72.4	ND	3.8	ND	ND	ND	ND	ND	ND
662.0	ND	13.2	39.7	55.1	530.0	ND	10.8	54.4	703.2	ND	2.7	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
601.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.0	272.0	893.0	34.7	1199.7	NA	ND	107.0
605.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60.5	259.0	ND	319.5	NA	ND	ND
616.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2	74.1	576.0	ND	650.1	NA	ND	ND
616.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.3	54.9	372.0	26.8	453.7	NA	ND	342.0
618.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60.2	584.0	ND	644.2	NA	ND	ND
648.0	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	73.0	ND	73.0	NA	ND	ND
648.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	43.4	ND	43.4	NA	ND	ND
650.0	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3	ND	110.0	ND	110.0	NA	ND	ND
650.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	51.9	11.3	63.2	NA	ND	ND
662.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	99.3	ND	99.3	NA	ND	ND

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State Mussel Watch Program

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Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
662.0	Royal Palms	RCM	11/25/96	ND	ND	2.5	ND	3.0	ND	2.1	ND	7.5	ND	ND
664.0	Cabrillo Beach	RCM	01/18/96	ND	ND	3.8	ND	4.1	ND	2.4	ND	10.3	ND	ND
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97	ND	1.4	15.3	1.1	10.8	7.7	14.7	ND	51.0	9.2	ND
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96	ND	2.5	35.6	1.8	34.5	16.4	32.6	1.2	124.6	5.4	ND
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97	ND	1.6	23.7	1.1	20.6	10.1	19.5	1.1	77.7	9.4	ND
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96	ND	2.0	30.6	1.5	30.5	18.3	30.0	1.4	114.3	4.9	ND
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97	ND	2.7	24.2	2.3	22.1	13.4	21.1	ND	85.8	14.7	2.4
723.4	Newport Bay/Turning Basin	TCM	01/17/96	ND	ND	19.2	ND	14.1	10.0	16.8	1.9	62.0	ND	ND
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96	ND	1.3	25.0	1.1	19.6	13.4	21.1	1.1	82.6	ND	2.3
725.0	Newport Bay/Crows Nest	TCM	01/17/96	ND	1.3	23.0	1.6	15.7	14.2	20.2	2.9	78.9	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
662.0	ND	6.0	18.3	33.8	442.0	ND	4.8	38.0	542.9	ND	2.8	ND	ND	ND	ND	ND	ND
664.0	ND	7.4	26.5	41.6	365.0	ND	8.3	48.4	497.2	ND	2.3	ND	ND	NA	ND	ND	ND
708.0	ND	11.8	25.4	16.9	281.0	4.1	17.0	21.9	378.0	ND	7.7	ND	ND	ND	ND	ND	ND
713.0	ND	34.2	61.2	13.0	260.0	4.6	19.1	16.0	408.1	ND	11.2	ND	ND	NA	ND	ND	ND
713.0	ND	13.0	28.5	5.6	195.0	5.5	42.6	10.7	300.9	ND	12.2	ND	ND	ND	ND	ND	ND
715.0	ND	18.8	39.5	6.1	247.0	ND	6.3	10.1	327.8	ND	8.5	ND	ND	NA	ND	ND	ND
715.0	ND	11.1	20.7	5.2	185.0	4.5	13.7	10.2	250.4	ND	12.6	ND	ND	ND	ND	ND	ND
723.4	ND	7.0	28.7	3.1	186.0	ND	4.0	6.5	235.3	ND	8.4	ND	ND	NA	ND	ND	ND
724.0	ND	17.1	72.3	13.4	514.0	ND	10.8	20.6	648.2	ND	10.5	ND	ND	NA	ND	ND	ND
725.0	ND	13.4	52.0	8.8	413.0	ND	739.0	17.0	1243.2	ND	10.2	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
662.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	71.0	128.0	ND	199.0	NA	ND	ND
664.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	77.2	ND	77.2	NA	ND	ND
708.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6	27.1	175.0	ND	202.1	NA	ND	ND
713.0	ND	ND	ND	ND	1.7	1.9	ND	ND	ND	ND	2.5	ND	194.0	ND	194.0	NA	ND	ND
713.0	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	3.2	ND	117.0	ND	117.0	NA	ND	ND
715.0	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	2.1	ND	183.0	ND	183.0	NA	ND	ND
715.0	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	4.5	89.3	197.0	ND	286.3	NA	ND	142.0
723.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	196.0	ND	196.0	NA	ND	ND
724.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.0	ND	165.0	ND	165.0	NA	ND	ND
725.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	140.0	1020.0	ND	1160.0	NA	ND	ND

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Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
725.0	Newport Bay/Crows Nest	TCM	01/27/97	ND	1.6	17.9	ND	14.1	13.4	14.6	1.6	63.3	9.3	2.5
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96	ND	ND	15.7	1.0	10.7	14.2	15.8	1.6	59.0	ND	ND
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97	ND	ND	16.0	1.2	12.1	10.1	12.6	ND	52.0	9.2	6.5
726.6	Newport Bay/Mariners Drive	TCM	01/27/97	ND	1.7	20.3	1.3	16.3	9.6	18.1	ND	67.4	14.4	9.9
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	ND	ND	4.9	ND	4.3	3.1	5.2	ND	17.6	ND	ND
742.0	San Juan Creek	RCM	01/18/96	ND	ND	7.5	ND	6.9	3.8	9.4	ND	27.6	ND	ND
750.0	Oceanside	RCM	01/18/96	ND	ND	7.7	ND	9.5	ND	8.8	ND	25.9	ND	ND
750.0	Oceanside	RCM	09/30/96	ND	ND	2.1	ND	1.6	ND	2.4	ND	6.1	ND	ND
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96	ND	ND	5.1	ND	5.3	6.2	5.5	ND	22.1	ND	ND
883.1	San Diego Bay/Chollas Creek	TCM	01/18/96	ND	ND	9.8	ND	11.5	9.5	12.1	ND	42.8	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
725.0	ND	12.7	42.8	7.3	384.0	6.9	24.6	16.1	494.4	ND	17.3	ND	ND	ND	ND	ND	ND
726.4	ND	8.2	33.2	ND	284.0	ND	4.6	ND	330.0	ND	10.1	ND	ND	NA	ND	ND	ND
726.4	ND	9.0	31.5	4.3	259.0	6.2	35.9	9.6	355.6	ND	16.1	ND	ND	ND	ND	ND	ND
726.6	63.2	16.6	55.2	7.7	319.0	15.5	66.7	13.7	494.4	ND	18.2	ND	ND	ND	ND	ND	ND
740.0	ND	ND	ND	ND	37.5	ND	4.4	ND	41.9	ND	2.4	7.6	ND	ND	7.6	ND	ND
742.0	ND	ND	6.4	ND	52.1	ND	4.6	ND	63.1	ND	ND	ND	ND	NA	ND	ND	ND
750.0	ND	9.2	26.1	6.1	159.0	ND	8.9	8.9	218.2	ND	4.6	ND	ND	ND	ND	ND	ND
750.0	ND	ND	4.0	ND	49.0	ND	ND	ND	53.0	ND	2.4	ND	ND	ND	ND	ND	ND
882.7	ND	ND	4.3	ND	21.5	ND	8.3	ND	34.2	ND	1.9	ND	ND	NA	ND	ND	ND
883.1	ND	ND	6.0	ND	22.2	ND	4.0	ND	32.2	ND	2.0	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
725.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.9	188.0	864.0	18.7	1070.7	NA	ND	189.0
726.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2	111.0	1010.0	ND	1121.0	NA	ND	ND
726.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21.9	99.0	488.0	10.9	597.9	NA	ND	245.0
726.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	46.0	ND	104.0	ND	104.0	NA	ND	319.0
740.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.1	ND	57.3	ND	57.3	NA	ND	ND
742.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	41.3	ND	41.3	NA	ND	ND
750.0	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23.0	ND	23.0	NA	ND	ND
750.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
882.7	ND	4.7	4.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	819.0	ND	819.0	NA	ND	ND
883.1	ND	9.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	365.0	ND	365.0	NA	ND	ND

* RCM = Resident California Mussel
RBM = Resident Bay Mussel (s = small size)
TCM = Transplanted California Mussel (a = archive)

OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
ND = Not Detected

APPENDIX N

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	ND	1.4	21.3	1.1	19.1	10.9	15.0	ND	68.8	ND	2.4
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	ND	1.3	14.6	ND	11.5	9.2	11.0	ND	47.6	ND	ND
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	ND	3.4	34.3	2.2	28.0	16.3	28.5	1.1	113.8	8.5	ND
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	ND	ND	13.0	ND	10.8	9.8	7.8	ND	41.4	4.3	ND
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96	ND	ND	8.6	ND	9.2	1.0	13.4	ND	32.3	ND	ND
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	ND	1.0	11.5	ND	11.0	6.8	7.2	ND	37.5	ND	2.2
883.8	San Diego Bay/Switzer Creek	TCM	01/18/96	ND	ND	9.4	ND	8.2	7.3	9.1	ND	34.0	ND	ND
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	ND	2.3	18.5	4.6	17.5	7.7	10.1	ND	60.7	4.4	3.0
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	ND	3.0	21.1	2.5	20.4	12.4	20.6	ND	80.0	ND	ND
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	ND	3.0	18.6	1.2	18.5	11.6	16.0	ND	68.9	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
883.1	ND	ND	6.4	ND	28.2	ND	11.6	ND	46.2	ND	7.7	ND	ND	ND	ND	ND	ND
883.2	ND	ND	6.7	ND	35.3	ND	8.8	ND	50.8	ND	4.8	ND	ND	ND	ND	ND	ND
883.3	ND	ND	9.1	ND	35.2	4.1	21.2	ND	69.6	ND	12.2	ND	ND	ND	ND	ND	ND
883.5	ND	ND	8.1	ND	30.4	ND	8.5	ND	47.0	ND	3.8	ND	ND	ND	ND	ND	ND
883.6	ND	5.9	12.5	ND	51.7	ND	7.6	ND	77.7	ND	ND	ND	ND	NA	ND	ND	ND
883.6	ND	ND	6.0	ND	19.3	ND	6.5	ND	31.8	ND	4.2	ND	ND	ND	ND	ND	ND
883.8	ND	ND	4.6	ND	25.6	ND	ND	ND	30.2	ND	2.4	ND	ND	NA	ND	ND	ND
883.8	ND	ND	5.3	ND	16.2	ND	11.0	ND	32.5	ND	6.6	ND	ND	ND	ND	ND	ND
885.1	ND	11.7	24.7	ND	54.3	4.2	11.9	ND	106.8	ND	6.8	ND	ND	ND	ND	ND	ND
885.3	ND	10.3	17.8	ND	62.7	ND	9.2	5.6	105.6	ND	7.0	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
883.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.9	ND	288.0	12.9	300.9	NA	ND	ND
883.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.0	76.4	495.0	27.9	599.3	NA	ND	ND
883.3	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	138.0	365.0	14.5	517.5	NA	ND	ND
883.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.7	50.0	460.0	43.1	553.1	NA	ND	ND
883.6	ND	6.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	690.0	ND	690.0	NA	ND	ND
883.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.9	ND	396.0	36.2	432.2	NA	ND	ND
883.8	ND	3.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	280.0	ND	280.0	NA	ND	ND
883.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.2	93.8	272.0	19.5	385.3	NA	ND	ND
885.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	29.1	198.0	681.0	39.1	918.1	NA	ND	ND
885.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21.0	166.0	647.0	10.4	823.4	NA	ND	ND

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PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
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APPENDIX N

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
886.0	San Diego Bay/NASSCO	TCM	01/18/96	ND	ND	8.9	ND	6.9	7.2	8.1	ND	31.0	ND	ND
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	ND	ND	9.0	ND	7.6	6.6	8.5	ND	31.6	ND	2.5
893.0	San Diego Bay/Laurel Street	TCM	01/18/96	ND	ND	17.0	ND	16.5	11.0	15.4	ND	59.9	ND	ND
893.5	San Diego Bay/B Street Pier	TCM	01/18/96	ND	ND	8.8	ND	7.0	6.1	6.7	ND	28.6	ND	ND
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	ND	3.5	22.8	7.1	20.6	7.2	13.4	ND	74.6	ND	3.4

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
886.0	ND	ND	6.4	ND	27.0	ND	5.6	ND	39.0	ND	2.8	ND	ND	NA	ND	ND	ND
888.0	ND	ND	5.8	ND	26.3	ND	8.9	ND	41.0	ND	2.0	ND	ND	ND	ND	ND	ND
893.0	ND	ND	8.8	ND	30.4	ND	6.0	ND	45.2	ND	2.2	ND	ND	NA	ND	ND	ND
893.5	ND	ND	8.4	ND	34.2	ND	5.2	ND	47.8	ND	4.5	ND	ND	NA	ND	ND	ND
894.0	ND	59.0	185.0	ND	29.7	12.2	5.4	7.9	299.2	ND	5.6	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
886.0	ND	4.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	472.0	ND	472.0	NA	ND	ND
888.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.2	147.0	423.0	17.1	587.1	NA	ND	ND
893.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.9	119.0	799.0	ND	918.0	NA	ND	ND
893.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	428.0	ND	428.0	NA	ND	ND
894.0	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	21.6	45300.0	8730.0	338.0	54368.0	NA	ND	ND

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OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
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APPENDIX O

Summary of 1995-97 Data
Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm
(ppb, lipid weight)

APPENDIX O

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
1.0	Crescent City Harbor	RCM	04/09/97	ND	ND	38.7	27.7	22.7	ND	24.4	ND	113.4	ND	ND
2.0	Crescent City/STP Outfall	RCM	04/09/97	ND	ND	65.2	ND	103.4	ND	39.3	ND	209.0	ND	ND
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	ND	ND	43.5	20.6	39.7	ND	21.4	ND	125.2	ND	ND
3.0	Crescent City/Control	RCM	04/10/97	ND	ND	19.8	ND	16.0	ND	ND	ND	35.8	ND	ND
100.0	Mad River Slough	OYS	04/10/97	ND	ND	19.7	ND	19.7	ND	ND	ND	40.2	ND	25.8
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	ND	ND	ND	ND	ND	ND	122.8	97.0	219.8	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	ND	ND	ND	ND	ND	ND	176.6	143.4	320.0	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	ND	ND	16.3	ND	11.0	ND	24.7	ND	52.0	ND	ND
102.6	Humboldt Bay/J Street	GLY	04/17/96	ND	ND	21.1	ND	ND	82.6	117.5	ND	221.4	122.6	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
1.0	ND	ND	ND	ND	100.0	ND	ND	ND	100.0	ND	ND	ND	ND	ND	ND	ND	ND
2.0	ND	ND	ND	ND	224.7	ND	48.3	ND	273.0	ND	39.3	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	ND	71.0	ND	ND	ND	71.0	ND	47.3	ND	ND	ND	ND	ND	ND
3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35.8	ND	ND	ND	ND	ND	ND
100.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.4	ND	ND	ND	ND	ND	ND
101.4	NA	ND	ND	ND	63.8	ND	ND	ND	63.8	ND	128.9	ND	ND	ND	ND	NA	ND
101.8	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND
101.8	NA	ND	ND	ND	45.0	ND	ND	ND	45.0	ND	ND	ND	ND	ND	ND	NA	ND
101.8	NA	ND	ND	ND	13.8	ND	ND	ND	13.8	ND	22.2	ND	ND	ND	ND	NA	ND
102.6	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	85.5	ND	ND	ND	ND	NA	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachloro-benzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	359.7	ND	359.7	NA	ND	ND
2.0	20.2	ND	ND	21.4	ND	ND	ND	ND	ND	ND	ND	ND	170.8	ND	170.8	NA	ND	ND
2.2	18.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	439.7	ND	439.7	NA	ND	ND
3.0	25.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
100.0	12.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	265.1	ND	265.1	NA	ND	ND
101.4	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
102.6	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND

* RCM = Resident California Mussel
RBM = Resident Bay Mussel (s = small size)
TCM = Transplanted California Mussel (a = archive)

OYS = Oyster (Crassostrea gigas)
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PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
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APPENDIX O

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
102.6	Humboldt Bay/J Street	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND	153.2	153.2	ND	ND
102.6	Humboldt Bay/J Street	RBM	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
102.6	Humboldt Bay/J Street	TCM	04/10/97	ND	ND	30.6	15.9	26.1	ND	16.6	ND	88.5	ND	ND
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
102.7	Humboldt Bay/H Street	GLY	04/17/96	ND	ND	16.7	ND	ND	14.4	42.4	ND	73.4	ND	ND
102.7	Humboldt Bay/H Street	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND	61.5	61.5	ND	ND
103.3	Humboldt Bay/E Street	TCM	04/10/97	ND	ND	24.1	ND	16.9	ND	ND	ND	41.0	ND	ND
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	ND	ND	30.1	ND	28.1	ND	15.1	ND	73.3	ND	ND
202.0	Bodega Head	RCM	09/11/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
202.0	Bodega Head	RCM	08/29/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
102.6	NA	ND	ND	ND	202.0	ND	ND	ND	202.0	ND	45.6	ND	ND	ND	ND	NA	ND
102.6	NA	ND	ND	ND	64.8	ND	ND	ND	64.8	ND	ND	ND	ND	ND	ND	NA	ND
102.6	ND	ND	ND	ND	45.2	ND	ND	ND	45.2	ND	51.0	ND	ND	ND	ND	ND	ND
102.7	NA	ND	ND	ND	49.3	ND	ND	ND	49.3	ND	ND	ND	ND	ND	ND	NA	ND
102.7	NA	ND	40.2	ND	338.0	ND	ND	ND	378.1	ND	12.5	ND	ND	ND	ND	NA	ND
102.7	NA	ND	ND	ND	359.9	ND	ND	ND	359.9	ND	53.1	ND	ND	ND	ND	NA	ND
103.3	ND	ND	ND	ND	48.8	ND	11.4	ND	60.2	ND	36.8	ND	ND	ND	ND	ND	ND
103.5	ND	ND	ND	ND	39.0	ND	ND	ND	39.0	ND	32.2	ND	ND	ND	ND	ND	ND
202.0	ND	ND	ND	ND	444.6	ND	ND	ND	444.6	ND	126.2	ND	ND	NA	ND	ND	ND
202.0	ND	ND	ND	ND	95.5	ND	ND	ND	95.5	ND	67.2	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
102.6	ND	ND	ND	ND	ND	ND	66.9	ND	NA	NA	NA	ND	ND	ND	ND	ND	NA	ND
102.6	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	1234.2	ND	1234.2	ND	NA	ND
102.6	12.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	269.4	ND	269.4	NA	ND	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	8483.7	ND	8483.7	ND	NA	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	1713.9	910.5	2624.5	ND	NA	ND
102.7	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	6390.9	6390.9	ND	NA	ND
103.3	12.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	282.5	ND	282.5	NA	ND	ND
103.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	376.0	ND	376.0	NA	ND	ND
202.0	220.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	704.1	ND	702.4	NA	ND	ND
202.0	37.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	506.8	ND	506.8	NA	ND	ND

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OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
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APPENDIX O

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	ND	16.0	48.7	15.1	35.3	ND	24.4	ND	138.7	ND	ND
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	ND	ND	32.2	ND	32.2	ND	24.4	ND	87.6	ND	31.0
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	ND	ND	18.7	ND	17.2	ND	ND	ND	35.1	ND	ND
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	ND	ND	14.8	ND	14.8	ND	ND	ND	29.6	ND	ND
280.0	Russian River/S Goat Rock	RCM	03/21/97	ND	ND	55.9	ND	38.0	ND	22.4	ND	116.3	ND	ND
307.0	San Francisco Bay/Treasure Is	TCM-a	01/26/81	ND	25.2	283.2	37.0	269.8	105.0	205.9	ND	926.0	ND	27.7
307.0	San Francisco Bay/Treasure Is	TCM-a	02/02/82	ND	27.2	288.4	34.0	246.6	108.7	194.2	ND	899.0	ND	ND
308.0	San Francisco Bay/Hunter's Point	TCM-a	01/26/81	ND	17.6	357.8	24.5	316.7	129.4	188.2	16.7	1051.0	ND	ND
309.0	San Mateo Bridge/8B	TCM-a	02/09/81	ND	19.3	346.8	31.2	280.7	127.5	234.9	16.5	1056.9	ND	52.3
313.0	San Francisco Bay/near Redwood Cr	TCM-a	01/26/81	ND	15.3	287.8	12.7	247.6	94.7	174.6	14.3	848.2	ND	24.3

