

Environmental Chemistry Quality Assurance and Data Report

for the

Toxic Substances Monitoring Program 2001-2002



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TOXIC SUBSTANCE MONITORING PROGRAM 2001-2002

FIELD AND LABORATORY OPERATIONS

Sample Collection

Samples were obtained using a Smith_Root Model VII and Model XIA Portable Electrofishers; a Smith_Root SR_16E electrofishing boat; variable mesh, woven, and monofilament gill nets; baited hoop nets measuring three feet in diameter with one inch square mesh; or beach seines of varying lengths, widths, and material. Collected fish were kept in clean stainless steel buckets until they could be double wrapped in extra heavy duty aluminum foil (dull side inward), labeled, and packed in an ice chest containing dry ice.

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 Quality Assurance/Quality Control (QA\QC) results provided by the Department of Fish and Game's Water Pollution Control Laboratory (WPCL) and Marine Pollution Studies Laboratory (MPSL). Copies of the Laboratory Quality Assurance Program Plan and QA\QC results are available upon request.

The MPSL analyzes TSMP samples for trace elements. Trace element analytical techniques are summarized below.

Quality Assurance Practices

Quality control (QC) activities are routinely employed to ensure sample analysis results of high quality. Quality control activities include the tracking of accuracy and precision as performance indices, verifying instrument calibration, diluting samples which exceed the instrument's calibrated range and documenting surrogate recoveries (synthetic organic analyses).

Trace Elements

In addition to routine trace element analyses, 10 percent of the samples were analyzed in duplicate to determine precision. The results of duplicate laboratory sample analyses are presented in Table 1. To ensure sample integrity, all materials contacting samples during laboratory operations were analyzed for trace element content. To evaluate accuracy, certified reference materials from the National Institute of Standards and Technology (NIST) and the National Research Council of Canada were analyzed (Table 2) and selected samples were fortified with target analytes (MS/MSD). Matrix spike (MS) and matrix spike duplicate (MSD) percent recoveries can be found in Table 3.

Synthetic Organics

Table 4 lists the four Florisil fractions and the synthetic organic compounds found in each fraction. The synthetic organic compound reporting limits can be found in Table 5. Synthetic organic surrogate compound recoveries are evaluated for acceptable recoveries prior to data processing (Table 6). Samples which have surrogate recoveries exceeding the criterion of 50% - 150%

are subjected to re-analysis or re-extraction. Marginal recoveries which exceed the range of 60% - 120% are closely inspected and corrective action is taken as appropriate.

Analytical precision and accuracy is evaluated by analyzing matrix spikes (Table 7), laboratory control spikes (Table 8), Standard Reference Materials (SRMs) (Table 9) and duplicate analyses (Table 10). Matrix spikes provide a means for assessing methodological performance for analytes not found in available SRMs.

Method blanks, representative of all materials and solutions contacting the sample, were prepared and analyzed (Table 11).

Hard copies of all chromatograms and electronic data are archived for each sample analyzed.

Trace Elements Analytical Techniques in Tissue and Sediment - 2001 and 2002 (Moss Landing Marine Laboratory)

EPA 3052 was used for tissue and sediment digestions using the CEM Microwave Accelerated Digestion System (MARS 5). Samples were weighed into pre-cleaned Teflon liners. One and a quarter grams of fish tissue and one gram of sediment were analyzed. Digestion of each tissue sample was accomplished by adding a 6 mL concentrated nitric acid and heating the sample in the MARS 5 for 15 minutes at 195°C and 250 psi. Once the digestate had cooled, it was transferred to a clean polyethylene bottle and diluted up to 20 mL with Type 11 water. Sediment samples were digested using 5 mL concentrated nitric acid and 3 mL concentrated hydrofluoric acid for 20 minutes at 195°C and 300 psi. Twenty mL of boric acid (2.5%) was added to each sediment sample before returning to the MARS 5 for 5 minutes at 160°C and 100 psi. Once the digestate had cooled, it was transferred to a clean polyethylene bottle.

Methyl Mercury Analytical Technique in Tissue and Sediment - 2001 and 2002 (Moss Landing Marine Laboratory)

Samples were preserved by freezing until prepared for analysis. Prior to analysis, samples were homogenized and one gram of each sample was digested on a hot plate for 4 hours in 10 mL of 25% potassium hydroxide/methanol solution. Samples were cooled and brought up to volume with methanol. For analysis, an aliquot of the digestate was added to milli-Q water and buffered to pH of 5. An ethylating agent (sodium tetraethylborate) was added to each sample to form a volatile methyl-ethylmercury derivative, and then purged onto graphite carbon traps as a means of preconcentration and interference removal. The samples were then isothermally chromatographed, pyrolytically broken down to elemental mercury, and detected using a cold vapor fluorescence detector.

Pesticides and PCBs Analytical Techniques in Tissue - 2001 and 2002

Samples were extracted using a pressurized fluid extraction (PFE)--Dionex Accelerated Solvent Extractor Model 200. Ten grams of homogenized tissue was mixed with approximately 7g of pre-extracted Hydromatrix® (Varian) until the mixture was free flowing. One to five grams (tissue homogenate) sample was weighed into a pre-weighed aluminum planchet and placed in a 70°C oven for 48 hours to determine moisture content. The Hydromatrix®-tissue mixture was poured into a 33 mL stainless steel extractor cell and packed by tamping the mixture. A solution containing pesticide and PCB surrogate compounds (DBOB, PCB congener 207, deuterated p,p'-DDD, and DBCE) was added to the cell and the cap was screwed onto the cell. The extractor cells (maximum of 24) were

placed on the ASE 200 autosampler rack and the samples were extracted with a 50/50 mixture of acetone/dichloromethane (DCM) using heat and pressure. The extracts were automatically collected in 60 mL VOA vials. The samples were extracted a second time resulting in two VOA vials per sample.

The two extracts were combined, dried with sodium sulfate, and evaporated to approximately 0.5mL using Kuderna-Danish (K-D) glassware equipped with 3-ball Snyder columns and micro-Snyder apparatus and diluted to five mL with DCM. The extracts were filtered through a 0.45 μ m syringe filter into ABC Autoprep 2000 Gel Permeation Chromatograph (GPC) autosampler tubes. One milliliter of the filtered extracts was removed and placed in pre-weighed aluminum planchets for percent lipid determination. The GPC autosampler tubes were placed on the GPC autosampler for initial sample cleanup using a column containing Biobeads and DCM elution solvent.

After the GPC, the extracts were evaporated using K-D apparatus and solvent exchanged into petroleum ether. The extracts then were fractionated using a standard 4 inch x 22 mm Florisil column. The Florisil columns were eluted with petroleum ether (PE) (Fraction 1), 6% diethyl ether/PE (Fraction 2), 15% diethyl ether/PE (Fraction 3), and 50% diethyl ether/PE (Fraction 4). The fractions were concentrated to an appropriate volume using K-D/micro K-D apparatus.

Polynuclear Aromatic Hydrocarbon Compounds (PAHs) Analytical Techniques in Tissue - 2001 and 2002

Ten grams of tissue was spiked with a deuterated PAH surrogate solution. The sample was mixed with Hydromatrix®, placed in a stainless steel cell and extracted using PFE. 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 with DCM/pentane (50:50).

Tables 12, 13, 14, 15 and 16 list the method blanks, duplicate analyses, laboratory control spikes, matrix spike recoveries and SRM results.

Instrument and Analytical Conditions for Trace Elements

Samples are analyzed on a Perkin-Elmer Sciex Elan 6000 Inductively-Coupled Plasma Mass Spectrophotometer. Samples are pumped with a peristaltic pump from the autosampler to a cone-spray nebulizer with a sapphire cone through PTFE tubing. Aerosol produced by the nebulizer is passed through a Rytan spray chamber and then transported to an alumina injector and quartz plasma torch. Elemental constituents in the aerosol are ionized within the plasma and pass through nickel sampler and skimmer cones into the mass spectrometric quadrupole and then on to an ETP detector, which detects the mass-to-charge ratio (m/z) of each ion detected. Instrument conditions are optimized to favor the production of singly-charged species within the plasma ($z=1$, mostly), so that mostly isotopic masses are detected and recorded.

Instrument and Analytical Conditions for Synthetic Organics and PCBs

Sample extracts were analyzed for synthetic organics and PCBs using an Agilent 6890 $plus$ gas chromatograph equipped with two ^{63}Ni micro-electron capture detectors with EPC and autosampler. A 5 meter length of DB-5 column is connected to a press fit "Y" union which splits the column effluent into two 60 m columns, a DB-5 and a DB-17. The injector is a split-splitless injector with EPC. Detector signals are acquired and processed with an Agilent 3365 Series II Chemstation and data processing was done using Enviroquant software.

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

Sample extracts were analyzed for PAHs using an Agilent 6890/5973 GC-MSD equipped with a 30 meter DB5-MS column (J&W Scientific). The injector is a split-splitless injector with EPC. Detector signals are acquired and processed with an Agilent 3365 Series II Chemstation and data processing was done using Enviroquant software.

Table 1

Toxic Substances Monitoring Program
Results of Duplicate Trace Element Analysis in Fish Tissue
Analyzed by ICP MS at MPSL (ug/g wet weight)

2001 Batch	TSM Bot No.	Ag	As	Cd	Cr	Cu	Ni	Pb	Se	Zn	Hg*	Methyl Hg*
Reporting Limit		0.003	0.05	0.002	0.015	0.002	0.003	0.001	0.05	0.01	0.009	0.004
1	055.001.W.01	0.008	0.20	0.045	0.19	1.65	ND	0.007	2.82	31.2	ND	
	055.001.W.01 dup	0.012	0.18	0.047	0.22	1.69	ND	0.014	2.77	35.0	ND	
RPD		46.2	7.3	4.3	14.7	2.4		71.4	1.8	11.4		
2	217.002.L.01	0.48	0.080	0.065	0.31	21.4	0.006	0.013	2.34	27.2	0.032	
	217.002.L.01 dup	0.45	0.07	0.058	0.48	19.9	0.006	0.011	2.23	25.1	0.030	
RPD		6.0	7.2	12.1	43.0	7.2	0.0	15.4	4.9	7.8	6.5	
3	247.001.F.01	ND	0.26	ND	0.24	0.67	0.013	ND	0.27	4.44	ND	
	247.001.F.01 dup	ND	0.27	ND	0.20	0.60	0.004	ND	0.27	4.24	ND	
RPD			5.7		19.2	9.5			0.9	4.6		
4	047.002.F.01		0.02	0.003			ND		0.10		0.104	
	047.002.F.01 dup		0.02	0.000			ND		0.11		0.103	
RPD			0.0						14.8		1.0	
5	319.002.F.01		0.29	ND			ND		0.67		0.242	
	319.002.F.01 dup		0.28	ND			ND		0.69		0.240	
RPD			3.4						2.8		0.8	
6	385.001.W.01	ND	0.21	0.018	0.24	1.22	0.026	0.026	2.28	14.2	0.055	
	385.001.W.01 dup	ND	0.23	0.023	0.84	1.22	0.26	0.030	2.44	13.7	0.069	
RPD			11.9	27.2	110.0	0.2	164.1	14.3	6.8	3.9	22.6	
7	136.001.L.01	0.20			0.14	60.8		ND		29.6	0.075	
	136.001.L.01 dup	0.20			0.12	61.0		ND		29.6	0.069	
RPD		1.1			11.8	0.4				0.0	8.3	
8	184.005.F.01											0.387
	184.005.F.01 dup											0.388
RPD												0.3

* Hg and Methyl Hg analyzed by CVAFS.

