TABLE 2-1
List of Species Potentially Occurring
Bolsa Chica Lowlands

Common Name	Scientific Name
Amphibians	
Western spadefoot	*Scaphiopus hammondii*
Western toad	*Bufo boreas*
Pacific treefrog	*Hyla regilla*
Red-legged frog	*Rana aurora*
Reptiles	
Western banded gecko	*Coleonyx variegatus*
Side-blotched lizard	*Uta stansburiana*
San Diego horned lizard	*Phrynosoma coronatum blainvillei*
Racer	*Coluber constrictor*
Gopher snake	*Pituophis melanoleucus*
Common kingsnake	*Lampropeltis getulus*
Long-nosed snake	*Rhinocheilus lecontei*
Common garter snake	*Thamnophis sirtalis*
Western black-headed snake	*Tantilla planiceps*
Lyre snake	*Trimorphodon biscutatus*
Night snake	*Hypsiglena torquata*
Western rattlesnake	*Crotalus viridis*
Birds	
Red-throated loon	*Gavia stellata*
Common loon	*Gavia immer*
Pied-billed grebe	*Podilymbus podiceps*
Horned grebe	*Podiceps auritus*
Eared grebe	*Podiceps nigricollis*
Western grebe	*Aechmophorus occidentalis*
American white pelican	*Pelecanus erythrorhynchos*
Brown pelican	*Pelecanus occidentalis*
Brandt's cormorant	*Phalacrocorax penicillatus*
Pelagic cormorant	*Phalacrocorax pelagicus*
American bittern	*Botaurus lentiginosus*
Great blue heron	*Ardea herodias*

TABLE 2-1
List of Species Potentially Occurring
Bolsa Chica Lowlands

Common Name	Scientific Name
Great egret	*Ardea herodias*
Snowy egret	*Egretta thula*
Cattle egret	*Bubulcus ibis*
Green heron	*Butorides virescens*
Black-crowned night heron	*Nycticorax nycticorax*
Greater white-fronted goose	*Anser albifrons*
Snow goose	*Chen caerulescens*
Canada goose	*Branta canadensis*
Green-winged teal	*Anas crecca*
Mallard	*Anas platyrhynchos*
Wood duck	*Aix sponsa*
Northern pintail	*Anas acuta*
Cinnamon teal	*Anas cyanoptera*
Northern shoveler	*Anas clypeata*
Eurasian wigeon	*Anas penelope*
American wigeon	*Anas americana*
Canvasback	*Aythya valisineria*
Redhead	*Aythya americana*
Ring-necked duck	*Aythya collaris*
Lesser scaup	*Aythya affinis*
Oldsquaw	*Clangula hyemalis*
Black scoter	*Melanitta nigra*
Surf scoter	*Melanitta perspicillata*
White-winged scoter	*Melanitta fusca*
Common goldeneye	*Bucephala clangula*
Hooded merganser	*Lophodytes cucullatus*
Common merganser	*Mergus merganser*
Red-breasted merganser	*Mergus serrator*
Ruddy duck	*Oxyura jamaicensis*
Turkey vulture	*Cathartes aura*
White-tailed kite	*Elanus leucurus*

TABLE 2-1
List of Species Potentially Occurring
Bolsa Chica Lowlands

Common Name	Scientific Name
Northern harrier	*Circus cyaneus*
Sharp-shinned hawk	*Accipiter striatus*
Cooper's hawk	*Accipiter cooperii*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Ferruginous hawk	*Buteo regalis*
Golden eagle	*Aquila chrysaetos*
American kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Peregrine falcon	*Falco peregrinus*
Prairie falcon	*Falco mexicanus*
Clapper rail	*Rallus longirostris*
Virginia rail	*Rallus limicola*
Sora	*Porzana carolina*
Common moorhen	*Gallinula chloropus*
American coot	*Fulica americana*
Black-bellied plover	*Pluvialis squatarola*
Snowy plover	*Charadrius alexandrinus*
Killdeer	*Charadrius vociferus*
Black-necked stilt	*Himantopus mexicanus*
American avocet	*Recurvirostra americana*
Greater yellowlegs	*Tringa melanoleuca*
Lesser yellowlegs	*Tringa flavipes*
Whimbrel	*Numenius phaeopus*
Long-billed curlew	*Numenius americanus*
Ruddy turnstone	*Arenaria interpres*
Black turnstone	*Arenaria melanocephala*
Surfbird	*Aphriza virgata*
Red knot	*Calidris canutus*
Western sandpiper	*Calidris mauri*
Least sandpiper	*Calidris minutilla*

TABLE 2-1
List of Species Potentially Occurring
Bolsa Chica Lowlands

Common Name	Scientific Name
Dunlin	*Calidris alpina*
Short-billed dowitcher	*Limnodromus griseus*
Long-billed dowitcher	*Limnodromus scolopaceus*
Common snipe	*Gallinago gallinago*
Wilson's phalarope	*Phalaropus tricolor*
Heermann's gull	*Larus heermanni*
Mew gull	*Larus canus*
Ring-billed gull	*Larus delawarensis*
California gull	*Larus californicus*
Herring gull	*Larus argentatus*
Thayer's gull	*Larus thayeri*
Glaucous-winged gull	*Larus glaucescens*
Caspian tern	*Sterna caspia*
Royal tern	*Sterna maxima*
Elegant tern	*Sterna elegans*
Forster's tern	*Sterna forsteri*
Least tern	*Sterna antillarum browni*
Black skimmer	*Rynchops niger*
Rock dove	*Columba livia*
Mourning dove	*Zenaida macroura*
Barn owl	*Tyto alba*
Western screech owl	*Otus kennicottii*
Great horned owl	*Bubo virginianus*
Short-eared owl	*Asio flammeus*
White-throated swift	*Aeronautes saxatalis*
Belted kingfisher	*Ceryle alcyon*
Northern flicker	*Colaptes auratus*
Black phoebe	*Sayornis nigricans*
Say's phoebe	*Sayornis saya*
Western kingbird	*Tyrannus verticalis*
Horned lark	*Eremophila alpestris*

TABLE 2-1
List of Species Potentially Occurring
Bolsa Chica Lowlands

Common Name	Scientific Name
Tree swallow	*Tachycineta bicolor*
Violet-green swallow	*Tachycineta thalassina*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Cliff swallow	*Hirundo pyrrhonota*
Barn swallow	*Hirundo rustica*
American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Marsh wren	*Cistothorus palustris*
Western bluebird	*Sialia mexicana*
Mountain bluebird	*Sialia currucoides*
American robin	*Turdus migratorius*
Northern mockingbird	*Mimus polyglottos*
American pipit	*Anthus rubescens*
Loggerhead shrike	*Lanius ludovicianus*
European starling	*Sturnus vulgaris*
Yellow-rumped warbler	*Dendroica coronata*
Common yellowthroat	*Geothlypis trichas*
Rufous-crowned sparrow	*Aimophila ruficeps*
Vesper sparrow	*Pooecetes gramineus*
Savannah sparrow	*Passerculus sandwichensis*
Song sparrow	*Melospiza melodia*
Red-winged blackbird	*Agelaius phoeniceus*
Tricolored blackbird	*Agelaius tricolor*
Western meadowlark	*Sturnella neglecta*
Brown-headed cowbird	*Molothrus ater*
House finch	*Carpodacus mexicanus*
Mammals	
Yuma myotis	*Myotis yumanensis*
Western pipistrelle	*Pipistrellus hesperus*
Big brown bat	*Eptesicus fuscus*
Western red bat	*Lasiurus blossevillii*

TABLE 2-1
List of Species Potentially Occurring
Bolsa Chica Lowlands

Common Name	Scientific Name
Pallid bat	*Antrozous pallidus*
Brazilian free-tailed bat	*Tadarida brasiliensis*
Western mastiff bat	*Eumops perotis*
Desert cottontail	*Sylvilagus audubonii*
Black-tailed hare	*Lepus californicus*
California ground squirrel	*Spermophilus beecheyi*
Botta's pocket gopher	*Thomomys bottae*
California pocket mouse	*Chaetodipus californicus*
Agile kangaroo rat	*Dipodomys agilis*
Western harvest mouse	*Reithrodontomys megalotis*
Deer mouse	*Peromyscus maniculatus*
California vole	*Microtus californicus*
House mouse	*Mus musculus*
Coyote	*Canis latrans*
Gray fox	*Urocyon cinereoargenteus*
Long-tailed weasel	*Mustela frenata*
Western spotted skunk	*Spilogale gracilis*
Striped skunk	*Mephitis mephitis*

Special-status species are listed in bold type.

TABLE 2-2
List of Special-Status Species Potentially Occurring in the Bolsa Chica Lowlands [a]
Bolsa Chica Lowlands

Species Name	Federal Status	State Status	Habitats On-Site
Western spadefoot *Scaphiopus hammondii*		CFP/CSC	Upland
Red-legged frog *Rana aurora*	FT	CFP/CSC	Upland, Open water (non-tidal)
San Diego horned lizard *Phrynosoma coronatum blainvillei*	FSC	CSC	Upland
Common loon *Gavia immer*		CSC	Open water
American white pelican *Pelecanus erythrorhynchos*		CSC	Open water
Brown pelican *Pelecanus occidentalis*	FE	CE/CFP	Open water
White-tailed kite *Elanus leucurus*		CFP	Pickleweed, Upland, Brackish marsh
Northern harrier *Circus cyaneus*		CSC	Pickleweed, Upland, Brackish marsh
Sharp-shinned hawk *Accipiter striatus*		CSC	Pickleweed, Upland, Brackish marsh
Cooper's hawk *Accipiter cooperii*		CSC	Upland, Brackish marsh
Ferruginous hawk *Buteo regalis*	FSC	CSC	Upland
Golden eagle *Aquila chrysaetos*		CFP/CSC	Upland
Osprey *Pandion haliaetus*		CSC	Open water, Brackish marsh, mudflat
Merlin *Falco columbarius*		CSC	Mudflat, Upland, Brackish marsh
Peregrine falcon *Falco peregrinus*		CE/CFP	Mudflat, Upland
Prairie falcon *Falco mexicanus*		CSC	Upland
Light-footed clapper rail *Rallus longirostris levipes*	FE	CE/CFP	Brackish marsh
Snowy plover *Charadrius alexandrinus nivosus*	FT	CSC	Mudflat, Open water
Long-billed curlew *Numenius americanus*		CSC	Mudflat, Open water
California gull *Larus californicus*		CSC	Mudflat, Open water

TABLE 2-2
List of Special-Status Species Potentially Occurring in the Bolsa Chica Lowlands [a]
Bolsa Chica Lowlands

Species Name	Federal Status	State Status	Habitats On-Site
Elegant tern *Sterna elegans*		CSC	Mudflat, Open water
California least tern *Sterna antillarum browni*	FE	CE/CFP	Mudflat, Open water
Black skimmer *Rynchops niger*		CSC	Mudflat, Open water
Short-eared owl *Asio flammeus*		CSC	Upland
Loggerhead shrike *Lanius ludovicianus*		CSC	Upland
Common yellowthroat *Geothlypis trichas*		CSC	Brackish marsh
Rufous-crowned sparrow *Aimophila ruficeps canescens*	FSC	CSC	Upland
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	FSC	CE/CSC	Pickleweed, Upland
Tricolored blackbird *Agelaius tricolor*	FSC	CSC	Brackish marsh
Pallid bat *Antrozous pallidus*		CSC	Upland, open water
Western mastiff bat *Eumops perotis*	FSC	CSC	Upland, open water

[a]Source: RareFind, 1999; CDFG, 1998, 2000

Federal Status

FE – Federal Endangered
FT – Federal Threatened
FSC – Federal Species of Concern

State Status

CE – State Endangered
CT – State Threatened
CFP – State Fully Protected
CSC – State Species of Special Concern

TABLE 2-3
Site-Wide Chemicals of Potential Ecological Concern
Bolsa Chica Lowlands

Metals		
Arsenic	Barium	Beryllium
Cadmium	Chromium	Cobalt
Copper	Lead	Mercury
Molybdenum	Nickel	Selenium
Thalium	Vanadium	Zinc
Total Extractable Petroleum Hydrocarbons		
Polynuclear Aromatic Hydrocarbons		
Acenaphthene	Acenapthylene	Anthracene
Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)flouranthene
Benzo(e)pyrene	Benzo(g,h,I)perylene	Benzo(k)flouranthene
Biphenyl	Chrysene	Dibenzo(a,h)anthracene
Dibenzothiophene	Fluoranthene	Fluorene
Indeno(1,2,3-cd)pyrene	Napthlalene	Perylene
Phenanthrene	Pyrene	
Volatile Organic Compounds		
1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloroethene
1,3-Dichlorobenzene	1,4-Dichlorobenzene	2-Butanone
2-Hexanone	4-Methyl-2-pentanone	Acetone
Benzene	Carbon disulfide	Chlorobenzene
Ethylbenzene	Methylene chloride	N-propylbenzene
Tetrachloroethene	Toluene	Trichloroethene
Xylene(s)		
Polychlorinated Biphenyls		
Aroclor 1254	PCB-8	PCB-18
PCB-28	PCB-44	PCB-52
PCB-66	PCB-101	PCB-105
PCB-118	PCB-128	PCB-138
PCB-153	PCB-170	PCB-180
PCB-187	PCB-195	PCB-206
PCB-209		
Organochlorine Pesticides		
4,4'-DDD	4,4'-DDE	4,4'-DDT
Aldrin	alpha-BHC	beta-BHC
delta-BHC	Dieldrin	Endosulfan sulfate
gamma-BHC	Heptachlor	
Organochlorine Herbicides		
2,4,5-TP	2,4-DB	Dalapon
Organophosphorous Insecticides		
Diazinon	Disyston	

Note: These COPECs were identified initially by the Bolsa Chica Technical Committee. Later, after some ERA samples had been analyzed, other PCB congeners (PCB-114, PCB-123, and PCB-126) were added to the analytical suite.

TABLE 2-4

Preliminary Chemicals of Potential Ecological Concern in Soil, Sediment, and Biota[a]
Bolsa Chica Lowlands

			Biota			
Soil	**Sediment**	**Surface Water**	**Fish**	**Benthic Infauna**	**Terrestrial Plants[b]**	**Small Mammals**
Inorganics						
Antimony	Antimony	Arsenic	Arsenic	Arsenic	Arsenic	Cadmium
Arsenic	Arsenic	Barium	Cadmium	Cadmium	Cadmium	Chromium
Barium	Barium	Chloride	Chromium	Chromium	Chromium	Copper
Beryllium	Beryllium	Chromium	Copper	Copper	Copper	Lead
Cadmium	Cadmium	Cobalt	Lead	Lead	Lead	Mercury
Chromium	Chromium	Copper	Mercury	Mercury	Mercury	Nickel
Cobalt	Cobalt	Lead	Nickel	Nickel	Nickel	Selenium
Copper	Copper	Mercury	Selenium	Selenium	Selenium	Zinc
Lead	Lead	Molybdenum	Silver	Silver	Silver	
Mercury	Mercury	Nickel	Zinc	Zinc	Zinc	
Molybdenum	Molybdenum	Phosphorus				
Nickel	Nickel	Selenium				
Selenium	Selenium	Sulfate				
Silver	Vanadium	Thallium				
Thallium	Zinc	Vanadium				
Vanadium		Zinc				
Zinc						
Organics						
1,2-Dichlorobenzene	1,2-Dichloroethane	1,4-Dichlorobenzene	2-Butanone	Acenaphthene		1,2-Dichloroethene (cis-)
1,2-Dichloroethane	1,4-Dichlorobenzene	2,4,5-TP (Silvex)	2-Hexanone	Anthracene		2-Butanone
1,3-Dichlorobenzene	2-Butanone	2,4-D	4,4'-DDD	Benzo(a)anthracene		2-Hexanone
1,4-Dichlorobenzene	Acetone	2,4-DB	4,4'-DDE	Benzo(a)pyrene		4,4'-DDE
2,4,5-TP (Silvex)	Benzo(a)pyrene	2-Butanone	4,4'-DDT	Benzo(b)fluoranthene		4-Methyl-2-pentanone
2,4-DB	Benzo(b)fluoranthene	Acenaphthylene	Acenaphthene	Benzo(e)pyrene		Acenaphthene
2-Butanone	Benzo(k)fluoranthene	Acetone	Acenaphthylene	Benzo(g,h,i)perylene		Acenaphthylene
4,4'-DDD	Carbon disulfide	Benzo(b)fluoranthene	Acetone	Benzo(k)fluoranthene		Acetone
4,4'-DDE	Fluoranthene	Carbon disulfide	Aldrin	Chrysene		Anthracene
4,4'-DDT	Indeno(1,2,3-c,d)pyrene	Diazinon	Anthracene	Dibenzothiophene		Benzene
Acenaphthylene	Phenanthrene	Disyston (Disulfoton)	Benzene	Fluoranthene		Benzo(a)anthracene
Acetone	TEPH	Methyl isobutyl ketone	Benzo(a)anthracene	Fluorene		Benzo(a)pyrene
Anthracene	Toluene	Phenanthrene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene		Benzo(b)fluoranthene
Benzene	Xylenes (total)	TEPH	Benzo(b)fluoranthene	Naphthalene		Benzo(e)pyrene
Benzo(a)pyrene		Tetrachloroethene	Benzo(e)pyrene	Perylene		Benzo(g,h,i)perylene
Benzo(b)fluoranthene		Toluene	Benzo(g,h,i)perylene	Phenanthrene		Benzo(k)fluoranthene
Benzo(g,h,i)perylene			Benzo(k)fluoranthene	Pyrene		BHC-alpha
Benzo(k)fluoranthene			BHC-alpha			BHC-beta
Carbon disulfide			BHC-beta			BHC-delta
Chlorobenzene			BHC-delta			BHC-gamma
Chloroform			BHC-gamma			Biphenyl
Chrysene			Biphenyl			Chloroform
Dalapon			Chloroform			Chrysene
Dibenzo(a,h)anthracene			Chrysene			Dibenzo(a,h)anthracene
Ethylbenzene			Dibenzo(a,h)anthracene			Dibenzothiophene
Fluoranthene			Dibenzothiophene			Dieldrin
Fluorene			Dieldrin			Ethylbenzene
Indeno(1,2,3-c,d)pyrene			Endosulfan sulfate			Fluoranthene
Methylene chloride			Fluoranthene			Fluorene
Naphthalene			Fluorene			Indeno(1,2,3-c,d)pyrene
PCB 1254			Heptachlor			Methylene chloride
Phenanthrene			Indeno(1,2,3-c,d)pyrene			Naphthalene
Pyrene			Methylene chloride			n-Propylbenzene
Styrene			Naphthalene			PCB 101
TEPH			PCB 8			PCB 105
Tetrachloroethene			PCB 18			PCB 118
Toluene			PCB 28			PCB 128
Trichloroethene			PCB 44			PCB 138
Xylenes (total)			PCB 52			PCB 153
			PCB 66			PCB 170
			PCB 101			PCB 180
			PCB 105			PCB 187
			PCB 118			PCB 195
			PCB 128			PCB 206
			PCB 138			PCB 209
			PCB 153			PCB 28
			PCB 170			PCB 44
			PCB 180			PCB 52
			PCB 187			PCB 66

TABLE 2-4

Preliminary Chemicals of Potential Ecological Concern in Soil, Sediment, and Biota[a]
Bolsa Chica Lowlands

			Biota			
Soil	**Sediment**	**Surface Water**	**Fish**	**Benthic Infauna**	**Terrestrial Plants[b]**	**Small Mammals**
			PCB 195			PCB 8
			PCB 206			Perylene
			PCB 209			Phenanthrene
			Perylene			Pyrene
			Phenanthrene			Toluene
			Pyrene			Xylene (m-,o-,p-)
			Toluene			

Notes:
[a]Media-specific chemicals listed are those detected in samples collected by Tetra Tech (1996) along with those identified by the Technical Committee during the Scoping Assessment.
[b]Terrestrial plant tissues were not submitted for analyses of organic chemicals.

COPEC - Chemical of potential ecological concern
PCB - Polychlorinated biphenyl
TEPH - Total extractable petroleum hydrocarbons

TABLE 2-5
Detected Concentrations in Soils - 1996
Bolsa Chica Lowlands

Chemical	Tank Farms and Processing Facilities	Former Sumps and Settling Ponds	Former and Existing Wet and Dry Gas Lines	Former Oil Pipelines	Pig Clean-Out Areas	Oil Wells	Utility Areas	Equipment Storage Area	Suspected Sandblast Area	Service Roads	Former Duck Blind Area	Lowland Pocket Area	Uncertain Areas
Inorganics (mg/kg)													
Antimony	--	0.95	0.78	0.72	--	1.7	--	--	0.67	0.86	--	--	1.9
Arsenic	1.7 - 8.3	1.2 - 139	2.6 - 86.5	1 - 441	2.9 - 246	2 - 229	3 - 6.5	1.8 - 27.4	4 - 7.4	2.4 - 14.7	--	1.7 - 11.5	2 - 42.1
Barium	31.6 - 861	16.1 - 11,400	31.2 - 1,220	13.1 - 5,750	41.8 - 491	23.9 - 436	--	23.5 - 539	45.6 - 499	38.5 - 5,820	--	38.9 - 405	21.7 - 1,090
Beryllium	0.28 - 0.4	0.12 - 4.5	0.15 - 0.87	0.1 - 1.7	0.17 - 1.1	0.14 - 0.79	--	0.13 - 1.9	0.34 - 2	0.23 - 0.66	--	0.25 - 1.4	0.19 - 3.2
Cadmium	0.096 - 8.7	0.082 - 2.9	0.85	0.089 - 2	0.11 - 1.9	0.73 - 0.11	--	0.14 - 0.83	0.077 - 0.68	0.075 - 0.42	--	0.067 - 0.091	0.083 - 0.49
Chromium	10.8 - 76.3	7.3 - 244	7.9 - 43.3	5.6 - 90.4	8.5 - 234	5.4 - 29.7	13.6 - 19.4	6.9 - 39	12.4 - 30	12.6 - 121	--	11.3 - 48.9	5.7 - 35.8
Cobalt	1.5 - 12	3.1 - 40.2	4 - 29.3	2.1 - 21.8	3.7 - 42.1	3.1 - 13.9	--	2.2 - 16.6	7.7 - 14.8	5 - 9.9	--	6.4 - 14.5	2.7 - 16.5
Copper	5.98 - 234	2.8 - 77.1	4.7 - 44.2	2.3 - 183	12.2 - 429	4.2 - 25.3	10.8 - 19.5	3.1 - 29	11.9 - 23.7	7.3 - 50.4	--	7 - 40.8	2.4 - 35.5
Lead	2.1 - 41.7	1.4 - 122	2.2 - 142	1.4 - 140	7.6 - 80.9	2 - 45.5	--	2.5 - 25.7	5.4 - 34.7	3.5 - 85.3	17.8	3.1 - 101	1.2 - 169
Mercury	0.094 - 0.86	0.0221.8	0.33 - 0.65	0.029 - 0.93	0.024 - 9.8	0.039 - 2	--	0.16 - 0.25	0.029 - 0.089	0.025 - 0.39	--	0.065 - 0.53	0.022 - 0.38
Molybdenum	0.42 - 3.8	0.13 - 18.5	0.14 - 7.4	0.22 - 9.4	0.46 - 5.6	0.24 - 2.1	--	0.21 - 6.6	0.46 - 6	0.43 - 4.1	--	0.25 - 8.3	0.21 - 3.9
Nickel	8.6 - 24.9	3.9 - 75.7	9.8 - 79.7	3.3 - 89.8	7.2 - 142	3.6 - 19.5	--	4 - 25.7	11.3 - 33.1	8.8 - 147	--	8.5 - 37	3.2 - 48.2
Selenium	0.37 - 1.3	0.37 - 1.8	0.46 - 1.5	0.39 - 2.9	0.4 - 4.9	0.33 - 0.82	--	0.49 - 0.87	0.34 - 1.7	0.53 - 1.3	--	--	0.32 -
Silver	0.69 - 2.2	0.12 - 0.17	--	0.12	--	--	--	0.12	0.12	0.32	--	--	--
Thallium	0.41	0.42 - 19	--	0.68 - 1.9	--	--	--	--	--	0.34	--	--	0.22 - 0.28
Vanadium	4.4 - 38.7	12.4 - 125	18.4 - 48.9	10.9 - 87.2	17.9 - 872	13.7 - 57.3	--	11 - 73.1	27.7 - 54.8	22.3 - 57.5	--	28.3 - 77.1	11.3 - 62.2
Zinc	30.3 - 1,620	17.4 - 233	22.7 - 175	12.5 - 3,790	50.1 - 362	16.1 - 74	--	15.5 - 123	40.3 - 85.4	40.9 - 216	--	30.8 - 126	15.9 - 147
Organics (ug/kg)													
1,2-Dichlorobenzene	--	--	1	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	--	--	2.6	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	2	1.5	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	--	--	1.3	--	--	--	--	--	--	--	--	--	--
2,4,5-TP (Silvex)	--	--	--	--	--	--	--	--	--	--	--	--	0.93 - 46
2,4-DB	--	--	--	--	--	--	--	--	--	--	--	--	20 - 49
2-Butanone	--	1.1 - 210	8.4	--	--	1.7	--	--	--	--	--	--	19
4,4'-DDD	--	--	--	16	--	--	--	--	--	--	--	--	44
4,4'-DDE	--	--	--	9	--	--	11	--	--	--	--	--	26
4,4'-DDT	--	--	--	30	--	--	21	--	50	--	--	--	--
Acenaphthylene	--	76	--	4800	--	7.7	--	--	--	--	--	--	--
Acetone	5.7 - 48	2.8 - 1,000	6.9 - 310	6.1 - 45	66	9 - 40	--	--	7.2 - 250	8.9 - 21	--	--	63
Anthracene	0.88 - 3.7	1.5	--	--	--	--	--	2.7	--	13	--	--	--
Benzene	0.84	--	0.62 - 0.65	--	1.2	--	--	--	--	--	--	--	--
Benzo(a)pyrene	11 - 38	3.6 - 30	--	46	13	13	--	7.4	--	16	--	--	--
Benzo(b)fluoranthene	7.3 - 39	20 - 270	77 - 1,500	4.5 - 1,100	11 - 270	5.6 - 680	--	12	--	6.2 - 23	--	5.1	6.5
Benzo(g,h,i)perylene	62	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	0.94 - 16	1.0 - 7.8	--	3.4 - 110	--	7.8	--	5.4	--	--	--	--	4.6
Carbon disulfide	0.78	8.2 - 17	--	1.1 - 1.5	--	1.7 - 4.4	--	--	--	2.4 - 4.1	--	--	--
Chlorobenzene	--	0.46 - 11	--	--	--		--	--	--	--	--	--	--

TABLE 2-5
Detected Concentrations in Soils - 1996
Bolsa Chica Lowlands

Chemical	Tank Farms and Processing Facilities	Former Sumps and Settling Ponds	Former and Existing Wet and Dry Gas Lines	Former Oil Pipelines	Pig Clean-Out Areas	Oil Wells	Utility Areas	Equipment Storage Area	Suspected Sandblast Area	Service Roads	Former Duck Blind Area	Lowland Pocket Area	Uncertain Areas
Chloroform	--	--	--	--	--	0.67	--	--	--	--	--	--	--
Chrysene	17 - 810	88	1,900 - 5,600	--	--	7.1 - 260	--	41	--	4.4 - 1,600	--	6.2 - 19	--
Dalapon	--	--	--	--	--	--	--	--	--	--	--	--	250
Dibenzo(a,h)anthracene	15 - 28	14 - 58	--	17 - 270	--	--	--	20	--	--	--	--	--
Ethylbenzene	2	0.76 - 110	35	--	3.4	--	--	--	--	4.6		--	1.2 - 370
Fluoranthene	6.3 - 47	20 - 61	--	60 - 430	23	--	--	31	--	--	--	12	14
Fluorene	--	--	--	36	--	--	--	--	--	--	--	--	610
Indeno(1,2,3-c,d)pyrene	6.4 - 33	30	--	--	--	--	--	5.6	--	--	--	--	--
Methylene chloride	2.1 - 46	1.2 - 2.5	0.79 - 2.2	1.2 - 1.3	1.4	1 - 32	--	--	1.9	3 - 10	--	5.2	2.7
Naphthalene	11	84	--	--	--	--	--	--	--	--	--	--	1800
PCB 1254	13,000	--	--	--	520	--	--	--	--	--	--	--	--
Phenanthrene	7 - 37	1.8 - 56	--	6.1 - 120	--	31 - 49	--	25	--	12 - 4,800	--	5.5	830
Pyrene	--	--	--	1,500	--	--	--	--	--	--	--	--	--
TEPH	23,000 - 25,000,000	11,000 - 17,000,000	20,000 - 100,000,000	85,000 - 88,000,000	39,000 - 23,000,000	10,000 - 19,000,000	--	14,000 - 1,800,000	17,000 - 23,000	120,000 - 7,900,000	--	30,000 - 1,400,000	18,000 - 89,000,000
Toluene	0.44 - 2.1	0.66 - 3.1	0.59 - 3.4	0.74 - 1.4	--	0.73 - 4.7	--	--	--	--	--	--	4.5
Trichloroethene	--	0.92	--	--	1.3	--	--	--	--	--	--	--	--
Xylenes (total)	1.6	1.3 - 9	1.1 - 2	--	3.6	--	--	--	--	3.8	--	--	250

Notes:
Source: Tetra Tech, 1996
A single value indicates that there was only one detected concentration.
-- either not analyzed for or not detected
PCB - Polychlorinated biphenyl
TEPH - Total extractable petroleum hydrocarbons

TABLE 2-6

Detected Concentrations in Sediment - 1996

Bolsa Chica Lowlands

Chemical	Waste Facility	Former Gas Plant Sumps	Former Gas Plant Ponds	Seacliff Runoff Culvert	Lake Signal	Freeman Creek	Ponded Area near SBTF	Ecological Preserve	Old Wintersburg Channel	Existing Wintersburg Channel	SLTF Sump	Old Channel	Ditch near Whipstock	Pond near Seacliff
Inorganics (mg/kg)														
Antimony	--	1.5	--	--	--	--	--	--	1.4	--	--	0.77	--	--
Arsenic	25.9	3.7 - 47.3	12 - 25.6	0.82	4.3 - 19.4	3.5 - 13.7	8	4.2	3.5 - 11.1	1.3 - 7.6	6.1 - 6.2	7.2	15.2	40.5
Barium	2270	89 - 1230	72.1 - 284	10.8	386 - 596	93.5 - 4630	1040	365	57 - 86.6	37.1 - 152	536 - 653	65.5	518	313
Beryllium	0.74	0.53 - 1.8	0.63 - 0.68	0.11	0.29 - 1.4	0.31 - 1.9	1.9	0.24	0.66 - 1.9	0.25 - 1.1	0.35 - 0.44	0.69	0.74	1.1
Cadmium	0.13	0.18	0.3	--	0.57 - 2.1	0.16 - 0.76	0.15	--	0.61 - 0.84	0.21 - 0.37	0.081 - 0.16	0.11	0.18	0.2
Chromium	56.1	24.6 - 123	51.5 - 251	3	14 - 34.8	7.4 - 50.3	10.9	11.9	10 - 17	11.3 - 35.5	17.6 - 20.1	18.9	24.9	40.5
Cobalt	13.2	10.9 - 11	6.9 - 9.5	1.4	6.1 - 24.8	7.2 - 36	6.4	5	9.1 - 41.7	5.9 - 20.1	6.3 - 8.4	9.6	9.9	17.8
Copper	31.1	16.7 - 54.5	41.3 - 59.1	3	9.6 - 88.1	18.4 - 43	16.9	8.8	15.6 - 24.8	9.7 - 34.8	20.7 - 163	15.4	15.8	43.5
Lead	21.1	14.5 - 189	31.9 - 283	1.2	9.9 - 124	6.9 - 23.5	47.2	9.1	43.9 - 68.3	11.5 - 64.5	14 - 23.4	80	9.1	23.1
Mercury	--	0.19 - 0.45	0.15 - 1.3	--	0.061 - 0.89	0.033 - 0.12	--	--	27.7	0.037	0.084 - 0.15	--	--	0.099
Molybdenum	7.7	0.32 - 1.9	1.2 - 8.8	0.37	2.0 - 11.3	1.7 - 10.1	2	1.5	1.9 - 10.8	0.88 - 3.6	1.4 - 3.2	3.2	3.8	4.1
Nickel	48.2	14.2 - 35.6	14.1 - 16.6	--	12.7 - 48.2	11.7 - 39.3	36.5	10.5	22.9 - 41.9	8.5 - 25	19.7 - 39.1	17.1	16.5	32.4
Selenium	0.95	1.0	1.3 - 2.2	--	1.9 - 2.7	0.55 - 3.9	--	--	1.4	0.79	0.76 - 1.2	0.81	1.1	1.9
Vanadium	87.8	42.3 - 65.4	54 - 112	6.1	26.6 - 56.1	15.9 - 50.6	20.9	23	23.3 - 34.7	21.3 - 70.8	29.4 - 40.8	32.1	36	67.1
Zinc	123	67.8 - 267	120 - 158	9.7	45.9 - 304	45.2 - 148	51.2	38.4	87 - 155	67.4 - 109	117 - 136	55	69.8	165
Organics (ug/kg)														
1,2-Dichloroethane	--	--	--	--	--	--	--	--	--	--	26	--	--	--
1,4-Dichlorobenzene	--	--	--	--	--	--	--	--	2.8	--	--	--	--	--
2-Butanone	12	34	--	--	--	--	--	--	8.2	--	8.4	--	--	--
Acetone	39	140	--	--	--	--	--	26	110	50	75	--	--	--
Benzo(a)pyrene	--	--	--	--	--	--	--	41	--	17 - 28	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--	20 - 22	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	--	--	14 - 15	--	--	--	--
Carbon disulfide	1.0	--	--	--	--	--	--	--	5.2	--	11	--	--	--
Fluoranthene	--	150	96	--	--	--	--	94	--	30 - 53	--	--	--	--
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	--	--	16	--	--	--	--
Phenanthrene	--	--	--	--	47 - 330	--	--	79	--	16 - 20	--	--	--	--
TEPH	1,700,000	36,000 - 280,000	32,000 - 770,000	--	--	28,000 - 850,000	28,000	190,000	--	46,000	390,000 - 4,100,000	--	190,000	82,000
Toluene	0.80	--	--	--	--	--	--	--	8.8	1.4	--	--	--	--
Xylenes (total)	2.1	0.76	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

Source: Tetra Tech, 1996

A single value indicates that there was a single detect or a single sample.