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
205.0	ND	ND	ND	ND	129.4	ND	ND	ND	129.4	ND	35.3	ND	ND	ND	ND	ND	ND
205.1	ND	ND	ND	ND	237.3	ND	ND	ND	237.3	ND	ND	ND	ND	ND	ND	ND	ND
205.3	ND	ND	ND	ND	121.6	ND	ND	ND	121.6	ND	38.1	ND	ND	ND	ND	ND	ND
205.5	ND	ND	ND	ND	77.0	ND	ND	ND	77.0	ND	ND	ND	ND	ND	ND	ND	ND
280.0	ND	ND	ND	ND	185.7	ND	88.4	ND	272.9	ND	106.3	ND	ND	ND	ND	ND	ND
307.0	ND	216.8	731.9	50.4	707.6	48.7	120.2	148.7	2025.2	ND	363.0	8.4	ND	ND	8.4	ND	ND
307.0	ND	196.1	599.0	45.6	605.8	73.8	161.2	145.6	1828.2	ND	574.8	ND	49.5	ND	49.5	ND	ND
308.0	ND	193.1	542.2	ND	739.2	ND	152.0	136.3	1762.8	ND	711.8	31.4	ND	ND	31.4	ND	ND
309.0	ND	122.0	335.8	ND	532.1	ND	141.3	83.5	1214.7	ND	763.3	31.2	ND	ND	31.2	ND	ND
313.0	ND	74.1	190.5	ND	327.5	ND	90.5	64.6	747.6	ND	578.8	22.8	ND	ND	22.8	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
205.0	ND	ND	ND	ND	ND	ND	12.6	ND	ND	ND	ND	ND	722.7	176.5	899.2	NA	ND	ND
205.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1490.0	ND	1490.0	NA	ND	ND
205.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	405.2	ND	405.2	NA	ND	ND
205.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
280.0	23.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
307.0	36.1	ND	ND	34.5	ND	10.1	ND	20.2	ND	ND	ND	1500.8	6316.8	307.6	8125.2	NA	ND	1282.3
307.0	45.6	ND	ND	37.9	ND	25.2	ND	ND	ND	ND	ND	1639.8	6275.7	285.4	8201.0	NA	ND	2492.2
308.0	34.3	ND	ND	ND	ND	17.6	ND	ND	ND	ND	ND	988.2	5584.3	424.5	6997.1	NA	ND	1742.2
309.0	22.9	ND	ND	35.8	ND	24.8	ND	14.7	ND	ND	ND	853.2	4339.5	393.6	5586.2	NA	ND	1364.2
313.0	14.8	ND	ND	27.0	ND	15.9	9.0	17.5	ND	ND	ND	481.5	2705.3	194.2	3380.4	NA	ND	931.2

* RCM = Resident California Mussel
RBM = Resident Bay Mussel (s = small size)
TCM = Transplanted California Mussel (a = archive)

OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
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APPENDIX O

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
321.0	Dumbarton Bridge/Channel Marker 14	TCM-a	02/09/81	0.9	31.5	381.8	37.6	300.6	140.0	241.2	13.9	1146.7	ND	80.0
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	ND	ND	59.3	ND	51.8	14.1	48.9	ND	174.1	ND	ND
400.7	Santa Cruz Harbor/Inner	TCM	03/25/96	ND	ND	1371.1	ND	1083.1	562.8	997.1	92.2	4105.8	62.0	ND
401.0	Santa Cruz Harbor	TCM	03/25/96	ND	ND	687.5	ND	571.9	312.2	575.0	49.4	2196.0	ND	ND
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	ND	ND	100.0	ND	92.5	32.3	58.7	ND	283.5	ND	49.6
404.0	Sandholdt Bridge	TCM	02/16/96	ND	ND	509.5	ND	438.7	251.7	440.2	ND	1640.2	212.6	714.6
404.0	Sandholdt Bridge	TCM	03/04/97	ND	30.8	524.9	ND	452.6	260.7	532.0	ND	1800.9	130.3	327.0
414.0	Pacific Grove	RCM	03/07/96	ND	ND	138.8	ND	120.1	ND	73.3	ND	332.2	ND	ND
414.0	Pacific Grove	RCM	04/25/97	ND	ND	43.2	ND	ND	ND	26.2	ND	68.1	ND	43.2
601.0	LA Harbor/National Steel	TCM	01/18/96	ND	ND	735.6	ND	692.0	418.5	648.0	ND	2494.2	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
321.0	ND	105.4	272.1	ND	495.8	ND	110.9	78.8	1063.0	ND	630.3	44.2	ND	22.4	66.1	23.0	ND
400.6	ND	ND	91.8	ND	694.8	ND	222.2	ND	1008.9	ND	183.7	ND	ND	ND	ND	ND	ND
400.7	ND	ND	305.8	ND	1314.9	ND	691.7	ND	2312.8	ND	1083.1	ND	ND	NA	ND	ND	ND
401.0	ND	ND	353.1	ND	1528.1	ND	646.9	ND	2528.1	ND	375.0	ND	ND	NA	ND	ND	ND
403.0	ND	141.4	414.3	47.4	3062.4	303.8	948.9	76.7	4994.7	ND	527.8	ND	ND	ND	ND	ND	ND
404.0	ND	1340.2	3980.0	678.4	28192.0	1489.5	11397.4	836.8	47914.3	ND	3482.5	55.8	154.0	ND	209.5	432.8	ND
404.0	ND	1234.6	5277.3	524.9	27900.5	2940.8	10789.1	601.9	49270.1	ND	3271.3	37.9	149.3	ND	188.4	257.1	ND
414.0	ND	ND	211.6	ND	1434.5	ND	418.0	ND	2064.4	ND	369.4	ND	ND	NA	ND	ND	ND
414.0	ND	ND	ND	ND	375.6	ND	107.3	ND	483.0	ND	129.6	ND	ND	ND	ND	ND	ND
601.0	ND	848.0	3050.2	1461.8	11986.9	ND	686.9	954.9	18989.1	ND	200.4	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachloro-benzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
321.0	24.2	ND	ND	64.8	ND	27.9	13.3	13.3	ND	ND	25.5	1618.2	4548.5	229.7	6396.4	NA	ND	1149.1
400.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	256.3	ND	256.3	NA	ND	ND
400.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	104.1	ND	2177.7	ND	2178.9	NA	ND	ND
401.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3406.3	ND	3406.3	NA	ND	ND
403.0	ND	ND	ND	ND	ND	ND	ND	ND	121.1	ND	ND	ND	1081.2	127.1	1208.3	NA	ND	3159.4
404.0	ND	ND	ND	ND	ND	51.0	ND	ND	ND	ND	109.1	ND	3708.2	ND	3708.7	NA	ND	25176.8
404.0	ND	ND	ND	ND	ND	15.4	ND	ND	ND	ND	ND	ND	3340.1	472.8	3812.8	NA	ND	27075.8
414.0	64.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	609.6	ND	609.8	NA	ND	ND
414.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1112.6	ND	ND	1112.6	NA	ND	ND
601.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3290.9	21243.6	ND	24534.2	NA	ND	ND

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Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
601.0	LA Harbor/National Steel	TCM	01/28/97	ND	21.6	236.5	ND	187.8	95.9	118.9	ND	662.2	ND	ND
605.0	LA Harbor/Cabrillo Pier	TCM	01/18/96	ND	ND	237.9	ND	216.2	96.9	174.0	ND	725.0	ND	ND
616.0	LA Harbor/Consolidated Slip	TCM	01/18/96	ND	49.8	901.3	65.7	896.2	490.8	936.0	52.7	3392.9	ND	ND
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	ND	19.5	355.3	ND	293.0	158.7	236.9	ND	1063.5	ND	39.1
618.0	LA Harbor/Angels Gate	RCM	01/18/96	ND	ND	167.9	ND	173.7	78.4	157.9	ND	578.0	ND	ND
648.0	Malibu	RBM	01/17/96	ND	ND	154.4	14.1	136.3	40.7	125.1	ND	470.4	ND	ND
648.0	Malibu	RCM	11/25/96	ND	ND	44.1	ND	39.4	18.8	57.1	ND	159.4	ND	ND
650.0	Santa Monica	RBM	01/17/96	ND	ND	142.8	16.7	168.3	ND	193.9	ND	521.7	ND	ND
650.0	Santa Monica	RCM	11/25/96	ND	ND	114.8	ND	103.9	44.5	93.8	ND	357.0	ND	ND
662.0	Royal Palms	RCM	01/18/96	ND	ND	389.3	ND	377.4	77.8	223.5	ND	1067.9	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
601.0	ND	216.2	732.4	289.2	4183.8	85.1	378.4	306.8	6190.5	ND	106.8	ND	ND	ND	ND	ND	ND
605.0	ND	318.1	961.8	1990.8	13769.0	ND	285.8	1277.5	18603.1	ND	105.7	ND	ND	NA	ND	ND	ND
616.0	ND	1095.4	3983.3	916.3	9858.6	ND	971.1	582.4	17406.7	ND	179.1	ND	ND	NA	ND	ND	ND
616.0	ND	305.3	962.2	124.5	4151.4	63.5	604.4	241.8	6451.8	ND	117.2	ND	ND	ND	ND	ND	ND
618.0	1186.9	350.9	963.3	1737.4	15326.8	ND	338.9	1737.4	20454.7	ND	28.6	ND	ND	NA	ND	ND	ND
648.0	ND	79.6	200.5	189.2	1825.1	ND	77.8	265.9	2638.1	ND	11.3	ND	ND	NA	ND	ND	ND
648.0	ND	ND	61.8	78.8	690.6	ND	ND	114.7	946.5	ND	22.4	ND	ND	ND	ND	ND	ND
650.0	ND	97.2	255.4	238.0	2321.8	ND	47.1	361.0	3320.6	ND	24.5	ND	ND	NA	ND	ND	ND
650.0	ND	ND	107.0	68.8	852.3	ND	ND	142.2	1170.3	ND	61.7	ND	ND	ND	ND	ND	ND
662.0	ND	939.9	2826.3	3922.6	37732.5	ND	768.7	3872.8	50063.4	ND	192.2	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
601.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	162.2	4410.8	14481.1	562.2	19454.1	NA	ND	1735.1
605.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1504.4	6437.1	ND	7940.8	NA	ND	ND
616.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	156.9	3690.4	28677.8	ND	32369.0	NA	ND	ND
616.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	385.8	837.6	5677.7	409.0	6924.3	NA	ND	5219.8
618.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1035.6	10045.9	ND	11081.4	NA	ND	ND
648.0	11.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	822.2	ND	822.4	NA	ND	ND
648.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	510.6	ND	510.6	NA	ND	ND
650.0	17.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	27.0	ND	1277.0	ND	1277.0	NA	ND	ND
650.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	839.1	182.8	1021.9	NA	ND	ND
662.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7070.0	ND	7069.5	NA	ND	ND

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Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
662.0	Royal Palms	RCM	11/25/96	ND	ND	42.1	ND	51.0	ND	35.7	ND	128.8	ND	ND
664.0	Cabrillo Beach	RCM	01/18/96	ND	ND	121.4	ND	129.6	ND	78.2	ND	329.1	ND	ND
708.0	Anaheim Bay/Navy Marsh	TCM	01/27/97	ND	14.7	159.4	11.2	112.3	80.6	152.9	ND	531.2	96.5	ND
713.0	Huntington Harbour/Edinger Street	TCM	01/17/96	ND	57.9	825.0	40.8	799.5	380.0	755.4	27.8	2886.4	124.6	ND
713.0	Huntington Harbour/Edinger Street	TCM	01/27/97	ND	24.6	356.6	16.4	310.1	151.6	293.7	16.4	1166.7	142.1	ND
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/17/96	ND	52.0	812.1	39.5	809.4	485.5	796.0	37.9	3032.5	130.0	ND
715.0	Huntington Harbour/Warner Ave Brdg	TCM	01/27/97	ND	45.0	396.2	37.7	362.8	219.2	345.4	ND	1407.8	240.9	39.2
723.4	Newport Bay/Turning Basin	TCM	01/17/96	ND	ND	651.0	ND	478.3	338.8	569.9	62.9	2101.1	ND	ND
724.0	Newport Bay/Highway 1 Bridge	TCM	01/17/96	ND	39.5	756.8	33.0	593.2	405.7	638.7	34.6	2501.4	ND	68.4
725.0	Newport Bay/Crows Nest	TCM	01/17/96	ND	27.4	500.7	34.7	341.8	309.2	439.8	63.3	1716.7	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
662.0	ND	102.0	312.5	577.8	7554.9	ND	81.6	649.2	9278.1	ND	48.5	ND	ND	ND	ND	ND	ND
664.0	ND	236.2	848.3	1331.6	11683.2	ND	265.1	1549.2	15913.5	ND	73.9	ND	ND	NA	ND	ND	ND
708.0	ND	122.9	264.7	175.9	2925.9	42.3	177.1	228.2	3935.9	ND	80.0	ND	ND	ND	ND	ND	ND
713.0	ND	792.5	1418.2	301.3	6025.0	105.9	442.6	370.8	9456.2	ND	259.5	ND	ND	NA	ND	ND	ND
713.0	ND	195.4	429.0	84.7	2930.3	82.0	640.7	161.2	4521.9	ND	183.1	ND	ND	ND	ND	ND	ND
715.0	ND	498.9	1048.3	160.5	6554.2	ND	168.0	268.0	8697.6	ND	226.5	ND	ND	NA	ND	ND	ND
715.0	ND	181.4	339.6	85.6	3034.8	74.0	225.0	166.9	4107.4	ND	206.1	ND	ND	ND	ND	ND	ND
723.4	ND	236.0	973.4	106.6	6308.4	ND	135.7	219.2	7979.0	ND	286.4	ND	ND	NA	ND	ND	ND
724.0	ND	517.6	2188.6	405.7	15558.9	ND	327.0	623.5	19621.1	ND	317.8	ND	ND	NA	ND	ND	ND
725.0	ND	291.7	1132.0	191.2	8990.5	ND	16087.1	370.1	27062.4	ND	222.1	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
662.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1213.0	2187.5	ND	3401.8	NA	ND	ND
664.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2470.2	ND	2471.1	NA	ND	ND
708.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	58.2	282.4	1822.3	ND	2104.1	NA	ND	ND
713.0	ND	ND	ND	ND	39.6	44.6	ND	ND	ND	ND	59.2	ND	4495.5	ND	4495.5	NA	ND	ND
713.0	ND	ND	ND	ND	ND	15.0	ND	ND	ND	ND	47.8	ND	1758.2	ND	1758.2	NA	ND	ND
715.0	ND	ND	ND	ND	ND	28.7	ND	ND	ND	ND	56.4	ND	4855.3	ND	4855.9	NA	ND	ND
715.0	ND	ND	ND	ND	ND	17.4	ND	ND	ND	ND	74.0	1464.4	3230.8	ND	4695.2	NA	ND	2329.5
723.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6646.9	ND	6647.5	NA	ND	ND
724.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	241.6	ND	4994.6	ND	4994.6	NA	ND	ND
725.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	52.4	3047.6	22204.1	ND	25251.7	NA	ND	ND

* RCM = Resident California Mussel
RBM = Resident Bay Mussel (s = small size)
TCM = Transplanted California Mussel (a = archive)

OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
ND = Not Detected

APPENDIX O

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
725.0	Newport Bay/Crows Nest	TCM	01/27/97	ND	27.0	297.3	ND	233.8	223.0	243.2	27.0	1051.3	154.1	41.9
726.4	Newport Bay/Rhine Channel/End	TCM	01/17/96	ND	ND	585.7	37.3	399.2	529.5	589.3	61.5	2202.5	ND	ND
726.4	Newport Bay/Rhine Channel/End	TCM	01/27/97	ND	ND	302.0	21.6	227.4	190.2	237.3	ND	978.4	172.6	121.6
726.6	Newport Bay/Mariners Drive	TCM	01/27/97	ND	25.9	309.0	19.8	248.1	146.1	275.5	ND	1025.9	219.2	152.2
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	ND	ND	71.3	ND	62.5	45.0	76.8	ND	256.6	ND	ND
742.0	San Juan Creek	RCM	01/18/96	ND	ND	167.6	ND	154.1	83.6	208.7	ND	613.8	ND	ND
750.0	Oceanside	RCM	01/18/96	ND	ND	360.6	ND	446.8	ND	412.4	ND	1219.6	ND	ND
750.0	Oceanside	RCM	09/30/96	ND	ND	34.3	ND	26.7	ND	39.0	ND	100.0	ND	ND
882.7	San Diego Bay/Sampson Street Pier	TCM	01/18/96	ND	ND	202.5	ND	208.9	242.6	215.3	ND	869.2	ND	ND
883.1	San Diego Bay/Chollas Creek	TCM	01/18/96	ND	ND	360.3	ND	424.7	350.2	447.0	ND	1581.9	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
725.0	ND	210.8	710.8	121.6	6382.4	114.9	409.5	267.6	8217.6	ND	287.8	ND	ND	ND	ND	ND	ND
726.4	ND	304.5	1238.1	ND	10591.8	ND	170.9	ND	12305.3	ND	376.6	ND	ND	NA	ND	ND	ND
726.4	ND	170.6	592.2	82.3	4874.5	117.7	676.5	180.4	6694.1	ND	303.9	ND	ND	ND	ND	ND	ND
726.6	962.0	252.7	840.2	117.2	4855.4	235.9	1015.2	208.5	7525.1	ND	277.0	ND	ND	ND	ND	ND	ND
740.0	ND	ND	ND	ND	547.2	ND	63.6	ND	610.8	ND	35.1	109.7	ND	ND	109.7	ND	ND
742.0	ND	ND	142.4	ND	1157.8	ND	101.3	ND	1401.5	ND	ND	ND	ND	NA	ND	ND	ND
750.0	ND	432.5	1227.2	288.3	7475.7	ND	418.4	416.5	10258.5	ND	213.8	ND	ND	ND	ND	ND	ND
750.0	ND	ND	64.8	ND	798.1	ND	ND	ND	861.9	ND	39.0	ND	ND	ND	ND	ND	ND
882.7	ND	ND	170.6	ND	846.5	ND	328.0	ND	1344.7	ND	74.8	ND	ND	NA	ND	ND	ND
883.1	ND	ND	220.2	ND	819.9	ND	148.4	ND	1188.5	ND	72.5	ND	ND	NA	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachloro-benzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
725.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	197.3	3124.3	14360.8	310.8	17797.3	NA	ND	3141.9
726.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	80.3	4139.3	37668.0	ND	41807.8	NA	ND	ND
726.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	411.8	1862.8	9186.3	205.9	11254.9	NA	ND	4611.8
726.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	700.2	ND	1582.9	ND	1582.9	NA	ND	4855.4
740.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	89.9	ND	835.5	ND	835.5	NA	ND	ND
742.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	917.1	ND	917.7	NA	ND	ND
750.0	100.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1081.2	ND	1081.4	NA	ND	ND
750.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND
882.7	ND	184.4	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	32237.6	ND	32237.2	NA	ND	ND
883.1	ND	358.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13480.8	ND	13480.8	NA	ND	ND

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TCM = Transplanted California Mussel (a = archive)

OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
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APPENDIX O

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	ND	29.8	441.4	23.9	395.6	224.6	310.1	ND	1423.5	ND	49.7
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	ND	20.0	212.7	ND	168.0	134.0	159.8	ND	693.3	ND	ND
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	ND	48.4	491.0	31.5	400.9	233.1	407.7	15.8	1628.4	121.6	ND
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	ND	ND	175.1	ND	145.9	131.8	105.6	ND	558.3	58.3	ND
883.6	San Diego Bay/7th Street Channel	TCM	01/18/96	ND	ND	61.6	ND	65.8	7.1	95.5	ND	230.0	ND	ND
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	ND	16.8	188.1	ND	180.4	110.8	117.3	ND	613.4	ND	36.1
883.8	San Diego Bay/Switzer Creek	TCM	01/18/96	ND	ND	416.8	ND	364.9	323.3	401.5	ND	1506.1	ND	ND
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	ND	44.6	369.4	93.4	350.3	152.9	201.7	ND	1212.3	87.1	59.5
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	ND	39.4	283.9	34.2	274.6	166.8	277.7	ND	1077.7	ND	ND
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	ND	45.3	277.7	17.9	275.3	172.8	238.4	ND	1027.4	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
883.1	ND	ND	133.2	ND	582.5	ND	240.6	ND	956.3	ND	159.1	ND	ND	ND	ND	ND	ND
883.2	ND	ND	98.7	ND	514.7	ND	128.1	ND	740.3	ND	70.5	ND	ND	ND	ND	ND	ND
883.3	ND	ND	130.6	ND	503.4	58.6	302.9	ND	995.5	ND	174.6	ND	ND	ND	ND	ND	ND
883.5	ND	ND	109.7	ND	409.5	ND	114.7	ND	633.8	ND	50.3	ND	ND	ND	ND	ND	ND
883.6	ND	42.1	89.1	ND	368.5	ND	53.8	ND	553.5	ND	ND	ND	ND	NA	ND	ND	ND
883.6	ND	ND	97.9	ND	315.7	ND	105.7	ND	520.6	ND	68.3	ND	ND	ND	ND	ND	ND
883.8	ND	ND	205.3	ND	1133.6	ND	ND	ND	1338.9	ND	107.3	ND	ND	NA	ND	ND	ND
883.8	ND	ND	106.2	ND	322.7	ND	218.7	ND	649.7	ND	131.6	ND	ND	ND	ND	ND	ND
885.1	ND	157.5	332.6	ND	731.6	57.0	160.6	ND	1439.4	ND	92.2	ND	ND	ND	ND	ND	ND
885.3	ND	153.8	265.8	ND	934.5	ND	137.1	83.4	1573.3	ND	104.9	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
883.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	143.1	ND	5954.3	266.4	6220.7	NA	ND	ND
883.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	102.2	1112.8	7212.7	406.6	8732.1	NA	ND	ND
883.3	ND	ND	ND	ND	ND	16.9	ND	ND	ND	ND	ND	1974.1	5220.7	207.2	7400.9	NA	ND	ND
883.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	90.5	674.0	6201.2	581.5	7456.7	NA	ND	ND
883.6	ND	48.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4918.1	ND	4918.1	NA	ND	ND
883.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	128.9	ND	6480.7	592.8	7073.5	NA	ND	ND
883.8	ND	164.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12396.9	ND	12397.0	NA	ND	ND
883.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	84.9	1872.6	5428.9	388.5	7690.0	NA	ND	ND
885.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	391.7	2667.4	9174.1	526.4	12367.9	NA	ND	ND
885.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	313.5	2473.2	9640.0	154.9	12268.2	NA	ND	ND