Table 1 - Continued

Toxic Substances Monitoring Program
Results of Duplicate Trace Element Analysis in Fish Tissue
Analyzed by ICP MS at MPSL (ug/g wet weight)

2002 Batch	TSM Bot No.	Ag	As	Cd	Cr	Cu	Ni	Pb	Se	Zn	Hg*
Reporting Limit		0.003	0.05	0.002	0.015	0.002	0.003	0.001	0.05	0.01	0.009
1	057.001.F.02	0.022	0.26	0.004	0.187	0.407	ND	0.008	0.92	7.77	1.21
	057.001.F.02 dup	ND	0.23	0.0005	0.187	0.367	ND	0.004	0.65	8.35	0.699
RPD			15.2	161.9	0.0	10.3		72.0	34.7	7.3	53.3
2	133.001.F.02	ND	0.10	ND	0.109	0.198	0.015	0.005	0.15	3.51	2.89
	133.001.F.02 dup	ND	0.14	ND	0.123	0.250	0.015	0.001	0.19	4.52	2.96
RPD			31.9		12.2	23.4	2.7	133.3	24.9	25.1	2.3
3	261.010.F.02	ND	0.04	0.0004	0.152	0.325	0.004	0.0004	0.39	4.77	4.72
	261.010.F.02 dup	ND	0.03	0.0004	0.126	0.359	0.008	0.001	0.32	4.41	4.82
RPD			40.0	0.0	19.0	10.1	53.3	111.1	19.3	8.0	2.1
4	261.030.F.02	ND	0.05	ND	0.106	0.325	0.005	0.005	0.36	4.62	1.73
	261.030.F.02 dup	ND	0.06	ND	0.150	0.403	0.004	0.003	0.41	5.17	1.94
RPD			12.8		34.6	21.6	25.6	66.7	11.5	11.1	11.1
5	261.050.F.02		0.05	ND			0.024		0.27		1.07
	261.050.F.02 dup		0.05	ND			0.024		0.29		1.02
RPD			13.3				1.0		6.5		4.6
6	324.001.F.02	ND	0.06	ND	0.163	0.201	0.008	ND	0.25	4.46	1.13
	324.001.F.02 dup	ND	0.07	ND	0.083	0.201	0.003	ND	0.26	4.67	1.07
RPD			16.0		65.3	0.0	85.7		7.1	4.5	6.1
7	390.001.F.02	ND	0.21	ND	0.104	0.282	ND	0.002	0.28	5.24	0.636
	390.001.F.02 dup	ND	0.22	ND	0.095	0.280	ND	0.005	0.32	5.55	0.725
RPD			2.1		8.9	0.8		70.6	13.1	5.8	13.0
8	261.053.L.02	0.003			0.239	2.606		ND		18.2	
	261.053.L.02 dup	0.004			0.269	2.606		ND		18.3	
RPD		6.5			12.1	0.0				0.4	
9	390.001.L.02	0.004			0.058	5.655		0.025		20.7	
	390.001.L.02 dup	0.003			0.069	5.655		0.001		20.7	
RPD		19.4			16.9	0.0		180.2		0.0	

* Hg analyzed by CVAFS.

Table 2

Toxic Substances Monitoring Program
 Trace Element Analysis of Certified Reference Materials (ug/g, dry weight)
 Analyzed by ICP MS at MPSL (ug/g dry weight)

SRM 2976 - Mussel Tissue

2001	Cd	Pb	Methyl Hg★
Certified Conc. Batch	0.82 ± 0.16	1.19 ± 0.18	0.278 ± 0.001
1	0.78	1.24	
2	0.94	1.51	
3	0.90	1.27	
4	0.83		
5	0.66		
6	0.84	1.13	
7		1.11	
8			0.237
2002	Cd	Pb	
Certified Conc. Batch	0.82 ± 0.16	1.19 ± 0.18	
1	0.78	1.15	
2	0.80	1.19	
3	0.84	1.21	
4	0.82	1.58	
5	0.83		
6	0.86	1.28	
7	0.89	1.22	
8		1.27	
9		1.20	

★ Methyl Hg analyzed by CVAFS.

Table 2 - Continued

Toxic Substances Monitoring Program
Trace Element Analysis of Certified Reference Materials (ug/g, dry weight)
Analyzed by ICP MS at MPSL (ug/g dry weight)

DORM 2 - Dogfish Muscle

2001	Ag	As	Cr	Cu	Ni	Se	Zn	Hg*	Methyl Hg*
Certified Conc. Batch	0.041 ± 0.13	18.0 ± 1.1	34.7 ± 5.5	2.34 ± 0.16	19.4 ± 3.1	1.40 ± 0.09	25.6 ± 2.3	4.64 ± .26	4.47 ± 0.32
1	0.051	17.6	38.3	2.19	19.8	1.55	25.0	5.28	
2	0.043	20.9	41.8	2.56	21.8	1.87	25.9	4.70	
3	0.036	17.8	36.1	2.29	19.0	1.37	23.7	4.43	
4		16.6			17.5	1.41		4.98	
5		16.9			17.0	1.58		4.95	
6	0.036	17.3	31.9	2.31	16.8	1.74	23.0	4.94	
7	0.021		33.3	2.13			22.9	5.05	
8									3.48
2002	Ag	As	Cr	Cu	Ni	Se	Zn	Hg*	
Certified Conc. Batch	0.041 ± 0.13	18.0 ± 1.1	34.7 ± 5.5	2.34 ± 0.16	19.4 ± 3.1	1.40 ± 0.09	25.6 ± 2.3	4.64 ± .26	
1	0.012	18.8	33.6	2.56	17.9	1.62	25.2	4.70	
2	0.027	15.5	37.7	2.02	20.2	1.31	21.8	5.21	
3	0.034	16.3	35.6	2.24	19.1	1.49	22.4	4.74	
4	0.032	15.5	34.5	2.17	18.8	1.36	19.9	4.16	
5		15.9			16.5	1.48		4.54	
6	0.040	16.8	34.1	2.19	18.2	1.70	22.7	4.79	
7	0.031	16.1	34.9	2.19	18.7	1.64	20.8	4.64	
8	0.031		32.0	2.16			20.4	4.19	
9	0.072		33.3	2.06			21.1		

* Hg and Methyl Hg analyzed by CVAFS.

Table 3

Toxic Substances Monitoring Program
Matrix Spike/Matrix Spike Duplicate Percent Recovery of Trace Element Analyses in Fish Tissue
Analyzed by ICP-MS at MPSL (ug/g wet weight)

		Percent Recovery									
2001		Ag	As	Cd	Cr	Cu	Ni	Pb	Se	Zn	Hg★
Batch	TSM Bot No.										Methyl Hg★
1	055.002.W.01 MS	59	99	100	116	109	108	73	99	92	106
	055.002.W.01 MSD	65	97	107	115	114	110	74	103	92	118
2	111.001W.01 MS	96	128	128	132	130	155	157	120	113	120
	111.001W.01 MSD	77	129	122	142	123	118	142	116	109	100
3	247.001.F.01 MS	99	112	108	115	111	110	105	93	100	116
	247.001.F.01 MSD	102	108	103	117	114	111	107	94	100	119
4	027.001.F.01 MS		136	98			106		92		128
	027.001.F.01 MSD		134	96			110		91		113
5	244.001.F.01 MS		152	97			109		93		113
	244.001.F.01 MSD		148	86			109		91		111
6	146.001.W.01 MS	93	90	98	93	103	117	92	90	90	301
	146.001.W.01 MSD	96	90	94	97	102	113	101	93	91	315
7	136.001.L.01 MS	95			108	82		106		91	
	136.001.L.01 MSD	94			106	80		101		93	
7	064.001.F.01 MS										116
	064.001.F.01 MSD										114
8	184.005.F.01 MS										89.2
	184.005.F.01 MSD										94.2

* Hg and Methyl Hg analyzed by CVAFS.

Table 3 - Continued

Toxic Substances Monitoring Program
Matrix Spike/Matrix Spike Duplicate Percent Recovery of Trace Element Analyses in Fish Tissue
Analyzed by ICP-MS at MPSL (ug/g wet weight)

		Percent Recovery									
2002 Batch	TSM Bot No.	Ag	As	Cd	Cr	Cu	Ni	Pb	Se	Zn	Hg*
1	057.001.F.02 MS	74	108	95	91	102	84	104	74	99	121
	057.001.F.02 MSD	98	118	113	108	116	101	118	82	111	107
2	133.001.F.02 MS	100	103	96	106	111	102	98	89	97	116
	133.001.F.02 MSD	98	102	95	107	109	98	97	93	95	110
3	261.010.F.02 MS	98	116	97	101	114	105	100	90	95	95.0
	261.010.F.02 MSD	97	112	95	98	107	105	99	86	88	95.0
4	261.030.F.02 MS		133	102			102		92		100
	261.030.F.02 MSD		137	101			101		90		101
5	261.050.F.02 MS		128	101			106		95		97.0
	261.050.F.02 MSD		118	92			152		90		92.0
6	324.001.F.02 MS	101	119	104	116	110	108	104	92	97	93.0
	324.001.F.02 MSD	98	131	103	116	112	112	101	99	99	109
7	390.001.F.02 MS	97	109	99	108	105	103	96	94	95	110
	390.001.F.02 MSD	96	112	97	108	104	100	97	92	97	122
8	261.053.L.02 MS	96			108	106		102		93	117
	261.053.L.02 MSD	99			108	106		101		95	115
9	390.001.L.02 MS	98			105	107		86		92	
	390.001.L.02 MSD	96			98	105		90		95	

* Hg analyzed by CVAFS.

TABLE 4

Toxic Substances Monitoring 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	oxadiazon
DDT, o,p'	DDD, o,p'	parathion, ethyl
DDT, p,p'*	DDD, p,p'	parathion, methyl
heptachlor	DDMU p,p'*	tetradifon (tedion)
hexachlorobenzene	DDT, p,p'*	
trans-nonachlor	toxaphene	
PCB 1248	heptachlor epoxide	
PCB 1254	methoxychlor	
PCB 1260	cis-nonachlor	
	oxychlordane	
		(50%) Fraction 4
		endosulfan II
		endosulfan sulfate

* Found in both 0% and 6% fractions.