-- either not analyzed for or not detected

TEPH - Total extractable petroleum hydrocarbons

TABLE 2-7

Range of Detected Concentrations in Surface Water - 1996

Bolsa Chica Lowlands

Chemical	Waste Facility	Former Gas Plant Sumps	Former Gas Plant Ponds	Seacliff Runoff Culvert	Lake Signal	Freeman Creek	Ponded Area near SBTF	Ecological Preserve	Old Wintersburg Channel	Existing Wintersburg Channel	SLTF Sump	Ditch near Whipstock	Pond near Seacliff
Inorganics (mg/L)													
Arsenic	--	0.056 - 4.8	0.15 - 0.15	0.01	0.015 - 0.018	0.062 - 0.15	0.14	--	0.061	0.011	0.0051 - 0.0054	3	0.58
Barium	0.16	0.14 - 2.0	0.28 - 0.32	0.065	0.11 - 0.13	0.18 - 0.35	0.26	0.048	0.22 - 0.36	0.027 - 0.064	0.3 - 0.31	0.099	0.42
Chloride	126,000	112,000	13,600	102	16,400	37,400	--	23,500	63,000	4,450	568 - 572	--	--
Chromium	--	--	0.023 - 0.052	0.0017	--	--	--	--	0.014	0.0015	0.002 - 0.0027	--	--
Cobalt	--	--	0.004	--	0.0049	--	--	--	0.015	--	0.0015	--	--
Copper	0.083	0.0079 - 0.12	0.013 - 0.03	0.0065	0.011 - 0.017	0.019 - 0.047	0.077	0.014	0.022 - 0.066	0.0046 - 0.0047	0.0043 - 0.0044	0.018	0.058
Lead	--	--	0.0035 - 0.01	0.0011	--	--	--	--	--	0.0015	0.0015 - 0.0035	--	--
Mercury	0.00025	0.00025 - 0.00062	0.00023 - 0.00027	--	0.00011	0.00013 - 0.00016	0.00016	--	0.0001 - 0.00011	--	--	--	0.00019
Molybdenum	0.1	0.0059	0.029 - 0.034	0.0032	0.033 - 0.042	0.025 - 0.043	--	0.0099	0.01 - 0.046	0.016 - 0.027	0.0035 - 0.0045	0.01	0.022
Nickel	0.067	0.0099 - 0.054	0.012 - 0.018	0.0028	0.005 - 0.0087	0.014	--	--	0.012	0.0035 - 0.0059	0.0057 - 0.0068	--	0.018
Phosphorous (as P)	0.39	1,610	2.2	0.55	0.25	0.43	--	0.2	0.36	0.061	0.41 - 0.51	--	--
Phosphorous (as PO4)	1.2	4,940	6.8	1.7	0.77	1.3	--	0.64	1.1	0.19	1.4 - 1.6	--	--
Selenium	--	--	0.011	--	--	--	--	--	--	--	--	--	--
Sulfate	9,890	266	474	169	3,000	5,940	--	2,940	7,180	891	27.2 - 29.2	--	--
Thallium	--	--	--	--	0.009	0.023 - 0.077	--	--	--	--	--	--	--
Vanadium	--	0.0087	0.036 - 0.043	0.0042	0.0047	--	--	--	--	0.004 - 0.0042	0.0042 - 0.006	--	0.014
Zinc	--	0.038	0.051 - 0.1	0.014	0.045 - 0.07	--	--	--	--	0.012 - 0.029	0.017 - 0.043	0.047	0.11
Organics (ug/L)													
1,4-Dichlorobenzene	--	--	--	--	--	--	--	--	2.8	--	--	--	--
2,4,5-TP (Silvex)	--	--	--	0.43	--	--	--	--	--	--	0.040	--	--
2,4-D	--	--	--	0.28	0.37	0.98	--	--	--	0.20	--	--	--
2,4-DB	--	--	--	--	--	--	--	--	--	--	0.52	--	--
2-Butanone	12	--	12	--	--	--	--	--	8.2	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--	0.23	--	--	--
Acetone	110	3.6 - 4.3	7 - 180	--	--	--	230	--	5.7 - 5.9	2.7	--	--	--
Benzo(b)fluoranthene	--	--	--	0.0081	--	--	--	--	--	--	--	--	--
Carbon disulfide	--	--	--	--	1.1	--	5.3	--	5.2	--	--	--	--
Diazinon	--	--	--	0.40	0.35 - 0.39	0.38 - 0.44	--	--	--	0.37	--	--	--
Disyston	--	--	--	--	--	0.32	--	--	--	--	--	--	0.62
Methyl isobutyl ketone	--	--	--	--	--	--	3.4	--	--	--	--	--	--
Phenanthrene	--	--	--	0.012	--	--	--	--	--	--	--	--	--
TEPH	11,000	4,200 - 51,000	3,700 - 23,000	--	--	1,900 - 2,200	4,400	--	--	--	1,900	--	2,000
Tetrachloroethene	--	1.1	--	--	--	--	--	--	--	--	--	--	--
Toluene	--	--	--	--	--	--	--	--	8.8	--	--	--	--

Notes:

Source: Tetra Tech, 1996

A single value indicates either a single detect or a single sample.

-- either not analyzed for or not detected

TEPH - Total extractable petroleum hydrocarbons

TABLE 2-8

Detected Concentrations in Benthic Infaunal Tissue - 1996 [a]

Bolsa Chica Lowlands

Chemical	Concentration
Inorganics (mg/kg)	
Arsenic	2.75
Cadmium	0.058
Chromium	0.29
Copper	0.99
Lead	0.074
Mercury	0.03
Nickel	0.66
Selenium	0.54
Zinc	7.7
Organics (µg/kg)	
Acenaphthene	7.8
Anthracene	31
Benzo(a)anthracene	26
Benzo(a)pyrene	7.1
Benzo(b)fluoranthene	11
Benzo(e)pyrene	5.9
Benzo(g,h,i)perylene	3
Benzo(k)fluoranthene	3.6
Chrysene	21
Dibenzothiophene	12
Fluoranthene	120
Fluorene	24
Indeno(1,2,3-c,d)pyrene	2
Naphthalene	8.9
Perylene	1.7
Phenanthrene	160
Pyrene	79

Notes:

Source: Tetra Tech, 1996

[a]Benthic infaunal tissue analyses consisted of a single sample - BE-7 mussel.

TABLE 2-9

Detected Concentrations in Fish Tissue - 1996

Bolsa Chica Lowlands

Chemical	Former Gas Plant Ponds and Sumps	Lake Signal	Freeman Creek	Ecological Preserve	Ditch near Whipstock
Inorganics (mg/kg)					
Arsenic	0.37 - 0.62	1.85	2 - 2.3	2.35 - 2.8	1.05 - 2.2
Cadmium	0.013	--	--	--	0.02
Chromium	0.34 - 0.5	--	0.06	0.06 - 0.08	0.42 - 0.63
Copper	0.89 - 1.27	1	0.67 - 0.85	1.7 - 2.5	1.23 - 2.2
Lead	0.06 - 0.225	0.123	0.092 - 0.115	0.052 - 0.087	0.47 - 0.59
Mercury	0.015 - 0.032	--	--	0.014	--
Nickel	0.21 - 0.28	0.18	0.14 - 0.48	0.06 - 0.33	0.23 - 0.62
Selenium	0.2 - 0.3	0.6	0.5 - 0.6	0.6 - 0.8	0.2 - 0.4
Silver	--	--	--	0.061	--
Zinc	23 - 28.5	31	19 - 30.5	20.5 - 23	27.5 - 28.5
Organics (ug/kg)					
2-Butanone	730	30	33 - 130	46	90
2-Hexanone	7.8	6.5	3.7 - 6.8	--	15
4,4'-DDD	2 - 4.6	7.3	7.1 - 8.3	1.5 - 1.8	2.5 - 3.4
4,4'-DDE	8.9 - 13	22	16 - 17	26 - 32	5.5 - 6.8
4,4'-DDT	--	0.049	0.032 - 0.051	0.09 - 0.16	0.3
Acenaphthene	0.16 - 0.21	0.47	0.22 - 0.37	0.09 - 0.14	0.22 - 0.46
Acenaphthylene	--	--	0.07	0.02 - 0.03	0.14 - 0.34
Acetone	1,300	380	610 - 1,500	590	1,000
Aldrin	--	0.049	0.0076	--	--
Anthracene	0.06 - 0.17	0.35	0.16 - 0.23	0.08 - 0.09	0.14 - 0.24
Benzene	3.1	2.5	2.9 - 5.6	2.9	3.4
Benzo(a)anthracene	0.2 - 0.63	0.2	0.19 - 0.2	0.22 - 0.23	0.27 - 0.62
Benzo(a)pyrene	0.04 - 0.19	0.05	0.05 - 0.06	0.03 - 0.04	0.14 - 0.28
Benzo(b)fluoranthene	0.09 - 0.32	0.06	0.09 - 0.1	0.07 - 0.08	0.25 - 0.48
Benzo(e)pyrene	0.1 - 0.24	0.08	0.1 - 0.12	0.05 - 0.07	0.22 - 0.37
Benzo(g,h,i)perylene	0.1 - 0.19	0.15	0.08 - 0.11	0.05 - 0.06	0.25 - 1
Benzo(k)fluoranthene	0.03 - 0.12	0.02	0.02 - 0.04	0.02 - 0.03	0.07 - 0.15
BHC-alpha	0.03 - 0.12	0.02	0.02 - 0.04	0.02 - 0.03	0.07 - 0.15
BHC-beta	--	0.3	0.18 - 0.23	--	--
BHC-delta	--	0.056	0.039 - 0.056	--	--
BHC-gamma	--	1.5	0.3 - 0.46	--	0.052
Biphenyl	0.42 - 1	0.53	0.34 - 0.38	0.17 - 0.23	0.03 - 0.32
Chloroform	--	10,000	31 - 79	67	24
Chrysene	0.15 - 0.38	0.12	0.12 - 0.3	0.07	0.42 - 0.62
Dibenzo(a,h)anthracene	0.04	--	0.04	0.02 - 0.03	0.07 - 0.92
Dibenzothiophene	0.21 - 0.4	0.75	0.37 - 0.55	0.08	0.15 - 0.38

TABLE 2-9

Detected Concentrations in Fish Tissue - 1996
Bolsa Chica Lowlands

Chemical	Former Gas Plant Ponds and Sumps	Lake Signal	Freeman Creek	Ecological Preserve	Ditch near Whipstock
Dieldrin	0.76 - 0.85	1.3	0.56 - 0.64	0.44 - 0.51	0.17 - 0.19
Endosulfan sulfate	--	1.6	--	--	--
Fluoranthene	0.32 - 0.6	0.68	0.41 - 0.59	0.18 - 0.2	0.5 - 1.8
Fluorene	0.53 - 0.78	1	0.69 - 1.3	0.14 - 0.17	0.41 - 0.55
Heptachlor	--	--	--	0.1 - 0.18	0.062 - 0.1
Indeno(1,2,3-c,d)pyrene	0.06 - 0.12	0.05	0.05	0.02 - 0.03	0.094 - 0.18
Methylene chloride	410	230	310 - 320	550	320
Naphthalene	1.3 - 2.4	1.3	0.83 - 0.94	0.55 - 0.71	0.92 - 1.5
PCB 8	0.48 - 1.4	1.8	1.9 - 2.1	0.099 - 0.16	0.48 - 0.62
PCB 18	0.094 - 0.45	--	0.1	0.024 - 0.027	0.11
PCB 28	0.28 - 1.4	0.27	0.24 - 0.25	0.22 - 0.32	0.094 - 0.24
PCB 44	1.2 - 2.2	0.95	0.43 - 0.44	0.08 - 0.099	0.19 - 0.27
PCB 52	3.3 - 5.4	0.82	0.29 - 0.36	0.21 - 0.27	0.39 - 0.66
PCB 66	1.5 - 3	0.18	0.051 - 0.24	0.68 - 1	0.24 - 0.34
PCB 101	9.6 - 14	1.1	0.78 - 0.81	1.1 - 1.4	1.2 - 1.8
PCB 105	4.1 - 6.9	0.49	0.46 - 0.49	0.62 - 0.76	0.58 - 0.74
PCB 118	11 - 17	0.83	0.83 - 0.94	2.1 - 2.3	1.5 - 1.8
PCB 128	2.5 - 3	0.24	0.02 - 0.22	0.39 - 0.42	0.3 - 0.37
PCB 138	14 - 15	2	1.7 - 1.8	2.6 - 3.2	2.1 - 2.4
PCB 153	11 - 15	2.1	1.7 - 1.9	3.3 - 3.7	2.2 - 2.6
PCB 170	1.2 - 1.4	0.51	0.51	0.39 - 0.43	0.32 - 0.42
PCB 180	2.4 - 3	2.2	1.3 - 1.4	1.4 - 1.8	0.73 - 0.96
PCB 187	1.2 - 1.7	0.63	0.54 - 0.58	1.1 - 1.8	0.6 - 0.72
PCB 195	0.057	0.051	--	--	--
PCB 206	0.074	0.12	0.076 - 0.12	0.055	0.055
PCB 209	0.045	--	0.041	--	0.018
Perylene	0.09 - 0.17	0.04	0.06	0.01 - 0.09	0.28 - 0.76
Phenanthrene	1.2 - 1.9	1.2	1 - 1.4	0.43 - 0.5	0.87 - 2.2
Pyrene	0.28 - 0.53	0.53	0.33 - 0.42	0.14 - 0.16	0.7 - 1.4
Toluene	--	--	--	4.7	--

Notes:
Source: Tetra Tech, 1996
-- not detected
PCB - polychlorinated biphenyl

TABLE 2-10
Detected Concentrations in Terrestrial Plants-1996 [a]
Bolsa Chica Lowlands

Chemical	Range of Detected Concentrations (mg/kg)
Arsenic	0.035 - 0.964
Cadmium	0.014 - 0.134
Chromium	0.32 - 4.18
Copper	0.74 - 5.68
Lead	0.081 - 3.36
Mercury	0.007 - 0.038
Nickel	0.12 - 4.68
Selenium	0.2 - 1.4
Silver	0.02 - 0.06
Zinc	2.3 - 35.3

Notes:
Source: Tetra Tech, 1996
[a]Plant samples were not submitted for analyses of organic chemicals.

TABLE 2-11
Detected Concentrations in Terrestrial Mammal Tissue - 1996
Bolsa Chica Lowlands

Chemical	Range of Detected Concentrations
Inorganics (mg/kg)	
Cadmium	0.015 - 0.063
Chromium	0.2 - 1.5
Copper	3.6 - 14.3
Lead	0.215 - 0.56
Mercury	0.018 - 0.064
Nickel	0.53 - 4.38
Selenium	0.3 - 0.6
Zinc	31 - 66
Organics (ug/kg)	
1,2-Dichloroethene (cis-)	32 - 110
2-Butanone	120
2-Hexanone	32 - 540
4,4'-DDE	0.85 - 3
4-Methyl-2-pentanone	9
Acenaphthene	0.11 - 0.3
Acenaphthylene	0.05
Acetone	280 - 3,700
Anthracene	0.12 - 0.29
Benzene	2.9 - 5.7
Benzo(a)anthracene	0.39 - 1.2
Benzo(a)pyrene	0.04 - 0.19
Benzo(b)fluoranthene	0.15 - 0.38
Benzo(e)pyrene	0.13 - 0.37
Benzo(g,h,i)perylene	0.12 - 0.34
Benzo(k)fluoranthene	0.08 - 0.17
BHC-alpha	0.083 - 0.68
BHC-beta	0.062
BHC-delta	0.048 - 0.38
BHC-gamma	0.03 - 0.081
Biphenyl	0.46 - 1.1
Chloroform	4,500 - 65,000
Chrysene	0.16 - 0.54
Dibenzo(a,h)anthracene	0.07 - 0.16
Dibenzothiophene	0.15 - 0.26

TABLE 2-11
Detected Concentrations in Terrestrial Mammal Tissue - 1996
Bolsa Chica Lowlands

Chemical	Range of Detected Concentrations
Dieldrin	0.25 - 14
Ethylbenzene	1.6
Fluoranthene	0.28 - 2.2
Fluorene	0.16 - 0.8
Indeno(1,2,3-cd)pyrene	0.07 - 0.19
Methylene chloride	740 - 1,900
Naphthalene	1.4 - 5.1
PCB 8	0.083 - 0.68
PCB 28	0.3
PCB 44	0.42
PCB 52	0.07 - 1.9
PCB 66	0.13 - 2.4
PCB 101	0.39 - 4.8
PCB 105	0.18 - 6.9
PCB 118	0.2 - 24
PCB 128	0.13 - 5.7
PCB 138	0.79 - 77
PCB 153	1 - 120
PCB 170	0.33 - 24
PCB 180	1.1 - 60
PCB 187	0.3 - 47
PCB 195	0.078 - 6.6
PCB 206	0.3 - 3
PCB 209	0.096 - 0.1
n-Propylbenzene	5.6
Perylene	0.05 - 0.21
Phenanthrene	0.97 - 2.6
Pyrene	0.29 - 0.63
Toluene	33
Xylene (total)	1.4 - 7.2

Notes:
Source: Tetra Tech, 1996
A single value indicates a single detected concentration.

TABLE 2-12

Preliminary Background Concentrations for Soil and Sediment

Bolsa Chica Lowlands

Chemical	Preliminary Background Value[a] (mg/kg)
Antimony	--
Arsenic	2.9
Barium	32
Beryllium	0.2
Cadmium	--
Chromium	12.7
Cobalt	5.7
Copper	5.6
Lead	2.1
Mercury	--
Molybdenum	1.3
Nickel	7.7
Selenium	0.8
Silver	--
Thallium	--
Vanadium	20
Zinc	31

Notes:

-- Not available

[a]Site-specific background information is being gathered as part of the on-going sampling effort. These preliminary values were based on 3 soil samples collected at 8 feet below surface from oil well sites (OW3, OW12, OW13) (Steffeck et al., 1996).

TABLE 2-13
Screening Benchmarks for Sediment
Bolsa Chica Lowlands

	U.S. EPA Values			Marine Sediments		Freshwater Sediments			
Chemical	Proposed	SQC	SQB	ER-L	Florida TEL	NBS-ARCS TEC	Ontario LEL	Estimated SQB [a]	Selected Sediment Benchmark
Inorganics (mg/kg)									
Antimony				2					**2**
Arsenic				8.2	7.24	12.1	6		**8.2**
Barium									**--**
Beryllium									**--**
Cadmium				1.2	0.68	0.592	0.6		**0.68**
Chromium				81	52.3	56	26		**52.3**
Cobalt									**--**
Copper				34	18.7	28	16		**18.7**
Lead				46.7	30.2	34.2	31		**30.2**
Mercury				0.15	0.13		0.2		**0.13**
Molybdenum									**--**
Nickel				20.9	15.9	39.6	16		**15.9**
Selenium									**--**
Silver				1.0	0.73				**0.73**
Thallium									**--**
Vanadium									**--**
Zinc				150	124	159	120		**124**
Organics (ug/kg)									
1,2-Dichlorobenzene			340					330 (cv)	**340**
1,2-Dichloroethane								250 (cv)	**250**
1,3-Dichlorobenzene								1,700 (cv)	**1,700**
1,4-Dichlorobenzene								340 (cv)	**340**
2,4,5-TP (silvex)									**--**
2,4-DB									**--**
2-Butanone								27 (cv)	**27**
4,4'-DDD[b]					1.22		8	110 (cv)	**1.22**
4,4'-DDE				2.2	2.07		5		**2.07**
4,4'-DDT[b]				1.6	1.19		8	340 (cv)	**1.19**
Acenaphthylene				44	5.87				**5.87**
Acetone								3,000 (f)	**3,000**
Anthracene				85.3	46.9		220	220 (cv)	**46.9**
Benzene			570					160(cv)	**570**
Benzo(a)pyrene				430	88.8	350	370	140 (cv)	**88.8**
Benzo(b)fluoranthene									**--**
Benzo(g,h,i)perylene						29,000	170		**170**
Benzo(k)fluoranthene				522[c]			240		**522**
Carbon disulfide								230 (d)	**230**
Chlorobenzene								410 (cv)	**410**
Chloroform								22 (cv)	**22**
Chrysene				384	108	500	340		**108**
Dalapon									**--**
Dibenzo(a,h)anthracene				63.4	6.22	28.2 (PEC)	60		**6.22**
Ethylbenzene			3,600					89 (cv)	**3,600**

TABLE 2-13
Screening Benchmarks for Sediment
Bolsa Chica Lowlands

	U.S. EPA Values			Marine Sediments			Freshwater Sediments		
Chemical	Proposed	SQC	SQB	ER-L	Florida TEL	NBS-ARCS TEC	Ontario LEL	Estimated SQB [a]	Selected Sediment Benchmark
Fluoranthene	6,200	2,900		600	113	64.23	750	6,200 (cwq)	**6,200**
Fluorene			540	19	21.2	34.64	190	540 (cv)	**540**
Indeno(1,2,3-cd)pyrene						78	200		**78**
Methylene chloride								18,000 (f)	**18,000**
Naphthalene			480	160	34.6	32.75		240 (cv)	**480**
PCB 1254				23[d]			60[e]	810 (cv)	**23**
Phenanthrene	1,800		850	240	86.7		560	1,800 (cwq)	**1,800**
Pyrene				665	153	570	490		**153**
TEPH (total extractable petroleum hydrocarbons)									**--**
Tetrachloroethene			530					410 (cv)	**530**
Toluene			670					50 (cv)	**670**
Trichloroethene			1600					220 (cv)	**1,600**
Xylene (total)			25					160 (cv)	**25**

Sediment Values	***Source***
U.S. EPA proposed	EPA (1993a,b)
U.S. EPA SQC	EPA (1996b)
U.S. EPA SQB	EPA (1996b)
ER-Ls	Long et al., 1995 and Long and Morgan, 1990
Florida TEL	MacDonald, 1994
Ontario LELs	Persaud et al., 1993
NBS-ARCS TECs	EPA, 1996c in Jones et al., 1997
Estimated SQB	Jones et al., 1997

Notes:
[a]Estimated sediment quality benchmark using equilibrium partitioning (EqP); 1% organic carbon; and the chronic ambient water quality criteria (cwq) lowest chronic value reported for fish (f) or daphnia (d), or the secondary ambient water quality value (cv)
[b]Long and Morgan, 1990
[c]Used value for low molecular weight PAHs
[d]Used value for total PCBs
[e]Tentative guideline

ARCS - EPAs Assessment and Remediation of Contaminated Sediment Project
ERL - Effects Range-Low
LEL - Lowest Effect Level
NEL - No Effect Level
PEC - Probable effects concentration
PQL - Practical quantitation limit for EPA contract laboratory program
SQC - Sediment Quality Criteria
SQB - Sediment Quality Benchmark
TEC - Threshold effects concentration
TEL - Threshold Effects Level

TABLE 2-14
Screening Benchmarks for Surface Water - Marine
Bolsa Chica Lowlands

Chemical	AWQC[a]		Lowest Observed Effect Level[b]		California Enclosed Bays and Estuaries - Proposed Criteria[b]		Selected Surface Water Benchmark[c]	
	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute
Inorganics (mg/L)								
Arsenic (III)	0.036	0.069	--	2.319	0.036	0.069	**0.036**	**0.069**
Barium	--	--	--	--	--	--	**--**	**--**
Chloride	--	--	--	--	--	--	**--**	**--**
Chromium (III or total)	--	--	--	10.3	--	--	**1.03**	**10.3**
Cobalt	--	--	--	--	--	--	**--**	**--**
Copper	0.0024	0.0024	--	--	0.0031	0.0048	**0.0024**	**0.0024**
Lead	0.008	0.21	--	--	0.0081	0.21	**0.008**	**0.21**
Mercury	0.000025	0.0018	--	--	0.00094	0.0018	**0.000025**	**0.0018**
Molybdenum	--	--	--	--	--	--	**--**	**--**
Nickel	0.008	0.074	--	--	0.0082	0.074	**0.008**	**0.074**
Phosphorous	--	0.0001	--	--	--	--	**0.00001**	**0.0001**
Selenium	0.071	0.29	--	--	0.071	0.29	**0.071**	**0.29**
Sulfate	--	--	--	--	--	--	**--**	**--**
Thallium	--	--		2.13	--	--	**0.213**	**2.13**
Vanadium	--	--	--	--	--	--	**--**	**--**
Zinc	0.081	0.09	--	--	0.081	0.09	**0.081**	**0.09**
Organics (ug/L)								
1,4-Dichlorobenzene	--	--	129	1,970	--	--	**129**	**1,970**
2,4,5-TP (silvex)	--	--	--	--	--	--	**--**	**--**
2,4-D	--	--	--	--	--	--	**--**	**--**
2,4-DB	--	--	--	--	--	--	**--**	**--**
2-Butanone	--	--	--	--	--	--	**--**	**--**
Acenaphthylene	--	--	--	300	--	--	**30**	**300**
Acetone	--	--	--	--	--	--	**--**	**--**
Benzo(b)fluoranthene	--	--	--	300	--	--	**30**	**300**
Carbon disulfide	--	--	--	--	--	--	**--**	**--**
Diazinon	--	--	--	--	--	--	**--**	**--**

TABLE 2-14
Screening Benchmarks for Surface Water - Marine
Bolsa Chica Lowlands

Chemical	AWQC[a]		Lowest Observed Effect Level[b]		California Enclosed Bays and Estuaries - Proposed Criteria[b]		Selected Surface Water Benchmark[c]	
	Chronic	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute
Disyston	--	--	--	--	--	--	**--**	**--**
Methyl isobutyl ketone	--	--	--	--	--	--	**--**	**--**
Phenanthrene	4.6	7.7	--	300	--	--	**4.6**	**7.7**
TEPH (total extractable petroleum hydrocarbons)	--	--	--	--	--	--	**--**	**--**
Tetrachloroethene	--	--	450	10,200	--	--	**450**	**10,200**
Toluene	--	--	5,000	6,300			**5,000**	**6,300**

Notes:

[a]Ambient Water Quality Criteria (EPA, 1991b, 1992b, and 1995b).

[b]Reprinted from Cal/EPA (1998)

[c]The surface water was selected in the following heirarchy: AWQC, Enclosed bays and estuaries, Lowest effect levels. If a chronic value was not available, the acute value was divided by an acute to chronic ratio of 10.

-- Not available.