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OYS = Oyster (Crassostrea gigas)
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PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
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APPENDIX O

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Mussel, Oyster, Shore Crab, and Sand Worm (ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
886.0	San Diego Bay/NASSCO	TCM	01/18/96	ND	ND	271.4	ND	210.4	218.6	246.3	ND	947.0	ND	ND
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	ND	ND	114.6	ND	97.5	85.1	108.4	ND	407.1	ND	32.5
893.0	San Diego Bay/Laurel Street	TCM	01/18/96	ND	ND	759.0	ND	736.9	491.1	687.5	ND	2674.5	ND	ND
893.5	San Diego Bay/B Street Pier	TCM	01/18/96	ND	ND	239.1	ND	191.6	165.3	182.8	ND	778.7	ND	ND
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	ND	70.5	463.9	145.9	418.0	145.9	272.1	ND	1516.4	ND	68.8

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Di-Chloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
886.0	ND	ND	195.6	ND	823.7	ND	170.2	ND	1189.6	ND	86.4	ND	ND	NA	ND	ND	ND
888.0	ND	ND	74.3	ND	337.5	ND	114.6	ND	526.3	ND	24.8	ND	ND	ND	ND	ND	ND
893.0	ND	ND	393.0	ND	1357.2	ND	269.4	ND	2019.6	ND	95.9	ND	ND	NA	ND	ND	ND
893.5	ND	ND	229.5	ND	930.3	ND	140.4	ND	1300.4	ND	121.3	ND	ND	NA	ND	ND	ND
894.0	ND	1200.0	3760.7	ND	603.3	247.5	109.8	160.7	6082.0	ND	113.1	ND	ND	ND	ND	ND	ND

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
886.0	ND	128.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14399.5	ND	14400.0	NA	ND	ND
888.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	92.9	1888.5	5435.0	219.8	7543.3	NA	ND	ND
893.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	531.4	5313.7	35675.3	ND	40988.2	NA	ND	ND
893.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11643.7	ND	11642.9	NA	ND	ND
894.0	ND	ND	ND	ND	ND	ND	27.9	ND	ND	ND	439.3	920852.4	177462.3	6870.5	1105185.0	NA	ND	ND

* RCM = Resident California Mussel
RBM = Resident Bay Mussel (s = small size)
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OYS = Oyster (Crassostrea gigas)
GLY = Sand Worm (Glycera spp.)
PAC = Shore Crab (Pachygrapsus crassipes)

NA = Not Analyzed
ND = Not Detected

APPENDIX P

Summary of 1995-97 Data
Organic Chemicals in Sediment
(ppb, dry weight)

APPENDIX P

State Mussel Watch Program

Summary of 1995-97 Data: Organic Chemicals in Sediment (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Aldrin	alpha-Chlordene	cis-Chlordane	gamma-Chlordene	trans-Chlordane	cis-Nonachlor	trans-Nonachlor	Oxychlordane	Total Chlordane	Chlorpyrifos	Dacthal
299.1	Selby Slag 4	SED	10/27/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
302.6	Paradise Cove	SED	10/26/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
306.1	Gashouse Cove/Laguna Street	SED	12/07/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
306.2	Sansome Street/Pier 31	SED	12/06/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
306.3	Howard Street/Pier 14	SED	12/06/95	ND	ND	ND	ND	1.0	1.1	ND	ND	2.1	ND	ND
306.4	Central Basin/Outer	SED	12/06/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
311.4	North South Bay	SED	12/06/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Station Number	Diazinon	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Dichloro-Benzophenone	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Total Endosulfan	Endrin	Ethion
299.1	NA	ND	1.0	ND	1.8	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND	NA
302.6	NA	ND	2.3	ND	1.7	ND	ND	ND	4.0	ND	ND	ND	ND	ND	ND	ND	NA
306.1	NA	ND	2.0	ND	1.9	ND	ND	ND	4.0	ND	3.9	ND	ND	ND	ND	ND	NA
306.2	NA	ND	1.5	ND	1.6	ND	1.7	ND	4.8	ND	ND	ND	ND	ND	ND	ND	NA
306.3	NA	1.7	5.0	ND	2.9	ND	1.6	ND	11.3	ND	ND	ND	ND	ND	ND	ND	NA
306.4	NA	0.0	1.7	ND	1.4	ND	ND	ND	3.1	ND	ND	ND	ND	ND	ND	ND	NA
311.4	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA

Station Number	alpha-HCH	beta-HCH	delta-HCH	gamma-HCH (Lindane)	Heptachlor	Heptachlor-epoxide	Hexachlorobenzene	Methoxychlor	Ethyl-parathion	Methyl-parathion	Oxadiazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	PCT 5460	Tetradifon	Toxaphene
299.1	ND	2.6	ND	ND	ND	ND	ND	1.7	NA	NA	ND	NA	NA	NA	NA	ND	NA	ND
302.6	ND	2.8	ND	ND	ND	ND	ND	1.3	NA	NA	ND	NA	NA	NA	NA	ND	NA	ND
306.1	ND	6.5	ND	ND	ND	ND	ND	2.8	NA	NA	ND	NA	NA	NA	NA	ND	NA	ND
306.2	ND	6.8	ND	ND	ND	ND	ND	2.4	NA	NA	ND	NA	NA	NA	NA	ND	NA	ND
306.3	ND	16.0	ND	ND	ND	ND	ND	8.2	NA	NA	ND	NA	NA	NA	NA	ND	NA	ND
306.4	ND	7.9	ND	ND	ND	ND	ND	3.1	NA	NA	ND	NA	NA	NA	NA	ND	NA	ND
311.4	ND	1.7	ND	ND	ND	ND	ND	ND	NA	NA	ND	NA	NA	NA	NA	ND	NA	ND

* SED = Sediment

NA = Not Analyzed
ND = Not Detected

APPENDIX Q

Summary of 1995-97 Data
PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm
(ppb, wet weight)

APPENDIX Q

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
1.0	Crescent City Harbor	RCM	04/09/97	186.1	1.9	4.1	ND	ND	9.7	14.3
2.0	Crescent City/STP Outfall	RCM	04/09/97	ND	ND	ND	ND	ND	ND	ND
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	14.6	ND	ND	ND	ND	ND	2.8
3.0	Crescent City/Control	RCM	04/10/97	15.6	ND	ND	ND	ND	ND	1.5
100.0	Mad River Slough	OYS	04/10/97	43.0	ND	ND	ND	ND	ND	8.4
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	3.6	ND	ND	ND	ND	ND	ND
101.5	Humboldt Bay/Eureka SM.22	TCM	02/15/95	24.2	ND	ND	ND	ND	ND	3.2
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	110.6	2.5	6.9	ND	ND	9.2	20.5
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	18.9	ND	1.6	ND	ND	1.3	2.1

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
1.0	6.6	2.7	7.3	10.1	4.1	7.0	19.3	13.9	ND
2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	ND	ND	3.3	ND	ND	ND
3.0	ND	ND	ND	ND	ND	1.6	1.6	ND	ND
100.0	ND	ND	2.2	ND	1.6	2.3	1.9	ND	ND
101.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.5	ND	ND	2.2	ND	ND	4.7	ND	ND	ND
101.8	6.2	6.7	1.8	2.0	1.9	2.7	ND	ND	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.8	ND	1.3	ND	2.0	ND	ND	ND	ND	2.3

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
1.0	ND	1.4	1.5	25.7	32.2	16.6	1.8	4.5	1.5
2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	6.6	ND	1.9	ND	ND	ND
3.0	ND	ND	ND	5.2	3.7	2.0	ND	ND	ND
100.0	ND	ND	ND	9.8	9.6	7.1	ND	ND	ND
101.4	ND	ND	ND	ND	ND	3.6	ND	ND	ND
101.5	ND	ND	ND	10.2	ND	4.0	ND	ND	ND
101.8	ND	4.7	4.0	12.3	ND	15.8	4.7	4.7	4.1
101.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.8	ND	1.4	ND	1.4	ND	4.3	1.3	ND	ND

* RCM = Resident California Mussel
TCM = Transplanted California Mussel
RBM = Resident Bay Mussel (s = small size)
OYS = Oyster (Crassostrea gigas)
POD = Abalone Jingle (Pododesmus cepio)
PAC = Shore Crab (Pachygrapsus crassipes)
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ND = Not Detected

APPENDIX Q

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
102.6	Humboldt Bay/J Street	RCM	02/15/95	181.6	1.0	8.3	ND	ND	10.9	63.8
102.6	Humboldt Bay/J Street	PAC	02/15/95	106.6	ND	2.7	ND	2.7	5.2	13.9
102.6	Humboldt Bay/J Street	TCM	02/15/95	27.7	ND	ND	ND	ND	ND	4.3
102.6	Humboldt Bay/J Street	POD	02/15/95	7168.1	461.9	301.1	28.4	81.2	456.3	1170.6
102.6	Humboldt Bay/J Street	GLY	04/17/96	35.9	ND	1.4	ND	ND	2.7	5.7
102.6	Humboldt Bay/J Street	PAC	04/17/96	19.4	ND	ND	ND	ND	5.2	5.0
102.6	Humboldt Bay/J Street	RBM	04/17/96	91.3	1.6	6.1	5.4	ND	9.7	12.0
102.6	Humboldt Bay/J Street	TCM	04/10/97	77.4	ND	2.3	ND	ND	3.1	14.4
102.7	Humboldt Bay/H Street	TCM	02/15/95	23.3	ND	ND	ND	ND	ND	3.0
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	126.4	2.8	7.2	ND	1.7	9.6	23.5

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
102.6	9.6	3.7	1.1	ND	ND	1.0	ND	ND	ND
102.6	7.4	2.3	2.1	5.6	3.9	4.8	5.4	ND	5.4
102.6	ND	ND	2.1	ND	ND	5.3	ND	ND	ND
102.6	286.1	103.2	422.6	254.3	104.7	61.3	37.0	9.7	525.5
102.6	1.7	ND	ND	3.8	ND	ND	ND	ND	7.1
102.6	ND	ND	ND	ND	ND	ND	ND	ND	4.1
102.6	5.7	5.9	1.1	1.3	1.2	1.6	ND	ND	1.4
102.6	ND	ND	4.2	ND	1.9	4.9	ND	ND	2.3
102.7	ND	ND	2.0	ND	ND	6.6	ND	ND	ND
102.7	5.7	6.2	2.4	3.9	3.3	4.4	ND	ND	3.9

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
102.6	ND	1.3	2.3	19.0	1.9	46.6	1.9	7.4	1.9
102.6	ND	ND	3.9	11.0	ND	19.7	3.5	4.1	3.1
102.6	ND	ND	ND	11.2	ND	4.8	ND	ND	ND
102.6	43.4	49.7	79.8	1453.0	51.4	774.2	190.7	131.3	90.5
102.6	ND	ND	ND	3.6	ND	10.0	ND	ND	ND
102.6	ND	ND	ND	ND	ND	5.2	ND	ND	ND
102.6	ND	4.4	3.5	5.9	ND	10.4	4.2	5.4	4.6
102.6	ND	ND	ND	20.8	7.3	16.1	ND	ND	ND
102.7	ND	ND	ND	8.4	ND	3.4	ND	ND	ND
102.7	ND	2.3	4.3	17.5	ND	17.4	2.7	5.0	2.7

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APPENDIX Q

State Mussel Watch Program

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(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
102.7	Humboldt Bay/H Street	PAC	04/17/96	103.9	ND	5.8	10.2	ND	11.8	3.9
102.7	Humboldt Bay/H Street	GLY	04/17/96	103.5	ND	ND	ND	ND	4.5	39.6
103.3	Humboldt Bay/E Street	TCM	04/10/97	49.8	ND	ND	ND	ND	3.3	8.1
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	54.1	2.1	3.8	ND	ND	4.5	8.7
104.1	Humboldt Bay/Union Oil Plant	TCM	02/15/95	29.0	ND	ND	ND	ND	1.6	4.2
104.2	Humboldt Bay/Coal Oil Gas Plant	TCM	02/15/95	41.2	ND	ND	ND	ND	ND	6.0
104.3	Humboldt Bay/Old Pac. Lumber	TCM	02/15/95	13.7	ND	ND	ND	ND	ND	2.0
202.0	Bodega Head	RCM	08/29/96	ND	ND	ND	ND	ND	ND	ND
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	79.2	1.8	2.0	ND	1.2	5.2	12.3
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	233.3	ND	7.5	ND	ND	28.0	77.4

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
102.7	8.4	11.1	ND	ND	ND	ND	ND	ND	ND
102.7	ND	ND	16.3	2.3	ND	ND	ND	ND	2.1
103.3	ND	ND	3.1	ND	ND	2.9	1.9	ND	ND
103.5	2.0	ND	2.9	ND	ND	3.1	2.0	ND	ND
104.1	ND	ND	1.9	ND	ND	6.4	ND	ND	ND
104.2	ND	ND	2.8	1.8	ND	5.3	ND	ND	2.2
104.3	ND	ND	ND	ND	ND	3.8	ND	ND	ND
202.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
205.0	1.8	1.2	2.6	ND	3.3	6.9	4.1	3.5	ND
205.1	9.0	3.5	3.9	ND	1.5	2.4	2.3	2.7	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
102.7	ND	7.4	10.4	ND	ND	4.8	10.5	7.8	11.8
102.7	ND	ND	ND	7.1	ND	29.1	ND	2.6	ND
103.3	ND	ND	ND	14.1	4.8	9.7	ND	2.0	ND
103.5	ND	ND	ND	16.4	2.7	5.9	ND	ND	ND
104.1	ND	ND	ND	10.7	ND	4.2	ND	ND	ND
104.2	ND	ND	ND	16.5	ND	6.5	ND	ND	ND
104.3	ND	ND	ND	5.9	ND	2.1	ND	ND	ND
202.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
205.0	ND	ND	ND	17.1	4.2	9.3	1.6	1.2	ND
205.1	ND	1.8	ND	25.7	15.1	44.3	2.2	6.0	ND

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APPENDIX Q

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	50.5	ND	2.0	ND	ND	4.4	8.4
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	47.2	1.0	1.4	ND	ND	3.4	7.4
280.0	Russian River/S Goat Rock	RCM	03/21/97	20.8	ND	ND	ND	6.9	ND	1.6
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	17.2	ND	ND	ND	ND	ND	3.0
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	37.0	ND	ND	ND	ND	ND	4.4
404.0	Sandholdt Bridge	TCM	03/04/97	42.7	1.2	1.2	ND	ND	2.0	4.3
414.0	Pacific Grove	RCM	04/25/97	1.3	ND	ND	ND	ND	ND	ND
601.0	LA Harbor/National Steel	TCM	01/28/97	240.4	5.0	ND	ND	ND	33.9	62.5
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	257.5	3.2	16.6	ND	ND	40.0	42.2
650.0	Santa Monica	RCM	11/25/96	38.9	ND	2.2	ND	ND	2.4	4.7

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
205.3	ND	ND	3.9	ND	ND	2.9	ND	3.7	ND
205.5	1.4	ND	2.8	ND	1.9	3.2	2.0	ND	ND
280.0	ND	ND	ND	ND	ND	1.6	ND	ND	ND
400.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
403.0	ND	ND	1.8	8.1	2.0	3.8	ND	ND	ND
404.0	ND	ND	2.8	6.4	1.2	2.8	1.2	ND	ND
414.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
601.0	26.9	9.3	2.0	ND	2.2	ND	ND	ND	ND
616.0	18.1	7.3	1.9	ND	3.8	5.1	3.2	5.3	2.5
650.0	ND	ND	3.6	ND	ND	3.6	ND	ND	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
205.3	ND	ND	ND	20.4	4.8	ND	ND	ND	ND
205.5	1.0	ND	ND	10.4	6.7	4.7	ND	ND	ND
280.0	ND	ND	ND	4.6	3.1	3.0	ND	ND	ND
400.6	ND	ND	ND	5.7	4.8	3.7	ND	ND	ND
403.0	ND	ND	ND	6.7	5.4	4.8	ND	ND	ND
404.0	ND	ND	ND	12.3	2.8	4.4	ND	ND	ND
414.0	ND	ND	ND	1.3	ND	ND	ND	ND	ND
601.0	1.2	ND	ND	5.8	2.5	61.7	7.1	20.3	ND
616.0	2.5	ND	3.6	7.1	10.6	55.3	6.1	18.7	4.4
650.0	ND	ND	ND	14.9	3.7	4.0	ND	ND	ND

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APPENDIX Q

State Mussel Watch Program

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(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	33.2	1.6	3.3	ND	ND	6.7	3.1
750.0	Oceanside	RCM	09/30/96	8.2	ND	ND	ND	ND	ND	1.6
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	2610.4	41.2	358.0	13.1	8.1	352.5	394.3
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	16291.6	691.2	1541.0	38.4	45.7	1108.6	4289.5
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	5028.1	47.7	449.1	6.4	7.9	430.1	1523.2
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	2913.3	115.4	231.6	3.8	5.7	211.2	892.8
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	13347.7	476.2	856.8	20.0	36.6	749.0	4079.6
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	307.0	5.9	29.4	2.3	1.6	32.6	77.4
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	5620.6	121.8	479.9	9.0	10.7	540.3	1608.9
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	22287.3	399.3	1773.9	32.1	42.2	1360.8	7524.9

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
740.0	2.4	ND	ND	ND	1.3	4.6	1.5	ND	ND
750.0	ND	ND	ND	ND	ND	1.7	ND	ND	ND
883.1	67.7	27.7	26.6	5.7	9.5	7.6	ND	5.7	20.4
883.2	1128.2	293.3	292.1	20.1	45.2	126.5	44.4	18.5	169.1
883.3	200.5	40.2	87.3	ND	4.8	12.3	8.2	5.2	59.7
883.5	107.6	28.1	46.8	ND	4.6	16.6	6.3	4.0	27.6
883.6	503.4	112.7	338.5	19.0	34.7	80.1	31.1	16.4	186.0
883.8	14.3	5.4	5.9	ND	2.0	2.8	ND	1.2	3.2
885.1	307.8	66.0	93.0	5.3	10.5	23.9	14.1	7.8	68.4
885.3	1158.3	275.4	226.0	7.2	43.6	102.1	49.5	19.1	185.5

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
740.0	ND	ND	ND	4.2	1.6	1.8	1.3	ND	ND
750.0	ND	1.8	ND	3.0	ND	ND	ND	ND	ND
883.1	8.9	ND	171.1	233.4	13.6	688.2	94.9	45.7	16.6
883.2	14.9	162.1	129.9	2219.5	143.8	2771.5	369.1	494.5	134.6
883.3	6.3	24.8	25.3	799.9	58.5	1078.6	29.0	98.6	24.8
883.5	4.4	17.0	10.8	459.6	31.4	594.0	24.2	58.4	11.2
883.6	16.4	72.2	58.2	2529.6	140.1	2554.4	137.6	244.3	54.9
883.8	1.6	ND	3.0	50.8	3.0	49.7	3.6	8.4	2.7
885.1	4.6	31.6	33.7	708.7	61.6	1171.8	57.4	155.3	28.5
885.3	14.7	134.5	118.3	3021.3	302.1	4568.4	325.6	485.2	117.4

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State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, wet weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	279.7	2.6	21.6	3.7	ND	40.0	78.0
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	134.2	2.8	8.7	ND	ND	17.9	38.9