TABLE 5

Toxic Substances Monitoring Program
Synthetic Organic Compounds
Reporting Limits in Tissue

Name	TSM 2001	TSM 2002
	Fresh Wt RL ppb (ng/g)	Fresh Wt RL ppb (ng/g)
aldrin	1	1
chlordane, cis	2	1
chlordane, trans	2	1
chlordene, alpha	1	0.5
chlordene, gamma	1	0.5
chlorpyrifos	2	1
dacthal	2	1
DCBP, p,p'	10	10
DDD, o,p'	2	1
DDD, p,p'	2	1
DDE, o,p'	2	2
DDE, p,p'	2	2
DDMU, p,p'	3	3
DDT, o,p'	3	3
DDT, p,p'	5	5
diazinon	20	20
dieldrin	2	0.5
endosulfan I	2	2
endosulfan II	10	10
endosulfan sulfate	10	10
endrin	2	2
HCH, alpha	1	0.5
HCH, beta	2	1
HCH, delta	2	2
HCH, gamma	1	0.5
heptachlor	2	1
heptachlor epoxide	1	0.5
hexachlorobenzene	0.3	0.3
methoxychlor	5	3
mirex	3	1.5
nonachlor, cis	2	1
nonachlor, trans	1	1
oxadiazon	3	1
oxychlordane	1	1
parathion, ethyl	2	2
parathion, methyl	4	4
tedion	2	2
toxaphene	20	20
PCB 1248	25	25
PCB 1254	10	10
PCB 1260	10	10

Table 6
Toxic Substances Monitoring Program
Percent Recovery of Synthetic Organic Surrogate Compounds for 2001

Station Number	Station Name	PCB 207	DBOB	DDD*, p,p'	DBCE
114.24.17	Lake Sonoma/Upper Warm Springs Arm	97.9	72.0	93.4	70.9
114.32.00	Lake Mendocino	105	73.6	83.3	81.9
201.12.14	Soulajule	83.0	58.4	80.5	62.1
201.12.14	Soulajule	98.8	71.7	85.9	52.4
201.13.06	Nicasio Reservoir	112	79.1	94.2	62.6
201.13.06	Nicasio Reservoir	110	78.0	88.9	69.8
201.13.06	Nicasio Reservoir	90.8	59.5	92.8	69.4
205.30.30	Anderson Reservoir	99.0	70.5	80.3	79.0
205.30.30	Anderson Reservoir	95.2	67.0	80.0	58.7
205.30.30	Anderson Reservoir	104	77.3	94.1	85.1
205.30.30	Anderson Reservoir	92.9	67.1	91.5	74.8
205.30.30	Anderson Reservoir	100	74.4	99.4	75.4
205.30.30	Anderson Reservoir Matrix Spike	97.5	67.8	106	73.5
205.30.30	Anderson Reservoir Matrix Spike Dup	121	86.2	103	69.3
205.30.30	Anderson Reservoir	100	75.2	91.9	73.7
307.00.01	Carmel Lagoon	103	63.6	91.2	68.1
307.00.01	Carmel Lagoon FR	105	75.7	103	68.8
310.13.00	San Simeon Creek Lagoon	98.7	71.6	82.8	80.2
310.14.09	Santa Rosa Creek/Soto Ranch	110	66.7	88.6	78.0
310.17.01	Whale Rock Reservoir	109	79.6	90.9	68.4
310.22.01	Chorro Creek/Lower	68.6	43.2	70.2	50.9
310.24.00	San Luis Obispo Creek Lagoon	98.3	64.5	95.5	72.2
310.26.01	Pismo Creek	111	75.3	94.2	69.5
310.31.00	Arroyo Grande Creek Lagoon	111	77.4	95.0	78.6
310.31.10	Lake Lopez	108	75.4	91.8	95.2
310.32.01	Oso Flaco Lake	107	77.1	105	72.2
402.10.05	Ventura River/d/s OVSD Discharge	106	79.0	101	105
402.10.06	Ventura River/u/s OVSD Discharge	104	79.9	95.3	87.3
403.11.00	Santa Clara River Estuary	107	82.1	96.2	93.9
403.12.06	Calleguas Creek	109	77.1	matrix interference	94.9
403.12.06	Calleguas Creek Dup	100	71.6	matrix interference	85.7
403.12.06	Calleguas Creek	110	85.9	126	88.6
405.12.09	Dominguez Channel/Avalon Blvd	103	73.7	94.2	89.8
403.21.09	Santa Paula Creek/d/s Stekel Park	109	80.2	106	95.2
403.31.08	Sespe Overflow Channel	110	87.0	104	97.3
403.41.03	Piru Creek	103	85.7	97.1	90.2
403.64.03	Arroyo Conejo/d/s Forks	110	80.4	103	89.0
403.64.03	Arroyo Conejo/d/s Forks	107	81.3	106	95.1
403.67.04	Arroyo Simi	115	84.4	112	93.3
510.00.30	Sacramento River/Hood	118	77.8	97.0	90.4
510.00.20	Prospect Slough off Liberty Island	110	69.8	93.6	78.5
510.00.20	Prospect Slough off Liberty Island Dup	107	82.4	98.4	77.9
515.40.00	Feather River above Yuba River	108	78.7	85.9	80.7
551.90.10	Kings River/Jackson Avenue	118	77.7	112	73.5
601.00.92	June Lake	118	84.2	110	95.3
601.00.92	June Lake	125	86.1	111	95.2
636.00.06	Stampede Reservoir	129	88.0	105	90.0
637.20.25	Susan River/d/s Piute Creek	104	71.7	93.6	matrix interference

Table 6 - Continued

Toxic Substances Monitoring Program
Percent Recovery of Synthetic Organic Surrogate Compounds for 2001

Station Number	Station Name	PCB 207	DBOB	DDD*, p,p'	DBCE
715.50.90	Colorado River/u/s Imperial Dam	116	77.8	113	91.2
715.50.90	Colorado River/u/s Imperial Dam Matrix Spike	124	93.5	90.9	96.9
715.40.08	Palo Verde Outfall Drain	114	89.5	106	88.5
715.50.90	Colorado River/u/s Imperial Dam Matrix Spike Dup	112	83.2	103	83.5
719.47.00	Coachella Valley Stormwater Channel	106	84.6	105	75.2
719.47.00	Coachella Valley Stormwater Channel Dup	111	89.9	89.1	68.8
723.10.02	New River/Westmorland	105	70.8	103	87.7
723.10.30	Central Drain	116	96.0	111	59.3
723.10.30	Central Drain Matrix Spike	118	87.2	105	84.8
723.10.30	Central Drain Matrix Spike Dup	113	88.3	104	68.3
723.10.32	Barbara Worth Drain	119	103.5	matrix interference	65.6
723.10.38	Rice Drain	122	85.9	99.0	72.7
723.10.47	Alamo River/International Boundary	117	108	102	86.6
723.10.48	Greeson Drain	112	83.0	99.2	84.9
723.10.91	Fig Drain	122	91.6	111	71.4
801.11.05	Delhi Channel	102	75.9	94.0	81.5
801.11.07	San Diego Creek/Michelson Drive	116	89.7	109	93.6
801.11.09	San Diego Creek/Barranca Parkway	116	90.2	103	96.1
801.11.09	San Diego Creek/Barranca Parkway FR	109	83.6	105	92.0
801.11.88	Upper Newport Bay/Ecological Reserve	118	75.0	112	74.3
801.11.96	Peters Canyon Channel	109	76.0	115	90.1
802.31.00	Lake Elsinore	88.8	71.0	76.2	79.3
801.71.07	Big Bear Lake/Dam	109	80.3	86.1	82.5
801.71.07	Big Bear Lake/Dam Matrix Spike	104	78.1	102	113
801.71.07	Big Bear Lake/Dam Matrix Spike Dup	83.3	64.6	71.8	84.0
801.71.10	Big Bear Lake	114	76.7	94.0	98.9
801.71.12	Big Bear Lake/Rathbone Creek	120	84.7	101	101
904.10.06	Loma Alta Creek/College Blvd	114	83.4	96.9	96.7
904.51.03	San Marcos Creek	107	79.8	99.5	85.9
904.61.02	Escondido Creek	103	73.7	94.7	91.8
904.62.04	Escondido Creek/Country Club Drive	109	75.6	89.8	91.1
906.10.01	Penasquitos Lagoon	103	76.7	92.1	100
906.40.01	Rose Creek/d/s Mission Bay Drive	116	87.2	105	99.8
906.40.04	San Clemente Canyon Creek/Regents	114	84.3	97.0	97.6
906.50.00	Tecolote Creek Estuary	123	93.5	99.3	96.2

Table 6 - Continued

Toxic Substances Monitoring Program
Percent Recovery of Synthetic Organic Surrogate Compounds for 2001

Station Number	Station Name	PCB 207	DBOB	DDD*, p,p'	DBCE
	Method Blank Bench Sheet 188	107	80.4	94.3	89.7
	Method Blank Bench Sheet 202	98.0	66.5	81.2	81.8
	Method Blank Bench Sheet 203	98.8	60.8	99.5	73.0
	Method Blank Bench Sheet 204	106	77.8	108	69.3
	Lab Control Spike Bench Sheet 188	102	77.2	99.7	105
	Lab Control Spike Bench Sheet 202	103	65.8	99.9	84.4
	Lab Control Spike Bench Sheet 203	122	88.5	99.8	94.2
	Lab Control Spike Bench Sheet 204	116	86.4	95.3	79.3
	SRM 2978 Bench Sheet 188	100	67.4	88.6	82.5
	SRM 2978 Bench Sheet 202	107	63.2	89.3	81.0
	SRM 2978 Bench Sheet 203	110	76.3	95.6	80.1
	SRM 2978 Bench Sheet 204	110	87.6	88.3	89.9

Table 6 - Continued

Toxic Substances Monitoring Program
Percent Recovery of Synthetic Organic Surrogate Compounds for 2002