TABLE 2-15
Screening Against Benchmarks - Soil
Bolsa Chica Lowlands

	Screening Benchmarks[a]		Maximum Detected Concentrations												Screening Quotients																								
															Tank Farms and Processing Facilities		Former Sumps and Settling Ponds		Former and Existing Wet and Dry Gas Lines		Former Oil Pipelines		Pig Clean-Out Areas		Oil Wells		Utility Areas		Equipment Storage Area		Suspected Sandblast Area		Service Roads		Former Duck Blind Area		Lowland Pocket Area		Uncertain Areas		Any Screening Quotient >1?		
Chemical	Background	Soil/Sediment Benchmark	Tank Farms and Processing Facilities	Former Sumps and Settling Ponds	Former and Existing Wet and Dry Gas Lines	Former Oil Pipelines	Pig Clean-Out Areas	Oil Wells	Utility Areas	Equipment Storage Area	Suspected Sandblast Area	Service Roads	Former Duck Blind Area	Lowland Pocket Area	Uncertain Areas	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	BGQ	SLQ	COPEC
Inorganics (mg/kg)																																							
Antimony	--	2	--	0.95	0.78	0.72	--	1.7	--	--	0.67	0.86	--	--	1.9	--	--	--	<1	--	<1	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	--	<1	--	No	No
Arsenic	2.9	8.2	8.3	139	86.5	441	246	229	6.5	27.4	7.4	14.7	--	11.5	42.1	3	1	48	17	30	11	152	54	85	30	79	28	2	<1	9	3	3	<1	5	2	--	--	4	1	15	5	Yes	Yes	Yes
Barium	32	--	861	11,400	1,220	5,750	491	436	--	539	499	5,820	--	405	1,090	27	--	356	--	38	--	180	--	15	--	14	--	--	--	17	--	16	--	182	--	--	--	13	--	34	--	Yes	--	Yes*
Beryllium	0.2	--	0.4	4.5	0.87	1.7	1.1	0.79	--	1.9	2	0.66	--	1.4	3.2	2	--	23	--	4	--	9	--	6	--	4	--	--	--	10	--	10	--	3	--	--	--	7	--	16	--	Yes	--	Yes*
Cadmium	--	0.68	8.7	2.9	0.85	2	1.9	0.11	--	0.83	0.68	0.42	--	0.091	0.49	--	13	--	4	--	1	--	3	--	3	--	<1	--	--	--	1	--	1	--	<1	--	--	--	<1	--	<1	--	Yes	Yes
Chromium	12.7	52.3	76.3	244	43.3	90.4	234	29.7	19.4	39	30	121	--	48.9	35.8	6	1	19	5	3	<1	7	2	18	4	2	<1	2	<1	3	<1	2	<1	10	2	--	--	4	<1	3	<1	Yes	Yes	Yes
Cobalt	5.7	--	12	40.2	29.3	21.8	42.1	13.9	--	16.6	14.8	9.9	--	14.5	16.5	2	--	7	--	5	--	4	--	7	--	2	--	--	--	3	--	3	--	2	--	--	--	3	--	3	--	Yes	--	Yes*
Copper	5.6	18.7	234	77.1	44.2	183	429	25.3	19.5	29	23.7	50.4	--	40.8	35.5	42	13	14	4	8	2	33	10	77	23	5	1	3	1	5	2	4	1	9	3	--	--	7	2	6	2	Yes	Yes	Yes
Lead	2.1	30.2	41.7	122	142	140	80.9	45.5	--	25.7	34.7	85.3	17.8	101	169	20	1	58	4	68	5	67	5	39	3	22	2	--	--	12	<1	17	1	41	3	8	<1	48	3	80	6	Yes	Yes	Yes
Mercury	--	0.13	0.86	1.8	0.65	0.93	9.8	2	--	0.25	0.089	0.39	--	0.53	0.38	--	7	--	14	--	5	--	7	--	75	--	15	--	--	--	2	--	<1	--	3	--	--	--	4	--	3	--	Yes	Yes
Molybdenum	1.3	--	3.8	18.5	7.4	9.4	5.6	2.1	--	6.6	6	4.1	--	8.3	3.9	3	--	14	--	6	--	7	--	4	--	2	--	--	--	5	--	5	--	3	--	--	--	6	--	3	--	Yes	--	Yes*
Nickel	7.7	15.9	24.9	75.7	79.7	89.8	142	19.5	--	25.7	33.1	147	--	37	48.2	3	2	10	5	10	5	12	6	18	9	3	1	--	--	3	2	4	2	19	9	--	--	5	2	6	3	Yes	Yes	Yes
Selenium	0.8	--	1.3	1.8	1.5	2.9	4.9	0.82	--	0.87	1.7	1.3	--	--	0.75	2	--	2	--	2	--	4	--	6	--	1	--	--	--	1	--	2	--	2	--	--	--	--	--	<1	--	Yes	--	Yes*
Silver	--	0.73	2.2	0.17	--	0.12	--	--	--	0.12	0.12	0.32	--	--	--	--	3	--	<1	--	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	<1	--	--	--	--	--	--	Yes	Yes
Thallium	--	--	0.41	19	--	1.9	--	--	--	--	--	0.34	--	--	0.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Vanadium	20	--	38.7	125	48.9	87.2	872	57.3	--	73.1	58.4	57.5	--	77.1	62.2	2	--	6	--	2	--	4	--	44	--	3	--	--	--	4	--	3	--	3	--	--	--	4	--	3	--	Yes	--	Yes*
Zinc	31	124	1,620	233	175	3,790	362	74	--	123	85.4	216	--	126	147	52	13	8	2	6	1	122	31	12	3	2	<1	--	--	4	<1	3	<1	7	2	--	--	4	1	5	1	Yes	Yes	Yes
Organics (ug/kg)																																											
1,2-Dichlorobenzene	na	340	--	--	1	--	--	--	--	--	--	--	--	--	--	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
1,2-Dichloroethane	na	250	--	--	2.6	--	--	--	--	--	--	--	--	--	--	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
1,3-Dichlorobenzene	na	1,700	--	2	1.5	--	--	--	--	--	--	--	--	--	--	na	--	na	<1	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
1,4-Dichlorobenzene	na	340	--	--	1.3	--	--	--	--	--	--	--	--	--	--	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
2,4,5-TP (Silvex)	na	--	--	--	--	--	--	--	--	--	--	--	--	--	46	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	Yes*
2,4-DB	na	--	--	--	--	--	--	--	--	--	--	--	--	--	49	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	Yes*
2-Butanone	na	27	--	210	8.4	--	--	1.7	--	--	--	--	--	--	19	na	--	na	8	na	<1	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	<1	na	Yes	Yes
4,4'-DDD	na	1.22	--	--	--	16	--	--	--	--	--	--	--	--	44	na	--	na	--	na	--	na	13	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	36	na	Yes	Yes
4,4'-DDE	na	2.07	--	--	--	9	--	--	11	--	--	--	--	--	26	na	--	na	--	na	--	na	4	na	--	na	--	na	5	na	--	na	--	na	--	na	--	na	13	na	Yes	Yes
4,4'-DDT	na	1.19	--	--	--	30	--	--	21	--	50	--	--	--	--	na	--	na	--	na	--	na	25	na	--	na	--	na	18	na	--	na	42	na	--	na	--	na	--	na	Yes	Yes
Acenaphthylene	na	5.87	--	76	--	4,800	--	7.7	--	--	--	--	--	--	--	na	--	na	13	na	--	na	818	na	--	na	1	na	--	na	--	na	--	na	--	na	--	na	--	na	Yes	Yes
Acetone	na	3,000	48	1,000	310	45	66	40	--	--	250	21	--	63	na	<1	na	<1	na	<1	na	<1	na	<1	na	<1	na	<1	na	--	na	--	na	<1	na	<1	na	<1	na	No	No
Anthracene	na	46.9	3.7	1.5	--	--	--	--	--	2.7	--	13	--	--	--	na	<1	na	<1	na	--	na	--	na	--	na	--	na	--	na	<1	na	--	na	<1	na	--	na	--	na	No	No
Benzene	na	570	0.84	--	0.65	--	1.2	--	--		--	--	--	--	--	na	<1	na	--	na	<1	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
Benzo(a)pyrene	na	88.8	38	30	--	46	13	13	--	7.4	--	16	--	--	--	na	<1	na	<1	na	--	na	<1	na	<1	na	<1	na	--	na	<1	na	--	na	<1	na	--	na	--	na	No	No
Benzo(b)fluoranthene	na	--	39	270	1,500	1,100	270	680	--	12	--	23	--	5.1	6.5	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	Yes*
Benzo(g,h,i)perylene	na	170	62	--	--	--	--	--	--	--	--	--	--	--	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
Benzo(k)fluoranthene	na	522	16	7.8	--	110	--	7.8	--	5.4	--	--	--	--	4.6	na	<1	na	<1	na	--	na	<1	na	--	na	<1	na	--	na	<1	na	--	na	--	na	--	na	<1	na	No	No
Carbon disulfide	na	230	0.78	17	--	1.5	--	4.4	--	--	--	4.1	--	--	--	na	<1	na	<1	na	--	na	<1	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
Chlorobenzene	na	410	--	11	--	--	--	--	--	--	--	--	--	--	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
Chloroform	na	22	--	--	--	--	--	0.67	--	--	--	--	--	--	--	na	--	na	--	na	--	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
Chrysene	na	108	810	88	5,600	--	--	260	--	41	--	1,600	--	19	--	na	8	na	<1	na	52	na	--	na	--	na	2	na	--	na	<1	na	--	na	15	na	--	na	<1	na	--	na	Yes	Yes
Dalapon	na	--	--	--	--	--	--	--	--	--	--	--	--	--	250	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	Yes*
Dibenz(a,h)anthracene	na	6.22	28	58	--	270	--	--	--	20	--	--	--	--	--	na	5	na	9	na	--	na	43	na	--	na	--	na	--	na	3	na	--	na	--	na	--	na	--	na	Yes	Yes
Ethylbenzene	na	3,600	2	110	35	--	3.4	--	--		--	4.6			370	na	<1	na	<1	na	<1	na	--	na	<1	na	--	na	--	na	--	na	--	na	<1	na	--	na	<1	na	No	No
Fluoranthene	na	6,200	47	61	--	430	23	--	--	31	--	--	--	12	14	na	<1	na	<1	na	--	na	<1	na	<1	na	--	na	--	na	<1	na	--	na	--	na	--	na	<1	na	No	No
Fluorene	na	540	--	--	--	36	--	--	--	--	--	--	--	--	610	na	--	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	1	na	No	No
Indeno(1,2,3-c,d)pyrene	na	78	33	30	--	--	--	--	--	5.6	--	--	--	--	--	na	<1	na	<1	na	--	na	--	na	--	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	No	No
Methylene chloride	na	18,000	46	2.5	2.2	1.3	1.4	32	--	--	1.9	10	--	5.2	2.7	na	<1	na	<1	na	<1	na	<1	na	<1	na	<1	na	<1	na	--	na	<1	na	<1	na	<1	na	<1	na	No	No
Naphthalene	na	480	11	84	--	--	--	--	--	--	--	--	--	--	1,800	na	<1	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	4	na	Yes	Yes
PCB 1254	na	23	13,000	--	--	--	520	--	--	--	--	--	--	--	--	na	565	na	--	na	--	na	--	na	23	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	Yes	Yes
Phenanthrene	na	1,800	37	56	--	120		49	--	25	--	4,800	--	5.5	830	na	<1	na	<1	na	--	na	<1	na	--	na	<1	na	--	na	<1	na	--	na	3	na	--	na	<1	na	Yes	Yes
Pyrene	na	153	--	--	--	1,500	--	--	--	--	--	--	--	--	--	na	--	na	--	na	--	na	10	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	Yes	Yes
TEPH	na	--	25,000,000	17,000,000	100,000,000	88,000,000	23,000,000	19,000,000	--	1,800,000	23,000	7,900,000	--	1,400,000	89,000,000	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	Yes*
Tetrachloroethene	na	530	--	--	--	--	--	--	--	--	--	--	--	--	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
Toluene	na	670	2.1	3.1	3.4	1.4	--	4.7	--	--	--	--	--	--	4.5	na	<1	na	<1	na	<1	na	<1	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	<1	na	No	No
Trichloroethene	na	1,600	--	0.92	--	--	1.3	--	--	--	--	--	--	--	--	na	--	na	<1	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No
Xylenes (total)	na	25	1.6	9	2	--	3.6	--	--	--	--	3.8	--	--	250	na	<1	na	<1	na	<1	na	--	na	<1	na	--	na	--	na	--	na	--	na	<1	na	--	na	10	na	Yes	Yes

Notes:

[a]Background values (Table 2-9) were used to screen inorganics only. Sediment screening benchmarks (Table 2-10) were used to screen soil because most of the soils at the site will become sediments post remediation.

--screening benchmark not available or Chemical not detected.

* A screening benchmark was not available so chemical was retained for evaluation in the Ecological Assessment.

BGQ - Background quotient (maximum detected value/background value)

na - not applicable - background values used for inorganics only

PCB - Polychlorinate biphenyl

SLQ - Soil benchmark quotient (maximum detected value/soil benchmark)

TEPH - Total extractable petroleum hydrocarbons

TABLE 2-16

Screening Against Benchmarks - Sediment

Bolsa Chica Lowlands

Chemical	Screening Benchmarks[a]: Background	Screening Benchmarks[a]: Sediment Benchmark	Maximum Detected Concentrations: Waste Facility	Former Gas Plant Sumps	Former Gas Plant Ponds	Seacliff Runoff Culvert	Lake Signal	Freeman Creek	Ponded Area near SBTF	Ecological Preserve	Old Wintersburg Channel	Existing Wintersburg Channel	SLTF Sump	Old Channel	Ditch near Whipstock	Pond near Seacliff
Inorganics (mg/kg)																
Antimony	--	2	--	1.5	--	--	--	--	--	--	1.4	--	--	0.77	--	--
Arsenic	2.9	8.2	25.9	47.3	25.6	0.82	19.4	13.7	8	4.2	11.1	7.6	6.2	7.2	15.2	40.5
Barium	32	--	2270	1230	284	10.8	596	4630	1040	365	88.6	152	653	65.5	518	313
Beryllium	0.2	--	0.74	1.8	0.68	0.11	1.4	1.9	1.9	0.24	1.9	1.1	0.44	0.69	0.74	1.1
Cadmium	--	0.68	0.13	0.18	0.3	--	2.1	0.76	0.15	--	0.84	0.37	0.16	0.11	0.18	0.2
Chromium	12.7	52.3	56.1	123	251	3	34.8	50.3	10.9	11.9	17	35.5	20.1	18.9	24.9	40.5
Cobalt	5.7	--	13.2	11	9.5	1.4	24.8	36	6.4	5	41.7	20.1	8.4	9.6	9.9	17.8
Copper	5.6	18.7	31.1	54.5	59.1	3	88.1	43	16.9	8.8	24.8	34.8	163	15.4	15.8	43.5
Lead	2.1	30.2	21.1	189	283	1.2	124	23.5	47.2	9.1	68.3	64.5	23.4	80	9.1	23.1
Mercury	--	0.13	--	0.45	1.3	--	0.89	0.12	--	--	27.7	0.037	0.15	--	--	0.099
Molybdenum	1.3	--	7.7	1.9	8.8	0.37	11.3	10.1	2	1.5	10.8	3.6	3.2	3.2	3.8	4.1
Nickel	7.7	15.9	48.2	35.6	16.6	--	48.2	39.3	36.5	10.5	41.9	25	39.1	17.1	16.5	32.4
Selenium	0.8	--	0.95	1	2.2	--	2.7	3.9	--	--	1.4	0.79	1.2	0.81	1.1	1.9
Vanadium	20	--	87.8	65.4	112	6.1	56.1	50.6	20.9	23	34.7	70.8	40.8	32.1	36	67.1
Zinc	31	124	123	267	158	9.7	304	148	51.2	38.4	155	109	136	55	69.8	165
Organics (ug/kg)																
1,2-Dichloroethane	na	250	--	--	--	--	--	--	--	--	--	--	26	--	--	--
1,4-Dichlorobenzene	na	340	--	--	--	--	--	--	--	--	2.8	--	--	--	--	--
2-Butanone	na	27	12	--	--	--	--	--	--	--	8.2	--	8.4	--	--	--
Acetone	na	3,000	110	--	--	--	--	--	--	26	110	50	75	--	--	--
Benzo(a)pyrene	na	88.8	--	--	--	--	--	--	--	41	--	28	--	--	--	--
Benzo(b)fluoranthene	na	--	--	--	--	--	--	--	--	--	--	22	--	--	--	--
Benzo(k)fluoranthene	na	522	--	--	--	--	--	--	--	--	--	15	--	--	--	--
Carbon disulfide	na	230	1.0	--	--	--	--	--	--	--	5.2	--	11	--	--	--
Fluoranthene	na	6,200	--	150	96	--	--	--	--	94	--	53	--	--	--	--
Indeno(1,2,3-c,d)pyrene	na	78	--	--	--	--	--	--	--	--	--	16	--	--	--	--
Phenanthrene	na	1,800	--	--	--	--	330	--	--	79	--	20	--	--	--	--
TEPH	na	--	1,700,000	280,000	770,000	--	--	850,000	28,000	190,000	--	46,000	4,100,000	--	190,000	82,000
Toluene	na	670	0.80	--	--	--	--	--	--	--	8.8	1.4	--	--	--	--
Xylenes (total)	na	25	2.1	--	--	--	--	--	--	--	--	--	--	--	--	--

Chemical	Screening Quotients: Waste Facility BGQ	Waste Facility SDQ	Former Gas Plant Sumps BGQ	Former Gas Plant Sumps SDQ	Former Gas Plant Ponds BGQ	Former Gas Plant Ponds SDQ	Seacliff Runoff Culvert BGQ	Seacliff Runoff Culvert SDQ	Lake Signal BGQ	Lake Signal SDQ	Freeman Creek BGQ	Freeman Creek SDQ	Ponded Area near SBTF BGQ	Ponded Area near SBTF SDQ
Inorganics (mg/kg)														
Antimony	--	--	--	<1	--	--	--	--	--	--	--	--	--	--
Arsenic	9	4	16	7	9	4	<1	<1	7	3	5	2	3	1
Barium	71	--	38	--	9	--	<1	--	19	--	145	--	33	--
Beryllium	4	--	9	--	3	--	<1	--	7	--	10	--	10	--
Cadmium	--	<1	--	<1	--	<1	--	--	--	3	--	1	--	<1
Chromium	4	1	10	2	20	5	<1	<1	3	<1	4	<1	<1	<1
Cobalt	2	--	2	--	2	--	<1	--	4	--	6	--	1	--
Copper	6	2	10	3	11	3	<1	<1	16	5	8	2	3	<1
Lead	10	<1	90	6	135	9	<1	<1	59	4	11	<1	22	2
Mercury	--	--	--	3	--	10	--	--	--	7	--	<1	--	--
Molybdenum	6	--	1	--	7	--	<1	--	9	--	8	--	2	--
Nickel	6	3	5	2	2	1	--	--	6	3	5	2	5	2
Selenium	1	--	1	--	3	--	--	--	3	--	5	--	--	--
Vanadium	4	--	3	--	6	--	<1	--	3	--	3	--	1	--
Zinc	4	<1	9	2	5	1	<1	<1	10	2	5	1	2	<1
Organics (ug/kg)														
1,2-Dichloroethane	na	--	na	--	na	--	na	--	na	--	na	--	na	--
1,4-Dichlorobenzene	na	--	na	--	na	--	na	--	na	--	na	--	na	--
2-Butanone	na	<1	na	--	na	--	na	--	na	--	na	--	na	--
Acetone	na	<1	na	--	na	--	na	--	na	--	na	--	na	--
Benzo(a)pyrene	na	--	na	--	na	--	na	--	na	--	na	--	na	--
Benzo(b)fluoranthene	na	--	na	--	na	--	na	--	na	--	na	--	na	--
Benzo(k)fluoranthene	na	--	na	--	na	--	na	--	na	--	na	--	na	--
Carbon disulfide	na	<1	na	--	na	--	na	--	na	--	na	--	na	--
Fluoranthene	na	--	na	<1	na	<1	na	--	na	--	na	--	na	--
Indeno(1,2,3-c,d)pyrene	na	--	na	--	na	--	na	--	na	--	na	--	na	--
Phenanthrene	na	--	na	--	na	--	na	--	na	<1	na	--	na	--
TEPH	na	--	na	--	na	--	na	--	na	--	na	--	na	--
Toluene	na	<1	na	--	na	--	na	--	na	--	na	--	na	--
Xylenes (total)	na	<1	na	--	na	--	na	--	na	--	na	--	na	--

Chemical	Ecological Preserve BGQ	Ecological Preserve SDQ	Old Wintersburg Channel BGQ	Old Wintersburg Channel SDQ	Existing Wintersburg Channel BGQ	Existing Wintersburg Channel SDQ	SLTF Sump BGQ	SLTF Sump SDQ	Old Channel BGQ	Old Channel SDQ	Ditch near Whipstock BGQ	Ditch near Whipstock SDQ	Pond near Seacliff BGQ	Pond near Seacliff SDQ	Any Screening Quotient >1? BGQ	Any Screening Quotient >1? SDQ	COPEC
Inorganics (mg/kg)															Yes	Yes	
Antimony	--	--	--	<1	--	--	--	--	--	<1	--	--	--	--	--	No	No
Arsenic	1	<1	4	2	3	1	2	<1	2	<1	5	2	14	6	Yes	Yes	Yes
Barium	11	--	3	--	5	--	20	--	2	--	16	--	10	--	Yes	--	Yes*
Beryllium	1	--	10	--	6	--	2	--	3	--	4	--	6	--	Yes	--	Yes*
Cadmium	--	--	--	1	--	<1	--	<1	--	<1	--	<1	--	<1	--	Yes	Yes
Chromium	<1	<1	1	<1	3	<1	2	<1	1	<1	2	<1	3	<1	Yes	Yes	Yes
Cobalt	<1	--	7	--	4	--	1	--	2	--	2	--	3	--	Yes	--	Yes*
Copper	2	<1	4	1	6	2	29	9	3	<1	3	<1	8	2	Yes	Yes	Yes
Lead	4	<1	33	2	31	2	11	<1	38	3	4	<1	11	<1	Yes	Yes	Yes
Mercury	--	--	--	213	--	<1	--	1	--	--	--	--	--	<1	--	Yes	Yes
Molybdenum	1	--	8	--	3	--	2	--	2	--	3	--	3	--	Yes	--	Yes*
Nickel	1	<1	5	3	3	2	5	2	2	1	2	1	4	2	Yes	Yes	Yes
Selenium	--	--	2	--	<1	--	2	--	1	--	1	--	2	--	Yes	--	Yes*
Vanadium	1	--	2	--	4	--	2	--	2	--	2	--	3	--	Yes	--	Yes*
Zinc	1	<1	5	1	4	<1	4	1	2	<1	2	<1	5	1	Yes	Yes	Yes
Organics (ug/kg)																	
1,2-Dichloroethane	na	--	na	--	na	--	na	<1	na	--	na	--	na	--	na	No	No
1,4-Dichlorobenzene	na	--	na	<1	na	--	na	--	na	--	na	--	na	--	na	No	No
2-Butanone	na	--	na	<1	na	--	na	<1	na	--	na	--	na	--	na	No	No
Acetone	na	<1	na	<1	na	<1	na	<1	na	--	na	--	na	--	na	No	No
Benzo(a)pyrene	na	<1	na	--	na	<1	na	--	na	--	na	--	na	--	na	No	No
Benzo(b)fluoranthene	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	Yes*
Benzo(k)fluoranthene	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	No	No
Carbon disulfide	na	--	na	<1	na	--	na	<1	na	--	na	--	na	--	na	No	No
Fluoranthene	na	<1	na	--	na	<1	na	--	na	--	na	--	na	--	na	No	No
Indeno(1,2,3-c,d)pyrene	na	--	na	--	na	<1	na	--	na	--	na	--	na	--	na	No	No
Phenanthrene	na	<1	na	--	na	<1	na	--	na	--	na	--	na	--	na	No	No
TEPH	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	--	Yes*
Toluene	na	--	na	<1	na	<1	na	--	na	--	na	--	na	--	na	No	No
Xylenes (total)	na	--	na	--	na	--	na	--	na	--	na	--	na	--	na	No	No

Notes:

[a]Background values (see Table 2-9) were used to screen inorganics only. Sediment screening benchmarks are shown on Table 2-10.

-- screening benchmark not available or chemical not detected

* A screening benchmark was not available so chemical was retained for evaluation in the Ecological Risk Assessment

BGQ - Background quotient (maximum detected value/background value)

na - not applicable - background values used for inorganics only

SDQ - Sediment benchmark quotient (maximum detected value/sediment benchmark)

TEPH - Total extractable petroleum hydrocarbons

Table 2-17
Screening Against Benchmarks - Surface Water
Bolsa Chica Lowlands

		Maximum Detected Concentrations													Screening Quotients														
Chemical	**Screening Benchmark[a]**	**Waste Facility**	**Former Gas Plant Sumps**	**Former Gas Plant Ponds**	**Seacliff Runoff Culvert**	**Lake Signal**	**Freeman Creek**	**Ponded Area near SBTF**	**Ecological Preserve**	**Old Wintersburg Channel**	**Existing Wintersburg Channel**	**SLTF Sump**	**Ditch near Whipstock**	**Pond near Seacliff**	**Waste Facility SWQ**	**Former Gas Plant Sumps SWQ**	**Former Gas Plant Ponds SWQ**	**Seacliff Runoff Culvert SWQ**	**Lake Signal SWQ**	**Freeman Creek SWQ**	**Ponded Area near SBTF SWQ**	**Ecological Preserve SWQ**	**Old Wintersburg Channel SWQ**	**Existing Wintersburg Channel SWQ**	**SLTF Sump SWQ**	**Ditch near Whipstock SWQ**	**Pond near Seacliff**	**Screening Quotient >1?**	**COPEC**
Inorganics (mg/L)																													
Arsenic	0.036	--	4.8	0.15	0.01	0.018	0.15	0.14	--	0.061	0.011	0.0054	3.0	0.58	--	133	4.2	<1	<1	4.2	3.9	--	1.7	<1	<1	83	16	Yes	Yes
Barium	--	0.16	2.0	0.32	0.065	0.13	0.35	0.26	0.048	0.36	0.064	0.31	0.099	0.42	--	--	--		--	--	--	--	--	--	--	--	--	--	Yes*
Chloride	--	126,000	112,000	13,600	102	16,400	37,400	--	23,500	63,000	4,450	572	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Chromium	1.03	--	--	0.052	0.0017	--	--	--	--	0.014	0.0015	0.0027	--	--	--	--	<1	<1	--	--	--	--	<1	<1	<1	--	--	No	No
Cobalt	--	--	--	0.004	--	0.0049	--	--	--	0.015	--	0.0015	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Copper	0.0031	0.083	0.12	0.03	0.0065	0.017	0.047	0.077	0.014	0.066	0.0047	0.0044	0.018	0.058	27	39	10	2.1	5.5	15	25	4.5	21	1.5	1.4	5.8	19	Yes	Yes
Lead	0.008	--	--	0.01	0.0011	--	--	--	--	--	0.0015	0.0035	--	--	--	--	1.3	<1	--	--	--	--	--	<1	<1	--	--	Yes	Yes
Mercury	0.000025	0.00025	0.00062	0.00027	--	0.00011	0.00016	0.00016	--	0.00011	--	--	--	0.00019	10	25	11	--	4.4	6.4	6.4	--	4.4	--	--	--	7.6	Yes	Yes
Molybdenum	--	0.10	0.0059	0.034	0.0032	0.042	0.043	--	0.0099	0.046	0.027	0.0045	0.01	0.022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Nickel	0.008	0.067	0.054	0.018	0.0028	0.0087	0.014	--	--	0.012	0.0059	0.0068	--	0.018	8	6.8	2.3	<1	1.1	1.8	--	--	1.5	<1	<1	--	2.3	Yes	Yes
Phosphorous (as P)	0.01	0.39	1,610	2.2	0.55	0.25	0.43	--	0.2	0.36	0.061	0.51	--	--	39	161,000	220	55	25	43	--	20	36	6	51	--	--	Yes	Yes
Phosphorous (as PO4)	0.01	1.2	4,940	6.8	1.7	0.77	1.3	--	0.64	1.1	0.19	1.6	--	--	120	494,000	680	170	77	130	--	64	110	19	160	--	--	Yes	Yes
Selenium	0.071	--	--	0.011	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	--	--	--	--	--	--	--	No	No
Sulfate	--	9,890	266	474	169	3,000	5,940	--	2,940	7,180	891	29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Thallium	0.213	--	--	--	--	0.009	0.077	--	--	--	--	--	--	--	--	--	--	--	<1	<1	--	--	--	--	--	--	--	No	No
Vanadium	--	--	0.0087	0.043	0.0042	0.0047	--	--	--	--	0.0042	0.006	--	0.014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Zinc	0.081	--	0.038	0.10	0.014	0.07	--	--	--	--	0.029	0.043	0.047	0.11	--	<1	1.2	<1	1	--	--	--	--	<1	<1	<1	1.4	Yes	Yes
Organics (ug/L)																													
1,4-Dichlorobenzene	129	--	--	--	--	--	--	--	--	2.8	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	--	No	No
2,4,5-TP (Silvex)	--	--	--	--	0.43	--	--	--	--	--	--	0.040	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
2,4-D	--	--	--	--	0.28	0.37	0.98	--	--	--	0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
2,4-DB	--	--	--	--	--	--	--	--	--	--	--	0.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
2-Butanone	--	12	--	12	--	--	--	--	--	8.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Acenaphthylene	30	--	--	--	--	--	--	--	--	--	0.23	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	No	No
Acetone	--	110	4.3	180	--	--	--	230	--	5.9	2.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Benzo(b)fluoranthene	30	--	--	--	0.0081	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	--	--	--	--	--	--	No	No
Carbon disulfide	--	--	--	--	--	1.1	--	5.3	--	5.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Diazinon	--	--	--	--	0.40	0.39	0.44	--	--	--	0.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Disyston	--	--	--	--	--	--	0.32	--	--	--	--	--	--	0.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Methyl isobutyl ketone	--	--	--	--	--	--	--	3.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Phenanthrene	4.6	--	--	--	0.012	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	--	--	--	--	--	--	No	No
TEPH	--	11,000	51,000	23,000	--	--	2,200	4,400	--	--	--	1,900	--	2,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes*
Tetrachloroethene	450	--	1.1	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	--	--	--	--	--	--	--	--	No	No
Toluene	5,000	--	--	--	--	--	--	--	--	8.8	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	--	No	No

Notes:
[a]Screening benchmarks for surface water are presented in Table 2-14.
-- Screening benchmark not available or chemical not detected
* A screening benchmark was not available so chemical was retained for evaluation in the Ecological Risk Assessment
na - not applicable - background values used for inorganics only
SWQ - Surface water benchmark quotient (maximum detected value/surface water benchmark)
TEPH - Total extractable petroleum hydrocarbons

TABLE 2-18

Chemicals of Potential Ecological Concern for the Ecological Risk Assessment - Soil

Bolsa Chica Lowlands

Chemical	Tank Farms and Processing Facilities	Former Sumps and Settling Ponds	Former and Existing Wet and Dry Gas Lines	Former Oil Pipelines	Pig Clean-Out Areas	Oil Wells	Utility Areas	Equipment Storage Area	Suspected Sandblast Area	Service Roads	Former Duck Blind Area	Lowland Pocket Area	Uncertain Areas
Inorganics													
Arsenic	X	X	X	X	X	X		X		X		X	X
Barium	X*	X*	X*	X*	X*	X*		X*	X*	X*		X*	X*
Beryllium	X*	X*	X*	X*	X*	X*		X*	X*	X*		X*	X*
Cadmium	X	X		X	X			X	X				
Chromium	X	X		X	X					X			
Cobalt	X*	X*	X*	X*	X*	X*		X*	X*	X*		X*	X*
Copper	X	X	X	X	X	X	X	X	X	X		X	X
Lead	X	X	X	X	X	X			X	X		X	X
Mercury	X	X	X	X	X	X		X		X		X	X
Molybdenum	X*	X*	X*	X*	X*	X*		X*	X*	X*		X*	X*
Nickel	X	X	X	X	X	X		X	X	X		X	X
Selenium	X*	X*	X*	X*	X*	X*		X*	X*	X*			X*
Silver	X												
Thallium	X*	X*		X*								X*	X*
Vanadium	X*	X*	X*	X*	X*	X*		X*	X*	X*		X*	X*
Zinc	X	X	X	X	X					X			X
Organics													
2,4,5-TP (Silvex)													X*
2,4-DB													X*
2-Butanone		X											
4,4'-DDD				X									X
4,4'-DDE				X			X						X
4,4'-DDT				X			X		X				
Acenaphthylene		X		X		X							
Benzo(b)fluoranthene	X*	X*	X*	X*	X*	X*		X*		X*		X*	X*
Chrysene	X		X			X				X			
Dalapon													X*
Dibenzo(a,h)anthracene	X	X		X				X					
Naphthalene													X
PCB 1254	X				X								
Phenanthrene										X			
Pyrene				X									
TEPH	X*	X*	X*	X*	X*	X*		X*	X*	X*		X*	X*
Xylenes (total)													X

Notes:

* A screening benchmark was not available so chemical was retained for evaluation in the Ecological Risk Assessment

PCB - Polychlorinated biphenyl

TEPH - Total extractable petroleum hydrocarbons

TABLE 2-19

Chemicals of Potential Ecological Concern for the Ecological Risk Assessment - Sediment

Bolsa Chica Lowlands

Chemical	Waste Facility	Former Gas Plant Sumps	Former Gas Plant Ponds	Seacliff Runoff Culvert	Lake Signal	Freeman Creek	Ponded Area near SBTF	Ecological Preserve	Old Wintersburg Channel	Existing Wintersburg Channel	SLTF Sump	Old Channel	Ditch near Whipstock	Pond near Seacliff
Inorganics														
Arsenic	X	X	X		X	X	X		X	X			X	X
Barium	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
Beryllium	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
Cadmium					X	X			X					
Chromium	X	X	X											
Cobalt	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
Copper	X	X	X		X	X			X	X	X			X
Lead		X	X		X		X		X	X		X		
Mercury		X	X		X				X		X			
Molybdenum	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
Nickel	X	X	X		X	X	X		X	X	X	X	X	X
Selenium	X*	X*	X*		X*	X*			X*	X*	X*	X*	X*	X*
Vanadium	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
Zinc		X	X		X	X			X		X			X
Organics														
Benzo(b)fluoranthene										X*				
TEPH	X*	X*	X*			X*	X*	X*		X*	X*		X*	X*

Notes:

* A screening benchmark was not available so chemical was retained for evaluation in the Ecological Risk Assessment

TEPH - Total extractable petroleum hydrocarbons

TABLE 2-20

Chemicals of Potential Ecological Concern for the Ecological Risk Assessment - Surface Water

Bolsa Chica Lowlands

Chemical	Waste Facility	Former Gas Plant Sumps	Former Gas Plant Ponds	Seacliff Runoff Culvert	Lake Signal	Freeman Creek	Ponded Area near SBTF	Ecological Preserve	Old Wintersburg Channel	Existing Wintersburg Channel	SLTF Sump	Ditch near Whipstock	Pond near Seacliff
Inorganics													
Arsenic		X	X			X	X		X			X	X
Barium	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
Chloride	X*	X*	X*	X*	X*	X*		X*	X*	X*	X*		
Cobalt					X*				X*		X*		
Copper	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead			X										
Mercury	X	X	X		X	X	X		X				X
Molybdenum	X*	X*	X*	X*	X*	X*		X*	X*	X*	X*	X*	X*
Nickel	X	X	X		X	X			X				X
Phosphorous (as P)	X	X	X	X	X	X		X	X	X	X		
Phosphorous (as PO4)	X	X	X	X	X	X		X	X	X	X		
Sulfate	X*	X*	X*	X*	X*	X*		X*	X*	X*	X*		
Vanadium		X*	X*	X*	X*					X*	X*		X*
Zinc			X										X
Organics													
2,4,5-TP (Silvex)				X*							X*		
2,4-D				X*	X*	X*				X*			
2,4-DB											X*		
2-Butanone	X*		X*						X*				
Acetone	X*	X*	X*				X*		X*	X*			
Carbon disulfide					X*		X*		X*				
Diazinon				X*	X*	X*				X*			
Disyston						X*							X*
Methyl isobutyl ketone							X*						
TEPH	X*	X*	X*			X*	X*				X*		X*

Notes:

* A screening benchmark was not available so chemical was retained for evaluation in the Ecological Risk Assessment

TEPH - Total extractable petroleum hydrocarbons

TABLE 2-21
Assessment Endpoints and Measures
Bolsa Chica Lowlands

Assessment Endpoints	Measures of Exposure
Terrestrial Habitats[a]	
Plant productivity or species composition	Comparison of soil concentrations with RTVs for growth rate, biomass, or reproduction
	Bioassays using site soil to measure growth rate, biomass, root elongation, or early seedling growth
Population levels of avian and mammalian consumers	Comparison of exposure dosages with RTVs for reproduction and other toxic effects that could affect reproduction or survival (bioaccumulation in prey is evaluated when calculating exposure dosages)
	Tissue analysis of receptor or prey species collected in the field to support dose estimates and food-chain transfer effects for chemicals that could bioaccumulate
Abundance of prey species (invertebrates, herbivorous mammals, and birds) available to secondary consumers	Comparisons of exposure point concentrations with RTVs for reproduction and other toxic effects that could affect reproduction or survival
	Bioassays using site soil to measure survival; tissue analysis of target invertebrate species
Health of individual special-status plant or wildlife species likely to be found in the terrestrial habitats of the site	Comparison of exposure point concentrations with RTVs for reproduction and other toxic effects that could affect reproduction or survival (bioaccumulation in prey is evaluated when calculating RTVs)
	Tissue analysis of receptor or prey species collected in the field to support dose estimates and food-chain transfer effects for chemicals that could bioaccumulate
Wetland/Aquatic Habitats[b]	
Wetland/Aquatic plant productivity or species composition	Comparison of sediment concentrations with RTVs for growth rate, biomass, or reproduction
	Bioassays using site sediment to measure growth rate, biomass, root elongation, or early seedling growth
Aquatic invertebrate species composition of the wetland community	Comparison of site water and sediment concentrations with RTVs for growth rate, survival, or reproduction
	Bioassays using site water, sediment pore water, or sediment to measure growth rate, survival, or reproduction
	Comparison of aquatic invertebrate communities between impacted and reference sites to evaluate species richness, diversity, relative abundance, and presence/absence
Population levels of fish species in aquatic areas	Comparisons of exposure point concentrations to aquatic organism RTVs for reproduction and other toxic effects that could affect reproduction or survival
	Tissue analysis of receptor or prey species collected in the field to evaluate food-chain transfer effects for chemicals that could bioaccumulate
Population levels of avian and mammalian consumers using wetland/aquatic areas	Comparison of exposure dosages with RTVs for reproduction and other toxic effects that could affect reproduction or survival (bioaccumulation in prey is evaluated when calculating exposure dosage)
	Tissue analysis of receptor or prey species collected in the field to support dose estimates and food-chain transfer effects for chemicals that could bioaccumulate
Individual special-status plant or wildlife species viability likely to be found in wetland/aquatic habitats of the site	Comparison of exposure point concentrations with RTVs for reproduction and other toxic effects that could affect reproduction or survival (bioaccumulation in prey is evaluated when calculating exposure dosages for wildlife)
	Tissue analysis of receptor or prey species collected in the field to support dose estimates and food-chain transfer effects for chemicals that could bioaccumulate

Notes:
[a] upland areas
[b] ponds and estuaries
RTV - Reference Toxicity Value

TABLE 2-22
Selection of Representative Ecological Receptors
Bolsa Chica Lowlands

Trophic Level and Common Name	Special Status	Small Home Range	Representative of Guild	High Reproductive Rate	Exposure Potential		
					Inhalation	Ingestion	Dermal
Aquatic Habitats							
Producers and Primary Consumers							
Aquatic Plants	L	H	---	H	---	---	H[a]
Aquatic Invertebrates	L	H	---	H	---	H	H
Secondary Consumers							
Insectivorous/Omnivorous Fish							
Estuarine Fish	M	M-H	---	H	H	H	H
Carnivorous Aquatic Birds							
Least Tern	H	L	H	L	L	H	M
Black-necked Stilt	L	M	M	L	L	H	M
Black-crowned Night-heron	L	L	H	L	L	H	M
Terrestrial Habitats							
Producers and Primary Consumers							
Terrestrial Plants	L	H	---	H	---	---	H[a]
Terrestrial Invertebrates	---	H	---	---	H	H	H
Secondary Consumers							
Omnivorous Mammals							
Western Harvest Mouse	L	H	H	H	L	M	L
Insectivorous/Omnivorous Birds							
Belding's Savannah Sparrow	H	H	M	L	L	M	L
Tertiary Consumers							
Carnivorous/Insectivorous Birds							
American Kestrel	L	M	H	L	L	M	L
Carnivorous Mammals							
Coyote	L	L	M	L	M	M	L

Notes:
[a] Includes root uptake
H = High Rating
M = Medium Rating
L = Low Rating

All of the above-listed receptors are known to occur within the Bolsa Chica Lowlands and are relevant to the assessment endpoints. All the receptors, but especially plants and invertebrates, are considered to be ecologically important within the community habitat structure. All the receptors would be considered to have high ratings relative to their exposure levels, sensitivity to contaminants, and susceptibility to bioaccumulation/biomagnification of COPECs from a limited number of food items.