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
888.0	36.0	13.1	ND	ND	ND	ND	ND	ND	ND
894.0	11.0	5.3	ND	ND	ND	ND	ND	ND	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
888.0	ND	ND	3.9	8.3	ND	43.1	5.5	19.3	4.8
894.0	ND	ND	3.3	6.3	ND	25.9	3.3	8.0	2.9

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APPENDIX R

Summary of 1995-97 Data
PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm
(ppb, dry weight)

APPENDIX R

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
1.0	Crescent City Harbor	RCM	04/09/97	1420.6	14.4	30.9	ND	ND	74.1	109.0
2.0	Crescent City/STP Outfall	RCM	04/09/97	ND	ND	ND	ND	ND	ND	ND
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	84.8	ND	ND	ND	ND	ND	16.0
3.0	Crescent City/Control	RCM	04/10/97	101.6	ND	ND	ND	ND	ND	10.0
100.0	Mad River Slough	OYS	04/10/97	284.5	ND	ND	ND	ND	ND	55.9
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	11.9	ND	ND	ND	ND	ND	ND
101.5	Humboldt Bay/Eureka SM.22	TCM	02/15/95	145.0	ND	ND	ND	ND	ND	19.0
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	723.1	16.2	45.4	ND	ND	60.1	134.0
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	165.7	ND	13.9	ND	ND	11.1	18.8
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
1.0	50.4	20.6	56.0	77.1	31.3	53.1	147.0	106.0	ND
2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	ND	ND	19.3	ND	ND	ND
3.0	ND	ND	ND	ND	ND	10.1	10.4	ND	ND
100.0	ND	ND	14.8	ND	10.8	15.4	12.8	ND	ND
101.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.5	ND	ND	13.0	ND	ND	28.0	ND	ND	ND
101.8	40.2	43.9	11.9	13.3	12.5	17.5	ND	ND	ND
101.8	ND	11.3	ND	17.4	ND	ND	ND	ND	20.1
101.8	ND	ND	ND	ND	ND	ND	ND	ND	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
1.0	ND	10.8	11.5	196.0	246.0	127.0	13.5	34.4	11.5
2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	38.3	ND	11.2	ND	ND	ND
3.0	ND	ND	ND	33.9	23.9	13.3	ND	ND	ND
100.0	ND	ND	ND	64.7	63.3	46.8	ND	ND	ND
101.4	ND	ND	ND	ND	ND	11.9	ND	ND	ND
101.5	ND	ND	ND	61.0	ND	24.0	ND	ND	ND
101.8	ND	30.8	26.3	80.3	ND	103.0	30.6	30.4	26.7
101.8	ND	12.3	ND	12.3	ND	37.5	11.0	ND	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	ND

* RCM = Resident California Mussel
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RBM = Resident Bay Mussel (s = small size)
OYS = Oyster (Crassostrea gigas)
POD = Abalone Jingle (Pododesmus cepio)
PAC = Shore Crab (Pachygrapsus crassipes)
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APPENDIX R

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
102.6	Humboldt Bay/J Street	TCM	02/15/95	173.0	ND	ND	ND	ND	ND	27.0
102.6	Humboldt Bay/J Street	POD	02/15/95	38332.0	2470.0	1610.0	152.0	434.0	2440.0	6260.0
102.6	Humboldt Bay/J Street	PAC	02/15/95	515.0	ND	13.0	ND	13.0	25.0	67.0
102.6	Humboldt Bay/J Street	RCM	02/15/95	2136.0	12.0	97.0	ND	ND	128.0	751.0
102.6	Humboldt Bay/J Street	RBM	04/17/96	861.3	14.7	57.5	51.3	ND	91.6	113.0
102.6	Humboldt Bay/J Street	GLY	04/17/96	261.8	ND	10.0	ND	ND	19.4	41.4
102.6	Humboldt Bay/J Street	PAC	04/17/96	59.0	ND	ND	ND	ND	15.7	15.1
102.6	Humboldt Bay/J Street	TCM	04/10/97	400.9	ND	12.1	ND	ND	16.1	74.5
102.7	Humboldt Bay/H Street	TCM	02/15/95	131.0	ND	ND	ND	ND	ND	17.0
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	987.9	21.5	56.2	ND	13.5	74.7	184.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
102.6	ND	ND	13.0	ND	ND	33.0	ND	ND	ND
102.6	1530.0	552.0	2260.0	1360.0	560.0	328.0	198.0	52.0	2810.0
102.6	36.0	11.0	10.0	27.0	19.0	23.0	26.0	ND	26.0
102.6	113.0	43.0	13.0	ND	ND	12.0	ND	ND	ND
102.6	53.5	56.0	10.3	12.5	11.0	15.0	ND	ND	12.8
102.6	12.1	ND	ND	27.8	ND	ND	ND	ND	52.0
102.6	ND	ND	ND	ND	ND	ND	ND	ND	12.4
102.6	ND	ND	21.6	ND	10.0	25.5	ND	ND	11.8
102.7	ND	ND	11.0	ND	ND	37.0	ND	ND	ND
102.7	44.8	48.2	18.8	30.2	25.4	34.4	ND	ND	30.2

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
102.6	ND	ND	ND	70.0	ND	30.0	ND	ND	ND
102.6	232.0	266.0	427.0	7770.0	275.0	4140.0	1020.0	702.0	484.0
102.6	ND	ND	19.0	53.0	ND	95.0	17.0	20.0	15.0
102.6	ND	15.0	27.0	224.0	22.0	548.0	22.0	87.0	22.0
102.6	ND	41.7	33.4	55.7	ND	97.6	39.4	50.6	43.7
102.6	ND	ND	ND	26.4	ND	72.7	ND	ND	ND
102.6	ND	ND	ND	ND	ND	15.8	ND	ND	ND
102.6	ND	ND	ND	108.0	37.9	83.4	ND	ND	ND
102.7	ND	ND	ND	47.0	ND	19.0	ND	ND	ND
102.7	ND	17.8	33.8	137.0	ND	136.0	21.2	39.1	21.1

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APPENDIX R

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
102.7	Humboldt Bay/H Street	PAC	04/17/96	311.9	ND	17.4	30.5	ND	35.5	11.7
102.7	Humboldt Bay/H Street	GLY	04/17/96	598.1	ND	ND	ND	ND	25.8	229.0
103.3	Humboldt Bay/E Street	TCM	04/10/97	275.2	ND	ND	ND	ND	18.4	44.8
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	302.3	11.7	21.2	ND	ND	25.0	48.7
104.1	Humboldt Bay/Union Oil Plant	TCM	02/15/95	181.0	ND	ND	ND	ND	10.0	26.0
104.2	Humboldt Bay/Coal Oil Gas Plant	TCM	02/15/95	247.0	ND	ND	ND	ND	ND	36.0
104.3	Humboldt Bay/Old Pac. Lumber	TCM	02/15/95	84.0	ND	ND	ND	ND	ND	12.0
202.0	Bodega Head	RCM	08/29/96	ND	ND	ND	ND	ND	ND	ND
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	733.2	16.8	18.1	ND	11.1	48.1	114.0
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	1822.9	ND	58.3	ND	ND	219.0	605.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
102.7	25.3	33.2	ND	ND	ND	ND	ND	ND	ND
102.7	ND	ND	94.1	13.1	ND	ND	ND	ND	11.9
103.3	ND	ND	17.0	ND	ND	16.2	10.3	ND	ND
103.5	11.4	ND	16.0	ND	ND	17.4	11.0	ND	ND
104.1	ND	ND	12.0	ND	ND	40.0	ND	ND	ND
104.2	ND	ND	17.0	11.0	ND	32.0	ND	ND	13.0
104.3	ND	ND	ND	ND	ND	23.0	ND	ND	ND
202.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
205.0	16.3	10.8	24.2	ND	30.1	64.1	38.0	32.5	ND
205.1	70.6	27.4	30.4	ND	11.8	18.6	17.7	20.7	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
102.7	ND	22.3	31.3	ND	ND	14.4	31.5	23.3	35.5
102.7	ND	ND	ND	41.2	ND	168.0	ND	15.0	ND
103.3	ND	ND	ND	77.7	26.3	53.6	ND	10.9	ND
103.5	ND	ND	ND	91.8	15.1	33.0	ND	ND	ND
104.1	ND	ND	ND	67.0	ND	26.0	ND	ND	ND
104.2	ND	ND	ND	99.0	ND	39.0	ND	ND	ND
104.3	ND	ND	ND	36.0	ND	13.0	ND	ND	ND
202.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
205.0	ND	ND	ND	158.0	38.5	86.2	15.3	11.1	ND
205.1	ND	14.2	ND	201.0	118.0	346.0	17.5	46.7	ND

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APPENDIX R

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	290.5	ND	11.8	ND	ND	25.4	48.1
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	476.7	10.5	13.7	ND	ND	34.1	74.5
280.0	Russian River/S Goat Rock	RCM	03/21/97	140.8	ND	ND	ND	46.9	ND	10.8
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	92.9	ND	ND	ND	ND	ND	16.2
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	229.8	ND	ND	ND	ND	ND	27.5
404.0	Sandholdt Bridge	TCM	03/04/97	367.9	10.4	10.1	ND	ND	17.0	37.4
414.0	Pacific Grove	RCM	04/25/97	14.7	ND	ND	ND	ND	ND	ND
601.0	LA Harbor/National Steel	TCM	01/28/97	2062.7	42.3	ND	ND	ND	287.0	530.0
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	2830.0	35.6	182.0	ND	ND	440.0	464.0
650.0	Santa Monica	RCM	11/25/96	188.1	ND	10.7	ND	ND	11.5	22.6

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
205.3	ND	ND	22.3	ND	ND	16.7	ND	21.4	ND
205.5	14.0	ND	28.4	ND	19.4	32.4	19.7	ND	ND
280.0	ND	ND	ND	ND	ND	11.0	ND	ND	ND
400.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
403.0	ND	ND	11.0	50.0	12.2	23.7	ND	ND	ND
404.0	ND	ND	24.0	55.3	10.7	23.9	10.7	ND	ND
414.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
601.0	228.0	78.7	16.9	ND	18.9	ND	ND	ND	25.4
616.0	199.0	79.7	21.0	ND	42.1	56.2	35.6	58.2	27.5
650.0	ND	ND	17.2	ND	ND	17.2	ND	ND	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
205.3	ND	ND	ND	117.0	27.8	ND	ND	ND	ND
205.5	10.0	ND	ND	105.0	67.7	47.3	ND	ND	ND
280.0	ND	ND	ND	30.9	21.0	20.2	ND	ND	ND
400.6	ND	ND	ND	30.9	25.7	20.1	ND	ND	ND
403.0	ND	ND	ND	41.8	33.8	29.8	ND	ND	ND
404.0	ND	ND	ND	106.0	24.4	38.0	ND	ND	ND
414.0	ND	ND	ND	14.7	ND	ND	ND	ND	ND
601.0	10.2	ND	ND	49.1	21.2	523.0	60.0	172.0	ND
616.0	27.5	ND	39.4	77.6	116.0	608.0	67.0	205.0	48.6
650.0	ND	ND	ND	71.9	17.8	19.2	ND	ND	ND

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APPENDIX R

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	310.2	14.8	30.5	ND	ND	62.5	29.0
750.0	Oceanside	RCM	09/30/96	53.3	ND	ND	ND	ND	ND	10.6
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	28069.2	443.0	3850.0	141.0	86.6	3790.0	4240.0
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	141666.0	6010.0	13400.0	334.0	397.0	9640.0	37300.0
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	44894.0	426.0	4010.0	57.1	70.2	3840.0	13600.0
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	24277.4	962.0	1930.0	32.0	47.8	1760.0	7440.0
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	107643.0	3840.0	6910.0	161.0	295.0	6040.0	32900.0
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	3528.7	68.2	338.0	27.0	18.5	375.0	890.0
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	60436.0	1310.0	5160.0	96.6	115.0	5810.0	17300.0
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	275151.3	4930.0	21900.0	396.0	521.0	16800.0	92900.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
740.0	22.8	ND	ND	ND	11.9	42.7	13.8	ND	ND
750.0	ND	ND	ND	ND	ND	11.1	ND	ND	ND
883.1	728.0	298.0	286.0	61.1	102.0	81.5	ND	61.7	219.0
883.2	9810.0	2550.0	2540.0	175.0	393.0	1100.0	386.0	161.0	1470.0
883.3	1790.0	359.0	779.0	ND	43.0	110.0	72.9	46.7	533.0
883.5	897.0	234.0	390.0	ND	38.4	138.0	52.3	32.9	230.0
883.6	4060.0	909.0	2730.0	153.0	280.0	646.0	251.0	132.0	1500.0
883.8	164.0	62.5	68.2	ND	23.6	32.4	ND	13.6	36.4
885.1	3310.0	710.0	1000.0	56.6	113.0	257.0	152.0	83.9	735.0
885.3	14300.0	3400.0	2790.0	88.3	538.0	1260.0	611.0	236.0	2290.0

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
740.0	ND	ND	ND	39.3	14.6	16.6	11.7	ND	ND
750.0	ND	12.0	ND	19.6	ND	ND	ND	ND	ND
883.1	95.3	ND	1840.0	2510.0	146.0	7400.0	1020.0	491.0	179.0
883.2	130.0	1410.0	1130.0	19300.0	1250.0	24100.0	3210.0	4300.0	1170.0
883.3	56.1	221.0	226.0	7142.0	522.0	9630.0	259.0	880.0	221.0
883.5	37.1	142.0	89.6	3830.0	262.0	4950.0	202.0	487.0	93.3
883.6	132.0	582.0	469.0	20400.0	1130.0	20600.0	1110.0	1970.0	443.0
883.8	18.2	ND	34.5	584.0	34.1	571.0	41.7	96.3	31.5
885.1	49.9	340.0	362.0	7620.0	662.0	12600.0	617.0	1670.0	306.0
885.3	181.0	1660.0	1460.0	37300.0	3730.0	56400.0	4020.0	5990.0	1450.0

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APPENDIX R

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	4053.1	37.2	313.0	53.3	ND	579.0	1130.0
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	1198.1	24.8	78.0	ND	ND	160.0	347.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
888.0	522.0	190.0	ND	ND	ND	ND	ND	ND	ND
894.0	98.3	47.2	ND	ND	ND	ND	ND	ND	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
888.0	ND	ND	55.9	120.0	ND	624.0	79.4	280.0	69.3
894.0	ND	ND	29.5	55.9	ND	231.0	29.1	71.2	26.1

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APPENDIX S

Summary of 1995-97 Data
PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm
(ppb, lipid weight)

APPENDIX S

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
1.0	Crescent City Harbor	RCM	04/09/97	15639.9	159.0	340.0	ND	ND	816.0	1200.0
2.0	Crescent City/STP Outfall	RCM	04/09/97	ND	ND	ND	ND	ND	ND	ND
2.2	Crescent City Harbor/Inner Jetty	RCM	04/09/97	1113.0	ND	ND	ND	ND	ND	210.0
3.0	Crescent City/Control	RCM	04/10/97	1476.0	ND	ND	ND	ND	ND	145.0
100.0	Mad River Slough	OYS	04/10/97	3253.0	ND	ND	ND	ND	ND	639.0
101.4	Arcata Bay/Jolly Giant Slough	PAC	04/18/96	595.0	ND	ND	ND	ND	ND	ND
101.5	Humboldt Bay/Eureka SM.22	TCM	02/15/95	2816.3	ND	ND	ND	ND	ND	368.6
101.8	Humboldt Bay/Halberson Shoreline	RBM-s	04/17/96	11064.0	248.0	695.0	ND	ND	920.0	2050.0
101.8	Humboldt Bay/Halberson Shoreline	PAC	04/17/96	ND	ND	ND	ND	ND	ND	ND
101.8	Humboldt Bay/Halberson Shoreline	GLY	04/17/96	1452.3	ND	121.5	ND	ND	97.7	164.6

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
1.0	555.0	224.9	616.0	849.0	345.0	585.0	1618.0	1167.0	ND
2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	ND	ND	253.0	ND	ND	ND
3.0	ND	ND	ND	ND	ND	147.0	151.0	ND	ND
100.0	ND	ND	169.0	ND	124.0	176.0	146.0	ND	ND
101.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.5	ND	ND	252.3	ND	ND	544.2	ND	ND	ND
101.8	615.0	672.0	182.0	203.0	191.0	268.0	ND	ND	ND
101.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.8	ND	99.2	ND	152.3	ND	ND	ND	ND	176.1

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
1.0	ND	119.0	127.0	2158.0	2708.0	1398.0	149.0	379.0	127.0
2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
2.2	ND	ND	ND	503.0	ND	147.0	ND	ND	ND
3.0	ND	ND	ND	493.0	347.0	193.0	ND	ND	ND
100.0	ND	ND	ND	740.0	724.0	535.0	ND	ND	ND
101.4	ND	ND	ND	ND	ND	595.0	ND	ND	ND
101.5	ND	ND	ND	1184.9	ND	466.3	ND	ND	ND
101.8	ND	471.0	402.0	1229.0	ND	1576.0	468.0	465.0	409.0
101.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
101.8	ND	107.7	ND	107.7	ND	329.2	96.2	ND	ND

* RCM = Resident California Mussel
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RBM = Resident Bay Mussel (s = small size)
OYS = Oyster (Crassostrea gigas)
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APPENDIX S

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
102.6	Humboldt Bay/J Street	RCM	02/15/95	60533.3	340.0	2750.0	ND	ND	3626.7	21280.0
102.6	Humboldt Bay/J Street	PAC	02/15/95	2216.4	ND	55.9	ND	55.9	107.7	288.4
102.6	Humboldt Bay/J Street	TCM	02/15/95	3181.6	ND	ND	ND	ND	ND	496.5
102.6	Humboldt Bay/J Street	POD	02/15/95	445222.4	28688.8	18700.0	1765.2	5041.0	28340.4	72709.3
102.6	Humboldt Bay/J Street	GLY	04/17/96	5124.3	ND	195.7	ND	ND	380.0	810.0
102.6	Humboldt Bay/J Street	PAC	04/17/96	1618.3	ND	ND	ND	ND	430.8	414.2
102.6	Humboldt Bay/J Street	RBM	04/17/96	13045.7	222.9	871.4	777.1	ND	1387.1	1711.4
102.6	Humboldt Bay/J Street	TCM	04/10/97	4929.0	ND	149.0	ND	ND	198.0	916.0
102.7	Humboldt Bay/H Street	TCM	02/15/95	2287.3	ND	ND	ND	ND	ND	297.1
102.7	Humboldt Bay/H Street	RBM-s	04/17/96	14050.0	305.6	798.9	ND	192.2	1062.2	2616.7

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
102.6	3203.3	1220.0	370.0	ND	ND	340.0	ND	ND	ND
102.6	154.9	47.4	43.0	116.2	81.7	99.0	111.8	ND	111.8
102.6	ND	ND	239.1	ND	ND	606.9	ND	ND	ND
102.6	17770.8	6411.2	26249.7	15796.3	6504.4	3809.9	2300.0	603.7	32637.9
102.6	237.1	ND	ND	544.3	ND	ND	ND	ND	1017.1
102.6	ND	ND	ND	ND	ND	ND	ND	ND	340.0
102.6	810.0	848.6	155.7	190.0	167.1	227.1	ND	ND	194.3
102.6	ND	ND	266.0	ND	123.0	313.0	ND	ND	145.0
102.7	ND	ND	192.2	ND	ND	646.1	ND	ND	ND
102.7	636.7	685.6	267.8	430.0	361.1	488.9	ND	ND	430.0

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
102.6	ND	426.7	766.7	6346.7	623.3	15526.7	623.3	2466.7	623.3
102.6	ND	ND	81.7	228.1	ND	408.9	73.2	86.1	64.7
102.6	ND	ND	ND	1287.4	ND	551.7	ND	ND	ND
102.6	2694.4	3089.4	4959.6	90247.8	3194.4	48085.7	11847.2	8153.4	5621.7
102.6	ND	ND	ND	517.1	ND	1422.9	ND	ND	ND
102.6	ND	ND	ND	ND	ND	433.3	ND	ND	ND
102.6	ND	631.4	505.7	842.9	ND	1478.6	597.1	765.7	661.4
102.6	ND	ND	ND	1328.0	466.0	1025.0	ND	ND	ND
102.7	ND	ND	ND	820.6	ND	331.4	ND	ND	ND
102.7	ND	253.3	481.1	1948.9	ND	1934.4	301.1	555.6	300.0