Station Number	Station Name	PCB 207	DBOB	DDD*, p,p'	DBCE
106.40.06	Claire Engle Lake	102	98.8	108	81.4
106.40.15	Claire Engle Lake/North	103	99.0	109	70.8
106.40.15	Claire Engle Lake/North	106	101	111	74.7
106.40.15	Claire Engle Lake/North	92.3	88.8	117	72.6
106.40.15	Claire Engle Lake/North	105	95.7	110	73.2
204.30.13	Shadow Cliffs Reservoir	98.8	97.8	103	71.0
204.30.13	Shadow Cliffs Reservoir	98.8	95.6	116	68.2
205.50.10	Stevens Creek Reservoir	120	109	106	91.8
205.50.10	Stevens Creek Reservoir	93.1	95.5	119	77.7
205.50.10	Stevens Creek Reservoir	111	106	103	72.1
207.32.04	Lafayette Reservoir	104	57.0	121	74.4
207.32.04	Lafayette Reservoir	115	110	126	78.9
207.32.04	Lafayette Reservoir	95.5	98.5	98.7	82.5
207.32.04	Lafayette Reservoir	110	98.4	106	71.1
404.21.04	Malibu Creek/Tapia Park	106	100	96.2	57.2
404.21.05	Malibu Creek/u/s Tapia Discharge	111	106	98.7	67.4
404.21.05	Malibu Creek/u/s Tapia Discharge Dup	103	90.9	105	66.4
405.11.04	Topanga Creek/Greenleaf Road	105	101	98.1	65.8
405.12.08	Dominguez Channel/Vermont Street	113	110	106	85.5
405.12.09	Dominguez Channel/Avalon Blvd	108	102	98.2	70.6
405.12.90	Harbor Park Lake	108	109	128	67.3
405.12.90	Harbor Park Lake	112	116	134	80.0
405.12.90	Harbor Park Lake	99.4	102	114	68.8
405.13.92	Ballona Creek/Centinella	110	99.6	114	63.9
405.13.92	Ballona Creek/Centinella	115	110	116	64.4
551.60.03	Kings River/HWY 99	103	102	111	85.3
551.60.03	Kings River/HWY 99 Dup	119	107	113	73.8
551.90.05	Kings River/Laurel Avenue	94.9	98	118	74.7
551.90.05	Kings River/Laurel Avenue Matrix Spike	120	113	105	68.2
551.90.05	Kings River/Laurel Avenue Matrix Spike Dup	138	125	105	80.5
603.20.29	Bishop Creek/S.F./Tribal Land	103	62.6	112	76.3
603.20.29	Bishop Creek/S.F./Tribal Land Matrix Spike	114	107	103	75.9
603.20.29	Bishop Creek/S.F./Tribal Land Matrix Spike Dup	114	112	107	79.1
603.20.30	Bishop Creek/N.F./Tribal Land	114	78.1	137	83.0
603.20.30	Bishop Creek/N.F./Tribal Land Dup	96.4	94.2	106	76.0
715.40.08	Palo Verde Outfall Drain	120	114	108	71.0
715.50.90	Colorado River/u/s Imperial Dam	118	114	116	81.3
719.47.00	Coachella Valley Stormwater Channel	112	103	109	58.2
723.10.02	New River/Westmorland	122	107	127	75.2
723.10.03	Alamo River/Calipatria	90.5	87.8	122	70.9
723.10.21	Holtville Main Drain	114	101	118	78.2
723.10.30	Central Drain	115	106	118	71.3
723.10.32	Barbara Worth Drain	118	94.8	134	80.9
723.10.38	Rice Drain	115	96	108	66.0
723.10.38	Rice Drain FR	111	98.2	113	61.5
723.10.47	Alamo River/International Boundary	97.1	83.6	117	66.9

Table 6 - Continued

Toxic Substances Monitoring Program
Percent Recovery of Synthetic Organic Surrogate Compounds for 2002

Station Number	Station Name	PCB 207	DBOB	DDD*, p,p'	DBCE
801.11.09	San Diego Creek/Barranca Parkway	112	108	56.5	matrix interference
801.11.09	San Diego Creek/Barranca Parkway FR	109	105	56.5	matrix interference
801.11.96	Peters Canyon Channel	90.9	88.3	125	71.2
801.11.96	Peters Canyon Channel	96.8	94.9	115	59.7
801.11.99	Upper Newport Bay/Newport Dunes	108	106	121	79.6
801.11.99	Upper Newport Bay/Newport Dunes	105	100	113	73.7
802.31.00	Lake Elsinore	112	112	118	67.6
802.31.00	Lake Elsinore	125	124	132	74.2
901.12.00	Aliso Creek	112	110	105	66.7
901.20.00	San Juan Creek/Doheny State Park	103	97.4	116	59.1
901.20.00	San Juan Creek/Doheny State Park FR	111	110	115	48.2
901.20.04	Trabuco Creek/Oso Road	110	108	109	77.6
910.31.01	Lower Otay Lake	106	103	116	75.2
	Method Blank Bench Sheet 269	105	101	121	83.2
	Method Blank Bench Sheet 270	110	93.0	107	62.3
	Method Blank Bench Sheet 271	117	53.0	113	64.9
	Lab Control Spike Bench Sheet 269	124	114	109	78.9
	Lab Control Spike Bench Sheet 270	113	110	112	75.1
	Lab Control Spike Bench Sheet 271	103	95.0	106	77.8
	SRM 2978 Bench Sheet 269	112	89.0	104	84.1
	SRM 2978 Bench Sheet 270	90.0	78.0	123	82.6
	SRM 2978 Bench Sheet 271	93.0	79.0	99.0	75.4

TABLE 7

Toxic Substances Monitoring Program
Results of Matrix Spike Analyses: 2001 Synthetic Organic Compounds
Fish Tissue

Station Name:	TSM 2001		TSM 2001	
	Big Bear Lake/Dam		Anderson Reservoir	
	801.71.07		205.30.30	
	086.001 MS	086.001 MSD	064.008.F.01 MS	064.008.F.01 MSD
Percent Recovery				
	MS	MSD	MS	MSD
aldrin	113	119	104	107
chlordane, cis	114	114	122	117
chlordane, trans	120	115	96.9	98.5
chlordene, alpha	89.3	93.2	84.8	86.5
chlordene, gamma	92.3	89.9	74.3	77.2
chlorpyrifos	46.3	37.3	86.1	86.1
dacthal	101	98.0	108	117
DCBP, p,p'	98.4	95.0	127	127
DDD, o,p'	107	107	109	103
DDD, p,p'	96.8	95.6	82.0	78.6
DDE, o,p'	96.9	100	97.4	97
DDE, p,p'	140	129	151	110
DDMU, p,p'	115	115	121	122
DDT, o,p'	96.7	98.9	100	103
DDT, p,p'	74.3	74.2	78.1	53.7
diazinon	66.9	71.3	112	99.5
dieldrin	92.7	90.2	78.8	102
endosulfan I	87.0	90.5	92.4	99.3
endosulfan II	NA	NA	NA	NA
endosulfan sulfate	NA	NA	NA	NA
endrin	97.0	97.7	83.3	94.1
HCH, alpha	50.1*	51.9*	30.8*	32.5*
HCH, beta	107	108	99.9	102
HCH, delta	NR	NR	NR	NR
HCH, gamma	45.9*	46.1*	21.0*	20.6*
heptachlor	20.3	14.1	71.9	71.6
heptachlor epoxide	108	97.3	99.1	105
hexachlorobenzene	86.4	94.5	97.9	100
methoxychlor	100	100	108	103
mirex	88.0	90.7	101	98.6
nonachlor, cis	102	99.7	118	101
nonachlor, trans	103	102	120	102
oxadiazon	92.8	94.7	107	106
oxychlordane	107	107	89.7	93.5
parathion, ethyl	66.8	66.7	91.6	100
parathion, methyl	66.2	66.6	84.9	90.5
tedion	108	109	105	102
Percent Moisture:	80.3	80.0	77.8	77.80
Percent Lipid:	0.868	0.656	2.96	2.61

* analyte degraded in
spiking solution
NA = not analyzed
NR = not recovered

TABLE 7 - Continued

Toxic Substances Monitoring Program
Results of Matrix Spike Analyses: 2001 Synthetic Organic Compounds
Fish Tissue

	TSM 2001		TSM 2001	
Station Name:	Colorado River/u/s Imperial Dam		Central Drain	
Station Number:	715.50.90		723.10.30	
	024.001.F.01 MS	024.001.F.01 MSD	210.001.W.01 MS	210.100.W.01 MSD
	Percent Recovery		Percent Recovery	
	MS	MSD	MS	MSD
aldrin	109	108	107	114
chlordane, cis	102	107	120	112
chlordane, trans	109	110	105	96.3
chlordene, alpha	87.5	86.7	83.4	89.0
chlordene, gamma	91.3	91.3	88.9	93.8
chlorpyrifos	108	109	101	95.8
dacthal	102	105	97.8	105
DCBP, p,p'	112	120	158	134
DDD, o,p'	113	113	53.6	48.7
DDD, p,p'	109	110	116	102
DDE, o,p'	95.1	93.7	96.1	101
DDE, p,p'	93.3	89.0	*	*
DDMU, p,p'	93.9	94.1	89.3	99.2
DDT, o,p'	91.6	90.8	97.8	93.5
DDT, p,p'	109	112	*	*
diazinon	110	108	129	150
dieldrin	74.5	76.5	57.6	56.2
endosulfan I	68.2	95.4	78.3	100
endosulfan II	NA	NA	NA	NA
endosulfan sulfate	NA	NA	NA	NA
endrin	95.5	85.4	111	90.5
HCH, alpha	121	123	120	117
HCH, beta	112	112	108	102
HCH, delta	NR	NR	NR	NR
HCH, gamma	112	112	75.9	80.3
heptachlor	86.3	86.0	84.6	87.2
heptachlor epoxide	111	111	77.3	82.1
hexachlorobenzene	86.5	86.1	84.7	91.5
methoxychlor	119	111	50.5	41.4
mirex	94.9	93.9	86.5	89.6
nonachlor, cis	108	112	71.9	67.7
nonachlor, trans	94.8	93.4	70.6	94.1
oxadiazon	98.9	98.7	99.4	110
oxychlordane	112	111	104	106
parathion, ethyl	95.3	96.4	91.9	102
parathion, methyl	106	104	112	126
tedion	98.3	100	102	114
Percent Moisture:	78.4	78.9	75.9	75.9
Percent Lipid:	0.486	0.526	3.02	3.03
*concentration of analyte in unfortified sample was greater than the spike concentration				

TABLE 7 - Continued

Toxic Substances Monitoring Program
Results of Matrix Spike Analyses: 2002 Synthetic Organic Compounds
Fish Tissue