TABLE 2-23
Exposure Pathway Analyses
Bolsa Chica Lowlands

Receptor	Potential Exposure Pathways	Exposure Pathway Potentially Complete	Pathway Retained for Analysis	Rationale
Terrestrial Habitats				
Plants	Root uptake	Yes	Yes	Root uptake by plants is a primary route of exposure to COPECs and a secondary route to higher trophic levels
Invertebrates	Ingestion of Soil	Yes	Yes	Ingestion of soil is considered the primary route of exposure to COPECs.
	Dermal Contact	Yes	Yes	Invertebrates, especially those that live in soil, are often in direct contact with COPECs that can be readily transmitted through moist dermal layers.
Birds	Ingestion of Soil	Yes	Yes	Ingestion of soil is considered the primary route of exposure to COPECs.
	Inhalation of Volatiles	Yes	No	Inhalation of volatiles is not considered a major exposure pathway to COPECs. Little or no toxicity information is available on inhalation of COPECs
	Inhalation of Particulates	Yes	No	Inhalation of volatiles is not considered a major exposure pathway to COPECs. Little or no toxicity information is available on inhalation of COPECs
	Dermal Contact	Yes	No	Dermal contact is a potential route of exposure; however, little toxicity information exists on dermal contact with COPECs.
	Food-chain transfer	Yes	Yes	Food-chain transport could occur through intake of contaminated plants or wildlife. It is of greater concern in higher trophic levels.
Mammals	Ingestion of Soil	Yes	Yes	Ingestion of soil is considered a primary route of exposure to COPECs.
	Inhalation of Volatiles	Yes	No	Inhalation of volatiles is not considered a major exposure pathway to COPECs. Little or no toxicity information is available on inhalation of COPECs
	Inhalation of Particulates	Yes	No	Inhalation of particulates is not considered a major exposure pathway to COPECs. Little or no toxicity information is available on inhalation of COPECs
	Dermal Contact	Yes	No	Dermal contact is a potential route of exposure; however, little toxicity information exists on dermal contact with COPECs.
	Food-chain transfer	Yes	Yes	Food-chain transport could occur through intake of contaminated plants or wildlife. It is of greater concern in higher trophic levels.

TABLE 2-23
Exposure Pathway Analyses
Bolsa Chica Lowlands

Receptor	Potential Exposure Pathways	Exposure Pathway Potentially Complete	Pathway Retained for Analysis	Rationale
Aquatic/Wetland Habitats				
Aquatic/ Wetland Plants	Root uptake	Yes	Yes	Root uptake by plants is a primary route of exposure to COPECs and a secondary route to higher trophic levels.
Aquatic Invertebrates and Fish	Ingestion of Sediment/Surface Water	Yes	Yes	Ingestion of sediment/surface water is considered the primary route of exposure to COPECs.
	Dermal Contact	Yes	Yes	Fish and invertebrates, especially benthic species, are often in direct contact with COPECs that can be readily transmitted through moist dermal layers.
	Food-chain transfer	Yes	No	Food-chain transport could occur through intake of contaminated plants or aquatic invertebrates, but no suitable exposure model is available.
Birds	Ingestion of Sediment/Surface Water	Yes	Yes	Ingestion of sediment and surface water is considered an important route of exposure to COPECs in these media.
	Dermal Contact	Yes	No	Dermal contact to sediments and surface water is considered a minor route of exposure, and little toxicity information exists on dermal contact with COPECs.
	Food-chain transfer	Yes	Yes	Food-chain transport could occur through intake of contaminated aquatic invertebrates and fish. It is of greater concern in higher trophic levels.
Mammals	Ingestion of Sediment/Surface Water	Yes	Yes	Ingestion of sediment and surface water is considered an important route of exposure to COPECs in these media.
	Dermal Contact	Yes	No	Dermal contact to sediments and surface water is considered a minor route of exposure, and little toxicity information exists on dermal contact with COPECs.
	Food-chain transfer	Yes	Yes	Food-chain transport could occur through intake of contaminated aquatic invertebrates and fish. It is of greater concern in higher trophic levels.

Notes:
COPECs - Chemicals of potential ecological concern

Table 2-24

Frequency of Detection, Maximum, and Geometric Mean Concentrations of Chemicals in Seal Beach NWR Invertebrates and Fish

A. Invertebrates

	Horned Snail			Saltmarsh Snail			Striped Shore Crab			Ghost Shrimp			Clam			Polychaete Worm		
Chemical[a]	N[b]	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM
Inorganics (mg/Kg, dry weight)																		
Aluminum	27/27	963	305.4	27/27	2,610	689.9	26/26	1,850	531.7	2/2	2,400	919.3	2/2	1,900	1,013	3/3	9200	8,842
Arsenic	25/27	1.98	1.207	26/27	2.92	1.442	25/26	7.58	4.316	2/2	13.0	8.767	2/2	5.91	5.047	3/3	29.5	20.72
Barium	27/27	4.70	2.954	22/22	13.4	5.950	18/18	12.5	8.851	1/1	5.59	5.590	--	--	NC	--	--	NC
Boron	27/27	13.0	7.720	22/22	10.3	6.807	18/18	15.3	10.71	1/1	18.7	18.68	--	--	NC	--	--	NC
Cadmium	8/27	0.15	NC	23/27	0.76	0.203	8/26	0.23	NC	2/2	0.66	0.335	0/2	--	NC	3/3	0.89	0.584
Chromium	27/27	12.7	11.65	27/27	13.3	11.41	26/26	8.89	7.000	2/2	10.9	8.288	2/2	10.2	9.767	3/3	9.62	7.874
Copper	27/27	33.7	14.81	26/26	18.2	11.46	26/26	105	64.71	2/2	363	254.6	2/2	5.36	4.867	3/3	86.5	55.24
Lead	27/27	2.50	0.979	27/27	7.32	1.930	25/26	3.09	1.171	2/2	8.18	2.477	2/2	2.33	2.169	3/3	148	25.51
Magnesium	27/27	4,100	1,962	22/22	4,020	2,281	18/18	12,100	10,310	1/1	8,700	8,698	--	--	NC	--	--	NC
Manganese	27/27	181	65.49	27/27	155	62.15	26/26	85.8	32.28	2/2	103	65.44	2/2	144	74.663	3/3	214	163.9
Mercury	2/27	0.56	NC	0/27	--	NC	4/26	0.16	NC	0/2	--	NC	0/2	--	NC	1/3	0.11	NC
Molybdenum	0/27	--	NC	0/22	--	NC	0/18	--	NC	0/1	--	NC	--	--	NC	--	--	NC
Nickel	0/27	--	NC	2/27	3.20	NC	0/26	--	NC	2/2	5.74	3.987	0/2	--	NC	3/3	9.35	8.726
Selenium	6/27	1.07	NC	8/27	1.14	NC	15/26	1.3	0.592	2/2	2.53	2.459	1/2	0.88	NC	3/3	2.97	2.068
Silver	0/27	--	NC	20/22	0.34	NC	9/18	0.73	NC	--	--	NC	--	--	NC	--	--	NC
Strontium	27/27	1,050	946.0	22/22	1,330	1,151	18/18	2,130	1,733	1/1	592	591.8	--	--	NC	--	--	NC
Vanadium	26/27	6.52	4.764	19/22	9.42	5.065	12/18	5.34	3.767	0/1	--	NC	--	--	NC	--	--	102.5
Zinc	27/27	61.6	27.75	27/27	542	248.1	26/26	62.8	49.83	2/2	87.3	85.34	2/2	106	71.16	3/3	113	NC
Organics (mg/Kg, wet weight)																		
1,1-Biphenyl	2/27	0.03	NC	3/23	0.03	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
4,4'-DDD	--	--	NC	--	--	NC	1/26	0.02	NC	--	--	NC	--	--	NC	--	--	NC
4,4'-DDE	4/30	0.05	NC	18/27	0.03	0.010	9/26	0.04	NC	--	--	NC	1/3	0.02	NC	--	--	NC
C1-Pyrenes and Fluoranthenes	--	--	NC	1/27	0.01	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
C1-Naphthalenes	1/27	0.02	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
C4-Naphthalenes	--	--	NC	1/27	0.01	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
Hexachlorobenzene	2/30	0.01	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
PCB-1254	3/28	0.02	NC	5/27	0.27	NC	4/26	0.58	NC	--	--	NC	1/3	0.07	NC	--	--	NC
PCB-1260	--	--	NC	--	--	NC	2/26	0.02	NC	--	--	NC	--	--	NC	--	--	NC
PCB-TOTAL	3/30	0.02	NC	5/27	0.28	NC	4/26	0.61	NC	--	--	NC	1/3	0.07	NC	--	--	NC

Table 2-24

Frequency of Detection, Maximum, and Geometric Mean Concentrations of Chemicals in Seal Beach NWR Invertebrates and Fish

B. Fish

	Topsmelt			Deepbody Anchovy			Northern Anchovy			Goby			Killifish			Diamond Turbot			Queenfish		
Chemical[a]	N[b]	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM	N	Max. Conc.	GM
Inorganics (mg/Kg, dry weight)																					
Aluminum	33/33	3,860	929.5	9/9	1,140	171.6	6/6	800	433.8	6/6	565	360.9	5/5	1,300	254.2	2/2	439	387.1	1/1	160	159.5
Arsenic	33/33	3.52	2.09	9/9	3.67	2.28	6/6	4.43	3.35	6/6	4.68	2.53	5/5	4.14	2.00	2/2	3.05	1.83	1/1	2.50	2.50
Barium	25/25	20.1	5.97	8/8	5.69	1.19	6/6	4.61	2.30	5/5	4.97	2.60	4/4	8.81	3.68	2/2	3.19	3.17	1/1	1.82	1.82
Boron	24/24	107	15.71	7/7	100	16.63	6/6	29.4	11.76	4/4	49.1	13.25	4/4	18.4	12.95	1/2	9.13	9.13	1/1	24.3	24.28
Cadmium	3/33	0.25	NC	2/9	0.15	NC	0/6		NC	1/6	0.16	NC	1/5	0.12	NC	0/2		NC	0/1		NC
Chromium	33/33	71.2	14.01	4/9	18.0	4.10	4-6	6.64	4.45	5/6	15.3	6.75	5/5	18.4	7.78	2/2	43.9	27.55	1/1	5.61	5.61
Copper	33/33	16.2	7.64	9/9	3.56	2.71	6/6	4.91	4.56	6/6	8.56	4.35	5/5	21.1	10.34	2/2	5.56	4.45	1/1	3.66	3.66
Lead	27/33	7.78	1.19	2/9	0.64	0.26	3/6	0.87	0.36	3/6	2.81	0.64	2/5	1.31	NC	0/2		NC	0/1		NC
Magnesium	25/25	4,020	3,118	8/8	3560	2,227	6/6	3,690	2,789	5/5	2,500	2,110	4/4	3,060	2,444	2/2	2,570	2,246	1/1	2,700	2,704
Manganese	33/33	113	28.15	9/9	29.0	14.64	6/6	26.4	20.86	6/6	55.8	31.96	5/5	73.5	32.52	2/2	59.4	54.67	1/1	22.8	22.75
Mercury	2/33	0.11	NC	8/9	0.26	0.16	0/6		NC	1/6	0.11	NC	1/5	0.11	NC	0/2		NC	0/1		NC
Molybdenum	8/24	110	NC	3/7	100	NC	1/6	4.80	NC	1/4	49.1	NC	1/4	2.60	NC	1/1	4.80	NC	0/1		NC
Nickel	26/33	44.5	9.58	1/9	11.0	NC	2/6	379	NC	4/6	8.29	4.54	3/5	9.61	4.47	2/2	25.5	17.61	1/1	2.84	2.84
Selenium	32/33	2.44	1.18	9/9	2.40	1.24	6/6	1.40	1.29	6/6	2.71	1.50	5/5	1.49	1.24	2/2	1.88	1.66	1/1	1.04	1.04
Strontium	23/24	206	114.6	6/7	181	51.69	6/6	158	76.86	4/4	174	46.02	4/4	349	273.4	1/1	137	137.00	1/1	158	158.2
Vanadium	16/25	10.4	5.96	0/8		NC	0/6		NC	1/5	3.68	NC	1/4	6.26	NC	2/2	4.70	4.22	0/1		NC
Zinc	33/33	147	120.3	9/9	117	80.00	6/6	84.0	80.00	6/6	99.0	85.18	5/5	116	103.3	2/2	97.4	84.45	1/1	75.3	75.3
Organics (mg/Kg, wet weight)																					
1,1-Biphenyl	1/10	0.02	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
4,4'-DDD	6/35	0.08	NC	11/11	0.08	0.05	3/5	0.03	0.01	2/4	0.02	0.02	1/4	0.02	NC	--	--	NC	1/1	0.03	0.03
4,4'-DDE	35/35	0.53	0.13	11/11	1.58	0.61	5/5	0.58	0.23	4/4	0.31	0.14	4/4	0.14	0.09	1/1	0.04	0.04	1/1	0.21	0.21
o,p'-DDE	--	--	NC	1/11	0.02	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
4,4'-DDT	1/35	0.02	NC	9/11	0.04	0.02	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
delta-BHC	1/35	0.01	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
C1-Naphthalenes	2/37	0.01	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
C2-Naphthalenes	1/37	0.01	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
C3-Fluorenes	2/37	0.04	NC	--	--	NC	1/5	0.02	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
C3-Naphthalenes	1/37	0.01	NC	1/11	0.03	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
C3-Phenanthrenes and Anthrancenes	--	--	NC	--	--	NC	1/5	0.02	0.02	--	--	NC	--	--	NC	--	--	NC	--	--	NC
C4-Naphthalenes	--	--	NC	1/11	0.03	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
cis-Nonachlor	1/35	0.02	NC	3/11	0.03	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
trans-Nonachlor	1/35	0.02	NC	10/11	0.04	0.03	1/5	0.01	NC	1/4	0.02	NC	--	--	NC	--	--	NC	--	--	NC
Naphthalene	1/37	0.01	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
PCB-1254	19/35	0.44	0.04	10/11	0.73	0.15	4/5	0.06	0.04	3/4	0.15	0.09	3/4	0.10	0.03	1/1	0.02	0.02	1/1	0.05	0.05
PCB-1260	1/35	0.02	NC	--	0.02	NC	1/5	0.02	NC	--	--	NC	--	--	NC	--	--	NC	--	--	NC
PCB-TOTAL	11/35	0.46	0.04	10/11	0.74	0.17	4/5	0.08	0.04	3/4	0.15	0.09	3/4	0.10	0.04	1/1	0.02	0.02	1/1	0.05	0.05

Source: SWDIV, 1995

[a]Only those chemicals detected in these samples are listed.

[b]N - Number with detectable concentration/number of samples analyzed.

GM - Geometric Mean

Table 2-25

Toxic Substances Monitoring Program Data for Trace Elements and Organic Chemicals in Fish

A. Trace Elements (mg/Kg, wet weight)

Station Name	Species	Tissue	Sample Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
Huntington Harbour/Anaheim Bay	Black Perch	Fillet	6/7/92	NA	NA	NA	NA	NA	0.05	NA	0.18	NA	NA
		Liver	6/7/92	1.00	0.08	<0.02	4.60	0.10	NA	<0.10	NA	<0.02	26.00
	Black Surf Perch	Fillet	6/18/93	0.45	<0.01	NA	NA	NA	0.05	<0.10	0.22	NA	NA
		Liver	6/18/93	NA	NA	0.06	2.40	0.10	NA	NA	NA	<0.02	26.00
Anaheim Bay/Sunset Boatworks	Yellowfin Croaker	Fillet	6/17/95	0.31	<0.01	NA	NA	NA	0.08	<0.10	0.41	NA	NA
		Liver	6/17/95	NA	NA	<0.02	9.20	0.15	NA	NA	NA	0.03	22.00

B. Organics (µg/Kg, wet weight)

Station Name	Species	Tissue	Sample Date	cis-Chlor-dane	cis-Nona-chlor	trans-Nona-chlor	Total Chlor-dane	p,p' DDD	p,p' DDE	p,p' DDT	Total DDT	PCB 1254
Huntington Harbour/Anaheim Bay	Black Perch	Fillet	6/7/92	<5.0	<5.0	5.3	5.3	<10.0	100.0	<10.0	100.0	<50.0
	Black Surf Perch	Fillet	6/18/93	<5.0	<5.0	<5.0	ND	<10.0	61.0	<10.0	61.0	<50.0
Anaheim Bay/Sunset Boatworks	Yellowfin Croaker	Fillet	6/17/95	7.1	7.4	14.0	28.5	21.0	200.0	22.0	243.0	70.0

Notes:

Source: Rasmussen (1995, 1997)

< - Below indicated detection limit

NA - Not Analyzed

ND - Chemical was not detected

Aldrin, alpha-chlordane, gama-chlordane, trans-chlordane, oxychlordane, chlorpyrifos, dachtal, dieldrin, o,p'-DDD, o,p'-DDE, o,p'-DDT, p,p'-DDMU, dicofol, diazinon, endrin, ethion, alpha-HCH, beta-HCH, delta-HCH, gamma-HCH (Lindane), heptachlor, heptachlor epoxide,hexachlorobenzene, methoxychlor, oxadiazon, ethyl parathion, parathion, PCB 1248, PCB 1260, and toxaphene were analyzed for but not detected.

Table 2-26
State Mussel Watch Program Data for Trace Elements, Organic Chemicals, and PAHs in California Mussels

A. Trace Elements (mg/Kg, dry weight)

Station Name	Sample Date	Aluminum	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc
Huntington Harbour/Warner Ave. Bridge													
	2/7/94	1400.0	12.0	10.0	2.5	19.0	13.0	45.0	0.270	2.6	2.8	0.067	480.0
	1/30/95	1600.0	NA	9.4	120.0	21.0	12.0	47.0	0.250	NA	NA	0.110	440.0

B. Organics (µg/Kg, dry weight)

Station Name	Sample Date	alpha-Chlor-dane	cis-Chlor-dane	gamma-Chlor-dane	trans-Chlor-dane	cis-Nona-chlor	trans-Nona-chlor	Oxy-chlor-dane	Total Chlor-dane	Chlor-pyrifos	Dacthal	o,p' DDD	p,p' DDD	o,p' DDE	p,p' DDE
Huntington Harbour/Warner Ave. Bridge															
	2/7/94	2.4	39.0	ND	35.0	23.0	36.0	1.8	137.2	11.0	3.0	14.0	47.0	12.0	333.0
	1/30/95	3.0	36.0	1.9	19.0	38.9	38.9	3.5	141.0	8.8	ND	14.1	43.0	12.8	400.0

(Continued)	o,p' DDT	p,p' DDT	p,p' DDMU	Total DDT	Diel-drin	Hepta-chlor epoxide	Oxa-diazon	PCB 1248	PCB 1254	PCB 1260	Total PCB	Toxa-phene	Tri-butyl-tin
	ND	14.0	16.0	433.0	14.0	ND	12.0	ND	140.0	ND	140.0	ND	1100.0
	16.9	56.5	12.5	556.0	22.2	1.6	5.6	50.6	185.0	19.3	255.0	163.0	NA

C. PAHs (µg/Kg, dry weight)

Station Name	Sample Date	Benz(a) anthracene	Chrysene	Fluor-anthene	Naph-thalene	2-Methyl naph-thalene	Phen-anthrene	Pyrene	Total PAH
Huntington Harbour/Warner Ave. Bridge									
	2/7/94	41.0	40.0	58.0	31.0	19.0	22.0	67.0	278.0

Notes:
Source: Rasmussen, 1996
NA - Not analyzed
ND - Not detected
Aldrin, chlorbenside, diazinon, dichloro-benzophenone, dicofol, endosulfan, endrin, ethion, alpha-HCH, beta-HCH, delta-HCH, gamma-HCH, heptachlor, hexachlorobenzene, methoxychlor, ethyl parathion, methyl anthracene, dibenz(a,h)anthracene, biphenyl, benzo(b)fluoranthene, benzo(k)fluoranthene, fluorene, 1-methyl naphthalene, 2,6-dimethyl naphthalene, 2,3,5-trimethyl naphthalene, acenaphthene, acenaphthylene, benzo(g,h,i) perylene, 1-methyl phenanthrene, benzo(a)pyrene, benzo(e)pyrene, and indeno(1,2,3-cd)pyrene were analyzed for but not detected.

Table 3-1
Chemicals Detected in Sediment/Soil, Surface Water, and Biological Tissues
Bolsa Chica Lowlands

Sediment/Soil	Surface Water[a]	Biological Tissue
Inorganics		
Ammonia as Nitrogen	Arsenic	Arsenic
Antimony	Barium	Barium
Arsenic	Beryllium	Beryllium
Barium	Cadmium	Cadmium
Beryllium	Chromium	Chromium
Cadmium	Cobalt	Cobalt
Chloride	Copper	Copper
Chromium	Lead	Lead
Cobalt	Mercury	Mercury
Copper	Nickel	Nickel
Lead	Selenium	Selenium
Mercury	Silver	Silver
Molybdenum	Sulfate	Thallium
Nickel	Vanadium	Vanadium
Phosphorus, Total as P	Zinc	Zinc
Phosphorus, Total as PO4		
Selenium		
Silver		
Sulfate		
Sulfide		
Sulfide, Dissolved		
Thallium		
Vanadium		
Zinc		
Organics		
1,2-Dichlorobenzene	2,4-D	1,2-Dichloroethene (cis)
1,2-Dichloroethane	2,4-DB	2-Butanone
1,2-Dichloroethene (total)	4,4'-DDT	2-Hexanone
1,3-Dichlorobenzene	4-Nitrophenol	4,4'-DDD
1,4-Dichlorobenzene	BHC-beta	4,4'-DDE
2,4,5-TP (Silvex)	BHC-delta	4,4'-DDT
2,4-D	BHC-gamma	4-Methyl-2-pentanone
2,4-DB	Chlorpyrifos	Acenaphthene
2-Butanone	Diazinon	Acenaphthylene
4,4'-DDD	Dicamba	Acetone
4,4'-DDE	Dieldrin	Aldrin
4,4'-DDT	Endrin	Anthracene
4-Methylphenol	Malathion	Aroclor 1254
4-Nitrophenol	TPH-Diesel	Aroclor 1260
Acenaphthene	Waste oil	Benzene
Acenaphthylene		Benzo(a)anthracene
Acetone		Benzo(a)pyrene
Aldrin		Benzo(b)fluoranthene
Anthracene		Benzo(e)pyrene
Aroclor 1254		Benzo(g,h,i)perylene
Aroclor 1260		Benzo(k)fluoranthene
Benzene		BHC-alpha
Benzo(a)anthracene		BHC-beta
Benzo(a)pyrene		BHC-delta
Benzo(b)fluoranthene		BHC-gamma
Benzo(e)pyrene		Biphenyl

Table 3-1
Chemicals Detected in Sediment/Soil, Surface Water, and Biological Tissues
Bolsa Chica Lowlands

Sediment/Soil	Surface Water[a]	Biological Tissue
Benzo(g,h,i)perylene		Chlordane (technical)
Benzo(k)fluoranthene		Chlordane-alpha
BHC-alpha		Chlordane-gamma
BHC-beta		Chloroform
BHC-delta		Chrysene
BHC-gamma		Dibenz(a,h)anthracene
Bis(2-ethylhexyl)phthalate		Dibenzothiophene
Butylbenzylphthalate		Dieldrin
Carbon disulfide		Endosulfan I
Chlordane (technical)		Endosulfan II
Chlordane-alpha		Endosulfan sulfate
Chlordane-gamma		Endrin
Chlorobenzene		Endrin aldehyde
Chloroform		Endrin ketone
Chrysene		Ethylbenzene
Dalapon		Fluoranthene
Diazinon		Fluorene
Dibenz(a,h)anthracene		Heptachlor
Dieldrin		Indeno(1,2,3-c,d)pyrene
Diethylphthalate		Methylene chloride
Dimethylphthalate		Naphthalene
Di-n-butylphthalate		n-Propylbenzene
Di-n-octylphthalate		PCB 008
Disulfoton		PCB 018
Endosulfan I		PCB 028
Endosulfan II		PCB 044
Endosulfan sulfate		PCB 052
Endrin		PCB 066
Endrin aldehyde		PCB 101
Endrin ketone		PCB 105
Ethylbenzene		PCB 118
Fluoranthene		PCB 126
Fluorene		PCB 128
Indeno(1,2,3-c,d)pyrene		PCB 138
MCPP		PCB 153
Methylene chloride		PCB 170
		PCB 180
Naphthalene		PCB 187
n-Propylbenzene		PCB 195
Oil and Grease		PCB 206
PCB 008		PCB 209
PCB 028		Perylene
PCB 044		Phenanthrene

Table 3-1
Chemicals Detected in Sediment/Soil, Surface Water, and Biological Tissues
Bolsa Chica Lowlands

Sediment/Soil	Surface Water[a]	Biological Tissue
PCB 052		Pyrene
PCB 066		Toluene
PCB 101		Xylene (m,p-)
PCB 105		Xylene (o-)
PCB 118		
PCB 138		
PCB 153		
PCB 170		
PCB 180		
PCB 187		
PCB 206		
Pentachlorophenol		
Phenanthrene		
Phenol		
Pyrene		
Styrene		
Tetrachloroethene		
Toluene		
TPH-Diesel		
Trichloroethene		
Waste oil		
Xylene (total)		
Chemical Group Totals		
High MW PAHs[b]	Total DDT[d]	High MW PAHs[b]
Low MW PAHs[c]		Low MW PAHs[c]
Total DDT[d]		Total DDT[d]
Total PAHs[e]		Total PAHs[e]
Total PCB[f]		Total PCB[f]
Total phenol[g]		
Total phthalate esters[h]		
Total volatile solids		

Notes:

Chemicals listed are those that were detected in soil, sediment, surface water, and biological tissues as reported in the electronic chemical databases for the ERA Random Sampling and Analysis, Focused Sampling and Analysis, and Tetra Tech Phase II Environmental Assessment.

[a]Surface water inorganics were detected in both total and dissolved fractions for all metals listed except for beryllium (dissolved only), and mercury, selenium, and sulfate (total only).