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APPENDIX S

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(ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
102.7	Humboldt Bay/H Street	PAC	04/17/96	10387.0	ND	579.0	1016.0	ND	1182.0	390.0
102.7	Humboldt Bay/H Street	GLY	04/17/96	3233.8	ND	ND	ND	ND	139.4	1238.1
103.3	Humboldt Bay/E Street	TCM	04/10/97	3000.0	ND	ND	ND	ND	201.0	488.0
103.5	Humboldt Bay/Clark Slough	TCM	04/10/97	3706.0	143.0	260.0	ND	ND	307.0	597.0
104.1	Humboldt Bay/Union Oil Plant	TCM	02/15/95	3575.3	ND	ND	ND	ND	197.5	513.6
104.2	Humboldt Bay/Coal Oil Gas Plant	TCM	02/15/95	4968.7	ND	ND	ND	ND	ND	724.1
104.3	Humboldt Bay/Old Pac. Lumber	TCM	02/15/95	1876.7	ND	ND	ND	ND	ND	268.5
202.0	Bodega Head	RCM	08/29/96	ND	ND	ND	ND	ND	ND	ND
205.0	Bodega Harbor/Spud Point Marina	TCM	03/21/97	6654.2	152.0	164.0	ND	101.0	437.0	1035.0
205.1	Bodega Bay/Porto Bodega	RBM	03/21/97	25924.4	ND	829.0	ND	ND	3115.0	8604.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
102.7	842.0	1106.0	ND	ND	ND	ND	ND	ND	ND
102.7	ND	ND	508.8	70.9	ND	ND	ND	ND	64.4
103.3	ND	ND	185.0	ND	ND	177.0	112.0	ND	ND
103.5	140.0	ND	196.0	ND	ND	213.0	135.0	ND	ND
104.1	ND	ND	237.0	ND	ND	790.1	ND	ND	ND
104.2	ND	ND	342.2	221.7	ND	643.4	ND	ND	261.5
104.3	ND	ND	ND	ND	ND	513.7	ND	ND	ND
202.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
205.0	148.0	97.2	220.0	ND	273.0	582.0	345.0	295.0	ND
205.1	1004.0	388.4	432.0	ND	168.0	265.0	252.0	294.0	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
102.7	ND	743.0	1042.0	ND	ND	480.0	1049.0	776.0	1182.0
102.7	ND	ND	ND	222.8	ND	908.1	ND	81.3	ND
103.3	ND	ND	ND	847.0	287.0	584.0	ND	119.0	ND
103.5	ND	ND	ND	1125.0	185.0	405.0	ND	ND	ND
104.1	ND	ND	ND	1323.5	ND	513.6	ND	ND	ND
104.2	ND	ND	ND	1991.6	ND	784.3	ND	ND	ND
104.3	ND	ND	ND	804.1	ND	290.4	ND	ND	ND
202.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
205.0	ND	ND	ND	1434.0	349.0	782.0	139.0	101.0	ND
205.1	ND	202.0	ND	2859.0	1678.0	4921.0	249.0	664.0	ND

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APPENDIX S

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
205.3	Bodega Bay/Mason's Marina	TCM	03/21/97	3773.0	ND	153.0	ND	ND	330.0	625.0
205.5	Bodega Bay/Back Marsh	RBM	03/21/97	6941.0	153.0	199.0	ND	ND	496.0	1085.0
280.0	Russian River/S Goat Rock	RCM	03/21/97	2342.0	ND	ND	ND	780.0	ND	180.0
400.6	Santa Cruz/Natural Bridges	RCM	06/09/97	1272.0	ND	ND	ND	ND	ND	222.0
403.0	Elkhorn Slough/Highway 1 Bridge	TCM	03/12/97	2782.0	ND	ND	ND	ND	ND	333.0
404.0	Sandholdt Bridge	TCM	03/04/97	5081.0	144.0	139.0	ND	ND	235.0	516.0
414.0	Pacific Grove	RCM	04/25/97	164.0	ND	ND	ND	ND	ND	ND
601.0	LA Harbor/National Steel	TCM	01/28/97	32890.3	675.0	ND	ND	ND	4576.0	8451.0
616.0	LA Harbor/Consolidated Slip	TCM	01/28/97	31404.5	395.0	2020.0	ND	ND	4883.0	5149.0
650.0	Santa Monica	RCM	11/25/96	3042.0	ND	173.0	ND	ND	186.0	365.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
205.3	ND	ND	290.0	ND	ND	217.0	ND	278.0	ND
205.5	204.0	ND	413.0	ND	282.0	472.0	287.0	ND	ND
280.0	ND	ND	ND	ND	ND	183.0	ND	ND	ND
400.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
403.0	ND	ND	133.0	605.0	148.0	287.0	ND	ND	ND
404.0	ND	ND	331.0	764.0	148.0	330.0	148.0	ND	ND
414.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
601.0	3636.0	1253.3	269.0	ND	301.0	ND	ND	ND	405.0
616.0	2208.0	884.5	233.0	ND	467.0	624.0	395.0	646.0	305.0
650.0	ND	ND	278.0	ND	ND	278.0	ND	ND	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
205.3	ND	ND	ND	1519.0	361.0	ND	ND	ND	ND
205.5	146.0	ND	ND	1529.0	986.0	689.0	ND	ND	ND
280.0	ND	ND	ND	514.0	349.0	336.0	ND	ND	ND
400.6	ND	ND	ND	423.0	352.0	275.0	ND	ND	ND
403.0	ND	ND	ND	506.0	409.0	361.0	ND	ND	ND
404.0	ND	ND	ND	1464.0	337.0	525.0	ND	ND	ND
414.0	ND	ND	ND	164.0	ND	ND	ND	ND	ND
601.0	163.0	ND	ND	783.0	338.0	8340.0	957.0	2743.0	ND
616.0	305.0	ND	437.0	861.0	1287.0	6747.0	744.0	2275.0	539.0
650.0	ND	ND	ND	1163.0	288.0	311.0	ND	ND	ND

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State Mussel Watch Program

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(ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
740.0	Dana Point Harbor/Boat Yard	TCM	01/27/97	3648.0	174.0	359.0	ND	ND	735.0	341.0
750.0	Oceanside	RCM	09/30/96	777.0	ND	ND	ND	ND	ND	154.0
883.1	San Diego Bay/Chollas Creek	TCM	01/28/97	522044.8	8240.0	71610.0	2623.0	1611.0	70494.0	78864.0
883.2	San Diego Bay/Chollas Creek/Mouth	TCM	01/28/97	1916617.0	81312.0	181294.0	4519.0	5371.0	130424.0	504647.0
883.3	San Diego Bay/Chollas Creek/End	TCM	01/28/97	564962.8	5361.0	50463.0	719.0	883.0	48324.0	171146.0
883.5	San Diego Bay/Tuna Docks	TCM	01/28/97	294257.1	11661.0	23394.0	388.0	579.0	21333.0	90182.0
883.6	San Diego Bay/7th Street Channel	TCM	01/28/97	1711321.0	61046.0	109851.0	2559.0	4690.0	96021.0	523026.0
883.8	San Diego Bay/Switzer Creek	TCM	01/28/97	65316.5	1262.0	6257.0	500.0	342.0	6941.0	16474.0
885.1	San Diego Bay/Paleta Creek/End	TCM	01/28/97	585440.5	12691.0	49988.0	936.0	1114.0	56284.0	167594.0
885.3	San Diego Bay/7th Street Ch/Mid	TCM	01/28/97	2653246.0	47539.0	211179.0	3819.0	5024.0	162000.0	895821.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
740.0	268.0	ND	ND	ND	140.0	502.0	162.0	ND	ND
750.0	ND	ND	ND	ND	ND	162.0	ND	ND	ND
883.1	13541.0	5498.8	5320.0	1136.0	1897.0	1516.0	ND	1148.0	4073.0
883.2	132724.0	34459.5	34365.0	2368.0	5317.0	14882.0	5222.0	2178.0	19888.0
883.3	22526.0	4522.8	9803.0	ND	541.0	1384.0	917.0	588.0	6707.0
883.5	10873.0	2822.1	4727.0	ND	465.0	1673.0	634.0	399.0	2788.0
883.6	64544.0	14525.3	43400.0	2432.0	4451.0	10270.0	3990.0	2098.0	23846.0
883.8	3036.0	1154.5	1262.0	ND	437.0	600.0	ND	252.0	674.0
885.1	32066.0	6842.5	9688.0	548.0	1095.0	2490.0	1473.0	813.0	7120.0
885.3	137893.0	32785.7	26904.0	851.0	5188.0	12150.0	5892.0	2276.0	22082.0

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
740.0	ND	ND	ND	462.0	172.0	195.0	138.0	ND	ND
750.0	ND	175.0	ND	286.0	ND	ND	ND	ND	ND
883.1	1773.0	ND	34224.0	46686.0	2716.0	137640.0	18972.0	9133.0	3329.0
883.2	1759.0	19076.0	15288.0	261118.0	16912.0	326059.0	43429.0	58176.0	15829.0
883.3	706.0	2781.0	2844.0	89877.0	6569.0	121187.0	3259.0	11074.0	2781.0
883.5	450.0	1721.0	1086.0	46424.0	3176.0	60000.0	2448.0	5903.0	1131.0
883.6	2098.0	9252.0	7456.0	324308.0	17964.0	327487.0	17646.0	31318.0	7043.0
883.8	337.0	ND	639.0	10810.0	631.0	10570.0	772.0	1783.0	583.0
885.1	483.0	3294.0	3507.0	73819.0	6413.0	122063.0	5977.0	16178.0	2964.0
885.3	1745.0	16007.0	14079.0	359679.0	35968.0	543857.0	38764.0	57761.0	13982.0

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APPENDIX S

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Mussel, Oyster, Abalone Jingle, Shore Crab, and Sand Worm

(ppb, lipid weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
888.0	San Diego Bay/Coronado Bridge	RBM	01/28/97	43037.4	395.0	3323.0	566.0	ND	6146.0	11995.0
894.0	SD Bay/Harbor Is/E Basin/Storm Dr	TCM	01/28/97	21995.2	455.0	1432.0	ND	ND	2938.0	6371.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
888.0	5541.0	2029.4	ND	ND	ND	ND	ND	ND	ND
894.0	1805.0	865.2	ND	ND	ND	ND	ND	ND	ND

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
888.0	ND	ND	593.0	1274.0	ND	6624.0	843.0	2972.0	736.0
894.0	ND	ND	542.0	1026.0	ND	4241.0	534.0	1307.0	479.0

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APPENDIX T

Summary of 1995-97 Data
PAHs in Sediment
(ppb, dry weight)

APPENDIX T

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Sediment (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
101.5	Humboldt Bay/Eureka SM.22	SED	02/15/95	1607.2	17.5	23.4	ND	69.9	62.2	82.1
102.6	Humboldt Bay/J Street	SED	02/15/95	12293.6	212.0	564.0	95.4	181.0	512.0	2260.0
102.7	Humboldt Bay/H Street	SED	02/15/95	2672.9	34.5	75.6	28.2	70.2	78.8	239.0
102.8	Humboldt Bay/Davenport Mar. C St	SED	02/15/95	1617.4	15.1	22.7	7.7	67.8	38.7	120.0
104.1	Humboldt Bay/Union Oil Plant	SED	02/15/95	1677.9	19.7	22.1	ND	72.3	39.5	98.0
104.2	Humboldt Bay/Coal Oil Gas Plant	SED	02/15/95	1982.7	26.2	33.8	11.9	66.0	62.0	217.0
104.3	Humboldt Bay/Old Pac. Lumber	SED	02/15/95	2768.0	25.2	57.7	21.7	69.9	72.6	277.0
299.1	Selby Slag 4	SED	10/27/95	2128.1	104.0	212.0	ND	9.8	300.0	348.0
302.6	Paradise Cove	SED	10/26/95	2255.9	30.1	139.0	60.7	14.9	131.0	278.0
306.1	Gashouse Cove/Laguna Street	SED	12/07/95	4101.2	135.0	253.0	52.3	18.1	357.0	515.0

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
101.5	72.2	16.5	71.1	111.0	135.0	243.0	76.8	31.8	15.1
102.6	604.0	258.0	445.0	266.0	268.0	572.0	90.1	32.0	624.0
102.7	162.0	51.3	75.2	130.0	135.0	243.0	77.8	33.9	12.0
102.8	58.8	12.3	77.0	112.0	131.0	237.0	72.6	31.6	17.0
104.1	77.1	17.0	75.4	126.0	138.0	249.0	81.3	33.1	11.9
104.2	92.1	24.6	70.9	113.0	125.0	226.0	76.0	28.5	17.3
104.3	169.0	50.2	70.9	137.0	129.0	230.0	70.3	31.9	11.1
299.1	155.0	22.8	34.1	16.8	8.4	15.1	13.5	8.2	16.2
302.6	110.0	175.0	20.2	30.6	14.7	22.3	15.1	10.3	12.4
306.1	350.0	26.2	40.1	61.4	40.2	40.5	26.2	17.9	39.8

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
101.5	ND	40.3	36.3	239.0	82.1	82.7	33.2	41.5	24.5
102.6	27.1	146.0	258.0	1920.0	122.0	1810.0	438.0	301.0	288.0
102.7	22.8	70.0	129.0	270.0	89.6	280.0	147.0	103.0	115.0
102.8	6.8	40.8	33.5	250.0	72.3	110.0	25.4	38.3	19.0
104.1	9.2	49.8	39.8	232.0	80.3	98.0	36.3	46.4	25.7
104.2	7.5	48.2	52.8	276.0	71.4	180.0	59.6	54.4	42.5
104.3	13.5	86.8	171.0	257.0	77.2	304.0	171.0	115.0	149.0
299.1	7.8	40.6	99.3	124.0	21.1	282.0	120.0	86.9	82.5
302.6	16.0	82.9	169.0	106.0	13.7	348.0	186.0	134.0	136.0
306.1	23.7	72.8	321.0	303.0	ND	648.0	317.0	188.0	255.0

* SED = Sediment

ND = Not Detected

APPENDIX T

State Mussel Watch Program

Summary of 1995-97 Data: PAHs in Sediment (ppb, dry weight)

Station Number	Station Name	Sample Type*	Sample Date	Total PAH	Anthracene	Anthracene, benz(a)	Anthracene, dibenz(a,h)	Biphenyl	Chrysene	Fluoranthene
306.2	Sansome Street/Pier 31	SED	12/06/95	5294.7	170.0	323.0	ND	27.4	313.0	928.0
306.3	Howard Street/Pier 14	SED	12/06/95	11177.4	250.0	1040.0	72.1	27.6	706.0	1350.0
306.4	Central Basin/Outer	SED	12/06/95	7939.1	428.0	641.0	87.1	16.3	844.0	1060.0
311.4	North South Bay	SED	12/06/95	810.2	10.0	31.8	ND	6.6	40.2	73.1

Station Number	Fluoranthene, benzo(b)	Fluoranthene, benzo(k)	Fluorene	Naphthalene	Naphthalene, 1-methyl	Naphthalene, 2-methyl	Naphthalene, 2,6-dimethyl	Naphthalene, 2,3,5-trimethyl	Naphthene, ace
306.2	346.0	24.6	90.1	57.1	22.4	38.6	26.4	16.1	70.1
306.3	1100.0	11.0	98.3	122.0	31.5	61.3	31.1	26.9	49.4
306.4	845.0	55.7	86.4	46.0	15.6	27.7	19.6	11.4	39.1
311.4	90.3	8.2	8.4	13.3	6.4	9.6	7.4	ND	7.4

Station Number	Naphthylene, ace	Perylene	Perylene, benzo(ghi)	Phenanthrene	Phenanthrene, 1-methyl	Pyrene	Pyrene, benzo(a)	Pyrene, benzo(e)	Pyrene, indeno(1,2,3-cd)
306.2	31.3	86.6	343.0	498.0	ND	1030.0	368.0	230.0	255.0
306.3	53.2	237.0	1070.0	394.0	110.0	1880.0	923.0	601.0	932.0
306.4	17.8	139.0	599.0	387.0	35.4	853.0	689.0	432.0	564.0
311.4	5.2	24.0	91.8	42.9	7.0	101.0	81.4	56.6	87.7

* SED = Sediment

ND = Not Detected

APPENDIX U

Field and Laboratory Operations

FIELD AND LABORATORY OPERATIONS

Sample Collection

The State Mussel Watch Program (SMWP) collects about 100 mussels at each station, which are randomly divided into two groups for trace element and synthetic organic chemical analysis. Based on recommendations by Goldberg (1980) and Risebrough et al. (1980), the SMWP samples 45 mussels, three replicates of 15 individuals each, for trace elements at each site. Trace element results in the SMWP represent a mean value for the three replicates. A single replicate of 45 composited individuals is analyzed for synthetic organic compounds.

Mussels of 55 to 65 mm in length are collected wherever possible in order to reduce size related effects. Mussels are collected from the highest tidal height where they occur in adequate numbers to reduce variability induced by habitat height. Stainless steel pry bars are used to collect mussels off rocks. The pry bars are cleaned and rinsed in the laboratory and rinsed again with seawater prior to use.

At locations where mussels are unavailable and sampling can be accomplished using scuba equipment, transplanted samples are used. The mussel transplant system used is one of the following three systems; 1) In an area of deep water and no structures, a bottom anchored submerged buoy system is used; 2) In areas with structures (i.e. pilings, floating docks, etc.), a polypropylene line may be tied between two pilings or a line hung beneath a dock; 3) In areas of shallow water, samples may be placed on PVC or wooden stakes that are pounded into the substrate. Transplanted mussels are placed in polypropylene mesh bags and kept cool in ice chests for no more than 48 hours prior to deployment. To minimize the risk of contamination of the mussel from boat exhaust or surface film during deployment or retrieval, mussel samples are placed in polyethylene bags, where they remain until submerged and deployed. Upon retrieval from the subsurface buoy system, samples are again placed in polyethylene bags before being brought through the air-water interface. Once collected, the transplants are triple bagged. To minimize contamination caused by handling the mussel samples, polyethylene gloves are worn during collection, as well as processing, of mussel samples. A two month transplant period is adequate in most cases where pollutant uptake rates are expected to be high, but for trace elements in less contaminated environments, a six month interval may be necessary for an adequate sample (Stephenson et al. 1980). A four to six month transplant interval is used for organic chemicals to be consistent with transplant periods for trace elements.

Mussels to be analyzed for trace elements are placed in a ZIPLOCK^{R} polyethylene bag of 4 mm thickness. The samples are placed inside two additional polyethylene ZIPLOCK^{R} bags. Mussels to be analyzed for synthetic organic compounds are placed in a bag constructed of two layers of "heavy duty" aluminum foil. Prior to use, the foil is cleaned by heating to 500^{o}C or by rinsing in hexane. Samples in the foil bags are placed in two polyethylene ZIPLOCK^{R} bags. After bagging, all samples are placed in non-metallic ice chests and frozen using dry ice and stored at or below -20^{o}C until processed.

Laboratory Analysis

A detailed description of procedures and techniques discussed below can be found in the Department of Fish and Game's (DFG) Laboratory Quality Assurance Program Plan (DFG 1990). The following is a summary of the 1995-96 and 1996-97 Quality Assurance/Quality Control (QA\QC) results provided by the DFG's Water Pollution Control and Moss Landing Laboratories. Copies of the Laboratory Quality Assurance Program Plan and QA\QC results are available upon request.

Trace Elements Analytical Techniques in Tissue and Sediment

The following procedures were employed for mussel dissection and homogenization for trace element analysis: Frozen mussels were removed individually from the bags, cleaned of epiphytic organisms and debris under running deionized water by personnel wearing polyethylene gloves, and allowed to thaw in clean polyethylene trays. Adductor muscles were severed and gonads removed with a MICRO^{R}-cleaned stainless steel scalpel. Gonads were removed from mussels to reduce variability in trace element concentrations due to the sex of the organism (Stephenson et al. 1987). The remainder of the soft part was placed in a pre-weighted, acid-cleaned polypropylene 4 oz. jar and re-weighed. The shell lengths were also taken at this time. Samples were then homogenized to a paste-like consistency in the jars using a Brinkmann Polytron (Model PT10-35) equipped with a titanium generator (Model PTA 20). The homogenized samples were then refrozen at -20^{o}C until analyzed.

A Perkin-Elmer Model 2280 spectrophotometer with deuterium arc background corrector and digital display was used for techniques employing conventional (flame) atomic absorption spectrophotometry (Al, Cd, Cu, Mn, Zn) and cold vapor technique for mercury. A Perkin-Elmer Model 3030 Zeeman atomic absorption spectrophotometer equipped with an HGA-600 graphite furnace and an AS-60 autosampler was used for techniques requiring a graphite furnace (Ag, As, Cr, Ni, Pb, Se). All analytical values were corrected using procedural blanks. Trace element detection limits are presented in Table U-1 The technique used for digesting samples was known as "Teflon vessel digestion". Separate techniques were performed on sediments and tissues in the "Teflon vessel digestion" technique.