	TSM 2002		TSM 2002	
Station Name:	Kings River/Laurel Avenue		Malibu Creek/Tapia Park	
Station Number:	551.90.05		404.21.04	
	021.002.F.02MS	021.2.F.02MSD	105.002.W.02MS	105.2.W.02MSD
	Percent Recovery		Percent Recovery	
	MS	MSD	MS	MSD
aldrin	110	107	119	120
chlordane, cis	79.1	76.6	72.3	71.6
chlordane, trans	68.8	70.5	86.7	88.6
chlordene, alpha	90.6	89.4	95.3	95.4
chlordene, gamma	92.7	93.8	101	98.6
chlorpyrifos	90.9	95.7	102	102
dacthal	105	91.6	113	140
DCBP, p,p'	108	92.4	86.1	92.0
DDD, o,p'	84.9	83.8	85.8	89.9
DDD, p,p'	85.2	87.0	90.0	90.7
DDE, o,p'	95.8	95.5	101	101
DDE, p,p'	86.7	84.2	111	110
DDMU, p,p'	99.7	99.4	112	118
DDT, o,p'	85.0	88.1	105	103
DDT, p,p'	88.1	91.5	114	115
diazinon	128.1	120.0	108	98.4
dieldrin	81.8	96.9	106	104
endosulfan I	75.3	81.0	94.8	91.3
endosulfan II	NA	NA	NA	NA
endosulfan sulfate	NA	NA	NA	NA
endrin	106	109	75.9	73.9
HCH, alpha	97.2	97.7	94.4	92.2
HCH, beta	89.9	88.4	96.5	97.9
HCH, delta	NR	NR	NR	NR
HCH, gamma	84.7	85.0	84.7	88.7
heptachlor	88.9	85.1	101	97.5
heptachlor epoxide	80.7	79.1	90.6	90.0
hexachlorobenzene	88.8	85.7	92.4	93.1
methoxychlor	86.5	96.9	111	116
mirex	102.3	101.5	105	104
nonachlor, cis	77.6	79.2	83.0	83.9
nonachlor, trans	92.7	93.2	110	106
oxadiazon	104.7	101.9	120	103
oxychlordane	84.3	83.8	101	97.7
parathion, ethyl	71.0	61.5	61.7	89.0
parathion, methyl	80.7	62.5	83.0	91.3
tedion	144	136	145	137
Percent Moisture:	80.8	80.1	76.4	76.8
Percent Lipid:	2.66	2.68	5.46	5.34

TABLE 7 - Continued

Toxic Substances Monitoring Program
Results of Matrix Spike Analyses: 2002 Synthetic Organic Compounds
Fish Tissue

TSM 2002		
Station Name:	Bishop Creek/S.F./Tribal Land	
Station Number:	603.20.29	
	316.002.F.02MS	316.2.F.02MSD
Percent Recovery		
	MS	MSD
aldrin	110	114
chlordane, cis	102	97.2
chlordane, trans	96.4	89.3
chlordene, alpha	88.4	92.2
chlordene, gamma	88.0	91.3
chlorpyrifos	100	95.7
dacthal	108	106
DCBP, p,p'	85.7	85.9
DDD, o,p'	99.7	97.5
DDD, p,p'	97.4	93.0
DDE, o,p'	85.4	89.7
DDE, p,p'	106	105
DDMU, p,p'	104	103
DDT, o,p'	76.4	86.3
DDT, p,p'	108	106
diazinon	126	125
dieldrin	93.1	92.9
endosulfan I	94.9	96.0
endosulfan II	NA	NA
endosulfan sulfate	NA	NA
endrin	117	116
HCH, alpha	98.7	93.9
HCH, beta	101	98.4
HCH, delta	NR	NR
HCH, gamma	99.3	96.0
heptachlor	71.9	90.1
heptachlor epoxide	94.9	93.1
hexachlorobenzene	84.2	89.8
methoxychlor	90.9	91.3
mirex	103	103
nonachlor, cis	97.4	92.2
nonachlor, trans	102	101
oxadiazon	98.7	98.8
oxychlordane	97.3	95.1
parathion, ethyl	77.3	79.2
parathion, methyl	78.5	81.9
tedion	118	105
Percent Moisture:	77.4	78.1
Percent Lipid:	1.38	1.21
NA = not analyzed		
NR = not recovered		

TABLE 8

Toxic Substances Monitoring Program
Results of Laboratory Control Spike (LCS):
2001 Synthetic Organic Compounds

	TSM 2001 LCS BS 188 % Recovery	TSM 2001 LCS BS 202 % Recovery	TSM 2001 LCS BS 203 % Recovery	TSM 2001 LCS BS 204 % Recovery
aldrin	113	99.4	98.3	101
chlordane, cis	115	114	105	106
chlordane, trans	122	103	114	108
chlordene, alpha	90.5	82.1	86.8	88.2
chlordene, gamma	100	83.4	90.0	87.6
chlorpyrifos	37.6	85.9	103	103
dacthal	98.0	104	106	115
DCBP, p,p'	95.4	114	112	128
DDD, o,p'	105	108	112	107
DDD, p,p'	92.4	81.6	110	107
DDE, o,p'	96.4	83.6	93.0	88.2
DDE, p,p'	123	130	98.4	100
DDMU, p,p'	114	119	94.2	99.0
DDT, o,p'	97.4	67.4	88.2	79.0
DDT, p,p'	75.9	55.4	110	108
diazinon	54.9	89.5	103	125
dieldrin	89.9	72.7	98.1	87.4
endosulfan I	87.7	91.1	71.2	77.5
endosulfan II	NA	NA	NA	NA
endosulfan sulfate	NA	NA	NA	NA
endrin	88.9	82.2	96.1	86.0
HCH, alpha	46.4*	32.0*	121	121
HCH, beta	106	109	112	112
HCH, delta	NR	NR	NR	NR
HCH, gamma	44.6*	19.9*	110	112
heptachlor	16.3	72.2	87.5	80.0
heptachlor epoxide	107	109	110	108
hexachlorobenzene	86.5	87.1	83.7	89.3
methoxychlor	105	106	115	111
mirex	91.6	101	94.6	95.1
nonachlor, cis	98.2	100	109	104
nonachlor, trans	102	102	95.4	95.9
oxadiazon	92.8	108	99.3	114
oxychlordane	107	97.8	110	108
parathion, ethyl	57.8	91.5	91.3	105
parathion, methyl	56.0	90.6	104	130
tedion	79.2	110	93.7	114
NR = not recovered				
NA = not analyzed				
* analyte degraded in spiking solution				

TABLE 8 - Continued

Toxic Substances Monitoring Program
Results of Laboratory Control Spike (LCS):
2002 Synthetic Organic Compounds

	TSM 2002 LCS BS 269 % Recovery	TSM 2002 LCS BS 270 % Recovery	TSM 2002 LCS BS 271 % Recovery
aldrin	107	121	115
chlordane, cis	82.2	89.3	108
chlordane, trans	74.2	80.5	106
chlordene, alpha	91.2	97.5	88.6
chlordene, gamma	89.0	97.1	82.2
chlorpyrifos	89.9	92.0	101
dacthal	95.1	101	109
DCBP, p,p'	78.0	84.0	90
DDD, o,p'	91.3	91.8	105
DDD, p,p'	84.5	88.4	103
DDE, o,p'	92.4	96.9	79.6
DDE, p,p'	101	111	104
DDMU, p,p'	101	97.7	100
DDT, o,p'	89.0	98.3	74.4
DDT, p,p'	96.9	104	109
diazinon	114	132	122
dieldrin	105	104	97.3
endosulfan I	93.0	97.7	108
endosulfan II	NA	NA	NA
endosulfan sulfate	NA	NA	NA
endrin	128	127	129
HCH, alpha	105	96.8	108
HCH, beta	91.2	96.2	109
HCH, delta	NR	NR	NR
HCH, gamma	87.2	91.5	106
heptachlor	91.4	91.2	87.5
heptachlor epoxide	87.5	92.8	98.9
hexachlorobenzene	88.3	90.9	84.5
methoxychlor	88.8	92.8	90.2
mirex	100	103	100
nonachlor, cis	84.4	86.2	101
nonachlor, trans	98.2	104	99.6
oxadiazon	114	105	105
oxychlordane	90.3	91.2	103
parathion, ethyl	50.8	71.2	54.6
parathion, methyl	51.3	71.5	57.6
tedion	130	133	123
NR = not recovered			
NA = not analyzed			

TABLE 9

Toxic Substances Monitoring Program
Results of Certified Reference Materials:
2001 Synthetic Organic Compounds

	SRM 2978 Mussel Tissue Cert. Conc. ppb (ng/g)	+/-	95% CI Ranges		70-130% of the 95% Confidence Interval ppb (ng/g)		TSM 2001 BS 188 ppb (ng/g)	TSM 2001 BS 202 ppb (ng/g)	TSM 2001 BS 203 ppb (ng/g)	TSM 2001 BS 204 ppb (ng/g)
aldrin										
chlordane, cis	15.56	0.83	14.73	16.39	10.31	21.31	16.5	15.5	15.7	13.7
chlordane, trans	11.38	0.56	10.82	11.94	7.57	15.52	12.6	10.8	10.9	10.6
chlordene, alpha										
chlordene, gamma										
chlorpyrifos										
dacthal										
DCBP, p,p'										
DDD, o,p'	10.5	1.0	9.5	11.5	6.65	14.95	15.5	15.9	17.1	17.8
DDD, p,p'	38.8	2.3	36.5	41.1	25.55	53.43	40.9	40.2	42.2	42.3
DDE, o,p'	4.41	0.56	3.85	4.97	2.70	6.46	4.63	3.2	2.7	3.4
DDE, p,p'	37.5	1.5	36	39	25.20	50.70	35.5	36.4	36.3	36.4
DDMU, p,p'										
DDT, o,p'	9.2	1.6	7.6	10.8	5.32	14.04	<RL	1.24	0.943	1.49
DDT, p,p'	3.84	0.28	3.56	4.12	2.49	5.36	<RL	4.15	3.93	7.26
diazinon										
dieldrin	6.3	0.67	5.63	6.97	3.94	9.06	7.29	5.80	5.01	4.05
endosulfan I										
endosulfan II										
endosulfan sulfate										
endrin										
HCH, alpha										
HCH, beta										
HCH, delta										
HCH, gamma										
heptachlor										
heptachlor epoxide										
hexachlorobe nzene										
methoxychlor										
mirex										
nonachlor, cis	8.23	0.56	7.67	8.79	5.37	11.43	6.11	7.10	7.46	6.85
nonachlor, trans	11.5	1	10.5	12.5	7.35	16.25	6.33	11.8	12.1	11.8
oxadiazon										
oxychlordane	2.13	0.27	1.86	2.4	1.30	3.12	ND	ND	ND	ND
parathion, ethyl										
parathion, methyl										
tedion										

TABLE 9 - Continued

Toxic Substances Monitoring Program
Results of Certified Reference Materials:
2002 Synthetic Organic Compounds