[b]High MW PAHs include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene,benzo(e)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, pyrene

[c]Low MW PAHs include acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene

[d]Total DDT includes 4,4'-DDD, 4,4'-DDE, 4,4'-DDT

[e]Total PAHs include anthracene, acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(e)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene

[f]Total PCB includes Aroclor-1242, Aroclor-1254, Aroclor-1260

[g]Total phenol includes pentachlorophenol

[h]Total phthalate esters includes bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, diethylphthalate, dimethylphthalate, di-n-butylphthalate, di-n-octylphthalate

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	Arsenic	mg/kg	24	33	3.4788	2.107	4.198	1.1	3.1	5	11
Bolsa Bay	Barium	mg/kg	63	63	84.2127	172.868	126.9	14.8	45	120	1200
Bolsa Bay	Beryllium	mg/kg	50	63	0.4576	0.22771	0.5139	0.14	0.43	0.7	1.2
Bolsa Bay	Cadmium	mg/kg	33	63	0.37159	0.32315	0.45138	0.05	0.29	0.65	1.3
Bolsa Bay	Chromium	mg/kg	63	63	19.9873	10.9934	22.702	7.3	17	33	67
Bolsa Bay	Cobalt	mg/kg	63	63	5.346	2.9481	6.074	1.8	4.5	8.6	15
Bolsa Bay	Copper	mg/kg	63	63	16.3365	14.5823	19.9374	3.2	11	35	83
Bolsa Bay	Lead	mg/kg	63	63	29.84	27.73	36.69	1.6	21	70	110
Bolsa Bay	Mercury	mg/kg	10	31	0.069	0.05	0.09	0.01	0.051	0.13	0.14
Bolsa Bay	Nickel	mg/kg	63	63	13.8	19.1	18.52	3.9	9	21	140
Bolsa Bay	Selenium	mg/kg	7	33	0.92	1.23	1.34	0.05	0.3	3.1	3.2
Bolsa Bay	Silver	mg/kg	11	63	0.1956	0.23492	0.2536	0.05	0.05	0.65	0.7
Bolsa Bay	Sulfate	mg/kg	6	6	2583.33	541.91	3016.95	1900	2650	3200	3200
Bolsa Bay	Sulfide	mg/kg	6	6	478.33	312.76	728.59	260	350	1100	1100
Bolsa Bay	Sulfide , Dissolved	mg/kg	1	6	0.13	0.19	0.28	0.05	0.05	0.52	0.52
Bolsa Bay	Thallium	mg/kg	42	63	0.33	0.23	0.39	0.05	0.25	0.65	1
Bolsa Bay	Vanadium	mg/kg	63	63	42.646	19.682	47.506	13.3	38	67	110
Bolsa Bay	Zinc	mg/kg	56	63	59.521	45.455	70.745	12	40.7	130	230
Bolsa Bay	Ammonia as Nitrogen	mg/kg	6	6	40.83	20.27	57.05	22	33	75	75
Bolsa Bay	Percent Solids	percent	6	6	99.83	0.41	100.16	99	100	100	100
Bolsa Bay	pH	units	19	19	8.09	0.94	8.51	5.8	8.4	9.1	9.1
Bolsa Bay	Specific Conductance	umhos	6	6	10850	3375.06	13550.61	7100	10900	15000	15000
Bolsa Bay	Total organic carbon	percent	6	6	0.7	0.21	0.87	0.45	0.71	0.93	0.93
Bolsa Bay	4,4'-DDD	mg/kg	8	50	0.00189	0.005347	0.00337	0.00019	0.00039	0.0047	0.035
Bolsa Bay	4,4'-DDE	mg/kg	36	50	0.00709	0.010449	0.00998	0.00029	0.0033	0.02	0.055
Bolsa Bay	4,4'-DDT	mg/kg	5	50	0.00061	0.000871	0.00085	0.00019	0.00038	0.00094	0.0059
Bolsa Bay	Anthracene	mg/kg	2	34	0.0066	0.004	0.008	0.0038	0.0055	0.009	0.02
Bolsa Bay	Benzo(a)anthracene	mg/kg	9	34	0.0131	0.0138	0.0177	0.0038	0.0058	0.04	0.051
Bolsa Bay	Benzo(a)pyrene	mg/kg	15	34	0.0163	0.01576	0.0216	0.0038	0.0083	0.04	0.059
Bolsa Bay	Benzo(b)fluoranthene	mg/kg	14	34	0.018	0.01902	0.0244	0.0038	0.0075	0.047	0.072
Bolsa Bay	Benzo(e)pyrene	mg/kg	14	34	0.0162	0.01573	0.0215	0.0038	0.0075	0.043	0.053
Bolsa Bay	Benzo(g,h,i)perylene	mg/kg	16	34	0.01905	0.01978	0.0257	0.0038	0.0091	0.047	0.069
Bolsa Bay	Benzo(k)fluoranthene	mg/kg	15	34	0.01715	0.01783	0.02314	0.0038	0.00825	0.044	0.07
Bolsa Bay	BHC-alpha	mg/kg	5	24	0.00072	0.001561	0.00135	0.00019	0.00033	0.00068	0.008
Bolsa Bay	BHC-beta	mg/kg	6	24	0.00209	0.005154	0.00415	0.00026	0.00035	0.0036	0.025
Bolsa Bay	BHC-gamma	mg/kg	1	24	0.00037	0.000217	0.00046	0.00019	0.0003	0.00065	0.001
Bolsa Bay	Bis(2-ethylhexyl)phthalate	mg/kg	29	41	0.2622	0.39709	0.3837	0.008	0.065	1	1.4
Bolsa Bay	Butylbenzylphthalate	mg/kg	20	41	0.0332	0.04657	0.0475	0.0038	0.01	0.1	0.17
Bolsa Bay	Chlordane-alpha	mg/kg	1	24	0.00555	0.01046	0.00974	0.0019	0.00298	0.0065	0.054
Bolsa Bay	Chlordane-gamma	mg/kg	1	24	0.00472	0.00647	0.00731	0.0019	0.00298	0.0065	0.034
Bolsa Bay	Chlordane-technical	mg/kg	1	24	0.01414	0.0524	0.0351	0.0019	0.00298	0.0065	0.26
Bolsa Bay	Chrysene	mg/kg	16	34	0.0225	0.0278	0.0318	0.0041	0.0093	0.067	0.12
Bolsa Bay	Dibenz(a,h)anthracene	mg/kg	1	34	0.0063	0.0021	0.007	0.0038	0.0055	0.0095	0.011
Bolsa Bay	Dieldrin	mg/kg	1	24	0.00039	0.000292	0.00051	0.00019	0.0003	0.00065	0.0015
Bolsa Bay	Diethylphthalate	mg/kg	4	41	0.01198	0.010973	0.01534	0.0038	0.009	0.0195	0.066
Bolsa Bay	Dimethylphthalate	mg/kg	2	41	0.0065	0.002637	0.00731	0.0038	0.006	0.009	0.017
Bolsa Bay	Di-n-butylphthalate	mg/kg	2	41	0.01865	0.02983	0.02778	0.0039	0.0075	0.0285	0.14
Bolsa Bay	Di-n-octylphthalate	mg/kg	16	41	0.05089	0.1446	0.09515	0.00405	0.0065	0.079	0.72
Bolsa Bay	Endosulfan II	mg/kg	1	24	0.00038	0.00031	0.00051	0.00019	0.00029	0.00065	0.0016
Bolsa Bay	Fluoranthene	mg/kg	17	34	0.029	0.04	0.04	0.0038	0.012	0.08	0.21
Bolsa Bay	Indeno(1,2,3-c,d)pyrene	mg/kg	13	34	0.02	0.02	0.02	0.0038	0.008	0.04	0.07
Bolsa Bay	Oil and Grease	mg/kg	31	36	643.611	1554.37	1151.37	50	245	1000	8600
Bolsa Bay	Aroclor 1254	mg/kg	2	24	0.014854	0.00724	0.01775	0.0085	0.012	0.023	0.0405
Bolsa Bay	Phenanthrene	mg/kg	9	34	0.01	0.01	0.02	0	0.01	0.03	0.05
Bolsa Bay	Phenol	mg/kg	1	6	0.06	0.03	0.08	0.04	0.05	0.12	0.12
Bolsa Bay	Pyrene	mg/kg	18	34	0.03	0.05	0.05	0	0.01	0.1	0.21
Bolsa Bay	TPH-Diesel	mg/kg	7	63	58.802	231.236	115.902	5.5	12	62	1800
Bolsa Bay	Waste Oil	mg/kg	43	63	305.6	1240.43	611.91	12	69	330	9600
Bolsa Bay	High MW PAHs	mg/kg	19	34	0.169	0.25	0.25	0	0.025	0.59	0.92
Bolsa Bay	Low MW PAHs	mg/kg	9	34	0.01	0.02	0.01	0	0	0.04	0.05
Bolsa Bay	Total DDT	mg/kg	36	50	0.01	0.02	0.01	0	0	0.03	0.09
Bolsa Bay	Total PAHs	mg/kg	19	34	0.18	0.26	0.27	0	0.03	0.62	0.97
Bolsa Bay	Total PAHs (lab)	mg/kg	15	28	0.159	0.252	0.252	0.0041	0.012	0.52	0.97
Bolsa Bay	Total PCB	mg/kg	2	24	0.002	0.006	0.004	0	0	0	0.02

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	Total Phenol	mg/kg	1	6	0.02	0.049	0.059	0	0	0.12	0.12
Bolsa Bay	Total Phthalate Esters	mg/kg	35	41	0.326	0.494	0.477	0	0.063	1.138	1.68
Bolsa Bay	Total Phthalate Esters (lab)	mg/kg	27	35	0.27	0.384	0.397	0.014	0.065	1	1.2
Bolsa Bay	Total volatile solids	percent	6	6	4.383	1.074	5.243	2.9	4.2	5.7	5.7
Full Tidal	Antimony	mg/kg	18	81	2.8	6.4	4.19	0	0	13.7	24.7
Full Tidal	Arsenic	mg/kg	314	394	11.4895	35.3422	14.9793	0	3.35	11	207
Full Tidal	Barium	mg/kg	408	408	270.891	1011.73	369.064	0.048	46	365	11400
Full Tidal	Beryllium	mg/kg	236	408	0.678	0.9196	0.768	0	0.58	0.85	5.69
Full Tidal	Cadmium	mg/kg	103	408	0.49519	0.87212	0.57982	0	0.305	0.7	5.35
Full Tidal	Chromium	mg/kg	402	408	19.697	16.761	21.3234	0	16	36.1	244
Full Tidal	Cobalt	mg/kg	401	408	6.81	9.34	7.71	0	4.6	9.4	56.4
Full Tidal	Copper	mg/kg	408	408	12.6319	14.2129	14.0111	0.0043	8.8	23.5	163
Full Tidal	Lead	mg/kg	360	408	16.0551	23.3328	18.3192	0	5.75	43.9	197
Full Tidal	Mercury	mg/kg	139	389	0.1174	0.2205	0.1393	0	0.085	0.19	3.4
Full Tidal	Molybdenum	mg/kg	78	81	18.0637	36.0323	25.9107	0	1.16	94.4	101
Full Tidal	Nickel	mg/kg	403	408	15.4	18.4	17.19	0	9.6	27.9	160
Full Tidal	Selenium	mg/kg	98	400	7.65	33.52	10.93	0	0.5	3.35	190
Full Tidal	Silver	mg/kg	44	408	0.447	0.8906	0.5335	0	0.05	0.7	5.1
Full Tidal	Sulfate	mg/kg	50	50	2789.78	3065.04	3639.37	27.2	1800	6600	17000
Full Tidal	Sulfide	mg/kg	30	50	19.21	60.93	36.1	0.03	0.27	51.5	350
Full Tidal	Thallium	mg/kg	185	411	6.83	34.36	10.16	0	0.32	0.7	197
Full Tidal	Vanadium	mg/kg	398	405	35.589	20.8592	37.62	0	30.9	67.5	120
Full Tidal	Zinc	mg/kg	363	408	45.632	33.0662	48.84	0	36.2	89	230
Full Tidal	Ammonia as Nitrogen	mg/kg	9	50	9.95	17.48	14.8	2.5	5	24.5	110
Full Tidal	Chloride	mg/kg	4	4	6525.5	11318.27	17617.4	572	1015	23500	23500
Full Tidal	Chloripyrifos	mg/kg	2	8	0.1256	0.2328	0.287	0	0	0.521	0.521
Full Tidal	Phosporus (total as PO4)	mg/kg	2	2	1.02	0.5374	1.7648	0.64	1.02	1.4	1.4
Full Tidal	Percent Solids	percent	5	5	76.2	15.8177	90.0648	60	76	100	100
Full Tidal	Percent water	percent	76	76	16.83	18.37	20.96	0.5	8.55	45	70
Full Tidal	pH	units	157	157	7.4796	1.3125	7.6849	4.1	8.1	8.6	9.2
Full Tidal	Specific Conductance	umhos	50	50	2516.88	3568.15	3505.92	2.7	11.5	9500	11000
Full Tidal	Total organic carbon	percent	75	79	160.83	634.56	300.77	0.02	0.32	9.83	3410
Full Tidal	1,1-Dichloroethene	mg/kg	4	49	0.004	0.012	0.007	0	0	0	0.05
Full Tidal	1,2-Dichlorobenzene	mg/kg	1	67	0.0013	0.00265	0.0019	0	0	0.003	0.019
Full Tidal	1,2-Dichloroethene (trans)	mg/kg	1	67	0.0013	0.00265	0.0019	0	0	0.003	0.019
Full Tidal	1,4-Dichlorobenzene	mg/kg	1	67	0.0013	0.00265	0.0019	0	0	0.003	0.019
Full Tidal	2,4,5-T	mg/kg	2	11	0.0026	0.00592	0.0061	0	0	0.0121	0.0167
Full Tidal	2,4,5-TP (silvex)	mg/kg	3	11	0.002	0.00425	0.0045	0	0	0.0087	0.0121
Full Tidal	2,4-D	mg/kg	2	11	0.0127	0.02859	0.0296	0	0	0.0611	0.0789
Full Tidal	2,4-DB	mg/kg	3	11	0.0063	0.01537	0.0154	0	0	0.02	0.049
Full Tidal	2-Butanone	mg/kg	1	67	0.0161	0.04886	0.0278	0	0	0.0325	0.39
Full Tidal	4,4'-DDD	mg/kg	56	217	0.00288	0.00997	0.00421	0	0.00032	0.0052	0.077
Full Tidal	4,4'-DDE	mg/kg	65	217	0.00157	0.0047	0.0022	0	0.00033	0.0032	0.045
Full Tidal	4,4'-DDT	mg/kg	58	225	0.00324	0.00898	0.00441	0	0.00032	0.0081	0.059
Full Tidal	4-Nitrophenol	mg/kg	4	50	0.0653	0.13597	0.103	0.0153	0.0313	0.0625	0.67
Full Tidal	Acenaphthene	mg/kg	9	226	0.0427	0.24487	0.0746	0	0.0048	0.0185	2.62
Full Tidal	Acetone	mg/kg	15	67	0.0367	0.1487	0.0724	0	0.0031	0.039	1.2
Full Tidal	Aldrin	mg/kg	6	220	0.0009	0.0044	0.0014	0	0.0003	0.0006	0.037
Full Tidal	Anthracene	mg/kg	3	246	0.033	0.0772	0.0427	0	0.0048	0.13	0.365
Full Tidal	Benzene	mg/kg	5	71	0.016	0.1022	0.04	0	0	0.004	0.86
Full Tidal	Benzo(a)anthracene	mg/kg	14	246	0.035	0.08	0.045	0	0.0049	0.135	0.37
Full Tidal	Benzo(a)pyrene	mg/kg	9	250	0.035	0.08	0.045	0	0.0049	0.135	0.37
Full Tidal	Benzo(b)fluoranthene	mg/kg	13	246	0.037	0.08	0.047	0	0.005	0.135	0.37
Full Tidal	Benzo(e)pyrene	mg/kg	8	199	0.043	0.0846	0.055	0.0023	0.005	0.245	0.365
Full Tidal	Benzo(g,h,i)perylene	mg/kg	4	246	0.042	0.0923	0.054	0	0.005	0.21	0.75
Full Tidal	Benzo(k)fluoranthene	mg/kg	5	246	0.0346	0.07806	0.04435	0	0.0048	0.135	0.365
Full Tidal	BHC-alpha	mg/kg	7	213	0.000366	0.00117775	0.0005237	0	0.00029	0.0006	0.017
Full Tidal	BHC-beta	mg/kg	22	213	0.001	0.0012	0.001	0	0	0.001	0.01
Full Tidal	BHC-delta	mg/kg	2	213	0.00028	0.00027	0.00031	0	0.00027	0.00055	0.0019
Full Tidal	BHC-gamma	mg/kg	7	219	0.00099	0.00478	0.00162	0	0.00029	0.0006	0.035
Full Tidal	Bis(2-ethylhexyl)phthalate	mg/kg	64	184	0.073	0.1173	0.09	0.0039	0.028	0.23	0.88
Full Tidal	Butylbenzylphthalate	mg/kg	12	184	0.034	0.07	0.044	0.0023	0.005	0.125	0.37
Full Tidal	Carbon Disulfide	mg/kg	9	67	0.002631	0.00778349	0.0044951	0	0	0.0035	0.058
Full Tidal	Chlordane-alpha	mg/kg	1	212	0.002722	0.0025578	0.0030667	0	0.002775	0.0055	0.019

TABLE 3-2
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Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Full Tidal	Chlordane-technical	mg/kg	1	168	0.003513	0.00283265	0.0039411	0.00075	0.00315	0.006	0.023
Full Tidal	Chlorobenzene	mg/kg	5	71	0.00398	0.01099	0.00654	0	0	0.004	0.0486
Full Tidal	Chloroform	mg/kg	1	45	0.000015	0.00009988	0.00004	0	0	0	0.00067
Full Tidal	Chrysene	mg/kg	32	246	0.0424	0.1015	0.0551	0	0.005	0.225	0.96
Full Tidal	Diazinon	mg/kg	3	8	0.12918	0.23908	0.29486	0	0	0.523	0.523
Full Tidal	Dibenz(a,h)anthracene	mg/kg	1	246	0.0427	0.0933	0.0544	0	0.0055	0.225	0.75
Full Tidal	Dieldrin	mg/kg	14	221	0.00095	0.00404	0.00149	0	0.0003	0.00088	0.0327
Full Tidal	Diesel fuel #2	mg/kg	6	86	12.5	56.33	24.41	0	0	0	270
Full Tidal	Diethylphthalate	mg/kg	31	184	0.03607	0.07184	0.04645	0.00325	0.0095	0.125	0.365
Full Tidal	Dimethylphthalate	mg/kg	4	184	0.03221	0.07317	0.04278	0.00228	0.005	0.125	0.365
Full Tidal	Di-n-butylphthalate	mg/kg	38	184	0.05096	0.08336	0.06301	0.00325	0.013	0.18	0.4
Full Tidal	Di-n-octylphthalate	mg/kg	38	184	0.06588	0.1332	0.08512	0.00228	0.00525	0.255	0.81
Full Tidal	Dinoseb	mg/kg	2	11	0.00484	0.01082	0.01123	0	0	0.0241	0.0291
Full Tidal	Disulfoton	mg/kg	1	6	0.00005	0.00013	0.00016	0	0	0.00032	0.00032
Full Tidal	Endosulfan I	mg/kg	2	212	0.00138	0.0018	0.00163	0	0.00115	0.0028	0.012
Full Tidal	Endosulfan II	mg/kg	1	212	0.000354	0.00051677	0.0004239	0	0.000285	0.00065	0.0043
Full Tidal	Endrin	mg/kg	15	221	0.00122	0.00519	0.0019	0	0.0003	0.00105	0.0397
Full Tidal	Endrin aldehyde	mg/kg	4	214	0.00037	0.00051	0.00044	0	0.00029	0.0007	0.00305
Full Tidal	Endrin ketone	mg/kg	4	168	0.00065	0.00293	0.00109	0.00008	0.00032	0.0008	0.038
Full Tidal	Ethylbenzene	mg/kg	3	67	0.06176	0.45346	0.17034	0	0	0.003	3.7
Full Tidal	Fluoranthene	mg/kg	19	246	0.04	0.08	0.05	0	0.0049	0.14	0.37
Full Tidal	Fluorene	mg/kg	16	250	0.05	0.13	0.06	0	0.0048	0.23	1.4
Full Tidal	Heptachlor	mg/kg	6	52	0.0024	0.0082	0.0046	0	0	0.0008	0.033
Full Tidal	Indeno(1,2,3-c,d)pyrene	mg/kg	8	250	0.0461	0.1039	0.059	0	0.0055	0.2425	1
Full Tidal	Methylene Chloride	mg/kg	7	67	0.0015	0.0026	0.0021	0	0	0.003	0.019
Full Tidal	Mevinphos	mg/kg	2	8	0.1346	0.2495	0.3075	0	0	0.556	0.556
Full Tidal	Naphthalene	mg/kg	10	250	0.07	0.27	0.1	0	0	0.22	2.52
Full Tidal	n-Propylbenzene	mg/kg	1	22	0.07	0.3	0.19	0.003	0	0	1.4
Full Tidal	Oil and Grease	mg/kg	79	166	1732.02	4878.91	2474.22	25	50	4700	47000
Full Tidal	Aroclor 1254	mg/kg	9	220	0.011574	0.013803	0.013398	0	0 0.0110	0.02375	0.14
Full Tidal	Aroclor 1260	mg/kg	1	212	0.010835	0.010226	0.012212	0	0 0.0110	0.0225	0.075
Full Tidal	Pentachlorophenol	mg/kg	1	50	0.0427	0.0722	0.0627	0.0153	0.0313	0.039	0.48
Full Tidal	Phenanthrene	mg/kg	25	246	0.0586	0.2098	0.0848	0	0.005	0.24	2.4
Full Tidal	Phorate (thimet)	mg/kg	2	8	0.1268	0.2348	0.2894	0	0	0.517	0.517
Full Tidal	Phosphorus (Total as P)	mg/kg	2	2	0.33	0.17	0.57	0.21	0.33	0.45	0.45
Full Tidal	Pyrene	mg/kg	33	252	0.07	0.25	0.1	0	0	0.25	2.91
Full Tidal	Trichloroethene	mg/kg	4	71	0.003738	0.01047842	0.0061754	0	0	0.0035	0.0468
Full Tidal	Tetrachlorvinphos	mg/kg	2	8	0.12	0.22	0.28	0	0	0.49	0.49
Full Tidal	Total dissolved solids	mg/kg	2	2	14160	18158.5	39326.4	1320	14160	27000	27000
Full Tidal	Toluene	mg/kg	18	71	0.01	0.02	0.01	0	0	0	0.17
Full Tidal	TPH-Diesel	mg/kg	34	326	218.29	1097.08	337.38	1.55	6.5	300	12000
Full Tidal	Waste Oil	mg/kg	146	317	813.53	3010.59	1144.95	3	13.5	1800	41000
Full Tidal	Xylene (total)	mg/kg	4	67	0.079	0.611	0.226	0	0	0.003	5
Full Tidal	High MW PAHs	mg/kg	45	186	0.0498	0.2436	0.0848	0	0	0.073	2.42
Full Tidal	Low MW PAHs	mg/kg	21	186	0.0657	0.4802	0.1347	0	0	0.012	4.76
Full Tidal	Total DDT	mg/kg	83	160	0.01	0.02	0.01	0	0	0.02	0.15
Full Tidal	Total PAHs	mg/kg	50	186	0.12	0.63	0.21	0	0	0.1	6.56
Full Tidal	Total PAHs (lab)	mg/kg	35	111	0.12	0.68	0.25	0	0.01	0.1	6.6
Full Tidal	Total PCB	mg/kg	8	155	0.002181	0.01270263	0.0041804	0	0	0	0.14
Full Tidal	Total PCB's (lab)	mg/kg	3	118	0.02	0.02	0.02	0.01	0.01	0.03	0.14
Full Tidal	Total Phenol	mg/kg	1	37	0.01	0.08	0.04	0	0	0	0.48
Full Tidal	Total Phthalate Esters	mg/kg	96	171	0.09	0.24	0.12	0	0.01	0.22	1.9
Full Tidal	Total Phthalate Esters (lab)	mg/kg	96	104	0.16	0.29	0.21	0.01	0.07	0.32	1.9
Full Tidal	Total volatile solids	percent	50	50	3.631	5.2672	5.091	0.74	1.85	7.35	26
Future Full Tidal	Antimony	mg/kg	21	117	2.02	5.26	2.97	0	0	11.2	22.5
Future Full Tidal	Arsenic	mg/kg	382	470	24.243	60.08	29.675	0.014	5.3	50.65	700
Future Full Tidal	Barium	mg/kg	492	498	375.272	2571.9	601.161	0.071	74.05	596	56000
Future Full Tidal	Beryllium	mg/kg	303	498	1.976	26.4196	4.2964	0	0.65	1.1	590
Future Full Tidal	Cadmium	mg/kg	199	498	0.97	8.55	1.72	0	0.39	0.78	190
Future Full Tidal	Chromium	mg/kg	493	499	47.6148	447.166	86.8499	0	23	46	10000
Future Full Tidal	Cobalt	mg/kg	489	498	16.21	174.63	31.55	0	6.3	13.6	3900
Future Full Tidal	Copper	mg/kg	498	498	33.3472	308.875	60.4757	0.0079	14.4	37.4	6900
Future Full Tidal	Lead	mg/kg	447	502	63.4298	759.004	129.827	0	15	70.6	17000
Future Full Tidal	Mercury	mg/kg	239	452	1.17	11.19	2.2	0	0.13	0.6	190

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Future Full Tidal	Molybdenum	mg/kg	114	117	15.08	32.62	20.99	0	1.4	93.8	102
Future Full Tidal	Nickel	mg/kg	495	498	47.42	582.23	98.55	0	14.15	46.4	13000
Future Full Tidal	Selenium	mg/kg	161	453	7.54	33.11	10.59	0	0.6	3.55	192
Future Full Tidal	Silver	mg/kg	63	499	0.5817	3.1537	0.8585	0	0.05	0.75	68
Future Full Tidal	Sulfate	mg/kg	66	67	5940.52	5849.48	7341.19	130	3400	16300	20900
Future Full Tidal	Sulfide	mg/kg	28	51	72.32	246.29	139.92	0.05	0.18	120	1400
Future Full Tidal	Sulfide, Dissolved	mg/kg	9	51	0.06	0.03	0.07	0.05	0.05	0.11	0.18
Future Full Tidal	Thallium	mg/kg	215	498	6.85	33.56	9.8	0	0.35	1.94	200
Future Full Tidal	Vanadium	mg/kg	493	497	97.304	1164.51	199.685	0	41	79	26000
Future Full Tidal	Zinc	mg/kg	476	498	169.35	1667.6	315.815	0	59.65	154	37000
Future Full Tidal	Ammonia as Nitrogen	mg/kg	17	51	17.16	24.18	23.79	5	5	53	110
Future Full Tidal	Chloride	mg/kg	16	16	24635	24618.99	36698.3	8360	16250	37400	112000
Future Full Tidal	Nitrate as N	mg/kg	4	14	2212.86	3645.11	4122.28	0	0	7530	8740
Future Full Tidal	Nitrate as N	mg/kg	4	14	2247.14	3701.49	4186.1	0	0	7650	8870
Future Full Tidal	Phosporus (total as PO4)	mg/kg	10	10	495.54	1561.63	1463.44	0.1	1.04	2473.4	4940
Future Full Tidal	Percent Solids	percent	10	10	94.5	17.04	105.06	46	100	100	100
Future Full Tidal	Percent water	percent	123	123	17.23	17.07	20.24	0.3	9	43	65
Future Full Tidal	pH	units	144	144	7.8382	0.929	7.99	4.7	8	8.8	10
Future Full Tidal	Specific Conductance	umhos	48	50	3756.71	5500.38	5281.34	1	2150	10100	29000
Future Full Tidal	Total organic carbon	percent	90	98	841.32	2110.51	1259.18	0.13	1.1	3280	11000
Future Full Tidal	1,1-Dichloroethene	mg/kg	8	78	0.005	0.0146	0.008	0	0	0.042	0.055
Future Full Tidal	2,4-D	mg/kg	2	9	0.0002	0.0003	0.0004	0	0	0.001	0.001
Future Full Tidal	2-Butanone	mg/kg	5	104	0.0118	0.0162	0.0149	0	0	0.034	0.044
Future Full Tidal	4,4'-DDD	mg/kg	144	235	0.0146	0.033	0.0188	0	0.0028	0.035	0.26
Future Full Tidal	4,4'-DDE	mg/kg	146	235	0.0121	0.0363	0.0167	0	0.0021	0.025	0.34
Future Full Tidal	4,4'-DDT	mg/kg	69	239	0.003	0.0087	0.0041	0	0.00039	0.007	0.088
Future Full Tidal	4-Methylphenol	mg/kg	1	51	0.5203	1.1747	0.8427	0.026	0.0375	2	4.7
Future Full Tidal	4-Nitrophenol	mg/kg	5	51	0.7545	2.0703	1.3227	0.026	0.04	2	13
Future Full Tidal	Acenaphthene	mg/kg	20	256	0.0857	0.2924	0.1216	0	0.0055	0.255	2.94
Future Full Tidal	Acenaphthylene	mg/kg	2	253	0.073	0.49	0.133	0	0.006	0.2	7.7
Future Full Tidal	Acetone	mg/kg	26	104	0.0198	0.0293	0.0254	0	0.0068	0.0385	0.18
Future Full Tidal	Aldrin	mg/kg	6	220	0.001	0	0.001	0	0	0.001	0.03
Future Full Tidal	Anthracene	mg/kg	13	286	0.069	0.12	0.083	0	0.006	0.265	0.7
Future Full Tidal	Benzene	mg/kg	12	112	0.0053	0.0145	0.008	0	0	0.004	0.083
Future Full Tidal	Benzo(a)anthracene	mg/kg	24	286	0.068	0.12	0.082	0	0.006	0.265	0.7
Future Full Tidal	Benzo(a)pyrene	mg/kg	26	288	0.0728	0.123	0.087	0	0.006	0.265	0.7
Future Full Tidal	Benzo(b)fluoranthene	mg/kg	35	287	0.0901	0.1695	0.1097	0	0.007	0.275	1.5
Future Full Tidal	Benzo(e)pyrene	mg/kg	18	188	0.0865	0.1307	0.1052	0.0039	0.009	0.27	0.7
Future Full Tidal	Benzo(g,h,i)perylene	mg/kg	11	286	0.0843	0.1632	0.1032	0	0.007	0.265	1.35
Future Full Tidal	Benzo(k)fluoranthene	mg/kg	17	286	0.06844	0.1197	0.08232	0	0.00595	0.265	0.7
Future Full Tidal	BHC-alpha	mg/kg	14	215	0.00067	0.00216	0.00096	0	0.00033	0.00075	0.028
Future Full Tidal	BHC-beta	mg/kg	21	216	0.00119	0.00888	0.00237	0	0.00033	0.00085	0.13
Future Full Tidal	BHC-delta	mg/kg	9	215	0.00083	0.00333	0.00128	0	0.00032	0.0007	0.042
Future Full Tidal	BHC-gamma	mg/kg	10	220	0.00088	0.00336	0.00133	0	0.00032	0.0007	0.0304
Future Full Tidal	Bis(2-ethylhexyl)phthalate	mg/kg	40	190	0.1877	0.378	0.2414	0.0043	0.07	0.3875	3.7
Future Full Tidal	Butylbenzylphthalate	mg/kg	27	190	0.1309	0.4307	0.1922	0.0039	0.009	0.2825	5.3
Future Full Tidal	Carbon Disulfide	mg/kg	14	104	0.001822	0.00363972	0.0025217	0	0	0.0035	0.027
Future Full Tidal	Chlordane-alpha	mg/kg	4	216	0.01	0.04	0.01	0	0	0.01	0.52
Future Full Tidal	Chlordane-gamma	mg/kg	4	216	0.01	0.02	0.01	0	0	0.01	0.28
Future Full Tidal	Chlordane-technical	mg/kg	5	178	0.04	0.34	0.09	0	0	0.01	3.8
Future Full Tidal	Chlorobenzene	mg/kg	11	112	0.00456	0.01259	0.00689	0	0	0.004	0.0594
Future Full Tidal	Chrysene	mg/kg	87	286	0.1391	0.394	0.1848	0	0.013	0.3	5.6
Future Full Tidal	Diazinon	mg/kg	3	13	0.0501	0.1803	0.1481	0	0	0.0004	0.65
Future Full Tidal	Dibenz(a,h)anthracene	mg/kg	6	286	0.0792	0.156	0.0972	0	0.0075	0.265	1.35
Future Full Tidal	Dieldrin	mg/kg	34	220	0.0019	0.0049	0.0025	0	0.00035	0.0037	0.041
Future Full Tidal	Diesel fuel #2	mg/kg	4	143	3.71	30.59	8.72	0	0	0	265
Future Full Tidal	Diethylphthalate	mg/kg	26	190	0.0775	0.1395	0.0973	0.00385	0.016	0.265	1
Future Full Tidal	Dimethylphthalate	mg/kg	3	190	0.0693	0.1251	0.0871	0.00385	0.0065	0.265	0.7
Future Full Tidal	Di-n-butylphthalate	mg/kg	46	190	0.1659	0.5088	0.2382	0.0041	0.0435	0.3225	6.7
Future Full Tidal	Di-n-octylphthalate	mg/kg	53	190	0.1496	0.3401	0.198	0.00385	0.0265	0.3025	3.2
Future Full Tidal	Endosulfan I	mg/kg	3	214	0.003162	0.00608	0.00398	0	0.001325	0.007	0.055
Future Full Tidal	Endosulfan II	mg/kg	1	216	0.000799	0.0015	0.001	0	0.000328	0.0022	0.0135
Future Full Tidal	Endrin	mg/kg	22	219	0.001922	0.00548	0.00265	0	0.000335	0.00405	0.0365
Future Full Tidal	Endrin aldehyde	mg/kg	13	218	0.001559	0.00504	0.00223	0	0.000343	0.00295	0.05