The "Teflon vessel digestion" technique for tissue and sediment were performed as follows: Samples were weighed into pre-cleaned 125 ml Teflon digestion vessels. Three grams of tissue and one gram of sediment were used. Digestion of each tissue sample was accomplished by adding a 4:1 concentrated HNO3: 3 ml concentrated HClO4 mixture and heating the sample on a warm (75^{o}C) hotplate 2-3 hours. After the initial reaction, the Teflon vessel was capped and heated in a 130^{o}C oven for four hours. Once the digestate had cooled it was transferred to a clean polyethylene bottle and diluted up to 20 ml with Type ll water. Sediment samples were digested using the same mixture as tissue samples except, instead of warming on a hotplate, sediment samples were heated in a 130^{o}C oven for four hours. After the initial reaction, 3 ml of hydrofluoric acid was added to the sediment sample and the Teflon vessel returned to a 130^{o}C oven for 12 hours. Twenty ml of boric acid (2.5%) was added to each sediment sample before again returning to a 130^{o}C oven for another 8 hours. Once the digestate was cool it was transferred to a clean polyethylene bottle and brought up to 20 ml with Type ll water.

To protect sample integrity, all materials contacting samples during laboratory operations were analyzed for trace element content. To ensure accuracy, reference materials from the National Bureau of Standards (NBS) were analyzed (Table U-2).

Synthetic Organic Compounds Analytical Techniques in Tissues - 1996

A 50 gram sample of tissue was spiked with a surrogate mixture of 4,4'-dibromo-octafluorobiphenyl, decachlorobiphenyl, and dibutylchlorendate (DBOB, DCB, DBCE) and extracted twice with acetonitrile by shaking for two hours on an orbital shaker at 300 rpm. The sample extracts were combined, filtered, and partitioned with petroleum ether. An aliquot of the petroleum ether extract was eluted through a Florisil^{R} column. The Florisil^{R} columns were eluted with petroleum ether (Fraction 1), six percent ethyl ether/petroleum ether (Fraction 2), and 15 percent ethyl ether/petroleum ether (Fraction 3). Fractions 2 and 3 were spiked with decachlorobiphenyl and all of the fractions were concentrated to an appropriate volume in a Zymark^{R} Turbovap concentrator prior to analysis by gas chromatography. The DCB was used as a surrogate to determine analyte recovery of the F1 compounds and to determine relative retention times for all fractions. DBOB was used to check the analyte recovery of the F2 compounds but was found to elute with the F1 compounds. DBCE was used to check the analyte recovery of the F3 compounds. The percent recoveries for the surrogate compounds are listed in Table U-5 for 1996. A mixture of synthetic standards was eluted through the Florisil^{R} column to determine the recovery and separation characteristics of the column. The distribution of synthetic organic compounds in the three fractions are listed in Table U-3. The detection limits for synthetic organics in mussels are presented in Table U-4.

At stations where the SMWP had previously detected endosulfan, samples were analyzed for endosulfan I, endosulfan II, and endosulfan sulfate. This required an additional elution through Florisil^{R} with 50 percent ethyl ether/petroleum ether (Fraction 4, Table U-3). All other stations were analyzed for endosulfan I only. This fraction was also spiked with decachlorobiphenyl prior to the concentration step. All of the 50 percent extracts were diluted with iso-octane by a factor of ten prior to analysis by gas chromatography because of the high lipid content of the fraction.

Procedure for Lipid Determination

Synthetic organic concentrations in organisms vary with lipid content so it is customary to provide lipid data when reporting tissue concentrations. A thoroughly homogenized sample weighing approximately 5 g (wet weight) is macerated and dried with anhydrous granular sodium sulfate. The dried sample is transferred to a blender with 150 ml of petroleum ether and blended for two minutes at high speed. The liquid is vacuum-filtered into a 250 ml filter flask through a 10 cm Buchner funnel containing Whatman #1 filter paper. The sample is blended once more with an additional 150 mL of petroleum ether and filtered. The filtrate is concentrated to approximately 25 mL with heat (steam bath) and nitrogen blowdown. The remaining filtrate is then quantitatively transferred into a 50 mL pre-weighed planchet. The petroleum ether is evaporated, the planchet containing the residue is reweighed, and the percent lipid is calculated.

SMW Samples Analyzed with the Bay Protection Toxic Cleanup Program

The Water Pollution Control Laboratory analyzed sediment samples for the Bay Protection and Toxic Cleanup Program - Group 17b. This group of samples also included sediment samples from the 1995 SMW program. These samples were analyzed for chlorinated hydrocarbons, PCBs and PAHs.

Polynuclear Aromatic Hydrocarbon Compounds (PAHs) and Chlorinated Hydrocarbons Analytical Techniques in Sediment

Thawed samples were stirred to a homogeneous appearance and two sample aliquots were removed, one for percent moisture determination (5 grams) and one for chemical analysis (20 grams). Sodium sulfate, activated copper and extraction surrogates were added to the bottle containing the 20 gram analytical sample which was then extracted three times with methylene chloride. After combining the three extraction aliquots, the extract was divided into two portions, one for chlorinated hydrocarbon (CH) analysis and the other for polycyclic aromatic hydrocarbon (PAH) analysis.

The CH portion was eluted through an activated Florisil column, separating the analytes into two fractions. Fraction 1 analytes were eluted with petroleum ether and fraction 2 analytes were eluted with 50% ethyl ether in petroleum ether. The two fractions were concentrated to 2 mL final volume using a Zymark Turbovap II evaporator.

The PAH aliquot was eluted through a silica gel/alumina column with methylene chloride. The extract was concentrated to 1 mL final volume using Kuderna-Danish (K-D) apparatus and a heated water bath.
Two sediment samples were spiked with solutions containing known concentrations of target analytes (chlorinated hydrocarbons, PCB congeners and PAHs) to assess accuracy and matrix effects. Percent recoveries for these analytes can be found in Tables U-10 (chlorinated hydrocarbons), Table U-11 (PCB congeners) and Table U-12 (PAHs).

Method blanks, representative of all materials and solutions contacting the sample, were prepared and analyzed. To preclude errors due to contamination, a vertical solvent was blank was prepared for each set of glassware used in the extraction and analyzed before introducing a new sample.

Synthetic Organic Compounds Analytical Techniques in Tissue - 1997

A 25 gram sample of tissue was spiked with a synthetic organic surrgate solution (DBOB, PCB congener 207, DBCE). The sample was dried with sodium sulfate and extracted three times by shaking with methylene chloride on an orbital shaker at 300 rpm. After combining the extracts, the sample was evaportated in a Zymark^{R} Turbovap to 10 mLs. A 2 mL aliquot was removed and placed in a tared planchett for lipid analysis. After the solvent evaporated, the planchett was briefly dried in a 70^{o}C oven to remove residual water. The percent lipid was then calculated. A 4 mL aliquot was eluted through a Florisil column as described above and four fractions (0%, 6%, 15%, and 50% petroleum ether/ethyl ether) were collected. The percent recoveries for the surrogate compounds are listed in Table U-6.

Mussel samples were spiked in duplicate with a solution containing known concentrations of target analytes to asses accuracy and matrix effects. Percent recoveries of the target analytes from the matrix spikes for 1996 and 1997 are listed in Table U-7.

Approximately 10 percent of samples were analyzed in duplicate to determine method precision. Precision results are listed in Table U-8 (1996) and Table U-9 (1997). Method blanks, representative of all materials and solutions contacting the sample, were prepared and analyzed. To preclude errors due to contamination, a vertical solvent was blank was prepared for each set of glassware used in the extraction and analyzed before introducing a new sample.

Polynuclear Aromatic Hydrocarbon Compounds (PAHs) Analytical Techniques in Tissue

Ten grams of tissue was spiked with a PAH surrogate solution that contains eight deuterated PAH compounds. The sample was dried, placed in a stainless steel cell and extracted by forcing heated solvents (1:1 solution of methylene chloride:acetone) under pressure through the sample. The extract was solvent exchanged into methylene chloride and eluted through a gel permeation chromatograph to remove most of the lipids. The extract was further cleaned up by eluting it through a silica gel/alumina column.

Table U-13 lists the PAH dry weight detection limits for tissue. PAH surrogate recoveries are listed in Table U-14. Tables U-15 and U-16 list the matrix spike recoveries and duplicate analysis results respectively.

Instrument and Analytical Conditions for Chlorinated Hydrocarbons

Sample extracts for chlorinated hydrocarbons were analyzed using a Varian Model 3500 gas chromatograph equipped with a Model 8035 autosampler, temperature programmable on-column injector, and dual Ni63 electron capture detectors. A 5 meter J&W DB5 fused silica capillary pre-column is connected to the temperature programmable injector, the column effluent is split using a press-fit "Y" connector to a 60 meter J&W DB5 and a 60 meter J&W DB17 column. The DB5 and DB17 columns are connected to the electron capture detectors. All three columns have a 0.25 mm ID and a 0.25 um liquid phase thickness. Helium was used as the carrier gas at a linear velocity of 35 cm/sec and nitrogen was used as the detector makeup gas at a flow of 25 ml/min. Chromatographic data was acquired and processed with a Hewlett-Packard Chem-Station, version A.03.02.

All sample extracts were analyzed with a single injection using the following conditions:

Injector temperature program:	Initial temperature - 70°C Program rate - 300°C/min Final temperature - 280°C Final temperature hold time – 70 min
Column temperature program:	Initial temperature - 70°C Program rate 1 - 15°C/min to 210°C Program 1 hold time - 10 min Program rate 2 - 2°C/min to 280°C
Final temperature hold time:	11 min
	Detector temperature: 330°C

Instrument and Analytical Conditions for Polynuclear Aromatic Hydrocarbon Compounds (PAHs)

Sample extracts were analyzed for PAH compounds using a Varian Saturn 4D Ion Trap GC-MS. Two microliters of sample extract were injected into a J&W Scientific DB-5MS, 60 meter x 0.25 mm I.D. fused silica capillary column with a 0.25 um film thickness. The GC oven temperature was initially held at 70°C for two minutes. The temperature ramp was 15°C per minute until the oven reached 150°C. The second temperature ramp was 2°C per minute to a final temperature of 280°C and held for 5 minutes. Injector temperature was isothermal at 300°C. The GC carrier gas was helium at a linear velocity of 37 cm/sec. Detection limits of the PAHs are reported in Table U-10. Results of duplicate analyses for PAHs in mussel and sediment are listed in Tables U-11, U-12, and U-13. Matrix spike recoveries for mussel tissue and sediment are listed in Table U-14.

State Mussel Watch Samples Analyzed with the Bay Protection Toxic Cleanup Program - Long Marine Laboratory (LML)

The Long Marine Laboratory in Santa Cruz analyzed tissue and sediment samples for the Bay Protection Toxic Cleanup Program - Group 14 and 17a. This group of samples also included several tissue and sediment samples from the 1996 and 1997 SMW program. The following are descriptions of methods used to analyze theses samples for PAHs and chlorinated hydrocarbons.

Analytical Techniques for Polynuclear Aromatic Hydrocarbon Compounds (PAHs) and Chlorinated Hydrocarbons (CH) Analyzed in Tissues by the Long Marine Laboratory

A 5 gram sample of tissue is extracted two times with methylene chloride using a Tekmar Tissumizer®. Prior to extraction, sodium sulfate and

extraction surrogates are added to the sample. After combining the two extraction aliquots, the extract is divided into three portions: one for lipid weight determination, one for chlorinated hydrocarbon (CH) analysis, and one for PAHs.

The CH portion is eluted through a silica/alumina column, separating the analytes into two fractions (Table U-17). Fraction 1 (F1) analytes are eluted using 1% methylene chloride in pentane and contains > 90% of p,p'-DDE and < 10% of p,p'-DDT. Fraction 2 (F2) analytes are eluted using 1% acetone in methylene chloride. The F2 fraction undergoes additional cleanup using size-exclusion High Performance Liquid Chromatography (HPLC/SEC). The F1 and F2 fractions are concentrated to 125 uL using a combination of rotary evaporator, tube heater, and nitrogen gas evaporation.

The PAH aliquot is eluted through a silica/alumina column using 100% methylene chloride. The eluate is further cleaned using HPLC/SEC. The PAH fraction is concentrated to 125 uL, using a combination of rotary evaporator, tube heater, and nitrogen gas evaporation.

Table U-18 lists the dry weight detection limits for chlorinated hydrocarbons in sediment and tissue; Table U-19 lists the dry weight detection limits for PAHs in tissue and sediments.

Analytical Techniques for Polynuclear Aromatic Hydrocarbon Compounds (PAHs) and Chlorinated Hydrocarbons (CH) Analyzed in Sediment by the Long Marine Laboratory

Samples are removed from the freezer and allowed to thaw. Each sample is stirred to a homogeneous appearance and two 10 gram sample aliquots are removed, one for dry weight determination and one for chemical analysis.

The dry weight sample is placed into a pre-weighed aluminum planchet and dried at 100˚C for 24 hrs. The dried sample is re-weighed to determine the sample's percent moisture.

The analytical sample is extracted three times with methylene chloride in a 250-mL amber Boston round bottle on a modified rock tumbler. Prior to rolling, sodium sulfate, copper, and extraction surrogates are added to the bottle. The sodium sulfate dehydrates the sample allowing for efficient sediment extraction. The copper, which is activated with hydrochloric acid, complexes free sulfur in the sediment.

After combining the three extraction aliquots, the extract is divided into two portions, one for chlorinated hydrocarbon (CH) analysis and the other for polycyclic aromatic hydrocarbon (PAH) analysis.

The CH portion is eluted through a silica/alumina column, separating the analytes into two fractions (Table U-17). Fraction 1 (F1) is eluted with 1% methylene chloride in pentane and contains > 90% of p,p'-DDE and < 10% of p,p'-DDT. Fraction 2 (F2) analytes are eluted with 1% acetone in methylene chloride. The two fractions are exchanged into hexane and concentrated to 500 uL using a combination of rotary evaporation, controlled boiling on tube heaters, and dry nitrogen blow downs. The F1 is treated a second time with a minimal amount of activated copper to ensure complete removal of sulfur prior to GC analysis.

The extract's PAH portion is eluted through a silica/alumina column with methylene chloride. The "cleaned" eluate is exchanged into hexane and concentrated to 500 uL in the same manner as the CH fractions.

Instrument and Analytical Conditions (Long Marine Laboratory)

The F1 and F2 fractions are analyzed by Gas Chromatography for chlorinated hydrocarbon analysis utilizing an Electron Capture Detector (GC/ECD). A single 2 uL splitless injection is directed onto two columns of different polarity (DB-17 & DB-5) to provide two dimensional confirmation of each analyte. The lowest analytical results are reported.

The PAH fraction is analyzed by Gas Chromatography Mass Spectrometry (GC/MS) for aromatic hydrocarbon analysis. A single 2 uL splitless injection is chromatographed on a DB-5 ms column and analyzed in a single ion monitoring (SIM) mode.

All analytes of interest are quantified using internal standard methodologies and are corrected for surrogate recoveries.

Quality control (QC) measures are routinely performed during sample analyses as described in the Bay Protection and Toxic Cleanup Program Quality Assurance Project Plan (BPTCP QAPP)[1]. The QC measures include the tracking of accuracy and precision as performance indices, instrument calibration verification, the dilution of samples which exceed the instrument's calibrated range and the documentation of surrogate recoveries.

Instrumental calibration is verified with continuing calibration check (CCC) solutions every 10-16 hours. Solutions purchased from the National Institute of Standards and Technology (NIST) are used to prepare mid-level CCC solutions with each analytical batch. The stability of all non-NIST analyte calibrations are monitored through the analysis of mid-level standards on 16-20 hour intervals.

All surrogates are inspected for acceptable recoveries prior to sample analysis. Samples which have recoveries exceeding the criterion of 50%-150% are subjected to re-analysis or re-extraction. Marginal recoveries which are in control yet exceed the range of 60% - 120% are closely inspected and corrective action is taken as appropriate. All corrective action is fully documented.

Prior to GC analysis, samples are spiked with a 20 fold excess of dilution internal standards. Therefore, samples exceeding the calibrated range of the instrument are subjected to a standard 1:20 dilution and reanalyzed. Deuterated fluoranthene (d12-FLA) is utilized as the PAH DIL-Istd.

Tracking of analytical precision and accuracy is accomplished through the use of method duplicates, matrix spikes, and Standard Reference Materials (SRMs) at a minimum of 5% each. Matrix spikes provide a means for assessing methodological performance for analytes not found in available SRMs. Matrix spike recoveries are presented in Tables U-20 through U-23. Tissues are

[1] Stephenson, M., M. Pucket, N. Morgan, and M. Reid. 1994. Bay Protection and Toxic Cleanup Program: Quality Assurance Project Plan. Bay Protection and Toxic Cleanup Program, State Water Resources Control Board, Sacramento, CA.

enriched such that resulting analyte levels are greater than ten times the method detection limit.

Hard copies of all chromatograms, area percent reports, and internal standard reports are generated and archived for each sample analyzed. Additionally, all phases of the analysis are archived magnetically on mini data cartridges.

TABLE U-1

State Mussel Watch Program
Trace Element Detection Limits

Tissue and Sediment

Element	Detection Limit (ug/g, ppm dry weight)	(ug/g, ppm wet weight)
Aluminum	1.0	0.2
Arsenic	0.25	0.04
Cadmium	0.002	0.0003
Chromium	0.02	0.003
Copper	0.003	0.0005
Mercury	0.03	0.005
Manganese	0.05	0.008
Nickel	0.1	0.02
Lead	0.03	0.005
Selenium	0.1	0.02
Silver	0.002	0.0003
Titanium	0.5	0.08
Zinc	0.02	0.003

TABLE U-2

State Mussel Watch Program
Trace Element Analysis of Reference Materials (*u*g/g, dry weight)*

	1995-96**	**1996-97****
	1566a - NBS Oyster	1566a - NBS Oyster
Ag	1.51±0.16 (1.68±0.15)	1.71±0.15 (1.68±0.15)
Al	204±9.54 (202.5±14.1)	201±7.74 (202.5±14.1)
As	13.5±0.751 (14.0±1.2)	11.8±0.141 (14.0±1.2)
Cd	4.32±0.10 (4.15±0.38)	4.39±0.10 (4.15±0.38)
Cr	1.11±0.08 (1.43±0.46)	1.14±0.04 (1.43±0.46)
Cu	64.7±0.80 (66.3±4.3)	65.2±0.39 (66.3±4.3)
Hg	0.064±0.004 (0.064±0.007)	0.0629±0.001 (0.064±0.007)
Mn	12.1±0.954 (12.3±1.5)	12.4±0.58 (12.3±1.5)
Ni	2.19±0.22 (2.25±0.44)	2.31±0.06 (2.25±0.44)
Pb	0.429±0.011 (0.371±0.014)	0.360±0.040 (0.371±0.014)
Se	2.12±0.45 2.21±0.24	1.85±0.0 (2.21±0.24)
Zn	840±21 (830±57)	859±30.7 (830±57)

* Sample values are given first, followed by reference values in parentheses, both values include 95% confidence interval where appropriate.
NBS refers to the National Bureau of Standards.
** Sample Year = State Fiscal Year (July 1 - June 30).

TABLE U-3

State Mussel Watch Program
Distribution of Synthetic Organic Compounds Among
Four Fractions of a Standard Florisil[R] Column

(0%) Fraction 1	(6%) Fraction 2	(15%) Fraction 3
HCH, alpha*	HCH, alpha*	dacthal
aldrin	HCH, beta	diazinon
chlordene, alpha	HCH, gamma	dichlorobenzophenone, p,p'
chlordene, gamma	HCH, delta	dieldrin
DDE, o,p'	cis-chlordane	endosulfan I
DDE, p,p'	trans-chlordane	endrin
DDMU, p,p'*	chlorpyrifos	malathion
DDT, o,p'	DDD, o,p'	oxadiazon
DDT, p,p'*	DDD, p,p'	parathion, ethyl
heptachlor	DDMU p,p'*	parathion, methyl
hexachlorobenzene	DDT, p,p'*	tetradifon (tedion)
trans-nonachlor	dicofol (kelthane)	
PCB 1248	ethion	
PCB 1254	heptachlor epoxide	
PCB 1260	methoxychlor	
	cis-nonachlor	(50%) Fraction 4
	oxychlordane	
	toxaphene	endosulfan II
		endosulfan sulfate

* Found in both 0% and 6% fractions.