	SRM 2978 Mussel Tissue Cert. Conc. ppb (ng/g)	+/-	95% CI Ranges		70-130% of the 95% Confidence Interval		TSM 2002 BS 269 ppb (ng/g)	TSM 2002 BS 270 ppb (ng/g)	TSM 2002 BS 271 ppb (ng/g)
aldrin									
chlordane,	15.56	0.83	14.7	16.4	10.3	21.3	12.2	13.0	13.5
cis									
chlordane,	11.38	0.56	10.8	11.9	7.57	15.5	7.43	7.91	7.63
trans									
chlordene,									
alpha									
chlordene,									
gamma									
chlorpyrifos									
dacthal									
DCBP, p,p'									
DDD, o,p'	10.5	1.0	9.5	11.5	6.65	15.0	14.7	13.2	14.2
DDD, p,p'	38.8	2.3	36.5	41.1	25.6	53.4	32.1	31.4	31.6
DDE, o,p'	4.41	0.56	3.85	4.97	2.70	6.46	4.00	3.40	3.78
DDE, p,p'	37.5	1.5	36.0	39.0	25.2	50.7	37.5	39.7	39.2
DDMU, p,p'									
DDT, o,p'	9.2	1.6	7.6	10.8	5.32	14.0	2.61	2.43	2.56
DDT, p,p'	3.84	0.28	3.56	4.12	2.49	5.36	4.83	5.01	3.33
diazinon									
dieldrin	6.3	0.67	5.63	6.97	3.94	9.06	6.63	5.29	6.08
endosulfan I									
endosulfan									
II									
endosulfan									
sulfate									
endrin									
HCH, alpha									
HCH, beta									
HCH, delta									
HCH, gamma									
heptachlor									
heptachlor									
epoxide									
hexachlorobe									
nzene									
methoxychlor									
mirex									
nonachlor,	8.23	0.56	7.67	8.79	5.37	11.43	5.59	5.82	6.10
cis									
nonachlor,	11.5	1	10.5	12.5	7.35	16.25	10.4	12.8	12.9
trans									
oxadiazon									
oxychlordane	2.13	0.27	1.86	2.4	1.30	3.12	0.441	0.347	0.431
parathion,									
ethyl									
parathion,									
methyl									
tedion									

TABLE 10

Toxic Substances Monitoring Program
Results of Duplicate Sample Analysis
2001 Synthetic Organic Compounds Quality Control

Station Name	Calleguas Creek				Prospect Slough off Liberty Island		
Station Number	403.12.06				510.00.20		
	TSM 2001 Fresh Weight Reporting Limit ppb (ng/g)	104.001.W.01 ppb (ng/g)	104.001.W.01 Dup ppb (ng/g)	RPD	013.002.F.01 ppb (ng/g)	013.002.F.01 Dup ppb (ng/g)	RPD
aldrin	1	<RL	<RL		<RL	<RL	
chlordane, cis	2	8.71	8.69	0.2	<RL	<RL	
chlordane, trans	2	3.94	3.79	3.8	<RL	<RL	
chlordene, alpha	1	<RL	<RL		<RL	<RL	
chlordene, gamma	1	1.12	1.06	5.8	<RL	<RL	
chlorpyrifos	2	2.74	2.45	11.0	<RL	<RL	
dacthal	2	23.0	23.4	1.7	<RL	<RL	
DCBP, p,p'	10	<RL	<RL		<RL	<RL	
DDD, o,p'	2	11.8	11.9	1.2	<RL	<RL	
DDD, p,p'	2	45.4	45.5	0.3	2.45	2.23	9.5
DDE, o,p'	2	7.44	6.63	11.4	<RL	<RL	
DDE, p,p'	2	578	604	4.5	20.9	19.5	7.1
DDMU, p,p'	3	18.5	18.9	1.9	<RL	<RL	
DDT, o,p'	3	20.8	22.0	5.5	<RL	<RL	
DDT, p,p'	5	34.9	35.4	1.4	<RL	<RL	
diazinon	20	<RL	<RL		<RL	<RL	
dieldrin	2	10.0	10.2	1.8	<RL	<RL	
endosulfan I	2	<RL	<RL		<RL	<RL	
endosulfan II	10	NA	NA		NA	NA	
endosulfan sulfate	10	NA	NA		NA	NA	
endrin	2	<RL	<RL		<RL	<RL	
HCH, alpha	1	<RL	<RL		<RL	<RL	
HCH, beta	2	<RL	<RL		<RL	<RL	
HCH, delta	2	<RL	<RL		<RL	<RL	
HCH, gamma	1	1.26	1.27	0.8	<RL	<RL	
heptachlor	2	<RL	<RL		<RL	<RL	
heptachlor epoxide	1	<RL	<RL		<RL	<RL	
hexachlorobenzene	0.3	1.33	1.38	3.6	<RL	<RL	
methoxychlor	5	<RL	<RL		<RL	<RL	
mirex	3	<RL	<RL		<RL	<RL	
nonachlor, cis	2	7.20	7.38	2.4	<RL	<RL	
nonachlor, trans	1	12.1	12.4	2.0	<RL	<RL	
oxadiazon	3	8.07	7.78	3.7	<RL	<RL	
oxychlordane	1	2.76	2.37	15.2	<RL	<RL	
parathion, ethyl	2	<RL	<RL		<RL	<RL	
parathion, methyl	4	<RL	<RL		<RL	<RL	
tedion	2	<RL	<RL		<RL	<RL	
toxaphene	20	901	917	1.8	<RL	<RL	
PCB 1248	25	<RL	<RL		<RL	<RL	
PCB 1254	10	56	47	17.5	<RL	<RL	
PCB 1260	10	17	18	5.7	<RL	<RL	
Percent Moisture		77.2	77.3	0.1	79.3	79.3	0.0
Percent Lipid		4.26	4.93	14.6	0.481	0.300	46
Surrogates:		% Recovery	% Recovery		% Recovery	% Recovery	
207		109	100	8.3	110	107	3
DBOB		77.1	71.6	7.4	69.8	82.4	17
DDD*, p,p'		232	151	42.0	93.6	98.4	5
DBCE		94.9	85.7	10.2	78.5	77.9	1

TABLE 10 - Continued

Toxic Substances Monitoring Program
Results of Duplicate Sample Analysis
2001 Synthetic Organic Compounds Quality Control

Station Name		Coachella Valley Stormwater Channel		
Station Number		719.47.00		
		TSM 2001 Fresh Weight Reporting Limit		
	ppb (ng/g)	119.002.W.01 ppb (ng/g)	119.2.W.01 Dup ppb (ng/g)	RPD
aldrin	1	<RL	<RL	
chlordane, cis	2	<RL	<RL	
chlordane, trans	2	<RL	<RL	
chlordene, alpha	1	<RL	<RL	
chlordene, gamma	1	<RL	<RL	
chlorpyrifos	2	<RL	<RL	
dacthal	2	77.7	88.2	12.7
DCBP, p,p'	10	<RL	<RL	
DDD, o,p'	2	3.89	5.01	25.1
DDD, p,p'	2	14.3	16.7	15.5
DDE, o,p'	2	5.42	4.75	13.1
DDE, p,p'	2	254	244	3.9
DDMU, p,p'	3	8.86	8.40	5.3
DDT, o,p'	3	2.51	2.23	11.8
DDT, p,p'	5	1.60	1.77	10.4
diazinon	20	<RL	<RL	
dieldrin	2	3.76	4.20	11.0
endosulfan I	2	<RL	<RL	
endosulfan II	10	NA	NA	
endosulfan sulfate	10	NA	NA	
endrin	2	<RL	<RL	
HCH, alpha	1	<RL	<RL	
HCH, beta	2	<RL	<RL	
HCH, delta	2	<RL	<RL	
HCH, gamma	1	2.14	2.55	17.4
heptachlor	2	<RL	<RL	
heptachlor epoxide	1	<RL	<RL	
hexachlorobenzene	0.3	0.304	0.285	6.5
methoxychlor	5	<RL	<RL	
mirex	3	<RL	<RL	
nonachlor, cis	2	<RL	<RL	
nonachlor, trans	1	2.21	3.27	38.8
oxadiazon	3	<RL	<RL	
oxychlordane	1	<RL	<RL	
parathion, ethyl	2	<RL	<RL	
parathion, methyl	4	<RL	<RL	
tedion	2	<RL	<RL	
toxaphene	20	<RL	<RL	
PCB 1248	25	<RL	<RL	
PCB 1254	10	18	18	0.0
PCB 1260	10	12	12	0.0
Percent Moisture		76.8	76.6	0.3
Percent Lipid		3.81	3.36	12.4
Surrogates:		% Recovery	% Recovery	
207		106	111	4.6
DBOB		84.6	89.9	6.1
DDD*, p,p'		105	89.1	16.3
DBCE		75.2	68.8	8.9

TABLE 10 - Continued
 Toxic Substances Monitoring Program
 Results of Duplicate Sample Analysis
 2002 Synthetic Organic Compounds Quality Control

Station Name	Kings River/Hwy 99				Malibu Creek u/s Tapia Discharge		
Station Number	551.60.03				404.21.05		
	TSM 2002 Fresh Weight Reporting Limit ppb (ng/g)	021.001.F.02 ppb (ng/g)	021.001.F.02 Dup ppb (ng/g)	RPD	105.001.F.02 ppb (ng/g)	105.1.F.02 Dup ppb (ng/g)	RPD
aldrin	1	<RL	<RL		<RL	<RL	
chlordane, cis	1	<RL	<RL		<RL	<RL	
chlordane, trans	1	<RL	<RL		<RL	<RL	
chlordene, alpha	0.5	<RL	<RL		<RL	<RL	
chlordene, gamma	0.5	<RL	<RL		<RL	<RL	
chlorpyrifos	1	<RL	<RL		<RL	<RL	
dacthal	1	<RL	<RL		<RL	<RL	
DCBP, p,p'	10	<RL	<RL		<RL	<RL	
DDD, o,p'	1	<RL	<RL		<RL	<RL	
DDD, p,p'	1	<RL	<RL		<RL	<RL	
DDE, o,p'	2	<RL	<RL		<RL	<RL	
DDE, p,p'	2	6.78	4.91	31.9	<RL	<RL	
DDMU, p,p'	3	<RL	<RL		<RL	<RL	
DDT, o,p'	3	<RL	<RL		<RL	<RL	
DDT, p,p'	5	<RL	<RL		<RL	<RL	
diazinon	20	<RL	<RL		<RL	<RL	
dieldrin	0.5	<RL	<RL		<RL	<RL	
endosulfan I	2	<RL	<RL		<RL	<RL	
endosulfan II	10	NA	NA		NA	NA	
endosulfan sulfate	10	NA	NA		NA	NA	
endrin	2	<RL	<RL		<RL	<RL	
HCH, alpha	0.5	<RL	<RL		<RL	<RL	
HCH, beta	1	<RL	<RL		<RL	<RL	
HCH, delta	2	<RL	<RL		<RL	<RL	
HCH, gamma	0.5	<RL	<RL		<RL	<RL	
heptachlor	1	<RL	<RL		<RL	<RL	
heptachlor epoxide	0.5	<RL	<RL		<RL	<RL	
hexachlorobenzene	0.3	<RL	<RL		<RL	<RL	
methoxychlor	3	<RL	<RL		<RL	<RL	
mirex	1.5	<RL	<RL		<RL	<RL	
nonachlor, cis	1	<RL	<RL		<RL	<RL	
nonachlor, trans	1	1.25	0.918	30.2	<RL	<RL	
oxadiazon	1	<RL	<RL		<RL	<RL	
oxychlordane	1	<RL	<RL		<RL	<RL	
parathion, ethyl	2	<RL	<RL		<RL	<RL	
parathion, methyl	4	<RL	<RL		<RL	<RL	
tedion	2	<RL	<RL		<RL	<RL	
toxaphene	20	<RL	<RL		<RL	<RL	
PCB 1248	25	<RL	<RL		<RL	<RL	
PCB 1254	10	<RL	<RL		<RL	<RL	
PCB 1260	10	<RL	<RL		<RL	<RL	
Percent Moisture		78.4	78.4	0.0	78.0	77.8	0.3
Percent Lipid		0.728	0.520	33.3	0.433	0.364	17.3
Surrogates:		% recovery	% Recovery		% Recovery	% Recovery	
207 (F1)		103	119	14.0	111	103	7.6
DBOB (F1)		102	107	4.9	106	90.9	15.1
DDD*, p,p'		111	113	2.2	98.7	105	6.0
DBCE		85.3	73.8	14.5	67.4	66.4	1.5