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Future Full Tidal	Endrin ketone	mg/kg	10	178	0.001581	0.00475	0.00228	0.00013	0.00039	0.00295	0.054
Future Full Tidal	Ethylbenzene	mg/kg	3	104	0.0016	0.0048	0.0025	0	0	0.0035	0.047
Future Full Tidal	Fluoranthene	mg/kg	50	286	0.07	0.12	0.09	0	0.01	0.27	0.6
Future Full Tidal	Fluorene	mg/kg	28	287	0.11	0.32	0.15	0	0.01	0.28	3.8
Future Full Tidal	Gasoline	mg/kg	4	22	0.57	1.53	1.21	0	0	1.08	5.23
Future Full Tidal	Heptachlor	mg/kg	2	42	0.001579	0.00714517	0.0037395	0	0	0	0.0332
Future Full Tidal	Indeno(1,2,3-c,d)pyrene	mg/kg	7	288	0.08	0.16	0.1	0	0.01	0.27	1.35
Future Full Tidal	Methylene Chloride	mg/kg	11	104	0.001579	0.00714517	0.0037395	0	0	0	0.0332
Future Full Tidal	Naphthalene	mg/kg	23	288	0.14	0.53	0.2	0	0.01	0.28	5.7
Future Full Tidal	Oil and Grease	mg/kg	139	164	9117.62	31542.48	13945.21	50	1600	28000	370000
Future Full Tidal	PCB 008	mg/kg	1	51	0.02	0.06	0.03	0.005	0.01	0.01	0.41
Future Full Tidal	PCB 028	mg/kg	2	51	0.009324	0.008412	0.011632	0.005	0 0.0070	0.014	0.064
Future Full Tidal	PCB 044	mg/kg	2	51	0.008873	0.004348	0.010066	0.005	0 0.0075	0.0145	0.027
Future Full Tidal	PCB 052	mg/kg	2	51	0.009402	0.006498	0.011185	0.005	0 0.0075	0.0145	0.042
Future Full Tidal	PCB 066	mg/kg	2	51	0.00899	0.004771	0.0103	0.005	0 0.0075	0.0145	0.03
Future Full Tidal	PCB 101	mg/kg	2	51	0.009206	0.005638	0.010753	0.005	0 0.0075	0.0145	0.036
Future Full Tidal	PCB 105	mg/kg	2	51	0.00427	0.00168	0.00473	0.0026	0.00365	0.007	0.0095
Future Full Tidal	PCB 118	mg/kg	1	51	0.00424	0.0019	0.00476	0.0026	0.0036	0.007	0.012
Future Full Tidal	Aroclor 1254	mg/kg	18	218	0.0234	0.04885	0.02989	0	0.0135	0.0295	0.39
Future Full Tidal	Aroclor 1260	mg/kg	8	216	0.01621	0.02166	0.0191	0	0.01275	0.027	0.16
Future Full Tidal	PCB 138	mg/kg	1	51	0.0044	0.00271	0.00514	0.0026	0.0036	0.007	0.02
Future Full Tidal	PCB 153	mg/kg	3	51	0.00478	0.00304	0.00562	0.0026	0.00365	0.0075	0.018
Future Full Tidal	PCB 180	mg/kg	1	51	0.00214	0.00105	0.00243	0.0013	0.0018	0.00355	0.0071
Future Full Tidal	Pentachlorophenol	mg/kg	2	51	0.5337	1.181	0.858	0.026	0.038	2	4.7
Future Full Tidal	Phenanthrene	mg/kg	68	286	0.2152	0.812	0.309	0	0.008	0.29	9
Future Full Tidal	Phosphorus (Total as P)	mg/kg	12	12	134.9	464.54	397.74	0.03	0.47	2.2	1610
Future Full Tidal	Pyrene	mg/kg	59	291	0.12	0.35	0.16	0	0.01	0.28	3.95
Future Full Tidal	Styrene	mg/kg	1	70	0.00001	0.00009084	0.00003	0	0	0	0.00076
Future Full Tidal	Trichloroethene	mg/kg	9	112	0.004409	0.01209299	0.0066486	0	0	0.004	0.0548
Future Full Tidal	Total Dissolved Solids	mg/kg	12	12	40333.33	49717.13	68463.45	11000	25950	59000	191000
Future Full Tidal	Tetrachloroethene	mg/kg	1	104	0.001107	0.00159284	0.0014129	0	0	0.0035	0.0045
Future Full Tidal	Toluene	mg/kg	21	112	0.004743	0.01249218	0.0070565	0	0	0.004	0.0536
Future Full Tidal	TPH-Diesel	mg/kg	66	357	550.94	2195.94	778.74	3.1	26	1150	31000
Future Full Tidal	Waste Oil	mg/kg	214	335	2160.74	6091.6	2813.07	6	180	5100	71000
Future Full Tidal	Xylene (total)	mg/kg	5	104	0.001	0	0.002	0	0	0.004	0.02
Future Full Tidal	High MW PAHs	mg/kg	94	209	0.18	0.44	0.24	0	0	0.55	3.64
Future Full Tidal	Low MW PAHs	mg/kg	60	209	0.45	2.01	0.72	0	0	0.53	18.9
Future Full Tidal	Total DDT	mg/kg	168	197	0.03	0.06	0.04	0	0.01	0.09	0.39
Future Full Tidal	Total PAHs	mg/kg	106	209	0.62	2.19	0.92	0	0.01	1.22	20.5
Future Full Tidal	Total PAHs (lab)	mg/kg	69	103	0.59	1.53	0.89	0	0.03	1.5	9.3
Future Full Tidal	Total PCB	mg/kg	24	178	0.01	0.05	0.02	0	0	0.02	0.39
Future Full Tidal	Total PCB's (lab)	mg/kg	5	127	0.02	0.03	0.03	0.01	0.02	0.03	0.29
Future Full Tidal	Total Phenol	mg/kg	3	51	0.037	0.23	0.099	0	0	0	1.6
Future Full Tidal	Total Phthalate Esters	mg/kg	111	190	0.32	0.93	0.45	0	0.02	0.92	6.88
Future Full Tidal	Total Phthalate Esters (lab)	mg/kg	96	106	0.492	1.05	0.692	0.005	0.15	1.2	7
Future Full Tidal	Total volatile solids	percent	51	51	7.096	4.33	8.286	1.6	5.6	13	20
Garden Grove	Arsenic	mg/kg	6	6	4.95	2.3193	6.8058	1.3	5.7	7.6	7.6
Garden Grove	Barium	mg/kg	9	9	56.9333	39.7531	82.9054	18.1	48	152	152
Garden Grove	Beryllium	mg/kg	8	9	0.5111	0.2745	0.6905	0.2	0.52	1.1	1.1
Garden Grove	Cadmium	mg/kg	8	9	0.44	0.16591	0.5484	0.18	0.45	0.65	0.65
Garden Grove	Chromium	mg/kg	9	9	19.4667	8.87032	25.2619	8.6	18.4	35.5	35.5
Garden Grove	Cobalt	mg/kg	9	9	7.9667	5.23522	11.387	3.4	6.4	20.1	20.1
Garden Grove	Copper	mg/kg	9	9	17.4444	9.8055	23.8507	4.5	15.7	34.8	34.8
Garden Grove	Lead	mg/kg	9	9	42.39	33.08	64	1.6	28	96	96
Garden Grove	Mercury	mg/kg	7	11	0.104	0.114	0.171	0	0.067	0.183	0.39
Garden Grove	Molybdenum	mg/kg	3	3	2.093	1.384	3.659	0.88	1.8	3.6	3.6
Garden Grove	Nickel	mg/kg	8	9	12.19	6.78	16.62	5.5	8.9	25	25
Garden Grove	Selenium	mg/kg	3	6	0.77	1.2	1.73	0	0.35	3.15	3.15
Garden Grove	Silver	mg/kg	1	9	0.1178	0.208	0.2537	0	0.05	0.65	0.65
Garden Grove	Sulfate	mg/kg	1	1	1300	-	-	1300	1300	1300	1300
Garden Grove	Sulfide	mg/kg	1	1	150	-	-	150	150	150	150
Garden Grove	Thallium	mg/kg	5	9	0.21	0.21	0.35	0	0.23	0.65	0.65
Garden Grove	Vanadium	mg/kg	9	9	45.089	21.2	58.94	15.6	44.3	79	79
Garden Grove	Zinc	mg/kg	8	9	82.017	36.759	106.032	12.55	78	140	140

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Garden Grove	Percent water	percent	4	4	31.25	0.96	32.19	30	31.5	32	32
Garden Grove	pH	units	1	1	8.6	-	-	8.6	8.6	8.6	8.6
Garden Grove	Specific Conductance	umhos	1	1	3	-	-	3	3	3	3
Garden Grove	Total organic carbon	percent	2	2	0.54	0.54	1.29	0.15	0.54	0.92	0.92
Garden Grove	1,1-Dichloroethene	mg/kg	2	3	0.034	0.03	0.068	0	0.051	0.052	0.05
Garden Grove	4,4'-DDD	mg/kg	4	7	0.0095	0.0131	0.0192	0	0.0087	0.037	0.037
Garden Grove	4,4'-DDE	mg/kg	4	7	0.0296	0.03726	0.0572	0	0.016	0.098	0.098
Garden Grove	Acetone	mg/kg	1	2	0.0405	0.0134	0.0591	0.031	0.0405	0.05	0.05
Garden Grove	Benzene	mg/kg	2	4	0.0241	0.0261	0.0496	0	0.0241	0.048	0.048
Garden Grove	Benzo(a)anthracene	mg/kg	4	7	0.0484	0.0897	0.1149	0	0.018	0.25	0.25
Garden Grove	Benzo(a)pyrene	mg/kg	6	7	0.0627	0.083	0.1242	0.017	0.032	0.25	0.25
Garden Grove	Benzo(b)fluoranthene	mg/kg	6	7	0.0626	0.0831	0.1241	0.02	0.033	0.25	0.25
Garden Grove	Benzo(e)pyrene	mg/kg	4	5	0.0788	0.0958	0.1628	0.031	0.039	0.25	0.25
Garden Grove	Benzo(g,h,i)perylene	mg/kg	1	7	0.0476	0.0901	0.1144	0	0.012	0.25	0.25
Garden Grove	Benzo(k)fluoranthene	mg/kg	6	7	0.0591	0.08469	0.1219	0.014	0.031	0.25	0.25
Garden Grove	BHC-beta	mg/kg	1	7	0.0008	0.0016	0.002	0	0.0003	0.005	0.005
Garden Grove	BHC-delta	mg/kg	1	7	0.0004	0.0006	0.0008	0	0.0002	0.002	0.002
Garden Grove	Bis(2-ethylhexyl)phthalate	mg/kg	4	5	0.474	0.1924	0.6427	0.25	0.47	0.76	0.76
Garden Grove	Butylbenzylphthalate	mg/kg	4	5	0.09	0.091	0.1698	0.029	0.049	0.25	0.25
Garden Grove	Chlordane-alpha	mg/kg	1	7	0.0026	0.00274	0.0047	0	0.0034	0.0071	0.0071
Garden Grove	Chlordane-gamma	mg/kg	1	7	0.0025	0.00244	0.0043	0	0.0034	0.0059	0.0059
Garden Grove	Chlordane-technical	mg/kg	1	4	0.0068	0.00751	0.0142	0.0019	0.0037	0.018	0.018
Garden Grove	Chlorobenzene	mg/kg	2	4	0.0252	0.02739	0.052	0	0.0253	0.0502	0.0502
Garden Grove	Chrysene	mg/kg	4	7	0.0549	0.08775	0.1199	0	0.027	0.25	0.25
Garden Grove	Dieldrin	mg/kg	2	7	0.0004	0.0005	0.0008	0	0.0002	0.0012	0.0012
Garden Grove	Diethylphthalate	mg/kg	1	5	0.0594	0.10707	0.1533	0.005	0.006	0.25	0.25
Garden Grove	Di-n-butylphthalate	mg/kg	4	5	0.074	0.099	0.161	0.021	0.024	0.25	0.25
Garden Grove	Di-n-octylphthalate	mg/kg	1	5	0.057	0.108	0.152	0.005	0.006	0.25	0.25
Garden Grove	Endosulfan II	mg/kg	1	7	0.000463	0.00074677	0.0010161	0	0.00034	0.0021	0.0021
Garden Grove	Endrin aldehyde	mg/kg	1	7	0.001	0.001	0.001	0	0	0.003	0.003
Garden Grove	Fluoranthene	mg/kg	6	7	0.074	0.079	0.133	0.029	0.053	0.25	0.25
Garden Grove	Indeno(1,2,3-c,d)pyrene	mg/kg	2	7	0.049	0.089	0.115	0	0.016	0.25	0.25
Garden Grove	Oil and Grease	mg/kg	4	4	555	145.488	697.578	410	530	750	750
Garden Grove	Aroclor 1254	mg/kg	2	7	0.02	0.03	0.05	0	0.01	0.07	0.07
Garden Grove	Phenanthrene	mg/kg	5	7	0.05	0.09	0.12	0.01	0.02	0.25	0.25
Garden Grove	Pyrene	mg/kg	5	7	0.06	0.05	0.09	0	0.06	0.12	0.12
Garden Grove	Trichloroethene	mg/kg	2	4	0.02	0.03	0.05	0	0.02	0.05	0.05
Garden Grove	Toluene	mg/kg	3	4	0.03	0.03	0.05	0	0.03	0.05	0.05
Garden Grove	Waste Oil	mg/kg	4	5	341.2	231.38	544.01	6	360	650	650
Garden Grove	High MW PAHs	mg/kg	5	5	0.29	0.13	0.404	0.12	0.273	0.475	0.475
Garden Grove	Low MW PAHs	mg/kg	3	5	0.018	0.019	0.035	0	0.013	0.039	0.039
Garden Grove	Total DDT	mg/kg	4	4	0.07	0.05	0.12	0.02	0.06	0.14	0.14
Garden Grove	Total PAHs	mg/kg	5	5	0.31	0.15	0.44	0.12	0.29	0.51	0.51
Garden Grove	Total PAHs (lab)	mg/kg	3	3	0.38	0.13	0.52	0.25	0.37	0.51	0.51
Garden Grove	Total PCB	mg/kg	2	4	0.03	0.04	0.07	0	0.03	0.07	0.07
Garden Grove	Total PCB's (lab)	mg/kg	1	3	0.03	0.03	0.06	0.01	0.02	0.06	0.06
Garden Grove	Total Phthalate Esters	mg/kg	4	5	0.497	0.327	0.783	0	0.54	0.878	0.878
Garden Grove	Total Phthalate Esters (lab)	mg/kg	3	3	0.537	0.125	0.678	0.41	0.54	0.66	0.66
Garden Grove	Total volatile solids	percent	1	1	3.8	-	-	3.8	3.8	3.8	3.8
Gas Plant	Arsenic	mg/kg	9	14	14.846	21.429	26.072	2.95	5.775	34.7	81
Gas Plant	Barium	mg/kg	14	14	102.264	75.6421	141.888	23.7	74.6	230	249
Gas Plant	Beryllium	mg/kg	4	14	0.911	0.4731	1.159	0.36	0.75	1.9	2
Gas Plant	Cadmium	mg/kg	4	14	0.60857	0.31169	0.77185	0.13	0.675	1	1.05
Gas Plant	Chromium	mg/kg	14	14	34.8357	28.0886	49.5494	11.2	23.85	52.7	120
Gas Plant	Cobalt	mg/kg	14	14	7.4929	2.9523	9.0394	3.1	7.15	11.8	14
Gas Plant	Copper	mg/kg	14	14	24.75	25.9125	38.3238	5.4	16.65	33	110
Gas Plant	Lead	mg/kg	11	14	17.51	25.67	30.96	2.1	8.45	60	91
Gas Plant	Mercury	mg/kg	4	14	0.17	0.08	0.21	0.1	0.15	0.21	0.41
Gas Plant	Nickel	mg/kg	14	14	17.25	8.56	21.73	6.7	13.05	27.7	34
Gas Plant	Selenium	mg/kg	2	14	2.85	1.87	3.83	0.05	3.43	5.1	5.35
Gas Plant	Silver	mg/kg	1	14	0.579	0.357	0.765	0.05	0.675	1	1.05
Gas Plant	Sulfate	mg/kg	3	3	836.67	466.94	1365.06	310	1000	1200	1200
Gas Plant	Sulfide	mg/kg	3	3	1266.67	1408.63	2860.68	30	970	2800	2800
Gas Plant	Thallium	mg/kg	4	14	1.67	1.59	2.5	0.16	0.9	3.75	4.4

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Gas Plant	Vanadium	mg/kg	14	14	58.86	29.6	74.36	19.1	47.5	97	110
Gas Plant	Zinc	mg/kg	13	14	80.15	71.99	117.86	15.85	56.35	150	300
Gas Plant	Ammonia as Nitrogen	mg/kg	3	3	25.33	13.32	40.4	14	22	40	40
Gas Plant	pH	units	4	4	8.53	0.33	8.85	8.2	8.5	8.9	8.9
Gas Plant	Specific Conductance	umhos	3	3	1963.33	1190.39	3310.39	590	2600	2700	2700
Gas Plant	Total organic carbon	percent	7	7	1.44	1.53	2.58	0.44	0.9	4.8	4.8
Gas Plant	4,4'-DDD	mg/kg	2	4	0.0489	0.0759	0.1232	0.0002	0.0177	0.16	0.16
Gas Plant	4,4'-DDE	mg/kg	4	4	0.0063	0.0061	0.0123	0.001	0.0055	0.013	0.013
Gas Plant	4,4'-DDT	mg/kg	1	4	0.0004	0.0001	0.0005	0.0002	0.0003	0.0006	0.001
Gas Plant	Acenaphthene	mg/kg	1	7	0.238	0.26	0.43	0.006	0.25	0.7	0.7
Gas Plant	Benzo(a)anthracene	mg/kg	1	11	0.144	0.1269	0.219	0.0075	0.14	0.28	0.41
Gas Plant	Benzo(a)pyrene	mg/kg	1	11	0.144	0.1269	0.219	0.0075	0.14	0.28	0.41
Gas Plant	Benzo(b)fluoranthene	mg/kg	1	11	0.15	0.1232	0.223	0.0075	0.14	0.28	0.41
Gas Plant	Benzo(g,h,i)perylene	mg/kg	1	11	0.196	0.1651	0.293	0.0195	0.145	0.41	0.55
Gas Plant	Benzo(k)fluoranthene	mg/kg	1	11	0.14995	0.12304	0.22266	0.0075	0.14	0.28	0.41
Gas Plant	BHC-alpha	mg/kg	1	4	0.00035	0.00014	0.00049	0.00017	0.00035	0.00052	0.00052
Gas Plant	BHC-beta	mg/kg	1	4	0.00052	0.00046	0.00097	0.00017	0.00035	0.0012	0.0012
Gas Plant	Chlorobenzene	mg/kg	1	4	1.425	0.81701	2.22567	0.2	1.825	1.85	1.85
Gas Plant	Chrysene	mg/kg	2	11	0.1493	0.1217	0.2212	0.0075	0.14	0.28	0.41
Gas Plant	Dieldrin	mg/kg	1	4	0.0008	0.0009	0.0016	0.0003	0.0004	0.0021	0.002
Gas Plant	Di-n-butylphthalate	mg/kg	1	8	0.08	0.06	0.13	0.008	0.1	0.15	0.15
Gas Plant	Di-n-octylphthalate	mg/kg	3	8	0.16	0.18	0.28	0.008	0.13	0.59	0.59
Gas Plant	Ethylbenzene	mg/kg	1	4	1	0.99	1.97	0.015	1.07	1.85	1.85
Gas Plant	Fluoranthene	mg/kg	2	11	0.15	0.12	0.22	0.008	0.14	0.28	0.41
Gas Plant	Fluorene	mg/kg	1	11	0.47	1.05	1.08	0.006	0.15	0.41	3.6
Gas Plant	Naphthalene	mg/kg	6	11	0.44	0.73	0.87	0.01	0.13	0.95	2.5
Gas Plant	n-Propylbenzene	mg/kg	4	4	0.98	0.51	1.48	0.23	1.2	1.3	1.3
Gas Plant	Oil and Grease	mg/kg	4	4	9082.5	13507.23	22319.58	230	3550	29000	29000
Gas Plant	Aroclor 1254	mg/kg	2	4	0.03225	0.0266	0.05832	0.0095	0.02625	0.067	0.067
Gas Plant	Aroclor 1260	mg/kg	2	4	0.18138	0.3131	0.48821	0.007	0.03425	0.65	0.65
Gas Plant	PCB 138	mg/kg	1	3	0.018767	0.025326	0.047426	0.00345	0.00485	0.048	0.048
Gas Plant	PCB 153	mg/kg	1	3	0.0181	0.024172	0.045453	0.00345	0.00485	0.046	0.046
Gas Plant	PCB 180	mg/kg	1	3	0.02805	0.044992	0.078963	0.0017	0.00245	0.08	0.08
Gas Plant	Phenanthrene	mg/kg	3	11	0.28	0.42	0.53	0.008	0.15	0.41	1.5
Gas Plant	Pyrene	mg/kg	3	11	0.16	0.12	0.23	0.008	0.15	0.28	0.41
Gas Plant	TPH-Diesel	mg/kg	9	14	235.43	457.14	474.89	10.5	55.5	700	1700
Gas Plant	Waste Oil	mg/kg	12	14	1135.86	3421.59	2928.2	7	155	670	13000
Gas Plant	High MW PAHs	mg/kg	3	11	0.05	0.09	0.1	0	0	0.16	0.25
Gas Plant	Low MW PAHs	mg/kg	7	11	0.88	2.08	2.11	0	0.09	2.5	6.75
Gas Plant	Total DDT	mg/kg	4	4	0.06	0.08	0.13	0.001	0.02	0.17	0.17
Gas Plant	Total PAHs	mg/kg	7	11	0.93	2.11	2.18	0	0.1	2.5	6.91
Gas Plant	Total PAHs (lab)	mg/kg	1	1	0.27	-	-	0.27	0.27	0.27	0.27
Gas Plant	Total PCB	mg/kg	4	4	0.2	0.3	0.5	0.04	0.06	0.65	0.65
Gas Plant	Total PCB's (lab)	mg/kg	1	1	0.04	-	-	0.04	0.04	0.04	0.04
Gas Plant	Total Phthalate Esters	mg/kg	3	8	0.09	0.2	0.23	0	0	0.59	0.59
Gas Plant	Total Phthalate Esters (lab)	mg/kg	1	1	0.16	-	-	0.16	0.16	0.16	0.16
Gas Plant	Total volatile solids	percent	3	3	10.73	4.65	15.99	7.2	9	16	16
Muted Tidal	Antimony	mg/kg	9	48	0.12	0.26	0.19	0	0	0.55	0.95
Muted Tidal	Arsenic	mg/kg	162	221	7.003	14.292	8.887	0	3.5	10	130
Muted Tidal	Barium	mg/kg	272	273	125.409	595.19	196.013	0	52.8	148	9270
Muted Tidal	Beryllium	mg/kg	172	273	0.61965	0.37184	0.66376	0	0.65	1	4.2
Muted Tidal	Cadmium	mg/kg	83	273	0.32712	0.38604	0.37291	0	0.17	0.65	4.1
Muted Tidal	Chromium	mg/kg	272	273	20.21	12.66	21.71	0	18	33	120
Muted Tidal	Cobalt	mg/kg	271	273	6.33	4.54	6.86	0	5.7	11	59
Muted Tidal	Copper	mg/kg	272	273	14.21	24.86	17.16	0	12	22.3	400
Muted Tidal	Lead	mg/kg	239	273	64.868	580.601	133.742	0	15	81	9600
Muted Tidal	Mercury	mg/kg	94	220	0.1	0.12	0.12	0	0.084	0.15	0.66
Muted Tidal	Molybdenum	mg/kg	45	48	1.26	1.6	1.71	0	0.96	3.2	8.1
Muted Tidal	Nickel	mg/kg	269	273	14.04	9.8	15.2	0	13	24.9	100
Muted Tidal	Selenium	mg/kg	58	220	1.24	1.41	1.43	0	0.47	3.28	4.2
Muted Tidal	Silver	mg/kg	33	273	0.254	0.286	0.288	0	0.05	0.65	0.8
Muted Tidal	Sulfate	mg/kg	31	31	4996.87	3142.94	6103.27	64	4200	10000	10900
Muted Tidal	Sulfide	mg/kg	5	24	5.1	22.45	14.09	0.05	0.05	0.31	110
Muted Tidal	Sulfide , Dissolved	mg/kg	1	24	0.05	0.02	0.06	0.05	0.05	0.05	0.15

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Muted Tidal	Thallium	mg/kg	143	273	0.55	0.72	0.64	0	0.37	0.7	4
Muted Tidal	Vanadium	mg/kg	270	273	42.143	25.349	45.15	0	37.6	72	130
Muted Tidal	Zinc	mg/kg	257	273	53.54	46.678	59.08	0.012	46	90.3	460
Muted Tidal	Ammonia as Nitrogen	mg/kg	10	24	26.13	55.51	48.33	5	5	34	240
Muted Tidal	Chloride	mg/kg	5	5	10736	5924.77	15929.29	2460	12300	17400	17400
Muted Tidal	Nitrate as N	mg/kg	2	7	43.86	74.9	99.34	0	0	154	154
Muted Tidal	Nitrate as N	mg/kg	2	7	53.29	91	120.7	0	0	187	187
Muted Tidal	Phosporus (total as PO4)	mg/kg	5	5	8.1	7.996	15.109	1.8	5.5	21.9	21.9
Muted Tidal	Percent Solids	percent	10	10	94.5	13.62	102.94	57	100	100	100
Muted Tidal	Percent water	percent	44	44	8.78	10.35	11.84	0.4	4.75	22	45
Muted Tidal	pH	units	80	80	6.9638	1.305	7.25	4	7.1	8.4	9.4
Muted Tidal	Specific Conductance	umhos	24	24	2357.3	3365.19	3703.66	4.4	1100	4400	16000
Muted Tidal	Total organic carbon	percent	51	52	919.57	1856.82	1424.26	0.05	1.1	2960	7720
Muted Tidal	1,1-Dichloroethene	mg/kg	10	45	0.01	0.02	0.02	0	0	0.05	0.05
Muted Tidal	1,2-Dichloroethane	mg/kg	1	56	0.001288	0.00167159	0.0017253	0	0	0.0035	0.006
Muted Tidal	1,2-Dichlorobenzene	mg/kg	1	56	0.001259	0.00166239	0.0016943	0	0	0.0035	0.006
Muted Tidal	1,3-Dichlorobenzene	mg/kg	1	56	0.001268	0.00166232	0.0017033	0	0	0.0035	0.006
Muted Tidal	1,4-Dichlorobenzene	mg/kg	1	56	0.001264	0.00166203	0.0016996	0	0	0.0035	0.006
Muted Tidal	2-Butanone	mg/kg	2	56	0.01	0.02	0.02	0	0	0.03	0.06
Muted Tidal	4,4'-DDD	mg/kg	90	139	0.01	0.02	0.01	0	0	0.02	0.13
Muted Tidal	4,4'-DDE	mg/kg	99	139	0.00418	0.00691	0.00533	0	0.0018	0.01	0.045
Muted Tidal	4,4'-DDT	mg/kg	68	139	0.00343	0.00802	0.00477	0	0.00065	0.0086	0.067
Muted Tidal	Acenaphthene	mg/kg	2	118	0.08	0.433	0.158	0	0.0047	0.065	3.43
Muted Tidal	Acenaphthylene	mg/kg	3	115	0.066	0.45	0.149	0	0.0047	0.033	4.8
Muted Tidal	Acetone	mg/kg	13	56	0.021	0.052	0.034	0	0.0085	0.034	0.39
Muted Tidal	Anthracene	mg/kg	2	135	0.056	0.1	0.072	0	0.0048	0.26	0.32
Muted Tidal	Benzene	mg/kg	11	66	0.00819	0.01665	0.0122	0	0	0.0449	0.0526
Muted Tidal	Benzo(a)anthracene	mg/kg	8	135	0.057	0.099	0.074	0	0.0048	0.26	0.32
Muted Tidal	Benzo(a)pyrene	mg/kg	7	135	0.058	0.099	0.074	0	0.0048	0.26	0.32
Muted Tidal	Benzo(b)fluoranthene	mg/kg	10	136	0.068	0.12	0.088	0	0.0049	0.265	0.73
Muted Tidal	Benzo(e)pyrene	mg/kg	8	95	0.04215	0.08127	0.05849	0.0039	0.0049	0.225	0.315
Muted Tidal	Benzo(g,h,i)perylene	mg/kg	3	135	0.0605	0.11071	0.07918	0	0.00485	0.26	0.65
Muted Tidal	Benzo(k)fluoranthene	mg/kg	4	135	0.0568	0.09955	0.07359	0	0.0048	0.26	0.315
Muted Tidal	BHC-alpha	mg/kg	3	97	0.00033	0.00033	0.0004	0	0.0003	0.0006	0.0025
Muted Tidal	BHC-beta	mg/kg	5	97	0.00048	0.001	0.00068	0	0.0003	0.00065	0.00695
Muted Tidal	BHC-delta	mg/kg	1	97	0.00034	0.00055	0.00045	0	0.00029	0.0006	0.0054
Muted Tidal	BHC-gamma	mg/kg	5	96	0.00032	0.00025	0.00037	0	0.0003	0.0006	0.0018
Muted Tidal	Bis(2-ethylhexyl)phthalate	mg/kg	40	117	0.11317	0.2729	0.16262	0.00475	0.036	0.265	2.6
Muted Tidal	Butylbenzylphthalate	mg/kg	30	117	0.057	0.102	0.075	0.00385	0.0085	0.255	0.56
Muted Tidal	Chlordane-alpha	mg/kg	1	97	0.003239	0.00329312	0.003894	0	0.0029	0.006	0.027
Muted Tidal	Chlordane-gamma	mg/kg	1	97	0.003115	0.00252762	0.003618	0	0.0029	0.006	0.015
Muted Tidal	Chlordane-technical	mg/kg	1	86	0.004618	0.01167978	0.0070866	0.0013	0.00305	0.006	0.11
Muted Tidal	Chlorobenzene	mg/kg	10	66	0.00808	0.01645	0.01205	0	0	0.044	0.0525
Muted Tidal	Chrysene	mg/kg	29	135	0.07	0.11	0.09	0	0.01	0.26	0.62
Muted Tidal	Dieldrin	mg/kg	12	102	0.00121	0.00368	0.00192	0	0.00031	0.00215	0.026
Muted Tidal	Diesel fuel #2	mg/kg	4	63	0.3	1.17	0.59	0	0	0	5.41
Muted Tidal	Diethylphthalate	mg/kg	15	117	0.05415	0.09925	0.07213	0.004	0.0105	0.255	0.5
Muted Tidal	Dimethylphthalate	mg/kg	4	117	0.04744	0.09167	0.06406	0.00385	0.00485	0.255	0.315
Muted Tidal	Di-n-butylphthalate	mg/kg	34	117	0.06914	0.11562	0.09009	0.00385	0.015	0.265	0.65
Muted Tidal	Di-n-octylphthalate	mg/kg	15	117	0.06188	0.11452	0.08263	0.00385	0.005	0.265	0.69
Muted Tidal	Endosulfan I	mg/kg	1	97	0.00285	0.01089	0.00502	0	0.0012	0.00425	0.105
Muted Tidal	Endosulfan II	mg/kg	1	97	0.000882	0.00304879	0.0014887	0	0.0003	0.00105	0.026
Muted Tidal	Endrin	mg/kg	4	97	0.00121	0.00423	0.00205	0	0.00031	0.00105	0.029
Muted Tidal	Endrin aldehyde	mg/kg	5	97	0.00233	0.0144	0.0052	0	0.00031	0.00215	0.14
Muted Tidal	Endrin ketone	mg/kg	1	86	0.00249	0.01529	0.00572	0.00013	0.00031	0.0011	0.14
Muted Tidal	Fluoranthene	mg/kg	14	135	0.06	0.1	0.08	0	0.005	0.26	0.32
Muted Tidal	Fluorene	mg/kg	2	135	0.06	0.1	0.07	0	0.005	0.26	0.32
Muted Tidal	Indeno(1,2,3-c,d)pyrene	mg/kg	3	135	0.06	0.11	0.08	0	0.006	0.26	0.65
Muted Tidal	MCPP	mg/kg	1	4	0.02	0.05	0.07	0	0	0.1	0.1
Muted Tidal	Methylene Chloride	mg/kg	2	56	0.001289	0.00165541	0.0017227	0	0	0.0035	0.006
Muted Tidal	Naphthalene	mg/kg	1	135	0.06	0.1	0.07	0	0	0.26	0.32
Muted Tidal	Oil and Grease	mg/kg	52	84	3196.31	9943.66	5322.8	50	190	7000	77000
Muted Tidal	PCB 101	mg/kg	1	24	0.01	0.01	0.01	0.005	0.01	0.01	0.04
Muted Tidal	Aroclor 1254	mg/kg	3	97	0.01329	0.01414	0.0161	0	0.012	0.0245	0.12