TABLE U-4

State Mussel Watch Program
Synthetic Organic Compounds Analyzed
and Their Detection Limits in Mussel and Sediment

Compound	Detection Limit (ng/g, ppb dry weight)
aldrin	1
cis-chlordane	1
trans-chlordane	1
chlordene, alpha	1
chlordene, gamma	1
chlorpyrifos	4
dacthal	2
DDD, o,'p	5
DDD, p,p'	3
DDE, o,p'	3
DDE, p,p'	3
DDMU,p,p'	5
DDT, o,p'	4
DDT, p,p'	4
diazinon	50
dichlorobenzophenone-p,p'	3
dicofol (Kelthane)	10
dieldrin	1
endosulfan I	1
endosulfan II	10
endosulfan sulfate	50
endrin	6
ethion	20
HCH, alpha	1
HCH, beta	3
HCH, gamma	0.8
HCH, delta	2
heptachlor	1
heptachlor epoxide	1
HCB	1
methoxychlor	15
cis-nonachlor	1
trans-nonachlor	1
oxadiazon	2
oxychlordane	1
parathion, ethyl	10
parathion, methyl	10
PCB 1248	50
PCB 1254	10
PCB 1260	10
PCT 5460	10
tetradifon (Tedion)	10
toxaphene	100
tributyltin	20

Table U-5

State Mussel Watch Program
Percent Recovery of Surrogate Compounds for 1996

Station Number	Station Name	DBOB	DCB	DBCE
202.0	Bodega Head	57	76	47
400.7	Santa Cruz Harbor/Inner	65	94	94
401.0	Santa Cruz Harbor/Outer	58	83	43
404.0	Sandholt Bridge	56	84	117
404.0 DUP	Santholt Bridge	59	85	120
414.0	Pacific Grove	58	83	110
601.0	LA Harbor/National Steel	57	82	75
605.0	LA Harbor/Cabrillo Pier	59	78	97
616.0	LA Harbor/Consolidated Slip	50	83	46
618.0	LA Harbor/Angels Gate	59	64	71
648.0	Malibu Pier	62	62	91
650.0	Santa Monica Pier	59	57	78
662.0	Royal Palms	58	77	92
664.0	Cabrillo Beach	62	87	99
713.0	Huntington Harbor/Edinger Street	64	83	95
715.0	Huntington Harbor/Warner Avenue Br.	64	89	95
715.0 DUP	Huntington Harbor/Warner Avenue Br.	60	83	91
723.4	Newport Bay/Turning Basin	53	82	90
724.0	Newport Bay/Highway 1 Bridge	59	83	85
725.0	Newport Bay/Crows Nest	53	81	64
726.4	Newport Bay/Rhine Channel/End	54	84	68
742.0	San Juan Creek	67	86	81
750.0	Oceanside	62	77	96
882.7	San Diego Bay/Sampson Street Pier	51	82	86
883.1	San Diego Bay/Chollas Creek	53	84	90
883.6	San Diego Bay/Seventh Street Channel	51	86	89
883.8	San Diego Bay/Switzer Creek	50	83	87
886.0	San Diego Bay/NASSCO	55	85	96
893.0	Laurel Street Stormdrain	58	84	94
893.5	B Street Pier	62	86	98
893.5 DUP	B Street Pier	60	84	95

DBOB = 4,4'-dibromo-octafluorobiphenyl
DCB = decachlorobiphenyl
DBCE = dibutylchlorendate

DUP = Duplicate analysis.

Table U-6

State Mussel Watch Program
Percent Recovery of Synthetic Organic Surrogate Compounds for 1997

Station Number	Station Name	PCB Congener DBOB	207	DBCE
1.0	Crescent City Harbor	70	88	63
2.0	Crescent City/STP Outfall	66	87	61
2.1	Crescent City Harbor Jetty	79	97	77
3.0	Crescent City/Control	67	87	72
100.0	Mad River Slough	89	96	57
102.6	Humboldt Bay/J Street	82	98	59
103.3	Humboldt Bay/E Street	64	85	67
103.5	Clark Slough	67	86	58
202.0	Bodega Bay	64	82	64
205.0	Bodega Bay/Spud Pt. Marina	69	73	67
205.1	Bodega Bay/Porto Bodega	61	78	97
205.3	Bodega Bay/Mason’s Marina	67	65	71
205.5	Bodega Bay/Back Marsh	68	88	74
280.0	Russian River/Goat Rock	64	85	69
400.6	Santa Cruz/Natual Bridges	68	86	64
403.0	Elkhorn Slough/Hwy. 1 Bridge	61	54	66
404.0	Sandholdt Bridge	86	101	68
404.0 DUP	Sandholdt Bridge	64	85	66
414.0	Pacific Grove	63	84	74
601.0	LA Harbor/National Steel	54	50	62
616.0	LA Harbor/Consolidated Slip	65	57	61
616.0 DUP	LA Harbor/Consolidated Slip	69	87	53
648.0	Malibu Pier	75	93	56
650.0	Santa Monica Bay	65	52	65
662.0	Royal Palms	77	102	67
707.0	Anaheim Bay/Navy Harbor	59	79	64
707.0 Dup	Anaheim Bay/Navy Harbor	51	54	63
708.0	Anaheim Bay/Navy Marsh	58	81	56
708.5	Anaheim Bay/Navy Marsh 1	54	80	63
713.0	Huntington Harbor/Edinger St.	60	80	81
715.0	Huntington Harbor/Warner Ave. Bridge	69	94	76
725.0	Newport Bay/Crow’s Nest	68	90	55
726.4	Newport Bay/Rhine Channel/End	70	96	62
726.6	Newport Bay/Mariners Drive	71	95	76
740.0	Dana Point Harbor/Boat Yard	68	89	61
750.0	Oceanside	63	53	73
883.1	San Diego/Chollas Creek	61	86	72
883.2	San Diego/Chollas Creek/Mouth	64	83	68
883.3	San Diego/Chollas Creek/Mouth	69	93	78
883.5	San Diego/Tuna Docks	65	59	63
883.6	San Diego/7th Street Channel	58	58	69
883.8	San Diego/Switzer Creek	56	84	60
885.1	San Diego Bay/Paleta Creek/End	57	84	63
894.0	S.D.Bay/Harbor Is./E.Basin/Storm Drain	58	62	120

DBOB = 4,4'-dibromo-octafluorobiphenyl
DBCE = dibutylchlorendate

Dup = Duplicate analysis.

TABLE U-7

State Mussel Watch Program
Results of Matrix Spike Analyses: 1996 and 1997
Synthetic Organic Compounds
Mussel Tissue

	1996		1997	
Station Name	Bodega Head		Bodega Head	
Station Number	202.0		202.0	
Species	RCM		RCM	
	Percent Recovery		Percent Recovery	
	MS	MSD	MS	MSD
Compound				
aldrin	69.0	71.2	84.0	90.4
chlordane, cis	84.7	89.0	66.4	80.6
chlordane, trans	81.4	86.1	54.0	77.1
chlordene, alpha	67.0	69.4	82.1	85.2
chlordene, gamma	72.0	72.7	85.8	83.0
chlorpyrifos	48.8	52.9	60.5	59.5
dacthal	62.8	65.1	35.8	25.9
DDD, o,p′	91.3	97.0	78.4	86.6
DDD, p,p′	92.2	97.9	78.6	82.7
DDE, o,p′	89.2	91.1	83.1	81.8
DDE, p,p′	87.1	87.8	66.8	75.1
DDMU, p,p′	87.1	87.3	86.9	90.2
DDT, o,p′	95.0	94.0	85.5	86.6
DDT, p,p′	99.4	99.2	108.0	115.0
diazinon	59.6	62.7	26.0	25.9
dieldrin	59.6	61.2	45.2	47.9
endosulfan I	67.4	71.5	56.4	54.4
endosulfan II	78.6	82.7	70.8	71.5
endosulfan sulfate	79.1	83.6	71.1	87.8
endrin	83.1	84.9	55.8	46.6
ethion	75.5	77.1	125.0	133.0
HCH, alpha	48.6	52.0	48.3	70.5
HCH, beta	62.5	67.0	57.1	85.4
HCH, delta	NR	NR	39.0	30.6
HCH, gamma	62.4	64.0	63.1	75.3
heptachlor	49.3	53.3	42.8	20.9
hexachlorobenzene	61.6	62.7	73.4	80.2
methoxychlor	105.0	110.0	118.0	123.0
nonachlor, cis	94.7	101.0	84.1	92.4
nonachlor, trans	87.9	89.3	80.9	79.1
oxadiazon	67.2	67.9	48.6	46.3
oxychlordane	62.6	65.9	29.2	77.4
parathion, ethyl	55.4	57.6	38.9	47.0
parathion, methyl	49.7	52.1	33.1	30.3
tedion	56.2	57.1	56.7	50.3
PCB 1254	72.0	74.8	71.0	89.8

RCM = Resident California Mussel.

TABLE U-8

State Mussel Watch Program
Results of Duplicate Sample Analysis
1996 Synthetic Organic Compounds Quality Control - Mussel Tissue
(ng/g dry weight)

Station Name	Sandholdt Bridge		Hunting Harbor/ Warner Ave. Bridge		San Diego Bay/ B Street Pier	
Station Number	404.0		715.0		893.5	
Species	TCM		TCM		TCM	
REPLICATE	1	2	1	2	1	2
Compound						
Aldrin						
chlordane, cis	33.9	32.4	30.7	30.8	8.80	8.07
chlordane, trans	29.1	28.5	30.6	29.6	7.04	6.64
chlordene, alpha			1.96	1.84		
chlordene, gamma			1.49	1.55		
chlorpyrifos	14.2	11.9	4.91	5.70		
dacthal	47.4	47.5				
DDD, o,p'	89.0	85.3	18.8	18.1		
DDD, p,p'	264	254	39.5	38.5	8.45	6.84
DDE, o,p'	45.1	44.5	6.06	5.50		
DDE, p,p'	1870	1830	248	228	34.3	34.0
DDMU, p,p'	55.6	58.6	10.1	8.18		
DDT, o,p'	98.9	116				
DDT, p,p'	756	731	5.15	4.40	5.16	4.91
diazinon						
dieldrin	231	229	8.55	9.10	4.47	2.27
endosulfan I	3.71	1.44				
endosulfan II	10.2	9.5				
endosulfan sulfate						
endrin	28.8	27.1				
ethion						
HCH, alpha						
HCH, beta					<RL	5.07
HCH, delta						
HCH, gamma						
heptachlor						
heptachlor epoxide	3.39	3.52	1.09	0.905		
hexachlorobenzene						
methoxychlor						
nonachlor,cis	16.8	14.6	18.4	17.8	6.08	5.41
nonachlor, trans	29.3	31.8	30.0	29.3	6.73	6.09
oxadiazon	7.25	4.64	2.13	2.39		
oxychlordane			1.43	1.33		
parathion, ethyl						
parathion, methyl						
tedion						
toxaphene	1670	1460				
PCB 1254	247	277	184	161	428	427
PCB 1260		15.2	15.4			
Percent moisture	86.1	86.3	87.9	88.3	85.8	86.3
Percent lipid	0.922	0.987	0.456	0.449	0.522	0.474

TCM = Transplanted California Mussel.

TABLE U-9

State Mussel Watch Program
Results of Duplicate Sample Analysis
1997 Synthetic Organic Compounds Quality Control - Mussel Tissue
(ng/g dry weight)

Station Name	Sandholdt Bridge		LA Harbor/ Consolidated Slip		Anaheim Bay/ Navy Harbor	
Station Number	404.0		616.0		707.0	
Species	TCM		TCM		TCM	
REPLICATE	1	2	1	2	1	2
Compound						
Aldrin						
chlordane, cis	38.2	34.6	23.3	24.8	17.4	17.4
chlordane, trans	32.9	25.8	19.2	20.7	17.3	16.4
chlordene, alpha	2.24	1.69	1.31	1.96	1.49	ND
chlordene, gamma						
chlorpyrifos	9.51	8.93	ND	5.32	9.07	8.28
dacthal	23.8	26.2	2.57	2.78		
DDD, o,p'	89.8	83.5	20.0	20.9	12.3	12.1
DDD, p,p'	384	368	63.0	68.2	25.7	22.9
DDE, o,p'	38.2	31.1	8.19	16.6	14.9	9.41
DDE, p,p'	2000	1500	272	228	271	240
DDMU, p,p'	43.8	38.0	15.8	16.5	20.9	17.2
DDT, o,p'	214	152	4.16	6.06	5.08	ND
DDT, p,p'	785	728	39.6	41.7	24.9	24.5
diazinon						
dieldrin	238	230	7.68	8.16	10.1	10.5
endosulfan I	2.77	3.81				
endosulfan II	10.9	11.7				
endosulfan sulfate						
endrin	18.7	18.1				
ethion						
HCH, alpha						
HCH, beta						
HCH, delta						
HCH, gamma						
heptachlor						
heptachlor epoxide	1.14	1.38				
hexachlorobenzene						
methoxychlor						
nonachlor,cis	19.0	17.4	10.4	11.3	9.12	7.4
nonachlor, trans	38.7	30.2	15.5	18.4	16.1	11.4
oxadiazon			25.3	27.0	6.6	3.99
oxychlordane						
parathion, ethyl						
parathion, methyl						
tedion						
toxaphene	1970	1940	342	348		
PCB 1248			54.9	89.8		
PCB 1254	243	152	372	460		
PCB 1260	34.4	25.7	26.8	28.3		
Percent moisture	88.4	88.4	87.5	87.4	83.6	83.6
Percent lipid	0.844	0.853	0.819	0.877	1.39	1.33

TCM = Transplanted California Mussel.

TABLE U-10

Bay Protection Toxic Cleanup - Group 17b
Results of Matrix Spike Analyses in Sediment: Chlorinated Hydrocarbons

Compound	Matrix Spike Percent Recovery	Matrix Spike Duplicate Percent Recovery
Aldrin	66	64
Chlordane, cis	52	51
Chlordane, trans	83	82
Chlordene, alpha	73	72
Chlordene, gamma	70	68
Chlorpyrifos	117	115
Dacthal	85	83
DDD, o,p’	93	91
DDD, p,p’	79	78
DDE, o,p’	81	80
DDE, p,p’	85	84
DDT, o,p’	85	84
DDT, p,p’	90	88
DDMU, p,p’	87	85
Oxadiazon	91	89
Dieldrin	94	93
Endosulfan I	83	82
Endosulfan II	92	90
Endosulfan sulfate	95	93
Endrin	77	75
HCH, alpha	70	61
HCH, beta	117	114
HCH, gamma	63	62
HCH, delta	82	80
Heptachlor	43	42
Heptachlor epoxide	83	82
Hexachlorobenzene	65	64
Methoxychlor	89	87
Nonachlor, cis	88	86
Nonachlor, trans	84	82
Oxychlordane	82	80

TABLE U-11

Bay Protection Toxic Cleanup - Group 17b
Results of Matrix Spike Analyses in Sediment: PCB Congeners

PCB Congener No.	Matrix Spike Percent Recovery	Matrix Spike Duplicate Percent Recovery
8	64	67
18	70	73
28	75	75
44	84	83
52	77	74
66	88	87
101	81	80
105	88	91
118	88	87
128	89	90
138	83	82
153	82	88
170	99	98
180	92	90
187	90	98
195	96	95
206	98	97

TABLE U-12

Bay Protection Toxic Cleanup - Group 17b
Results of Matrix Spike Analyses in Sediment: PAHs

Compound	Matrix Spike Percent Recovery	Matrix Spike Duplicate Percent Recovery
naphthalene	102	102
1-methylnaphthalene	100	99
2-methylnaphthalene	101	102
biphenyl	96	95
2,6-dimethylnaphthalene	91	91
acenaphthylene	98	99
acenaphthene	96	97
2,3,5-trimethylnaphthalene	100	102
fluorene	102	100
phenanthrene	105	101
anthracene	117	104
1-methylphenanthrene	129	123
fluoranthene	96	75
pyrene	95	79
benzo[a]anthracene	112	93
chrysene	114	93
benzo[e]fluroanthene	195	140
benzo[k]fluroanthene	24	40
benzo[e]pyrene	117	98
benzo[a]pyrene	126	102
perylene	98	83
indeno[123-cd)pyrene	122	78
dibenzo[a]anthracene	106	82
benzo[g,h,i]perylene	117	88

TABLE U-13

State Mussel Watch Program
Polynuclear Aromatic Hydrocarbons (PAHs) Analyzed
and Their Detection Limits in Mussel and Sediment

Compound	Detection Limit (ng/g, ppb dry weight)
naphthalene	10
1-methylnaphthalene	10
2-methylnaphthalene	10
biphenyl	10
2,6-dimethylnaphthalene	10
acenaphthylene	10
acenaphthene	10
2,3,5-trimethylnaphthalene	10
fluorene	10
phenanthrene	10
anthracene	10
1-methylphenanthrene	10
fluoranthene	10
pyrene	10
benz[a]anthracene	10
chrysene	10
benzo[b]fluoranthene	10
benzo[k]fluoranthene	10
benzo[e]pyrene	10
benzo[a]pyrene	10
perylene	10
indeno[1,2,3-cd]pyrene	10
dibenz[a,h]anthracene	10
benzo[ghi]perylene	10

TABLE U-14

State Mussel Watch Program
Percent Recovery of Deuterated PAH Surrogate Compounds for 1997

Station Number	Station Name	d8-NPH	d10-BPH	d10-ACE	d10-PYR	d12-BAA	d12-BEP	d12-PER	d12-BGP
1.0	Crescent City Harbor	60	107	93	135	230	134	106	123
2.1	Crescent City/Harbor Jetty	72	113	119	119	136	123	103	109
3.0	Crrescent City Control	29	45	60	52	69	58	56	40
100.0	Mad River Slough	25	45	60	47	76	65	64	53
102.6	Humboldt Bay/J Street	52	65	63	59	66	50	44	33
103.3	Humboldt Bay/E Street	26	89	96	93	119	104	99	88
103.5	Clark Slough	44	54	62	78	72	66	63	64
202.0	Bodega Bay	20	47	61	57	68	62	57	56
205.0	Bodega Bay/Spud Point Marina	56	83	102	99	82	77	67	71
205.1	Bodega Bay/Port Bodega	34	70	75	65	94	62	64	47
205.3	Bodega Bay/Mason’s Marina	10	52	54	51	73	64	58	55
205.5	Bodega Bay/Back Marsh	19	59	81	73	101	86	80	61
280.0	Russian River/Goat Rock	49	90	136	120	148	142	132	120
400.6	Santa Cruz/Natural Bridges	40	82	99	91	118	89	85	65
403.0	Elkhorn Slough/Hwy 1 Bridge	55	96	115	101	119	84	84	62
414.0	Pacific Grove	66	81	85	104	96	95	69	100
404.0	Sandholdt Bridge	67	139	143	141	171	132	124	105
404.0 Dup	Sandholdt Bridge	55	128	132	135	156	134	125	111
650.0	Santa Monica Pier	16	45	61	60	76	65	61	56
707.0	Anaheim Bay/Navy Harbor	6	85	115	103	188	130	119	132
707.0 Dup	Anaheim Bay/Navy Harbor	28	79	93	83	116	92	87	71
708.5	Anaheim Bay/Navy Marsh 1	19	50	77	74	100	76	77	63
740.0	Dana Point Harbor/Boat Yard	62	78	95	126	108	107	101	102
750.0	Oceanside	62	75	85	100	92	92	62	89
883.1	San Diego Bay/Chollas Ck	73	74	88	103	91	90	71	67
883.2	San Diego Bay/Chollas Ck/Mouth	82	82	88	108	98	81	75	63
883.3	San Diego Bay/Chollas Ck/End	71	69	84	110	74	77	53	70
883.5	San Diego Bay/Tuna Docks	73	77	89	107	94	88	77	82
883.6	San Diego Bay/7th St. Channel	75	78	87	97	86	80	72	73
883.8	San Diego Bay/Switzer Ck	63	76	82	93	77	72	54	62
885.1	San Diego Bay/Paleta Ck/End	70	80	90	99	54	61	48	51
885.3	San Diego Bay/7th St Ch/Mid	66	72	76	105	96	90	79	78
888.0	San Diego Bay/Coronado Bridge	38	43	46	64	49	60	34	50
894.0	SD Bay/Harbor Is/E.Basin/Storm	61	66	74	96	78	76	58	67

d8-NPH = naphthalene-d8
d10-BPH = biphenyl-d10
d10-ACE = acenaphthene-d10
d10-PYR = pyrene-d10
d12-BAA = benzo[a]anthracene-d12
d12-BEP = benzo[e]pyrene-d12
d12-PER = perylene-d12
d12-BGP = benzo[g,h,i]perylene-d12

DUP = Duplicate analysis.