TABLE 10 - Continued
 Toxic Substances Monitoring Program
 Results of Duplicate Sample Analysis
 2002 Synthetic Organic Compounds Quality Control

Station Name	Bishop Creek/N.F.			
	Tribal Land			
Station Number	603.20.30			
	TSM 2002 Fresh Weight Reporting Limit ppb (ng/g)	316.001.F.02 ppb (ng/g)	316.1.F.02 Dup ppb (ng/g)	RPD
aldrin	1	<RL	<RL	
chlordane, cis	1	<RL	<RL	
chlordane, trans	1	<RL	<RL	
chlordene, alpha	0.5	<RL	<RL	
chlordene, gamma	0.5	<RL	<RL	
chlorpyrifos	1	<RL	<RL	
dacthal	1	<RL	<RL	
DCBP, p,p'	10	<RL	<RL	
DDD, o,p'	1	<RL	<RL	
DDD, p,p'	1	<RL	<RL	
DDE, o,p'	2	<RL	<RL	
DDE, p,p'	2	2.32	2.26	2.8
DDMU, p,p'	3	<RL	<RL	
DDT, o,p'	3	<RL	<RL	
DDT, p,p'	5	<RL	<RL	
diazinon	20	<RL	<RL	
dieldrin	0.5	<RL	<RL	
endosulfan I	2	<RL	<RL	
endosulfan II	10	NA	NA	
endosulfan sulfate	10	NA	NA	
endrin	2	<RL	<RL	
HCH, alpha	0.5	<RL	<RL	
HCH, beta	1	<RL	<RL	
HCH, delta	2	<RL	<RL	
HCH, gamma	0.5	<RL	<RL	
heptachlor	1	<RL	<RL	
heptachlor epoxide	0.5	<RL	<RL	
hexachlorobenzene	0.3	<RL	<RL	
methoxychlor	3	<RL	<RL	
mirex	1.5	<RL	<RL	
nonachlor, cis	1	<RL	<RL	
nonachlor, trans	1	<RL	<RL	
oxadiazon	1	<RL	<RL	
oxychlordane	1	<RL	<RL	
parathion, ethyl	2	<RL	<RL	
parathion, methyl	4	<RL	<RL	
tedion	2	<RL	<RL	
toxaphene	20	<RL	<RL	
PCB 1248	25	<RL	<RL	
PCB 1254	10	<RL	<RL	
PCB 1260	10	<RL	<RL	
Percent Moisture		77.6	77.6	0.0
Percent Lipid		0.944	0.894	5.4
Surrogates:		% Recovery	% Recovery	
207 (F1)		114	96.4	16.3
DBOB (F1)		78.1	94.2	18.7
DDD*, p,p'		137	106	25.7
DBCE		83.0	76.0	8.8

TABLE 11

Toxic Substances Monitoring Program
Results of Method Blanks Analysis
2001 Synthetic Organic Compounds Quality Control

	Fresh Wt Reporting Limit	TSM 2001 Method Blank BS 188	TSM 2001 Method Blank BS 202	TSM 2001 Method Blank BS 203	TSM 2001 Method Blank BS 204
	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)
aldrin	1	ND	ND	ND	ND
chlordane, cis	2	<RL	ND	ND	ND
chlordane, trans	2	<RL	<RL	<RL	<RL
chlordene, alpha	1	ND	ND	ND	ND
chlordene, gamma	1	<RL	ND	ND	ND
chlorpyrifos	2	ND	ND	ND	ND
dacthal	2	ND	ND	ND	ND
DCBP, p,p'	10	ND	ND	ND	ND
DDD, o,p'	2	ND	ND	ND	ND
DDD, p,p'	2	ND	ND	ND	ND
DDE, o,p'	2	ND	ND	ND	ND
DDE, p,p'	2	ND	ND	ND	ND
DDMU, p,p'	3	ND	ND	ND	ND
DDT, o,p'	3	ND	ND	ND	ND
DDT, p,p'	5	ND	ND	ND	ND
diazinon	20	ND	ND	ND	ND
dieldrin	2	ND	ND	<RL	ND
endosulfan I	2	ND	ND	ND	ND
endosulfan II	10	ND	NA	NA	NA
endosulfan sulfate	10	ND	NA	NA	NA
endrin	2	ND	ND	ND	ND
HCH, alpha	1	ND	ND	ND	ND
HCH, beta	2	ND	ND	ND	ND
HCH, delta	2	ND	ND	ND	ND
HCH, gamma	1	ND	ND	ND	ND
heptachlor	2	ND	ND	ND	ND
heptachlor epoxide	1	<RL	ND	ND	ND
hexachlorobenzene	0.3	ND	ND	ND	ND
methoxychlor	5	<RL	ND	<RL	<RL
mirex	3	ND	ND	ND	ND
nonachlor, cis	2	ND	ND	ND	ND
nonachlor, trans	1	<RL	ND	ND	ND
oxadiazon	3	ND	ND	ND	ND
oxychlordane	1	ND	ND	ND	ND
parathion, ethyl	2	ND	ND	ND	ND
parathion, methyl	4	ND	ND	ND	ND
tedion	2	ND	ND	ND	ND
toxaphene	20	ND	ND	ND	ND
PCB 1248	25	ND	<RL	<RL	<RL
PCB 1254	10	ND	<RL	<RL	<RL
PCB 1260	10	ND	<RL	<RL	<RL
Percent Moisture		NA	NA	NA	NA
Percent Lipid		ND	NA	NA	NA
ND = not detected					
<RL = less than reporting limit					
Surrogates:		% Recovery	% Recovery	% Recovery	% Recovery
207		80.4	98.0	98.8	106
DBOB (F1)		107	66.5	60.8	77.8
DDD*, p,p'		94.3	81.2	99.5	108
DBCE		89.7	81.8	73.0	69.3

TABLE 11 - Continued

Toxic Substances Monitoring Program
Results of Method Blanks Analysis
2002 Synthetic Organic Compounds Quality Control

	Fresh Wt Reporting Limit ppb (ng/g)	TSM 2002 Method Blank BS 269 ppb (ng/g)	TSM 2002 Method Blank BS 270 ppb (ng/g)	TSM 2002 Method Blank BS 271 ppb (ng/g)
aldrin	1	ND	<RL	ND
chlordane, cis	1	ND	ND	ND
chlordane, trans	1	ND	ND	ND
chlordene, alpha	0.5	ND	ND	ND
chlordene, gamma	0.5	ND	ND	ND
chlorpyrifos	1	ND	ND	ND
dacthal	1	ND	ND	ND
DCBP, p,p'	10	ND	ND	ND
DDD, o,p'	1	ND	ND	ND
DDD, p,p'	1	ND	ND	ND
DDE, o,p'	2	ND	ND	ND
DDE, p,p'	2	<RL	ND	ND
DDMU, p,p'	3	ND	ND	ND
DDT, o,p'	3	ND	ND	ND
DDT, p,p'	5	ND	ND	ND
diazinon	20	ND	ND	ND
dielrin	1	<RL	<RL	ND
endosulfan I	2	ND	ND	ND
endosulfan II	10	NA	NA	NA
endosulfan sulfate	10	NA	NA	NA
endrin	2	ND	ND	<RL
HCH, alpha	0.5	ND	ND	ND
HCH, beta	1	ND	ND	ND
HCH, delta	2	ND	ND	ND
HCH, gamma	0.5	ND	ND	ND
heptachlor	1	<RL	ND	ND
heptachlor epoxide	0.5	ND	ND	ND
hexachlorobenzene	0.3	ND	ND	ND
methoxychlor	3	ND	ND	ND
mirex	1.5	ND	ND	ND
nonachlor, cis	1	ND	ND	ND
nonachlor, trans	1	<RL	ND	ND
oxadiazon	1	ND	ND	ND
oxychlordane	1	ND	ND	ND
parathion, ethyl	2	ND	ND	ND
parathion, methyl	4	ND	ND	ND
tedion	2	ND	ND	ND
toxaphene	20	<RL	<RL	<RL
PCB 1248	25	<RL	<RL	<RL
PCB 1254	10	<RL	<RL	<RL
PCB 1260	10	<RL	<RL	<RL
Percent Moisture		NA	NA	NA
Percent Lipid		NA	NA	NA
ND = not detected				
<RL = less than reporting limit				
Surrogates:		% Recovery	% Recovery	% Recovery
207		105	110	117
DBOB (F1)		101	93.2	52.5
DDD*, p,p'		121	107	112
DBCE		83.2	62.3	64.9

TABLE 12

Toxic Substances Monitoring Program
Results of Method Blank Analyses: 2001 and 2002
Polynuclear Aromatic Hydrocarbons (PAHs)

	Fresh Wt Reporting Limit ppb (ng/g)	TSM 2001 Method Blank BS 190 ppb (ng/g)	TSM 2002 Method Blank BS 273 ppb (ng/g)
naphthalene	10	<RL	<RL
2-Methylnaphthalene	10	<RL	<RL
1-Methylnaphthalene	10	<RL	<RL
biphenyl	10	<RL	<RL
2,6-Dimethylnaphthalene	10	<RL	<RL
acenaphthylene	10	<RL	<RL
acenaphthene	10	<RL	<RL
2,3,5-Trimethylnaphthalene	10	<RL	<RL
fluorene	10	<RL	<RL
dibenzothiophene	10	<RL	<RL
phenanthrene	10	<RL	<RL
anthracene	10	<RL	<RL
1-Methylphenanthrene	10	<RL	<RL
fluoranthene	10	<RL	<RL
pyrene	10	<RL	<RL
benz[a]anthracene	10	<RL	<RL
chrysene	10	<RL	<RL
benzo[b]fluoranthene	10	<RL	<RL
benzo[k]fluoranthene	10	<RL	<RL
benzo[e]pyrene	10	<RL	<RL
benzo[a]pyrene	10	<RL	<RL
perylene	10	<RL	<RL
indeno[1,2,3-cd]pyrene	10	<RL	<RL
dibenz[a,h]anthracene	10	<RL	<RL
benzo[ghi]perylene	10	<RL	<RL
Surrogate		% Recovery	% Recovery
naphthalene-d8		105	53.9
biphenyl-d10		101	56.3
acenaphthene-d10		123	54.0
dibenzothiophene-d8		110	45.4
pyrene-d10		100	63.0
benz[a]anthracene-d12		30	11.8
benz[e]pyrene-d12		32	31.1
perylene-d12		30	27.5
benzo(g,h,i)perylene-d12		18	4.17