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Muted Tidal	Aroclor 1260	mg/kg	2	97	0.04309	0.28455	0.09972	0	0.0115	0.024	2.8
Muted Tidal	PCB 138	mg/kg	1	24	0.01231	0.04424	0.03001	0.0026	0.0032	0.0044	0.22
Muted Tidal	PCB 153	mg/kg	1	24	0.01315	0.04832	0.03248	0.0026	0.0032	0.0044	0.24
Muted Tidal	PCB 170	mg/kg	1	24	0.00866	0.03437	0.02241	0.0013	0.0016	0.0022	0.17
Muted Tidal	PCB 180	mg/kg	1	24	0.0166	0.073	0.046	0.0013	0.0016	0.0022	0.36
Muted Tidal	PCB 187	mg/kg	1	24	0.0067	0.017	0.013	0.0026	0.0032	0.0044	0.09
Muted Tidal	PCB 206	mg/kg	1	24	0.002	0.002	0.003	0.0013	0.0016	0.0022	0.01
Muted Tidal	Phenanthrene	mg/kg	15	135	0.0598	0.109	0.078	0	0.0049	0.26	0.63
Muted Tidal	Phenol	mg/kg	2	24	0.1121	0.322	0.241	0.026	0.032	0.11	1.6
Muted Tidal	Phosphorus (Total as P)	mg/kg	7	7	2.09	2.32	3.81	0.6	1.2	7.2	7.2
Muted Tidal	Pyrene	mg/kg	17	138	0.15	0.79	0.29	0	0	0.27	6.9
Muted Tidal	Trichloroethene	mg/kg	10	66	0.01	0.02	0.01	0	0	0.04	0.05
Muted Tidal	Total Dissolved Solids	mg/kg	6	6	18758.33	12116.04	28453.18	4950	20400	33800	33800
Muted Tidal	Tetrachloroethene	mg/kg	1	56	0.00142	0.00203107	0.0019516	0	0	0.0035	0.01
Muted Tidal	Toluene	mg/kg	27	66	0.01	0.02	0.01	0	0	0.05	0.05
Muted Tidal	TPH-Diesel	mg/kg	25	194	149.211	650.76	240.79	2.6	7	200	7000
Muted Tidal	Waste Oil	mg/kg	97	178	952.8	3934.18	1530.76	6	35	1100	40000
Muted Tidal	Xylene (total)	mg/kg	5	56	0.001	0.002	0	0	0	0.004	0.01
Muted Tidal	High MW PAHs	mg/kg	27	114	0.04	0.11	0.06	0	0	0.1	0.62
Muted Tidal	Low MW PAHs	mg/kg	14	114	0.01	0.06	0.02	0	0	0.02	0.63
Muted Tidal	Total DDT	mg/kg	111	128	0.02	0.03	0.02	0	0.01	0.04	0.17
Muted Tidal	Total PAHs	mg/kg	30	114	0.05	0.13	0.07	0	0	0.13	0.63
Muted Tidal	Total PAHs (lab)	mg/kg	20	59	0.06	0.12	0.09	0	0	0.27	0.62
Muted Tidal	Total PCB	mg/kg	5	86	0.04	0.3	0.1	0	0	0	2.8
Muted Tidal	Total PCB's (lab)	mg/kg	3	62	0.021	0.04	0.03	0.006	0.013	0.025	0.31
Muted Tidal	Total Phenol	mg/kg	2	24	0.017	0.064	0.04	0	0	0	0.3
Muted Tidal	Total Phthalate Esters	mg/kg	77	117	0.112	0.34	0.17	0	0.021	0.267	3.11
Muted Tidal	Total Phthalate Esters (lab)	mg/kg	63	70	0.125	0.203	0.17	0.0048	0.067	0.285	1.3
Muted Tidal	Total volatile solids	percent	24	24	7.408	7.175	10.28	2.2	5.3	9.9	39
Seasonal Ponds	Arsenic	mg/kg	70	80	22.14	41.03	31.13	0	8.75	51.5	320
Seasonal Ponds	Barium	mg/kg	86	92	252.874	1286.37	515.736	0.083	57.25	246	12100
Seasonal Ponds	Beryllium	mg/kg	62	92	0.7441	0.4617	0.8385	0	0.6675	1.1	3.2
Seasonal Ponds	Cadmium	mg/kg	36	92	0.33098	0.29025	0.39029	0	0.23	0.7	1.165
Seasonal Ponds	Chromium	mg/kg	92	92	31.9306	30.913	38.2475	0.019	25.1	53	250
Seasonal Ponds	Cobalt	mg/kg	92	92	6.8212	3.3575	7.5073	0.018	6.805	11	18
Seasonal Ponds	Copper	mg/kg	92	92	16.7644	11.6593	19.1469	0.025	15	33.6	58
Seasonal Ponds	Lead	mg/kg	84	92	20.3349	28.6581	26.1911	0.014	12.5	38	220
Seasonal Ponds	Mercury	mg/kg	23	61	0.19	0.26	0.25	0	0.11	0.68	1.11
Seasonal Ponds	Molybdenum	mg/kg	9	9	1.68	1.79	2.85	0.03	0.87	4.1	4.1
Seasonal Ponds	Nickel	mg/kg	90	92	19.56	25.6	24.8	0	15	30	202
Seasonal Ponds	Selenium	mg/kg	14	59	1.5	1.6	1.9	0	0.65	3.65	5.5
Seasonal Ponds	Silver	mg/kg	7	92	0.256	0.31	0.319	0	0.05	0.7	1.17
Seasonal Ponds	Sulfate	mg/kg	12	12	6151.08	6258.81	9692.34	83	4800	17000	20000
Seasonal Ponds	Sulfide	mg/kg	9	12	1311.75	3153.68	3096.11	0.05	20.22	2300	11000
Seasonal Ponds	Sulfide , Dissolved	mg/kg	4	12	0.12	0.13	0.2	0.05	0.05	0.25	0.48
Seasonal Ponds	Thallium	mg/kg	52	92	0.54	0.67	0.68	0	0.41	0.8	3.4
Seasonal Ponds	Vanadium	mg/kg	92	92	52	27.6	57.64	0.044	47	93	120
Seasonal Ponds	Zinc	mg/kg	86	92	70.27	54.74	81.45	0.069	57.15	140	351
Seasonal Ponds	Ammonia as Nitrogen	mg/kg	7	12	63.42	120.27	131.47	5	12	150	420
Seasonal Ponds	Percent Solids	percent	4	4	76.5	26.59	102.56	52	77	100	100
Seasonal Ponds	Percent water	percent	13	13	24.25	19.18	34.68	0.3	22	40	70
Seasonal Ponds	pH	units	21	21	7.7714	0.8498	8.1349	6.1	7.8	8.5	9.6
Seasonal Ponds	Specific Conductance	umhos	12	12	10672.03	14959.27	19136.03	5.4	2300	30000	47000
Seasonal Ponds	Total organic carbon	percent	19	23	2386.08	4628.15	4277.55	0.01	0.92	12200	15300
Seasonal Ponds	1,1-Dichloroethene	mg/kg	2	9	0.01	0.019	0.02	0	0	0.045	0.05
Seasonal Ponds	2,4,5-TP (silvex)	mg/kg	1	5	0.071	0.135	0.19	0	0	0.31	0.31
Seasonal Ponds	2-Butanone	mg/kg	2	22	0.026	0.019	0.03	0	0.032	0.035	0.07
Seasonal Ponds	4,4'-DDD	mg/kg	19	49	0.0029	0.0079	0.0051	0	0.0004	0.007	0.053
Seasonal Ponds	4,4'-DDE	mg/kg	25	49	0.00311	0.01057	0.00607	0	0.00065	0.0057	0.074
Seasonal Ponds	4,4'-DDT	mg/kg	17	51	0.00242	0.00776	0.00455	0	0.00034	0.0032	0.0399
Seasonal Ponds	4-Nitrophenol	mg/kg	1	12	0.761	1.62	1.678	0.027	0.07	4.05	4.4
Seasonal Ponds	Acetone	mg/kg	5	22	0.032	0.03	0.046	0	0.0323	0.035	0.16
Seasonal Ponds	Aldrin	mg/kg	2	32	0.003	0.01	0.006	0	0.0002	0.001	0.04
Seasonal Ponds	Anthracene	mg/kg	1	38	0.098	0.17	0.152	0	0.005	0.31	0.65

TABLE 3-2
Summary Statistics for Chemicals Detected in Soil/Sediment
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Seasonal Ponds	Benzene	mg/kg	2	24	0.006	0.0122	0.0109	0	0.003	0.007	0.046
Seasonal Ponds	Benzo(a)anthracene	mg/kg	1	38	0.098	0.1696	0.1519	0	0.005	0.31	0.65
Seasonal Ponds	Benzo(a)pyrene	mg/kg	2	38	0.0988	0.1693	0.1527	0	0.005	0.31	0.65
Seasonal Ponds	Benzo(b)fluoranthene	mg/kg	4	38	0.0997	0.1689	0.1534	0	0.0053	0.31	0.65
Seasonal Ponds	Benzo(e)pyrene	mg/kg	1	24	0.1214	0.1938	0.199	0.0039	0.0068	0.33	0.65
Seasonal Ponds	Benzo(k)fluoranthene	mg/kg	2	38	0.09838	0.16939	0.15224	0	0.005	0.31	0.65
Seasonal Ponds	BHC-alpha	mg/kg	1	30	0.0003	0.0005	0.0005	0	0.0002	0	0.003
Seasonal Ponds	BHC-beta	mg/kg	1	30	0.0006	0.0022	0.0014	0	0.0002	0	0.012
Seasonal Ponds	BHC-gamma	mg/kg	3	32	0.00252	0.00889	0.0056	0	0.00025	0.00075	0.0366
Seasonal Ponds	Bis(2-ethylhexyl)phthalate	mg/kg	4	39	0.1266	0.1576	0.1761	0.005	0.06	0.31	0.65
Seasonal Ponds	Butylbenzylphthalate	mg/kg	5	39	0.1012	0.1654	0.1531	0.0041	0.0065	0.31	0.65
Seasonal Ponds	Carbon Disulfide	mg/kg	4	22	0.0048	0.0102	0.009	0	0.003	0.0041	0.05
Seasonal Ponds	Chlorobenzene	mg/kg	2	24	0.00761	0.01868	0.01509	0	0.003	0.007	0.0858
Seasonal Ponds	Chrysene	mg/kg	6	38	0.1018	0.1679	0.1552	0	0.0053	0.31	0.65
Seasonal Ponds	Dalapon	mg/kg	1	5	0.112	0.1548	0.2477	0	0	0.31	0.31
Seasonal Ponds	Dibenz(a,h)anthracene	mg/kg	1	38	0.1133	0.209	0.1797	0	0.007	0.31	0.9
Seasonal Ponds	Dieldrin	mg/kg	4	32	0.00284	0.00974	0.00621	0	0.00027	0.0011	0.04
Seasonal Ponds	Diethylphthalate	mg/kg	2	39	0.09603	0.16367	0.1474	0.00385	0.0115	0.31	0.65
Seasonal Ponds	Di-n-butylphthalate	mg/kg	9	39	0.10988	0.16363	0.16123	0.00385	0.0165	0.31	0.65
Seasonal Ponds	Di-n-octylphthalate	mg/kg	7	39	0.10979	0.16476	0.1615	0.00385	0.014	0.31	0.65
Seasonal Ponds	Endosulfan I	mg/kg	1	30	0.001523	0.00248716	0.0024134	0	0.001	0.001875	0.013
Seasonal Ponds	Endosulfan Sulfate	mg/kg	1	30	0.01	0.01	0.01	0	0.005	0.01	0.07
Seasonal Ponds	Endrin	mg/kg	4	32	0.003723	0.01138216	0.0076664	0	0.000265	0.0032	0.0456
Seasonal Ponds	Endrin aldehyde	mg/kg	1	30	0.00089	0.00309	0.00199	0	0.00025	0.00047	0.017
Seasonal Ponds	Fluoranthene	mg/kg	1	38	0.1	0.17	0.15	0	0.005	0.31	0.65
Seasonal Ponds	Heptachlor	mg/kg	2	6	0.01	0.02	0.03	0	0	0.04	0.04
Seasonal Ponds	Methylene Chloride	mg/kg	1	22	0.002909	0.00245743	0.003936	0	0.003	0.0055	0.01
Seasonal Ponds	Oil and Grease	mg/kg	18	28	1253.57	2919.78	2335.07	50	245	3800	15000
Seasonal Ponds	Aroclor 1254	mg/kg	3	32	0.02419	0.05234	0.04232	0	0.00925	0.02	0.219
Seasonal Ponds	Phenanthrene	mg/kg	4	38	0.2245	0.7807	0.4728	0	0.005	0.33	4.8
Seasonal Ponds	Pyrene	mg/kg	6	38	0.1	0.17	0.16	0	0.01	0.31	0.65
Seasonal Ponds	Trichloroethene	mg/kg	2	24	0.01	0.01	0.01	0	0	0.01	0.04
Seasonal Ponds	Toluene	mg/kg	2	24	0.01	0.01	0.01	0	0.003	0.01	0.05
Seasonal Ponds	TPH-Diesel	mg/kg	5	62	90.53	295.67	164.13	2.7	9.25	120	1650
Seasonal Ponds	Waste Oil	mg/kg	36	55	570.52	1617.1	997.9	5.5	93	1400	8500
Seasonal Ponds	High MW PAHs	mg/kg	8	30	0.02	0.09	0.06	0	0	0.05	0.46
Seasonal Ponds	Low MW PAHs	mg/kg	3	30	0.002467	0.00781569	0.0052635	0	0	0.0085	0.033
Seasonal Ponds	Total DDT	mg/kg	28	45	0.01	0.02	0.01	0	0	0.02	0.08
Seasonal Ponds	Total PAHs	mg/kg	8	30	0.03	0.09	0.06	0	0	0.06	0.5
Seasonal Ponds	Total PAHs (lab)	mg/kg	1	9	0.01	0.02	0.02	0.004	0.005	0.07	0.07
Seasonal Ponds	Total PCB	mg/kg	1	26	0.003192	0.01627764	0.0094492	0	0	0	0.083
Seasonal Ponds	Total PCB's (lab)	mg/kg	1	14	0.02	0.02	0.03	0.007	0.012	0.01	0.08
Seasonal Ponds	Total Phthalate Esters	mg/kg	19	39	0.04	0.07	0.06	0	0	0.19	0.23
Seasonal Ponds	Total Phthalate Esters (lab)	mg/kg	17	18	0.09	0.12	0.15	0.005	0.054	0.23	0.51
Seasonal Ponds	Total volatile solids	percent	12	12	6.75	4.55	9.33	0.43	7.05	10	17

Notes:
-- not applicable
Chemicals summarized are those that were detected in samples collected as part of the ERA Sampling and Analysis, the Focused Sampling and Analysis (CH2M HILL, 1998a; 2000) and Tetra Tech Phase II Environmental Assessment (1996)..
Concentrations are presented on a dry weight basis.

TABLE 3-3
Summary Statistics for Chemicals Detected in Surface Water
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	Arsenic, Dissolved	µg/L	2	2	1.55	0.07071068	1.648	1.5	1.55	1.6	1.6
Bolsa Bay	Beryllium, Dissolved	µg/L	2	2	79	4.24264069	84.88	76	79	82	82
Bolsa Bay	Cadmium, Dissolved	µg/L	2	2	0.14	0.01414214	0.1596	0.13	0.14	0.15	0.15
Bolsa Bay	Chromium, Dissolved	µg/L	2	2	27	0	27	27	27	27	27
Bolsa Bay	Copper, Dissolved	µg/L	2	2	7.15	0.07071068	7.248	7.1	7.15	7.2	7.2
Bolsa Bay	Lead, Dissolved	µg/L	2	2	0.44	0.02828427	0.4792	0.42	0.44	0.46	0.46
Bolsa Bay	Silver, Dissolved	µg/L	2	2	0.29	0	0.29	0.29	0.29	0.29	0.29
Bolsa Bay	Zinc, Dissolved	µg/L	2	2	11.8	3.11126984	16.112	9.6	11.8	14	14
Bolsa Bay	Sulfate	µg/L	2	2	2300000	0	2300000	2300000	2300000	2300000	2300000
Full Tidal	Arsenic, Dissolved	µg/L	2	2	18.25	20.85965	47.16	3.5	18.25	33	33
Full Tidal	Barium, Dissolved	µg/L	1	2	90	56.5685425	168.4	50	90	130	130
Full Tidal	Beryllium, Dissolved	µg/L	2	2	126.5	89.8025612	250.96	63	126.5	190	190
Full Tidal	Cadmium, Dissolved	µg/L	2	2	0.47	0.46669048	1.1168	0.14	0.47	0.8	0.8
Full Tidal	Chromium, Dissolved	µg/L	2	2	32.5	6.36396103	41.32	28	32.5	37	37
Full Tidal	Cobalt, Dissolved	µg/L	2	2	0.715	0.10606602	0.862	0.64	0.715	0.79	0.79
Full Tidal	Copper, Dissolved	µg/L	2	2	7.5	0.42426407	8.088	7.2	7.5	7.8	7.8
Full Tidal	Lead, Dissolved	µg/L	2	2	1.08	1.01823376	2.4912	0.36	1.08	1.8	1.8
Full Tidal	Mercury	µg/L	1	2	0.08	0.04242641	0.1388	0.05	0.08	0.11	0.11
Full Tidal	Nickel, Dissolved	µg/L	2	2	15	12.7279221	32.64	6	15	24	24
Full Tidal	Silver, Dissolved	µg/L	2	2	0.22	0.04242641	0.2788	0.19	0.22	0.25	0.25
Full Tidal	Zinc, Dissolved	µg/L	2	2	9.5	3.53553391	14.4	7	9.5	12	12
Full Tidal	Dieldrin	µg/L	1	2	0.009	0.00565685	0.01684	0.005	0.009	0.013	0.013
Full Tidal	Endrin	µg/L	1	2	0.0295	0.03464823	0.07752	0.005	0.0295	0.054	0.054
Full Tidal	Sulfate	µg/L	2	2	4700000	2262741.7	7836000	3100000	4700000	6300000	6300000
Full Tidal	TPH-Diesel	µg/L	2	2	1840	1781.91	4309.6	580	1840	3100	3100
Full Tidal	Waste oil	µg/L	2	2	7950	8555.99	19808	1900	7950	14000	14000
Future Full Tidal	Arsenic	µg/L	4	4	18.925	20.0959988	38.6190788	2.1	15.3	43	43
Future Full Tidal	Arsenic, Dissolved	µg/L	6	6	9.18333333	7.57850029	15.2473965	1.4	7.05	19	19
Future Full Tidal	Barium	µg/L	4	4	249.35	288.685452	532.261743	29	154.2	660	660
Future Full Tidal	Barium, Dissolved	µg/L	4	6	55.25	30.7046413	79.81883	16	57.25	88	88
Future Full Tidal	Beryllium, Dissolved	µg/L	1	6	5.91666667	8.36908995	12.6133333	2.5	2.5	23	23
Future Full Tidal	Cadmium	µg/L	3	3	0.35	0.2116601	0.58951596	0.19	0.27	0.59	0.59
Future Full Tidal	Cadmium, Dissolved	µg/L	5	6	0.20333333	0.18481522	0.35121631	0.025	0.125	0.47	0.47
Future Full Tidal	Chromium	µg/L	3	3	7.9	4.59020697	13.0943082	4.1	6.6	13	13
Future Full Tidal	Chromium, Dissolved	µg/L	4	6	5.68333333	3.3937688	8.39891394	3.3	4.65	12.5	12.5
Future Full Tidal	Cobalt	µg/L	3	3	1.72	1.2701181	3.15727394	0.46	1.7	3	3
Future Full Tidal	Cobalt, Dissolved	µg/L	4	6	0.36666667	0.20066556	0.52723255	0.1	0.33	0.63	0.63
Future Full Tidal	Copper	µg/L	4	4	12.35	2.5993589	14.8973717	9.4	12.5	15	15
Future Full Tidal	Copper, Dissolved	µg/L	6	6	7.48333333	3.28719739	10.1136391	4.1	7.5	13	13
Future Full Tidal	Lead	µg/L	4	4	10.625	9.7926418	20.221789	3	7.25	25	25
Future Full Tidal	Lead, Dissolved	µg/L	6	6	0.44	0.29779187	0.67828313	0.13	0.42	0.92	0.92
Future Full Tidal	Mercury	µg/L	1	6	0.06333333	0.03265986	0.08946667	0.05	0.05	0.13	0.13
Future Full Tidal	Nickel	µg/L	3	4	8.975	4.32078311	13.2093674	3	9.95	13	13
Future Full Tidal	Nickel, Dissolved	µg/L	2	6	4.38333333	2.30253484	6.22574492	2.5	3.65	8	8
Future Full Tidal	Silver	µg/L	3	3	0.42766667	0.50183297	0.99554414	0.063	0.22	1	1
Future Full Tidal	Silver, Dissolved	µg/L	3	6	0.08	0.06187407	0.12950956	0.025	0.07	0.19	0.19
Future Full Tidal	Vanadium	µg/L	4	4	35.55	34.8005268	69.6545163	6.2	26	84	84
Future Full Tidal	Vanadium, Dissolved	µg/L	1	6	3.21666667	1.75546765	4.62133333	2.5	2.5	6.8	6.8
Future Full Tidal	Zinc	µg/L	4	4	50.15	26.3784634	76.0008942	21.6	52	75	75
Future Full Tidal	Zinc, Dissolved	µg/L	6	6	12.9166667	10.7451229	21.5145557	2.7	10.9	31	31
Future Full Tidal	2,4-D	µg/L	1	3	1.06666667	0.11547005	1.19733333	1	1	1.2	1.2
Future Full Tidal	2,4-DB	µg/L	1	5	1.82	1.99674736	3.57022623	0.5	0.5	5	5
Future Full Tidal	4,4'-DDT	µg/L	1	5	0.0066	0.00357771	0.009736	0.005	0.005	0.013	0.013
Future Full Tidal	4-Nitrophenol	µg/L	3	5	10.468	13.2673554	22.0973498	0.56	1.1	25	25
Future Full Tidal	BHC-delta	µg/L	1	5	0.0204	0.03443545	0.050584	0.005	0.005	0.082	0.082
Future Full Tidal	Chlorpyrifos	µg/L	1	3	0.06	0.03464102	0.0992	0.04	0.04	0.1	0.1
Future Full Tidal	Diazinon	µg/L	1	5	0.262	0.2306946	0.46421274	0.04	0.23	0.5	0.5
Future Full Tidal	Dicamba	µg/L	1	3	0.1	0	0.1	0.1	0.1	0.1	0.1
Future Full Tidal	Dieldrin	µg/L	1	5	0.0068	0.00402492	0.010328	0.005	0.005	0.014	0.014
Future Full Tidal	Malathion	µg/L	1	3	0.09	0.09526279	0.1978	0.035	0.035	0.2	0.2
Future Full Tidal	Sulfate	µg/L	5	5	480000	744858.71	1132897.45	27000	240000	1800000	1800000
Future Full Tidal	Total DDT	µg/L	1	5	0.0026	0.00581378	0.007696	0	0	0.013	0.013
Future Full Tidal	TPH-Diesel	µg/L	4	5	241.7	122.74	349.28	48.5	270	370	370
Future Full Tidal	Waste oil	µg/L	5	5	984	199.82	1159.15	800	890	1200	1200
Garden Grove	Arsenic	µg/L	1	1	2.2	.	.	2.2	2.2	2.2	2.2
Garden Grove	Arsenic, Dissolved	µg/L	3	4	1.625	0.75443135	2.36434273	0.5	1.95	2.1	2.1
Garden Grove	Barium	µg/L	2	2	40.75	0.35355339	41.24	40.5	40.75	41	41
Garden Grove	Barium, Dissolved	µg/L	3	4	29.475	6.63092502	35.9733065	24.9	27	39	39
Garden Grove	Cadmium	µg/L	1	1	0.7	.	.	0.7	0.7	0.7	0.7
Garden Grove	Cadmium, Dissolved	µg/L	3	4	0.09975	0.00758837	0.1071866	0.092	0.0985	0.11	0.11
Garden Grove	Chromium	µg/L	1	1	8	.	.	8	8	8	8
Garden Grove	Chromium, Dissolved	µg/L	3	4	4.2	1.79814719	5.96218425	1.9	4.4	6.1	6.1
Garden Grove	Cobalt	µg/L	1	1	1.3	.	.	1.3	1.3	1.3	1.3
Garden Grove	Copper	µg/L	1	1	17	.	.	17	17	17	17
Garden Grove	Copper, Dissolved	µg/L	4	4	3.35	1.06614571	4.39482279	2.1	3.3	4.7	4.7
Garden Grove	Lead	µg/L	1	1	6.2	.	.	6.2	6.2	6.2	6.2
Garden Grove	Lead, Dissolved	µg/L	3	4	0.405	0.27742867	0.6768801	0.18	0.32	0.8	0.8
Garden Grove	Mercury	µg/L	1	4	0.0625	0.025	0.087	0.05	0.05	0.1	0.1
Garden Grove	Nickel	µg/L	1	1	54	.	.	54	54	54	54
Garden Grove	Selenium	µg/L	1	4	0.725	0.45	1.166	0.5	0.5	1.4	1.4
Garden Grove	Vanadium	µg/L	2	2	43.7	52.7501659	116.808	6.4	43.7	81	81
Garden Grove	Vanadium, Dissolved	µg/L	2	4	4.45	2.25757983	6.66242823	2.5	4.35	6.6	6.6
Garden Grove	Zinc	µg/L	1	2	32.5	44.5477272	94.24	1	32.5	64	64
Garden Grove	Zinc, Dissolved	µg/L	4	4	8.35	2.21133444	10.5171077	5.6	8.4	11	11
Garden Grove	2,4-DB	µg/L	2	4	1.275	1.08435849	2.33767132	0.5	0.9	2.8	2.8
Garden Grove	4-Nitrophenol	µg/L	1	2	12.695	17.4018979	36.8128	0.39	12.695	25	25
Garden Grove	BHC-delta	µg/L	1	2	0.02	0.0212132	0.0494	0.005	0.02	0.035	0.035
Garden Grove	BHC-gamma	µg/L	1	2	0.0085	0.00494975	0.01536	0.005	0.0085	0.012	0.012
Garden Grove	Diazinon	µg/L	1	4	0.425	0.15	0.572	0.2	0.5	0.5	0.5
Garden Grove	Dieldrin	µg/L	1	2	0.0515	0.06576093	0.14264	0.005	0.0515	0.098	0.098
Garden Grove	Sulfate	µg/L	2	2	210000	155563.492	425600	100000	210000	320000	320000
Garden Grove	TPH-Diesel	µg/L	2	2	230	141.42	426	130	230	330	330

TABLE 3-3
Summary Statistics for Chemicals Detected in Surface Water
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Value	Median	90th Percentile	Maximum Reported Value
Garden Grove	Waste oil	µg/L	2	2	1220	961.67	2552.8	540	1220	1900	1900
Seasonal Ponds	Arsenic, Dissolved	µg/L	5	5	4.18	3.27520992	7.05084807	2.3	2.8	10	10
Seasonal Ponds	Barium	µg/L	1	1	78.2	.	.	78.2	78.2	78.2	78.2
Seasonal Ponds	Barium, Dissolved	µg/L	3	5	56.28	40.6918542	91.9479829	25	38.3	120	120
Seasonal Ponds	Beryllium, Dissolved	µg/L	1	5	9.4	15.428869	22.924	2.5	2.5	37	37
Seasonal Ponds	Cadmium, Dissolved	µg/L	3	5	0.1034	0.02797856	0.12792429	0.075	0.1	0.15	0.15
Seasonal Ponds	Chromium, Dissolved	µg/L	2	5	5.34	4.25769891	9.07203764	2	5	12.5	12.5
Seasonal Ponds	Cobalt, Dissolved	µg/L	2	5	0.244	0.11588788	0.3455802	0.1	0.25	0.42	0.42
Seasonal Ponds	Copper	µg/L	1	1	1.5	.	.	1.5	1.5	1.5	1.5
Seasonal Ponds	Copper, Dissolved	µg/L	5	5	4.78	1.44810221	6.04931755	2.9	4.6	6.7	6.7
Seasonal Ponds	Lead, Dissolved	µg/L	4	5	0.622	0.60470654	1.15204865	0.11	0.35	1.6	1.6
Seasonal Ponds	Silver, Dissolved	µg/L	2	5	0.214	0.25993749	0.44184526	0.025	0.1	0.64	0.64
Seasonal Ponds	Vanadium, Dissolved	µg/L	1	5	3.52	2.28078934	5.5192	2.5	2.5	7.6	7.6
Seasonal Ponds	Zinc	µg/L	1	1	136	.	.	136	136	136	136
Seasonal Ponds	Zinc, Dissolved	µg/L	5	5	26.64	33.0285937	55.5908388	6.8	15	85	85
Seasonal Ponds	BHC-beta	µg/L	1	3	0.03266667	0.04792007	0.08689333	0.005	0.005	0.088	0.088
Seasonal Ponds	Diazinon	µg/L	1	4	0.825	0.65	1.462	0.5	0.5	1.8	1.8
Seasonal Ponds	Sulfate	µg/L	3	3	534666.67	836003.19	1480693.33	52000	52000	1500000	1500000
Seasonal Ponds	TPH-Diesel	µg/L	3	3	326.67	241.94	600.44	140	240	600	600
Seasonal Ponds	Waste oil	µg/L	3	3	1186.67	475.96	1725.26	760	1100	1700	1700

Notes:
-- not applicable
Chemicals summarized are those that were detected in samples collected as part of the ERA Sampling and Analyses, the Focused Sampling and Analyses (CH2M HILL, 1998a; 2000) and Tetra Tech Phase II Environmental Assessment (1996).

TABLE 3-4
Summary Statistics for Chemicals Detected in Terrestrial Plant Tissue
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	Arsenic	mg/Kg	2	2	0.0665	0.00636396	0.07532	0.062	0.0665	0.071	0.071
Bolsa Bay	Cadmium	mg/Kg	2	2	0.032	0.01697056	0.05552	0.02	0.032	0.044	0.044
Bolsa Bay	Chromium	mg/Kg	2	2	0.37	0.07071068	0.468	0.32	0.37	0.42	0.42
Bolsa Bay	Copper	mg/Kg	2	2	1.535	0.0212132	1.5644	1.52	1.535	1.55	1.55
Bolsa Bay	Lead	mg/Kg	2	2	0.191	0.0311127	0.23412	0.169	0.191	0.213	0.213
Bolsa Bay	Nickel	mg/Kg	2	2	0.325	0.03535534	0.374	0.3	0.325	0.35	0.35
Bolsa Bay	Selenium	mg/Kg	2	2	0.4	0	0.4	0.4	0.4	0.4	0.4
Bolsa Bay	Zinc	mg/Kg	2	2	5.1	0.56568542	5.884	4.7	5.1	5.5	5.5
Full Tidal	Arsenic	mg/Kg	1	3	0.0976667	0.04734272	0.15124	0.043	0.125	0.125	0.125
Full Tidal	Barium	mg/Kg	2	2	35.5	43.1335137	95.28	5	35.5	66	66
Full Tidal	Beryllium	mg/Kg	1	2	0.085	0.04949747	0.1536	0.05	0.085	0.12	0.12
Full Tidal	Cadmium	mg/Kg	2	3	0.0633333	0.05131601	0.121403	0.02	0.05	0.12	0.12
Full Tidal	Chromium	mg/Kg	3	3	0.8433333	0.91522311	1.879006	0.3	0.33	1.9	1.9
Full Tidal	Cobalt	mg/Kg	1	2	0.18	0.18384776	0.4348	0.05	0.18	0.31	0.31
Full Tidal	Copper	mg/Kg	3	3	2.58	1.00059982	3.712285	1.6	2.54	3.6	3.6
Full Tidal	Lead	mg/Kg	3	3	0.6083333	0.77608526	1.486556	0.085	0.24	1.5	1.5
Full Tidal	Mercury	mg/Kg	1	3	0.0131667	0.01255322	0.027372	0.0025	0.01	0.027	0.027
Full Tidal	Nickel	mg/Kg	3	3	0.76	0.55569776	1.388831	0.4	0.48	1.4	1.4
Full Tidal	Selenium	mg/Kg	1	3	0.2	0.25980762	0.494	0.05	0.05	0.5	0.5
Full Tidal	Vanadium	mg/Kg	2	2	1.605	1.40714249	3.5552	0.61	1.605	2.6	2.6
Full Tidal	Zinc	mg/Kg	3	3	13.3	9.49052159	24.03954	5.9	10	24	24
Future Full Tidal	Arsenic	mg/Kg	3	8	0.216125	0.23732403	0.380582	0.103	0.125	0.799	0.799
Future Full Tidal	Barium	mg/Kg	5	5	23.78	23.8157931	44.65546	3.9	20	63	63
Future Full Tidal	Beryllium	mg/Kg	1	5	0.074	0.05366563	0.12104	0.05	0.05	0.17	0.17
Future Full Tidal	Cadmium	mg/Kg	6	8	0.13275	0.10815828	0.2077	0.014	0.112	0.31	0.31
Future Full Tidal	Chromium	mg/Kg	8	8	1.2075	0.85200184	1.797907	0.18	1.14	2.92	2.92
Future Full Tidal	Cobalt	mg/Kg	3	5	0.158	0.12357184	0.266315	0.05	0.12	0.33	0.33
Future Full Tidal	Copper	mg/Kg	8	8	3.345	1.6855012	4.512993	0.99	2.96	6.1	6.1
Future Full Tidal	Lead	mg/Kg	8	8	0.947375	0.78850907	1.493784	0.1	0.667	2.1	2.1
Future Full Tidal	Mercury	mg/Kg	6	8	0.063	0.12469964	0.149412	0.007	0.016	0.37	0.37
Future Full Tidal	Nickel	mg/Kg	8	8	1.05375	0.75445226	1.576559	0.32	0.775	2.2	2.2
Future Full Tidal	Selenium	mg/Kg	3	8	0.29375	0.46785033	0.617954	0.05	0.05	1.4	1.4
Future Full Tidal	Silver	mg/Kg	2	8	0.03875	0.01642081	0.050129	0.01	0.05	0.05	0.05
Future Full Tidal	Vanadium	mg/Kg	5	5	1.432	0.87288029	2.197113	0.48	1.1	2.7	2.7
Future Full Tidal	Zinc	mg/Kg	8	8	35.7625	39.8271242	63.36129	5	25.75	130	130
Muted Tidal	Arsenic	mg/Kg	4	14	0.1829286	0.22964269	0.303223	0.041	0.125	0.253	0.964
Muted Tidal	Barium	mg/Kg	10	10	3.693	4.63552958	6.566131	0.27	1.5	11.05	15
Muted Tidal	Beryllium	mg/Kg	2	10	0.061	0.02330951	0.075447	0.05	0.05	0.105	0.11
Muted Tidal	Cadmium	mg/Kg	7	14	0.0916429	0.10296721	0.14558	0.018	0.05	0.28	0.35
Muted Tidal	Chromium	mg/Kg	14	14	0.7435714	1.05317547	1.295258	0.11	0.395	1.3	4.18
Muted Tidal	Cobalt	mg/Kg	4	10	0.109	0.09527154	0.16805	0.05	0.05	0.28	0.31
Muted Tidal	Copper	mg/Kg	14	14	2.1514286	1.32149599	2.843671	0.79	1.555	3.2	5.68
Muted Tidal	Lead	mg/Kg	11	14	0.5975714	0.87439577	1.055608	0.05	0.325	1.2	3.36
Muted Tidal	Mercury	mg/Kg	2	14	0.0091429	0.00358645	0.011022	0.0025	0.01	0.01	0.017
Muted Tidal	Nickel	mg/Kg	14	14	0.9128571	1.11868349	1.498859	0.27	0.61	1.3	4.68
Muted Tidal	Selenium	mg/Kg	4	14	0.1642857	0.21964007	0.27934	0.05	0.05	0.4	0.8
Muted Tidal	Silver	mg/Kg	1	14	0.0421429	0.0176193	0.051372	0.01	0.05	0.05	0.06
Muted Tidal	Vanadium	mg/Kg	10	10	0.804	0.57833477	1.162456	0.19	0.6	1.8	1.8
Muted Tidal	Zinc	mg/Kg	14	14	18.135714	14.0963502	25.51983	4.8	12	40	50
Muted Tidal	Aldrin	mg/Kg	1	10	0.000325	0.00023717	0.000472	0.00025	0.00025	0.000625	0.001
Muted Tidal	BHC-alpha	mg/Kg	1	10	0.000405	0.00049015	0.000709	0.00025	0.00025	0.001025	0.0018
Muted Tidal	BHC-beta	mg/Kg	1	10	0.000405	0.00049015	0.000709	0.00025	0.00025	0.001025	0.0018
Muted Tidal	BHC-gamma	mg/Kg	1	10	0.000395	0.00045853	0.000679	0.00025	0.00025	0.000975	0.0017
Muted Tidal	BHC-delta	mg/Kg	2	10	0.00051	0.00058775	0.000874	0.00025	0.00025	0.00155	0.002

TABLE 3-4
Summary Statistics for Chemicals Detected in Terrestrial Plant Tissue
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Value	Median	90th Percentile	Maximum Reported Value
Seasonal Ponds	Arsenic	mg/Kg	3	5	0.101	0.03770942	0.134054	0.035	0.113	0.125	0.125
Seasonal Ponds	Barium	mg/Kg	2	2	9.95	8.55599205	21.808	3.9	9.95	16	16
Seasonal Ponds	Beryllium	mg/Kg	1	2	0.16	0.15556349	0.3756	0.05	0.16	0.27	0.27
Seasonal Ponds	Cadmium	mg/Kg	2	5	0.0535	0.03438023	0.083636	0.0025	0.05	0.097	0.097
Seasonal Ponds	Chromium	mg/Kg	5	5	0.76	0.4007493	1.111272	0.34	0.8	1.16	1.16
Seasonal Ponds	Cobalt	mg/Kg	1	2	0.09	0.05656854	0.1684	0.05	0.09	0.13	0.13
Seasonal Ponds	Copper	mg/Kg	5	5	2.45	1.33895482	3.623646	0.74	2.15	4.4	4.4
Seasonal Ponds	Lead	mg/Kg	5	5	0.4256	0.3958261	0.772557	0.081	0.36	1.1	1.1
Seasonal Ponds	Mercury	mg/Kg	2	5	0.0067	0.00327109	0.009567	0.0025	0.006	0.01	0.01
Seasonal Ponds	Nickel	mg/Kg	5	5	0.742	0.5315261	1.207903	0.12	0.74	1.36	1.36
Seasonal Ponds	Selenium	mg/Kg	3	5	0.14	0.08215838	0.212015	0.05	0.2	0.2	0.2
Seasonal Ponds	Vanadium	mg/Kg	2	2	0.93	0.38183766	1.4592	0.66	0.93	1.2	1.2
Seasonal Ponds	Zinc	mg/Kg	5	5	16.08	9.06735904	24.02789	2.3	16	26	26

Notes:
-- not applicable
Chemicals summarized are those that were detected in samples collected as part of the ERA Sampling and Analyses, the Focused Sampling and Analyses (CH2M HILL, 1998a; 2000) and Tetra Tech Phase II Environmental Assessment (1996).
Concentrations are presented on a dry weight basis.