TABLE U-15

State Mussel Watch Program
Results of Matrix Spike Analyses: 1997 Polynuclear Aromatic Hydrocarbons (PAHs)

Station Name	Bodega Head		Crescent City/ STP Outfall	
Station Number	202.0		2.0	
Species	TCM		TCM	
	Percent Recovery		Percent Recovery	
	MS	MSD	MS	MSD
Compound				
naphthalene	100	99	115	107
1-methylnaphthalene	96	99	97	97
2-methylnaphthalene	104	109	105	100
biphenyl	100	103	104	101
2,6-dimethylnaphthalene	105	105	99	96
acenaphthylene	102	99	102	93
acenaphthene	97	99	100	102
2,3,5-trimethylnaphthalene	100	102	105	102
fluorene	118	119	115	107
phenanthrene	111	113	115	111
anthracene	94	92	62	58
1-methylphenanthrene	123	123	96	102
fluoranthene	124	128	92	110
pyrene	116	121	94	105
benz[a]anthracene	109	109	98	94
chrysene	119	121	124	127
benzo[b]fluoranthene	101	103	96	99
benzo[k]fluoranthene	104	101	97	99
benzo[e]pyrene	115	89	94	97
benzo[a]pyrene	86	86	72	66
perylene	104	97	87	77
indeno[1,2,3-cd]pyrene	101	87	90	87
dibenz[a,h]anthracene	82	74	92	88
benzo[ghi]perylene	94	85	92	89

TCM = Transplanted California Mussel

TABLE U-16

State Mussel Watch Program
Results of Duplicate Sample Analysis: 1997 Polynuclear Aromatic Hydrocarbons Quality Control
(ng/g dry weight)

Station Name	Sandholdt Bridge		Anaheim Bay/ Navy Harbor		LA Harbor/ Consolidated	
Slip						
Station Number	404.0		707.0		616.0	
Species	TCM		TCM		TCM	
REPLICATE	1	2	1	2	1	2
Compound						
naphthalene	55.3	94.7	<50	<50	<50	<50
1-methylnaphthalene	10.7	16.1	<10	<10	<10	<10
2-methylnaphthalene	23.9	33.7	12.7	16.5	56.2	71.7
biphenyl	<10	<10	<10	<10	<10	<10
2,6-dimethylnaphthalene	10.7	12.3	10.4	10.3	35.6	44.7
acenaphthylene	<10	<10	<10	<10	27.5	27.8
acenaphthene	<10	<10	24.3	23.4	27.5	40.1
2,3,5-trimethylnaphthalene	<10	<10	14.0	12.7	58.2	47.8
fluorene	24.0	23.9	36.8	38.7	21.0	20.1
phenanthrene	106	107	180	167	77.6	95.6
anthracene	10.4	11.6	51.1	51.6	35.6	43.2
1-methylphenanthrene	24.4	25.3	34.9	29.8	116	78.7
fluoranthene	37.4	41.0	117	144	464	703
pyrene	38.0	41.7	126	143	608	848
benz[a]anthracene	10.1	10.1	29.2	30.5	182	215
chrysene	17.0	16.4	43.6	49.3	440	388
benzo[b]fluoranthene	<10	<10	22.3	17.1	199	236
benzo[k]fluoranthene	<10	<10	<10	<10	79.7	83.8
benzo[e]pyrene	<10	<10	16.3	13.9	205	242
benzo[a]pyrene	<10	<10	<10	<10	<10	<10
perylene	<10	<10	<10	<10	<10	<10
indeno[1,2,3-cd]pyrene	<10	<10	<10	<10	48.6	30.3
dibenz[a,h]anthracene	<10	<10	<10	<10	<10	<10
benzo[ghi]perylene	<10	<10	<10	<10	39.4	56.3
percent moisture	88.4	88.4	83.6	83.6	90.0	90.0

TCM = Transplanted California Mussel.

TABLE U-17

Bay Protection Toxic Cleanup Program
Distribution of Synthetic Organic Compounds Among
Two Fractions of a Silica/Alumina Column

Fraction 1	Fraction 2	Fraction 1 & 2
Aldrin	Chlordane, cis	DDE, p,p′
Chlordene, alpha	Chlordane, trans	DDT, p,p′
Chlordene, gamma	Chlorpyrifos	DDMU, p,p′
DDE, o,p′	Dacthal	Nonachlor, trans
DDT, o,p′	DDD, o,p′	
Heptachlor	DDD, p,p′	
Hexachlorobenzene	DCBP, p,p′	
Mirex	Methoxychlor	
Dieldrin		
Endosulfan I		
Endosulfan II		
Endosulfan sulfate		
Endrin		
HCH, alpha		
HCH, beta		
HCH, gamma		
HCH, delta		
Heptachlor epoxide		
Nonachlor, cis		
Oxychlordane		

TABLE U-18

Bay Protection Toxic Cleanup Program
Synthetic Organic Compounds Analyzed and Their Detection Limits

Compound	Detection Limit (ng/g, ppb dry weight) Sediment	Detection Limit (ng/g, ppb dry weight) Tissue
Aldrin	0.5	1.0
Chlordene, alpha	0.5	1.0
Chlordene, gamma	0.5	1.0
DDE, o,p′	1.0	3.0
DDT, o,p′	1.0	4.0
Heptachlor	0.5	1.0
Hexachlorobenzene	0.2	1.0
Mirex	0.5	1.0
DDE, p,p′	1.0	1.0
DDT, p,p′	1.0	4.0
DDMU, p,p′	2.0	5.0
Nonachlor, trans	0.5	1.0
Chlordane, cis	0.5	1.0
Chlordane, trans	0.5	1.0
Chlorpyrifos	1.0	4.0
Dacthal	0.2	2.0
DDD, o,p′	1.0	5.0
DDD, p,p′	0.4	3.0
DCBP, p,p′	3.0	25
Methoxychlor	1.5	15
Dieldrin	0.5	1.0
Endosulfan I	0.5	1.0
Endosulfan II	1.0	3.0
Endosulfan sulfate	2.0	5.0
Endrin	2.0	6.0
HCH, alpha	0.2	1.0
HCH, beta	1.0	3.0
HCH, gamma	0.2	0.8
HCH, delta	0.5	2.0
Heptachlor epoxide	0.5	1.0
Nonachlor, cis	0.5	1.0
Oxychlordane	0.5	1.0

TABLE U-19

Bay Protection Toxic Cleanup Program
Polynuclear Aromatic Hydrocarbons (PAHs)
Analyzed and Their Detection Limits

Compound	Tissue dry weight (ng/g, ppb)	Sediment dry weight (ng/g, ppb)
naphthalene	10	5
1-methylnaphthalene	10	5
2-methylnaphthalene	10	5
biphenyl	10	5
2,6-dimethylnaphthalene	10	5
acenaphthylene	10	5
acenaphthene	10	5
2,3,5-trimethylnaphthalene	10	5
fluorene	10	5
phenanthrene	10	5
anthracene	10	5
1-methylphenanthrene	10	5
fluoranthene	10	5
pyrene	10	5
benz[a]anthracene	10	5
chrysene	10	5
benzo[b]fluoranthene	10	5
benzo[k]fluoranthene	10	5
benzo[e]pyrene	10	5
benzo[a]pyrene	10	5
perylene	10	5
indeno[1,2,3-cd]pyrene	15	5
dibenz[a,h]anthracene	15	5
benzo[ghi]perylene	15	5

TABLE U-20

Bay Protection Toxic Cleanup - Group 14
Results of Matrix Spike Analyses: Polynuclear Aromatic Hydrocarbons (PAHs)

Compound	Percent Recovery TCM	Percent Recovery TCM
naphthalene	94	99
1-methylnaphthalene	101	105
2-methylnaphthalene	104	108
biphenyl	107	110
2,6-dimethylnaphthalene	107	110
acenaphthylene	97	103
acenaphthene	98	103
2,3,5-trimethylnaphthalene	102	107
fluorene	104	109
phenanthrene	106	110
anthracene	109	115
1-methylphenanthrene	114	118
fluoranthene	102	106
pyrene	91	95
benz[a]anthracene	95	98
chrysene	84	90
benzo[b]fluoranthene	101	106
benzo[k]fluoranthene	94	99
benzo[e]pyrene	97	99
benzo[a]pyrene	97	104
perylene	99.5	100
indeno[1,2,3-cd]pyrene	101	107
dibenz[a,h]anthracene	99	107
benzo[ghi]perylene	94	99

TCM = Transplanted California Mussel

TABLE U-21

Bay Protection Toxic Cleanup Group 17A
Results of Matrix Spike Analyses: Chlorinated Hydrocarbons

Compound	Percent Recovery TCM
Aldrin	108
Chlordane, cis	76
Chlordane, trans	85
Chlordene, alpha	97
Chlordene, gamma	94
Chlorpyrifos	89
Dacthal	80
DDE, o,p’	97
DDE, p,p’	106
DDD, o,p’	76
DDD, p,p’	114
DDT, o,p’	94
DDT, p,p’	85
DDMU, p,p’	109
Diclorobenzophenone	103
Dieldrin	74
Endrin	82
Endosulfan I	79
Endosulfan II	76
Endosulfan sulfate	84
Hexachlorobenzene	100
HCH, alpha	97
HCH, beta	90
HCH, gamma	84
HCH, delta	94
Heptachlor	106
Heptachlor epoxide	83
Nonachlor, cis	85
Nonachlor, trans	89
Methoxychlor	77
Mirex	101
Oxadiazon	76
Oxychlordane	73

TCM = Transplanted California Mussel

TABLE U-22

Bay Protection Toxic Cleanup - Group 17A
Results of Matrix Spike Analyses: Polychlorinated Biphenyls (PCBs)

PCB Congener No.	Percent Recovery TCM
5	106
8	112
15	NR
18	108
27	93
28	116
29	109
31	111
44	104
49	105
52	112
66	114
70	108
74	81
87	92
95	104
97	83
99	102
101	108
105	108
110	105
118	114
128	105
132	101
137	86
138	108
149	105
151	108
153	108
156	95
157	102
158	93
170	113
174	103
177	112
180	109
183	105
187	106
189	109
194	107
195	109
201	118
203	108
206	104
209	98
PCT 5460	96

TCM = Transplanted California Mussel

TABLE U-23

Bay Protection Toxic Cleanup - Group 17A
Results of Matrix Spike Analyses: Polynuclear Aromatic Hydrocarbons (PAHs)

Compound	Percent Recovery TCM
naphthalene	99
1-methylnaphthalene	95
2-methylnaphthalene	94
biphenyl	95
2,6-dimethylnaphthalene	100
acenaphthylene	98
acenaphthene	100
2,3,5-trimethylnaphthalene	97
fluorene	98
phenanthrene	98
anthracene	89
1-methylphenanthrene	100
fluoranthene	90
pyrene	90
benz[a]anthracene	73
chrysene	80
benzo[b]fluoranthene	77
benzo[k]fluoranthene	89
benzo[e]pyrene	91
benzo[a]pyrene	76
perylene	83
indeno[1,2,3-cd]pyrene	92
dibenz[a,h]anthracene	84
benzo[ghi]perylene	90

TCM = Transplanted California Mussel

APPENDIX V

Median International Standards

Median International Standards

In 1982, the Food and Agricultural Organization (FAO) of the United Nations conducted a survey of standards and legal limits for metals including mercury, pesticides, and other contaminants in fishery products. This was in response to frequent inquiries from institutions and companies active in international commerce that found it difficult finding such information.

The FAO surveyed nations that were members of the FAO as well as those who were not. Most nations cooperated with the survey and, in certain other cases, the standards were drawn from other sources. The FAO took all of the responses and presented them in a report entitled "Compilation of Legal Limits for Hazardous Substances in Fish and Fishery Products" (Nauen 1983). Most of the limits were presented in a standard format and in standard units of fresh or live weight. Exceptions are clearly noted.

Nearly all of the standards for pesticides were from the United States (FDA standards). However, with the exception of mercury, the United States has no standards for trace metals in fishery products. It is this very lack of standards that makes interpretation of some of the SMWP findings difficult.

Table V-1 summarizes the standards and guidelines for metals from the FAO report. The table notes whether the standards are for freshwater fish, marine fish, shellfish, or a combination of these. When more than one standard was listed by the FAO report, those values closest to a standard for fresh weight, edible portion were chosen. Exceptions are clearly noted in the table. Standards for each element are arranged in ascending order. The country of origin and the approximate date of adoption are also noted.

As can be seen in Table V-1, some of the standards are not truly for edible portion, fresh weight. For example, some standards refer to canned products or protein. In the case of India, the standards are on a dry weight basis. If the Indian standards were stated in fresh weight terms, they would be approximately one fifth or one sixth of the stated standard.

Table V-1 has many striking features. One feature is that most of the standards are surprisingly similar. Another feature is the large number of countries that have standards for metals. Also, although many of these countries are less developed nations, the standards adopted by these nations do not differ from those of the more developed nations.

The standards were not summarized for mercury because there is a USFDA standard of 1.0 ppm for methyl mercury in the edible portions of fish and shellfish. This was, incidentally, the highest limit set by any nation in the FAO study. The great majority of nations have set a mercury standard of 0.5 ppm.

Median International Standards presented in Table 4 were calculated from the standards listed in Table V-1. The median standard was chosen for use for several reasons. The median is less influenced than the mean by outliers in the data. Also, direct comparisons of standards for fresh versus canned versus dry can be misleading. By using median standards, these misleading comparisons can be more easily avoided. In most cases, the Median International Standard is actually a standard set by one or more nations rather than an average value not actually set by any country. The median was calculated as follows. All standards or guidelines (with the exception of

the Indian standards which are based on dry weight) were considered to be more-or-less equivalent. For the purposes of calculating the median, the Indian standards were divided by five. The median was calculated as the middle value of all of the standards (e.g., the fourth of seven values arranged in ascending order). In a few cases, the number of standards was even. In this event, the two mid-values were averaged (most were not different). None of the adjusted dry-weight standards from India ended up as a median or as part of a mid-value pair.

For obvious reasons, the Median International Standards can only be used to provide a general idea of what other nations have chosen to use as a standard. The range of all values is listed in Table 4 as a reminder of this. However, with the lack of American standards, Median International Standards can provide a guidepost for those responsible for interpreting trace metal findings in fish and shellfish tissue.

TABLE V-1

International Standards for Trace Elements in Fish and Molluscs

Element	Standard	Freshwater Fish	Marine Fish	Molluscs/ Shellfish	Country	Approximate Date of Adoption
Antimony	1.0 ppm	x	x	x	Hong Kong	1983
	1.0 ppm	x	x	x	New Zealand	1971
	1.5 ppm	x	x	x	Australia	1982
Arsenic	0.1 ppm	x	x	x	Venezuela	-
	1.0 ppm	x	x	x	Chile	-
	1.0 ppm	d	d	x	India	-
	1.0 ppm	x	x	x	New Zealand	1971
	1.0 ppm	e	e	e	United Kingdom	1959
	1.4 ppm	x			Hong Kong	1983
	1.5 ppm	x	x	x	Australia	1982
	1.5 ppm	c	c	c	Thailand	1982
	3.5 ppm	p	p		Canada	1976
	5.0 ppm	x	x	x	Finland	1980
	5.0 ppm	x	x	x	Zambia	1976
Cadmium	0.05 ppm	x	x		Netherlands	-
	0.1 ppm	c	c	c	Switzerland	1982
	0.1 ppm	r	x		Venezuela	-
	0.2 ppm	x	x		Australia	1982
	0.3 ppm	r	r		Finland	-
	0.5 ppm	x			W. Germany	1979
	1.0 ppm	x			Netherlands	-
	1.0 ppm	x	x		New Zealand	1971
	2.0 ppm	x			Australia	1982
	2.0 ppm	x	x	x	Hong Kong	1983
Chromium	1.0 ppm	x	x	x	Hong Kong	1983
Copper	10.0 ppm	x	x	x	Chile	-
	10.0 ppm	d	d		India	-
	10.0 ppm	x	x		Venezuela	-
	20.0 ppm	c	c	c	Thailand	1982
	20.0 ppm	g	g	g	United Kingdom	1956
	30.0 ppm	x	x	x	Australia	1982
	30.0 ppm	x	x	x	New Zealand	1971
	100.0 ppm	x	x		Zambia	1976
Fluoride	150.0 ppm	p	p		Canada	1979
Fluorine	10.0 ppm	x	x		New Zealand	1971
	25.0 ppm	x	x		Zambia	1976

p - in protein
e - except where natural levels are higher
c - in metal containers
g - recommended guideline
d - dry weight basis
r - revised limit (proposed)

TABLE V-1 (continued)

International Standards for Trace Elements in Fish and Molluscs

Element	Standard	Freshwater Fish	Marine Fish	Molluscs/ Shellfish	Country	Approximate Date of Adoption
Lead	0.5 ppm	p	p		Canada	1979
	0.5 ppm	x			W. Germany	1979
	0.5 ppm	x	x		Netherlands	-
	1.0 ppm	x	x	x	Sweden	1979
	1.0 ppm	c	c	c	Switzerland	1982
	1.0 ppm	c	c	c	Thailand	1982
	2.0 ppm	x	x		Australia	1982
	2.0 ppm	x	x	x	Chile	1982
	2.0 ppm	x			Finland	1980
	2.0 ppm	x			Italy	1978
	2.0 ppm	x			Netherlands	-
	2.0 ppm	x	x		New Zealand	-
	2.0 ppm	l	l		Sweden	1979
	2.0 ppm	x	x		United Kingdom	1980
	2.0 ppm	x	x		Venezuela	-
	2.5 ppm	x			Australia	1982
	5.0 ppm	d	d		India	-
	6.0 ppm	x	x	x	Hong Kong	1983
	10.0 ppm	x	x		Zambia	1976
Mercury	International Standards for Mercury range from 0.1 ppm to 1.0 ppm. Twenty-eight countries have established standards for Mercury. The U. S. Food and Drug Administration has set an action level of 1.0 ppm in the edible portion of fish and molluscs. The median international standard is 0.5 ppm.					
Selenium	0.3 ppm	x	x	x	Chile	1982
	2.0 ppm	x	x		Australia	1982
	2.0 ppm	x	x		New Zealand	1971
Tin	50.0 ppm	x	x		Australia	1982
	100.0 ppm	x	x		Venezuela	-
	150.0 ppm	c	c	c	Finland	1979
	150.0 ppm	x	x		New Zealand	1977
	230.0 ppm	x	x	x	Hong Kong	1983
	250.0 ppm	d	d		India	-
	250.0 ppm	x	x		Thailand	1982
	250.0 ppm	g,c	g,c	g,c	United Kingdom	1973
Zinc	40.0 ppm	x	x	x	Australia	1982
	40.0 ppm	x	x		New Zealand	1971
	50.0 ppm	d	d		India	-
	50.0 ppm	g	g		United Kingdom	1953
	100.0 ppm	x	x	x	Chile	1982
	100.0 ppm	x	x		Zambia	1976

p - in protein
e - except where natural levels are higher
c - in metal containers
l - in liver
g - recommended guideline
d - dry weight basis
r - revised limit (proposed)

APPENDIX W

Elevated Data Levels

Elevated Data Levels (EDL)

An EDL is defined for the purposes of the SMWP as that concentration of a toxic substance in mussels or clams that equals or exceeds a specified percentile (such as 85 percent) of all SMWP measurements of the toxic substance in the same species and exposure condition (resident or transplant) between 1977 and 1997. EDLs were determined as follows:

(1) All SMWP data from 1977 through 1997 were pooled by species and exposure, (2) The concentrations of each toxicant were ranked from highest to lowest concentration down to, and including, instances when a chemical was not detected, (3) The cumulative frequency of occurrence and percentile ranking for all concentrations were calculated, (4) The concentration of the toxic substance representing the 85th percentile was identified and designated the 85 percent EDL or EDL 85, and (5) The concentration of the toxic substance representing the 95th percentile was identified and designated the 95 percent EDL or EDL 95. The EDL 85 is that concentration of a toxic substance that equals or exceeds 85 percent of all SMWP measurements of the toxic substance in the same species and exposure between 1977 and 1997. The EDL 95 is that concentration of a toxic substance that equals or exceeds 95 percent of all SMWP measurements of the toxic substance in the same species and exposure between 1977 and 1997. EDLs for trace elements are summarized in Tables 5 and 7. EDLs for synthetic organic substances are summarized in Tables 8 through 12.

Because EDLs are based on the relative ranking of each measurement, rather than a percentage of the highest concentration obtained, they are not influenced by unusually high (anomalous) toxicant values. This characteristic of EDLs is especially desirable in the evaluation of synthetic organic toxicants where the highest concentration may be as much as ten times the next highest concentration. EDLs do, however, reflect the biases of the data upon which they have been based.

Because they are based on SMWP data rather than an absolute number external to the SMWP, EDLs, when exceeded, can provide a sensitive first indication of elevated toxicant levels in California waters. As such, EDLs fulfill the monitoring function of the SMWP effectively. In addition, EDLs may be expressed in dry weight to eliminate data variability due to moisture content and to conform to scientific literature relevant to mussel or clam monitoring programs worldwide. However, EDLs do not assess adverse impacts, nor do they necessarily represent concentrations that may be damaging to the mussels, clams, or to a human consuming these species. They do not directly relate to Maximum Tissue Residue levels (MTRLs), FDA action levels, NAS guidelines, or Median International Standards (MIS).

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