TABLE 13

Toxic Substances Monitoring Program
Results of Duplicate Analyses: 2001 and 2002
Polynuclear Aromatic Hydrocarbons (PAHs)

Station Name	Oso Flaco Lake				Kings River/HWY 99			
Station Number	310.32.01				551.60.03			
	TSM 2001				TSM 2002			
	Fresh Weight Reporting Limit	341.001.F.01	341.001.F.01		021.001.F.02	021.001.F.02		
	ppb (ng/g)	ppb (ng/g)	Dup		ppb (ng/g)	Dup		
	ppb (ng/g)	ppb (ng/g)	ppb (ng/g)	RPD	ppb (ng/g)	ppb (ng/g)	RPD	
naphthalene	10	<RL	<RL		18.0	15.1	17.5	
2-Methylnaphthalene	10	<RL	<RL		24.3	19.8	20.4	
1-Methylnaphthalene	10	<RL	<RL		12.7	10.4	19.9	
biphenyl	10	<RL	<RL		<RL	<RL		
2,6-Dimethylnaphthalene	10	<RL	<RL		6.28	5.15	19.8	
acenaphthylene	10	<RL	<RL		<RL	<RL		
acenaphthene	10	<RL	<RL		<RL	<RL		
2,3,5-Trimethylnaphthalene	10	<RL	<RL		<RL	<RL		
fluorene	10	<RL	<RL		<RL	<RL		
dibenzothiophene	10	<RL	<RL		<RL	<RL		
phenanthrene	10	<RL	<RL		<RL	<RL		
anthracene	10	<RL	<RL		<RL	<RL		
1-Methylphenanthrene	10	<RL	<RL		<RL	<RL		
fluoranthene	10	<RL	<RL		<RL	<RL		
pyrene	10	<RL	<RL		<RL	<RL		
benz[a]anthracene	10	<RL	<RL		<RL	<RL		
chrysene	10	<RL	<RL		<RL	<RL		
benzo[b]fluoranthene	10	<RL	<RL		<RL	<RL		
benzo[k]fluoranthene	10	<RL	<RL		<RL	<RL		
benzo[e]pyrene	10	<RL	<RL		<RL	<RL		
benzo[a]pyrene	10	<RL	<RL		<RL	<RL		
perylene	10	<RL	<RL		<RL	<RL		
indeno[1,2,3-cd]pyrene	10	<RL	<RL		<RL	<RL		
dibenz[a,h]anthracene	10	<RL	<RL		<RL	<RL		
benzo[ghi]perylene	10	<RL	<RL		<RL	<RL		
Surrogate:		% Recovery	% Recovery		% Recovery	% Recovery		
naphthalene-d8		125	123	1.3	93.6	111	17.0	
biphenyl-d10		132	132	0.6	103	120	15.2	
acenaphthene-d10		161	161	0.2	108	130	18.5	
dibenzothiophene-d8		132	139	4.8	102	109	6.6	
pyrene-d10		150	164	9.1	156	186	17.5	
benz[a]anthracene-d12		159	200	22.9	183	213	15.2	
benz[e]pyrene-d12		135	173	24.4	147	169	13.9	
perylene-d12		155	202	26.8	150	170	12.5	
benzo(g,h,i)perylene-d12		78	132	51.8	103	120	15.2	

TABLE 14

Toxic Substances Monitoring Program
Results of Laboratory Control Spike Analyses (LCS): 2001 and 2002
Polynuclear Aromatic Hydrocarbons (PAHs)

	TSM 2001	TSM 2002
	LCS BS 205	LCS BS 273
	Percent Recovery	Percent Recovery
naphthalene	112	101
2-Methylnaphthalene	108	99.6
1-Methylnaphthalene	99.0	100
biphenyl	102	97.5
2,6-Dimethylnaphthalene	94.6	102
acenaphthylene	105	106
acenaphthene	87.2	97.9
2,3,5-Trimethylnaphthalene	83.0	113
fluorene	91.2	108
dibenzothiophene	NA	NA
phenanthrene	110	248
anthracene	101	71.5
1-Methylphenanthrene	96.0	90.4
fluoranthene	111	101
pyrene	102	89.3
benz[a]anthracene	100	91.6
chrysene	102	111
benzo[b]fluoranthene	102	92.7
benzo[k]fluoranthene	57.7	85.0
benzo[e]pyrene	85.4	98.6
benzo[a]pyrene	82.2	23.0
perylene	98.5	117
indeno[1,2,3-cd]pyrene	100	127
dibenz[a,h]anthracene	87.5	110
benzo[ghi]perylene	92.3	88.8
Surrogate:	% Recovery	% Recovery
naphthalene-d8	127	84.3
biphenyl-d10	132	88.3
acenaphthene-d10	161	90.2
dibenzothiophene-d8	133	42.8
pyrene-d10	150	128
benz[a]anthracene-d12	161	106
benz[e]pyrene-d12	138	98.2
perylene-d12	143	36.3
benzo(g,h,i)perylene-d12	88	39.0

TABLE 15

Toxic Substances Monitoring Program
Results of Matrix Spike and Matrix Spike Duplicate Analyses:
2001 and 2002 Polynuclear Aromatic Hydrocarbons (PAHs)

Station Name	Lake Lopez 310.31.10		Kings River/Laurel Avenue 551.90.05	
Station Number	TSM 2001 377.001.F.01 MS Percent Recovery	TSM 2001 377.001.F.01 MSD Percent Recovery	TSM 2002 021.002.F.02 MS Percent Recovery	TSM 2002 021.002.F.02 MSD Percent Recovery
naphthalene	110	113	100	100
2-Methylnaphthalene	112	113	105	104
1-Methylnaphthalene	103	103	104	104
biphenyl	103	105	96.4	96.3
2,6-Dimethylnaphthalene	96.7	98.8	106	106
acenaphthylene	113	112	140	138
acenaphthene	84.8	85.0	102	94.9
2,3,5-Trimethylnaphthalene	86.9	84.9	112	112
fluorene	92.5	92.3	108	108
dibenzothiophene	NA	NA	NA	NA
phenanthrene	112	109	174	179
anthracene	122	118	217	220
1-Methylphenanthrene	93.5	96.0	88.5	86.5
fluoranthene	113	113	100	98.9
pyrene	104	103	88.9	88.1
benz[a]anthracene	98.4	98.8	87.7	88.4
chrysene	107	99.3	75.1	76.8
benzo[b]fluoranthene	120	109	79.7	84.4
benzo[k]fluoranthene	53.7	60.6	78.5	84.6
benzo[e]pyrene	86.6	86.5	101	100
benzo[a]pyrene	107	102	121	122
perylene	88	86.7	104	104
indeno[1,2,3-cd]pyrene	108	114	130	131
dibenz[a,h]anthracene	95.2	98.1	120	122
benzo[ghi]perylene	94.1	94.0	87.2	89.4
Surrogate:	% Recovery	% Recovery	% Recovery	% Recovery
naphthalene-d8	127	137	103	100
biphenyl-d10	135	142	110	107
acenaphthene-d10	166	177	118	116
dibenzothiophene-d8	136	147	77.8	74.8
pyrene-d10	167	167	170	170
benz[a]anthracene-d12	199	186	210	208
benz[e]pyrene-d12	166	155	162	168
perylene-d12	201	185	178	181
benzo(g,h,i)perylene-d12	127	113	112	141

TABLE 16

Toxic Substances Monitoring Program
Results of Certified Reference Material Analyses: 2001 and 2002
Polynuclear Aromatic Hydrocarbons (PAHs)

	Fresh Weight	SRM 2977 Mussel tissue	SRM 2977 Certified Range 95% CI		70-130% of the 95% Confidence Interval		TSM 2001 SRM 2977 BS 205	TSM 2002 SRM 2977 BS 273
	Reportin g Limit ppb (ng/g)	Certifie d Conc. ppb (ng/g)	ppb (ng/g)		ppb (ng/g)		ppb (ng/g)	ppb (ng/g)
naphthalene	10	19.0	14.0	24.0	9.8	31.2	14.7	10.1
2-Methylnaphthalene	10	16.0	11.0	21.0	7.7	27.3	17.7	11.1
1-Methylnaphthalene	10	18.0	13.0	23.0	9.1	29.9	9.25	7.87
biphenyl	10	6.80	6.2	7.4	4.3	9.6	5.13	<RL
2,6-Dimethylnaphthalene	10							
acenaphthylene	10							
acenaphthene	10	4.20	3.8	4.6	2.7	6.0	4.80	<RL
2,3,5-Trimethylnaphthalene	10							
fluorene	10	10.2	9.0	11.0	6.3	14.3	10.9	6.46
dibenzothiophene	10							
phenanthrene	10	35.1	31.0	39.0	21.7	50.7	37.2	40.8
anthracene	10	8.0	4.0	12.0	2.8	15.6	7.83	5.84
1-Methylphenanthrene	10	44.0	42.0	46.0	29.4	59.8	35.3	44.3
fluoranthene	10	38.7	38.0	40.0	26.6	52.0	27.7	28.0
pyrene	10	78.9	75.4	82.4	52.8	107.1	52.3	58.9
benz[a]anthracene	10	20.3	19.6	21.1	13.7	27.5	13.3	14.8
chrysene	10	49.0	47.0	51.0	32.9	66.3	58.4	35.0
benzo[b]fluoranthene	10	11.0	10.7	11.0	7.5	14.3	14.3	11.4
benzo[k]fluoranthene	10	4.00	3.0	5.0	2.1	6.5	3.75	<RL
benzo[e]pyrene	10	13.1	12.0	14.0	8.4	18.2	13.1	12.6
benzo[a]pyrene	10	8.35	7.0	9.0	4.9	11.7	7.47	7.24
perylene	10	3.50	2.7	4.3	1.9	5.5	<RL	<RL
indeno[1,2,3-cd]pyrene	10	4.84	4.0	6.0	2.8	7.8	11.7	7.45
dibenz[a,h]anthracene	10	1.41	1.0	2.0	0.7	2.6	10.2	<RL
benzo[ghi]perylene	10	9.53	9.0	10.0	6.3	13.0	13.2	7.20
Surrogate:							% Recovery	% Recovery
naphthalene-d8							99	93.1
biphenyl-d10							109	103
acenaphthene-d10							144	116
dibenzothiophene-d8							129	93.0
pyrene-d10							212	160
benz[a]anthracene-d12							317	219
benz[e]pyrene-d12							153	155
perylene-d12							156	172
benzo(g,h,i)perylene-d12							66	94.2