TABLE 3-5

Summary Statistics for Chemicals Detected in Terrestrial Invertebrates Tissue

Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Sitewide	Arsenic	mg/kg	1	4	0.17	0.09	0.26	0.125	0.125	0.31	0.31
Sitewide	Barium	mg/kg	4	4	16.18	24.66	40.34	1	5.35	53	53
Sitewide	Cadmium	mg/kg	3	4	0.405	0.3299	0.728	0.05	0.375	0.82	0.82
Sitewide	Chromium	mg/kg	4	4	3.4125	3.568	6.909	0.95	2	8.7	8.7
Sitewide	Cobalt	mg/kg	4	4	0.4625	0.4335	0.887	0.13	0.31	1.1	1.1
Sitewide	Copper	mg/kg	4	4	34.6	33.9329	67.854	6.4	26	80	80
Sitewide	Lead	mg/kg	4	4	1.61	1.8234	3.397	0.25	0.945	4.3	4.3
Sitewide	Mercury	mg/kg	3	4	0.0608	0.0863	0.145	0.01	0.0215	0.19	0.19
Sitewide	Nickel	mg/kg	4	4	2.89	2.9845	5.815	0.86	1.7	7.3	7.3
Sitewide	Selenium	mg/kg	2	4	0.36	0.3581	0.711	0.05	0.355	0.68	0.68
Sitewide	Silver	mg/kg	2	4	0.2	0.21	0.4	0.05	0.125	0.49	0.49
Sitewide	Vanadium	mg/kg	4	4	4.425	2.9398	7.306	1.6	4.4	7.3	7.3
Sitewide	Zinc	mg/kg	4	4	75	33.1763	107.513	49	65.5	120	120
Sitewide	Percent Lipids	percent	4	4	2.7925	1.8648	4.62	0.57	2.95	4.7	4.7

Notes:

-- not applicable

Chemicals summarized are those that were detected in samples collected as part of the ERA Sampling and Analysis, the Focused Sampling and Analysis (CH2M HILL, 1998a; 2000) and Tetra Tech Phase II Environmental Assessment (1996).

Concentrations are presented on a dry weight basis.

TABLE 3-6
Summary Statistics for Chemicals Detected in Stilt Eggs
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Full Tidal	Barium	mg/Kg	8	9	0.4788889	0.37267427	0.722369	0.05	0.45	1.1	1.1
Full Tidal	Chromium	mg/Kg	8	9	0.2011111	0.14886608	0.29837	0.05	0.15	0.56	0.56
Full Tidal	Copper	mg/Kg	9	9	1.22	0.2007486	1.351156	0.92	1.2	1.6	1.6
Full Tidal	Lead	mg/Kg	7	9	0.1033333	0.03278719	0.124754	0.05	0.12	0.14	0.14
Full Tidal	Mercury	mg/Kg	9	9	0.2457778	0.10883678	0.316884	0.082	0.24	0.41	0.41
Full Tidal	Nickel	mg/Kg	4	9	0.1322222	0.15409232	0.232896	0.05	0.05	0.52	0.52
Full Tidal	Selenium	mg/Kg	9	9	0.2366667	0.08062258	0.28934	0.16	0.22	0.41	0.41
Full Tidal	Zinc	mg/Kg	9	9	17.444444	4.21637021	20.19914	11	17	25	25
Full Tidal	4,4'-DDD	mg/Kg	2	9	0.0022556	0.0045899	0.005254	0.00025	0.00025	0.014	0.014
Full Tidal	4,4'-DDE	mg/Kg	9	9	2.8288889	2.39332637	4.392529	0.6	2.2	6.9	6.9
Full Tidal	4,4'-DDT	mg/Kg	9	9	0.0727778	0.05742773	0.110297	0.015	0.048	0.19	0.19
Full Tidal	Aroclor 1260	mg/Kg	9	9	0.1181111	0.08073792	0.17086	0.059	0.083	0.31	0.31
Full Tidal	BHC-alpha	mg/Kg	2	9	0.0005644	0.00069947	0.001021	0.00025	0.00025	0.0024	0.0024
Full Tidal	BHC-beta	mg/Kg	9	9	0.0093556	0.00517883	0.012739	0.003	0.011	0.016	0.016
Full Tidal	BHC-delta	mg/Kg	2	9	0.0012167	0.00202438	0.002539	0.00025	0.00025	0.006	0.006
Full Tidal	BHC-gamma	mg/Kg	2	9	0.0005	0.00045069	0.000794	0.00025	0.00025	0.0015	0.0015
Full Tidal	Chlordane-alpha	mg/Kg	1	9	0.0070556	0.01238306	0.015146	0.0025	0.0025	0.04	0.04
Full Tidal	Dieldrin	mg/Kg	8	9	0.0439833	0.03205273	0.064924	0.00025	0.036	0.09	0.09
Full Tidal	Endosulfan II	mg/Kg	7	9	0.0239722	0.01678282	0.034937	0.00025	0.026	0.055	0.055
Full Tidal	Endrin	mg/Kg	1	9	0.0007833	0.00147118	0.001745	0.00025	0.00025	0.0047	0.0047
Full Tidal	Endrin ketone	mg/Kg	4	9	0.0020111	0.00347219	0.00428	0.00025	0.0005	0.011	0.011
Full Tidal	PCB 008	mg/Kg	1	9	0.0067222	0.00294863	0.008649	0.005	0.005	0.0125	0.0125
Full Tidal	PCB 066	mg/Kg	3	9	0.0170556	0.02148611	0.031093	0.005	0.007	0.071	0.071
Full Tidal	PCB 118	mg/Kg	9	9	0.0117556	0.00771559	0.016796	0.0051	0.0076	0.025	0.025
Full Tidal	PCB 126	mg/Kg	8	9	0.0328444	0.02905177	0.051825	0.0065	0.023	0.091	0.091
Full Tidal	PCB 138	mg/Kg	2	9	0.0042167	0.00262774	0.005933	0.0025	0.0025	0.01	0.01
Full Tidal	PCB 153	mg/Kg	8	9	0.0097	0.00309354	0.011721	0.0065	0.0095	0.016	0.016
Full Tidal	PCB 180	mg/Kg	3	9	0.0031722	0.00239754	0.004739	0.00125	0.0018	0.0071	0.0071
Full Tidal	PCB 187	mg/Kg	9	9	0.0242222	0.01228594	0.032249	0.014	0.02	0.052	0.052
Full Tidal	PCB 206	mg/Kg	2	9	0.0024111	0.00173867	0.003547	0.00125	0.00125	0.0057	0.0057
Full Tidal	Total DDT	mg/Kg	9	9	2.9036889	2.41689246	4.482725	0.629	2.404	6.987	6.987
Full Tidal	Total PCB	mg/Kg	9	9	0.1181111	0.08073792	0.17086	0.059	0.083	0.31	0.31
Future Full Tidal	Barium	mg/Kg	7	7	0.6185714	0.39830594	0.913641	0.22	0.63	1.3	1.3
Future Full Tidal	Chromium	mg/Kg	7	7	0.1514286	0.03716117	0.178958	0.1	0.15	0.2	0.2
Future Full Tidal	Cobalt	mg/Kg	4	7	0.2128571	0.22603202	0.380304	0.05	0.16	0.68	0.68
Future Full Tidal	Copper	mg/Kg	7	7	1.28	0.33980386	1.53173	0.96	1.2	2	2
Future Full Tidal	Lead	mg/Kg	5	7	0.1085714	0.04740906	0.143693	0.05	0.11	0.18	0.18
Future Full Tidal	Mercury	mg/Kg	7	7	0.46	0.22150997	0.624097	0.18	0.41	0.79	0.79
Future Full Tidal	Nickel	mg/Kg	1	7	0.0585714	0.02267787	0.075371	0.05	0.05	0.11	0.11
Future Full Tidal	Selenium	mg/Kg	7	7	0.2814286	0.13296974	0.379934	0.19	0.21	0.56	0.56
Future Full Tidal	Zinc	mg/Kg	7	7	17.285714	3.14718317	19.61718	15	16	24	24
Future Full Tidal	4,4'-DDD	mg/Kg	2	7	0.0018429	0.00279366	0.003912	0.00025	0.00025	0.0073	0.0073
Future Full Tidal	4,4'-DDE	mg/Kg	7	7	11.45	22.4413866	28.07481	0.65	2.1	62	62
Future Full Tidal	4,4'-DDT	mg/Kg	6	7	0.3083214	0.6160616	0.764706	0.00025	0.093	1.7	1.7
Future Full Tidal	Aldrin	mg/Kg	4	7	0.0064643	0.00590097	0.010836	0.00025	0.0095	0.013	0.013
Future Full Tidal	Aroclor 1260	mg/Kg	7	7	0.2731429	0.45440159	0.609768	0.047	0.13	1.3	1.3
Future Full Tidal	BHC-alpha	mg/Kg	2	7	0.0004057	0.00020362	0.000557	0.00025	0.00025	0.00071	0.00071
Future Full Tidal	BHC-beta	mg/Kg	7	7	0.0166571	0.00703488	0.021869	0.0046	0.017	0.024	0.024
Future Full Tidal	BHC-delta	mg/Kg	3	7	0.0029714	0.00373149	0.005736	0.00025	0.00025	0.0095	0.0095
Future Full Tidal	BHC-gamma	mg/Kg	1	7	0.0004214	0.00035574	0.000685	0.00025	0.00025	0.0012	0.0012
Future Full Tidal	Dieldrin	mg/Kg	7	7	0.1885714	0.32962699	0.432763	0.032	0.05	0.93	0.93
Future Full Tidal	Endosulfan II	mg/Kg	1	7	0.0073929	0.01878822	0.021311	0.00025	0.00025	0.05	0.05
Future Full Tidal	Endrin	mg/Kg	1	7	0.0473929	0.12461807	0.139711	0.00025	0.00025	0.33	0.33
Future Full Tidal	Endrin ketone	mg/Kg	5	7	0.0022886	0.00329597	0.00473	0.00025	0.0016	0.0096	0.0096
Future Full Tidal	PCB 066	mg/Kg	5	7	0.0221429	0.0149714	0.033234	0.005	0.022	0.047	0.047
Future Full Tidal	PCB 105	mg/Kg	2	7	0.0057	0.00642521	0.01046	0.0025	0.0025	0.02	0.02
Future Full Tidal	PCB 118	mg/Kg	7	7	0.0193571	0.01255174	0.028656	0.0071	0.019	0.044	0.044
Future Full Tidal	PCB 126	mg/Kg	6	7	0.0499286	0.04719678	0.084892	0.0025	0.028	0.13	0.13
Future Full Tidal	PCB 138	mg/Kg	3	7	0.0120286	0.01840668	0.025664	0.0025	0.0042	0.053	0.053
Future Full Tidal	PCB 153	mg/Kg	7	7	0.0208	0.01852665	0.034525	0.0069	0.016	0.061	0.061
Future Full Tidal	PCB 180	mg/Kg	3	7	0.0044071	0.00376646	0.007197	0.00125	0.0021	0.0097	0.0097
Future Full Tidal	PCB 187	mg/Kg	6	7	0.0247857	0.01401742	0.03517	0.0025	0.027	0.047	0.047
Future Full Tidal	PCB 206	mg/Kg	1	7	0.0016786	0.00082253	0.002288	0.00125	0.00125	0.0034	0.0034
Future Full Tidal	Total DDT	mg/Kg	7	7	11.759914	23.0557461	28.83985	0.65	2.156	63.7	63.7
Future Full Tidal	Total PCB	mg/Kg	7	7	0.2731429	0.45440159	0.609768	0.047	0.13	1.3	1.3
Muted Tidal	Barium	mg/Kg	4	5	0.286	0.17896927	0.442873	0.05	0.3	0.51	0.51
Muted Tidal	Cadmium	mg/Kg	1	5	0.064	0.03130495	0.09144	0.05	0.05	0.12	0.12

TABLE 3-6
Summary Statistics for Chemicals Detected in Stilt Eggs
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Muted Tidal	Chromium	mg/Kg	5	5	0.16	0.02738613	0.184005	0.13	0.18	0.18	0.18
Muted Tidal	Cobalt	mg/Kg	1	5	0.068	0.04024922	0.10328	0.05	0.05	0.14	0.14
Muted Tidal	Copper	mg/Kg	5	5	1.2	0.12247449	1.307354	1	1.2	1.3	1.3
Muted Tidal	Lead	mg/Kg	3	5	0.088	0.0349285	0.118616	0.05	0.11	0.12	0.12
Muted Tidal	Mercury	mg/Kg	5	5	0.1258	0.06329455	0.18128	0.077	0.1	0.23	0.23
Muted Tidal	Nickel	mg/Kg	1	5	0.072	0.0491935	0.11512	0.05	0.05	0.16	0.16
Muted Tidal	Selenium	mg/Kg	5	5	0.306	0.12601587	0.416458	0.17	0.31	0.45	0.45
Muted Tidal	Zinc	mg/Kg	5	5	16.4	3.04959014	19.07308	11	18	18	18
Muted Tidal	4,4'-DDE	mg/Kg	6	6	2.9033333	2.48420343	4.89111	0.82	1.7	7.2	7.2
Muted Tidal	4,4'-DDT	mg/Kg	5	6	0.0950417	0.07024322	0.151248	0.00025	0.096	0.19	0.19
Muted Tidal	Aroclor 1260	mg/Kg	6	6	0.106	0.06351378	0.156822	0.029	0.1095	0.19	0.19
Muted Tidal	BHC-alpha	mg/Kg	1	6	0.0007833	0.00083166	0.001449	0.00025	0.00025	0.002	0.002
Muted Tidal	BHC-beta	mg/Kg	6	6	0.0440333	0.06713275	0.097751	0.0042	0.0225	0.18	0.18
Muted Tidal	BHC-delta	mg/Kg	1	6	0.0006667	0.0007188	0.001242	0.00025	0.00025	0.002	0.002
Muted Tidal	Chlordane-alpha	mg/Kg	2	6	0.0119167	0.01081396	0.02057	0.0025	0.00975	0.027	0.027
Muted Tidal	Chlordane-gamma	mg/Kg	1	6	0.007	0.0074162	0.012934	0.0025	0.0025	0.02	0.02
Muted Tidal	Dieldrin	mg/Kg	5	6	0.0550417	0.04122269	0.088027	0.00025	0.067	0.097	0.097
Muted Tidal	Endosulfan II	mg/Kg	3	6	0.02425	0.02801696	0.046668	0.00025	0.017	0.067	0.067
Muted Tidal	Endrin ketone	mg/Kg	3	6	0.0012333	0.00077825	0.001856	0.00025	0.0016	0.002	0.002
Muted Tidal	PCB 052	mg/Kg	1	6	0.0133333	0.01807392	0.027795	0.005	0.005	0.05	0.05
Muted Tidal	PCB 066	mg/Kg	2	6	0.0183333	0.01806285	0.032787	0.005	0.011	0.05	0.05
Muted Tidal	PCB 118	mg/Kg	3	6	0.0114167	0.00932425	0.018878	0.0025	0.01025	0.025	0.025
Muted Tidal	PCB 126	mg/Kg	3	6	0.0301667	0.03012751	0.054274	0.0025	0.022	0.078	0.078
Muted Tidal	PCB 153	mg/Kg	4	6	0.0126833	0.00908899	0.019956	0.0025	0.0111	0.025	0.025
Muted Tidal	PCB 187	mg/Kg	4	6	0.0268333	0.03627212	0.055857	0.0025	0.013	0.097	0.097
Muted Tidal	PCB 195	mg/Kg	1	6	0.0043667	0.00497561	0.008348	0.00125	0.00125	0.0125	0.0125
Muted Tidal	PCB 206	mg/Kg	3	6	0.0049333	0.0042211	0.008311	0.00125	0.004	0.0125	0.0125
Muted Tidal	Total DDT	mg/Kg	6	6	2.9983333	2.5390097	5.029964	0.82	1.796	7.35	7.35
Muted Tidal	Total PCB	mg/Kg	6	6	0.106	0.06351378	0.156822	0.029	0.1095	0.19	0.19
Seasonal Ponds	Barium	mg/Kg	3	3	0.5833333	0.54848276	1.204	0.15	0.4	1.2	1.2
Seasonal Ponds	Chromium	mg/Kg	3	3	0.2033333	0.06658328	0.278679	0.16	0.17	0.28	0.28
Seasonal Ponds	Copper	mg/Kg	3	3	1.1666667	0.2081666	1.402229	1	1.1	1.4	1.4
Seasonal Ponds	Mercury	mg/Kg	3	3	0.26	0.09539392	0.367948	0.15	0.31	0.32	0.32
Seasonal Ponds	Nickel	mg/Kg	1	3	0.08	0.05196152	0.1388	0.05	0.05	0.14	0.14
Seasonal Ponds	Selenium	mg/Kg	3	3	0.2033333	0.0321455	0.239709	0.18	0.19	0.24	0.24
Seasonal Ponds	Zinc	mg/Kg	3	3	14.666667	3.05505046	18.12378	12	14	18	18
Seasonal Ponds	4,4'-DDD	mg/Kg	1	3	0.0026667	0.00409949	0.007306	0.00025	0.00035	0.0074	0.0074
Seasonal Ponds	4,4'-DDE	mg/Kg	3	3	3.2	1.99749844	5.460382	1	3.7	4.9	4.9
Seasonal Ponds	4,4'-DDT	mg/Kg	2	3	0.0414167	0.03867843	0.085185	0.00025	0.047	0.077	0.077
Seasonal Ponds	Aldrin	mg/Kg	1	3	0.0007667	0.00080984	0.001683	0.00025	0.00035	0.0017	0.0017
Seasonal Ponds	Aroclor 1260	mg/Kg	3	3	0.1933333	0.10115994	0.307807	0.13	0.14	0.31	0.31
Seasonal Ponds	BHC-beta	mg/Kg	2	3	0.0034833	0.00282857	0.006684	0.00025	0.0047	0.0055	0.0055
Seasonal Ponds	BHC-gamma	mg/Kg	2	3	0.0007267	0.00043432	0.001218	0.00025	0.00083	0.0011	0.0011
Seasonal Ponds	Dieldrin	mg/Kg	2	3	0.0614167	0.08619757	0.158958	0.00025	0.024	0.16	0.16
Seasonal Ponds	Endosulfan I	mg/Kg	1	3	0.0039333	0.00473849	0.009295	0.001	0.0014	0.0094	0.0094
Seasonal Ponds	Endosulfan II	mg/Kg	2	3	0.0100833	0.00987526	0.021258	0.00025	0.01	0.02	0.02
Seasonal Ponds	Endrin	mg/Kg	1	3	0.0013	0.00173277	0.003261	0.00025	0.00035	0.0033	0.0033
Seasonal Ponds	Endrin aldehyde	mg/Kg	1	3	0.0006667	0.00063705	0.001388	0.00025	0.00035	0.0014	0.0014
Seasonal Ponds	PCB 105	mg/Kg	2	3	0.0063833	0.00252603	0.009242	0.00355	0.0072	0.0084	0.0084
Seasonal Ponds	PCB 118	mg/Kg	3	3	0.0216667	0.01101514	0.034131	0.011	0.021	0.033	0.033
Seasonal Ponds	PCB 126	mg/Kg	3	3	0.038	0.01868154	0.05914	0.021	0.035	0.058	0.058
Seasonal Ponds	PCB 138	mg/Kg	3	3	0.016	0.00754983	0.024543	0.008	0.017	0.023	0.023
Seasonal Ponds	PCB 153	mg/Kg	3	3	0.0216333	0.01120729	0.034316	0.0089	0.026	0.03	0.03
Seasonal Ponds	PCB 180	mg/Kg	2	3	0.0060333	0.00376342	0.010292	0.0018	0.0073	0.009	0.009
Seasonal Ponds	PCB 187	mg/Kg	3	3	0.0159333	0.00531162	0.021944	0.0098	0.019	0.019	0.019
Seasonal Ponds	PCB 206	mg/Kg	2	3	0.0038	0.002	0.006063	0.0018	0.0038	0.0058	0.0058
Seasonal Ponds	PCB 209	mg/Kg	1	3	0.0018833	0.00067885	0.002652	0.00125	0.0018	0.0026	0.0026
Seasonal Ponds	Total DDT	mg/Kg	3	3	3.2438	2.0282723	5.539006	1	3.7844	4.947	4.947
Seasonal Ponds	Total PCB	mg/Kg	3	3	0.1933333	0.10115994	0.307807	0.13	0.14	0.31	0.31

Notes:

-- not applicable

Chemicals summarized are those that were detected in samples collected as part of the ERA Sampling and Analyses, the Focused Sampling and Analyses (CH2M HILL, 1998a; 2000) and Tetra Tech Phase II Environmental Assessment (1996).

Concentrations are presented on a dry weight basis.

TABLE 3-7
Summary Statistics for Chemicals Detected in Small Mammals
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	2-Butanone	mg/kg	1	1	0.12	-	-	0.12	0.12	0.12	0.12
Bolsa Bay	4,4'-DDE	mg/kg	1	1	0.0021	-	-	0.0021	0.0021	0.0021	0.0021
Bolsa Bay	4-Methyl-2-pentanone	mg/kg	1	1	0.009	-	-	0.009	0.009	0.009	0.009
Bolsa Bay	Acenaphthene	mg/kg	1	1	0.0002	-	-	0.0002	0.0002	0.0002	0.0002
Bolsa Bay	Acetone	mg/kg	1	1	1.2	-	-	1.2	1.2	1.2	1.2
Bolsa Bay	Anthracene	mg/kg	1	1	0.0003	-	-	0.0003	0.0003	0	0
Bolsa Bay	Benzene	mg/kg	1	1	0.0057	-	-	0.0057	0.0057	0.0057	0.0057
Bolsa Bay	Benzo(a)anthracene	mg/kg	1	1	0.0009	-	-	0.0009	0.0009	0.0009	0.0009
Bolsa Bay	Benzo(a)pyrene	mg/kg	1	1	0.0001	-	-	0.0001	0.0001	0.0001	0.0001
Bolsa Bay	Benzo(b)fluoranthene	mg/kg	1	1	0.0002	-	-	0.0002	0.0002	0.0002	0.0002
Bolsa Bay	Benzo(e)pyrene	mg/kg	1	1	0.00022	-	-	0.00022	0.00022	0.00022	0.00022
Bolsa Bay	Benzo(g,h,i)perylene	mg/kg	1	1	0.00022	-	-	0.00022	0.00022	0.00022	0.00022
Bolsa Bay	Benzo(k)fluoranthene	mg/kg	1	1	0.0001	-	-	0.0001	0.0001	0.0001	0.0001
Bolsa Bay	Biphenyl	mg/kg	1	1	0.0011	-	-	0.0011	0.0011	0.0011	0.0011
Bolsa Bay	Chloroform	mg/kg	1	1	4.5	-	-	4.5	4.5	4.5	4.5
Bolsa Bay	Chrysene	mg/kg	1	1	0.0003	-	-	0.0003	0.0003	0.0003	0.0003
Bolsa Bay	Dibenzothiophene	mg/kg	1	1	0.00023	-	-	0.00023	0.00023	0.00023	0.00023
Bolsa Bay	Ethylbenzene	mg/kg	1	1	0.0016	-	-	0.0016	0.0016	0.0016	0.0016
Bolsa Bay	Fluoranthene	mg/kg	1	1	0.001	-	-	0.0007	0.001	0	0
Bolsa Bay	Fluorene	mg/kg	1	1	0.001	-	-	0.0007	0.001	0	0
Bolsa Bay	Indeno(1,2,3-c,d)pyrene	mg/kg	1	1	0.00011	-	-	0.00011	0.00011	0.00011	0.00011
Bolsa Bay	Methylene Chloride	mg/kg	1	1	0.74	-	-	0.74	0.74	0.74	0.74
Bolsa Bay	Naphthalene	mg/kg	2	2	0.00435	0.00091924	0.005624	0.0037	0.00435	0.005	0.005
Bolsa Bay	n-Propylbenzene	mg/kg	1	1	0.01	-	-	0.0056	0.006	0.01	0.01
Bolsa Bay	PCB 138	mg/kg	1	1	0.015	-	-	0.015	0.015	0.015	0.015
Bolsa Bay	PCB 153	mg/kg	1	1	0.0061	-	-	0.0061	0.0061	0.0061	0.0061
Bolsa Bay	PCB 170	mg/kg	1	1	0.0025	-	-	0.0025	0.0025	0.0025	0.0025
Bolsa Bay	PCB 180	mg/kg	1	1	0.028	-	-	0.028	0.028	0.028	0.028
Bolsa Bay	PCB 187	mg/kg	1	1	0.0022	-	-	0.0022	0.0022	0.0022	0.0022
Bolsa Bay	PCB 195	mg/kg	1	1	0.00028	-	-	0.00028	0.00028	0.00028	0.00028
Bolsa Bay	Perylene	mg/kg	1	1	0.000087	-	-	0.000087	0.000087	0.000087	0.000087
Bolsa Bay	Phenanthrene	mg/kg	1	1	0.0021	-	-	0.0021	0.0021	0.0021	0.0021
Bolsa Bay	Pyrene	mg/kg	1	1	0.00063	-	-	0.00063	0.00063	0.00063	0.00063
Bolsa Bay	Toluene	mg/kg	1	1	0.03	-	-	0.03	0.03	0.03	0.03
Bolsa Bay	Xylene (m,p-)	mg/kg	1	1	0.007	-	-	0.0072	0.007	0.007	0.01
Bolsa Bay	Xylene (o-)	mg/kg	1	1	0.001	-	-	0.0014	0.001	0.001	0
Full Tidal	Barium	mg/kg	4	4	3	0.96	3.943	2	2.85	4.3	4.3
Full Tidal	Cadmium	mg/kg	2	4	0.15	0.12	0.27	0.05	0.12	0.3	0.3
Full Tidal	Chromium	mg/kg	4	4	0.7575	0.2798	1.0317	0.36	0.835	1	1
Full Tidal	Cobalt	mg/kg	4	4	0.15	0.0294	0.1789	0.12	0.15	0.18	0.18
Full Tidal	Copper	mg/kg	4	4	6.925	0.5852	7.4985	6.2	6.95	7.6	7.6
Full Tidal	Lead	mg/kg	4	4	0.4875	0.0506	0.5371	0.43	0.485	0.55	0.55
Full Tidal	Mercury	mg/kg	4	4	0.031	0.0047	0.0356	0.026	0.0305	0.037	0.037
Full Tidal	Nickel	mg/kg	4	4	1.7	0.29	1.99	1.4	1.65	2.1	2.1
Full Tidal	Selenium	mg/kg	4	4	0.27	0.05	0.32	0.21	0.26	0.34	0.34
Full Tidal	Vanadium	mg/kg	3	4	0.175	0.0961	0.269	0.05	0.195	0.26	0.26
Full Tidal	Zinc	mg/kg	4	4	120.5	25.0533	145.052	92	120	150	150
Full Tidal	Percent Lipids	percent	4	4	10.875	1.8428	12.6809	8.5	11	13	13
Full Tidal	1,2-Dichloroethene (cis)	mg/kg	1	1	0.032	-	-	0.032	0.032	0.032	0.032
Full Tidal	4,4'-DDD	mg/kg	1	3	0.01685	0.02784	0.04836	0.0005	0.00105	0.049	0.049
Full Tidal	4,4'-DDE	mg/kg	2	3	0.00993	0.01394	0.02571	0.001	0.0028	0.026	0.026
Full Tidal	Acenaphthene	mg/kg	1	1	0.0001	-	-	0.0001	0.0001	0.0001	0
Full Tidal	Acetone	mg/kg	1	1	3.3	-	-	3.3	3.3	3.3	3.3
Full Tidal	Anthracene	mg/kg	1	1	0.00021	-	-	0.00021	0.00021	0.00021	0.00021
Full Tidal	Benzene	mg/kg	1	1	0.003	-	-	0.0029	0.003	0.003	0.003
Full Tidal	Benzo(a)anthracene	mg/kg	1	1	0.001	-	-	0.0006	0.0006	0.001	0
Full Tidal	Benzo(a)pyrene	mg/kg	1	1	0.00007	-	-	0.00007	0.00007	0.00007	0.00007
Full Tidal	Benzo(b)fluoranthene	mg/kg	1	1	0.00024	-	-	0.00024	0.00024	0.00024	0.00024
Full Tidal	Benzo(e)pyrene	mg/kg	1	1	0.00023	-	-	0.00023	0.00023	0.00023	0.00023
Full Tidal	Benzo(g,h,i)perylene	mg/kg	1	1	0.00024	-	-	0.00024	0.00024	0.00024	0.00024
Full Tidal	Benzo(k)fluoranthene	mg/kg	1	1	0.00012	-	-	0.00012	0.00012	0.00012	0.00012

TABLE 3-7
Summary Statistics for Chemicals Detected in Small Mammals
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Full Tidal	BHC-alpha	mg/kg	1	3	0.001	0.0003	0.001	0.0005	0.001	0.001	0.001
Full Tidal	BHC-beta	mg/kg	1	3	0.01973	0.03315	0.05724	0.00019	0.001	0.058	0.058
Full Tidal	BHC-delta	mg/kg	2	3	0.00281	0.00364	0.00693	0.00043	0.001	0.007	0.007
Full Tidal	Biphenyl	mg/kg	1	1	0.00073	-	-	0.00073	0.00073	0.00073	0.00073
Full Tidal	Chloroform	mg/kg	1	1	28	-	-	28	28	28	28
Full Tidal	Chrysene	mg/kg	1	1	0.0004	-	-	0.0004	0.0004	0.0004	0
Full Tidal	Dibenz(a,h)anthracene	mg/kg	1	1	0.0001	-	-	0.0001	0.0001	0.0001	0
Full Tidal	Dibenzothiophene	mg/kg	1	1	0.00018	-	-	0.00018	0.00018	0.00018	0.00018
Full Tidal	Dieldrin	mg/kg	1	3	0.00758	0.01249	0.02171	0.00025	0.0005	0.022	0.022
Full Tidal	Fluoranthene	mg/kg	1	1	0.0022	-	-	0.0022	0.0022	0.0022	0.0022
Full Tidal	Fluorene	mg/kg	1	1	0.00026	-	-	0.00026	0.00026	0.00026	0.00026
Full Tidal	Indeno(1,2,3-c,d)pyrene	mg/kg	1	1	0.0001	-	-	0.0001	0.0001	0.0001	0
Full Tidal	Methylene Chloride	mg/kg	1	1	0.82	-	-	0.82	0.82	0.82	0.82
Full Tidal	Naphthalene	mg/kg	1	2	0.0009	0.00127279	0.002664	0	0.0009	0.0018	0.0018
Full Tidal	PCB 008	mg/kg	1	3	0.02	0.02	0.05	0.001	0.02	0.05	0.05
Full Tidal	PCB 105	mg/kg	1	3	0.01187	0.012302	0.02579	0.00061	0.01	0.025	0.025
Full Tidal	PCB 118	mg/kg	1	3	0.0121	0.011989	0.02566	0.0013	0.01	0.025	0.025
Full Tidal	PCB 138	mg/kg	1	3	0.01253	0.011413	0.02545	0.0026	0.01	0.025	0.025
Full Tidal	PCB 153	mg/kg	1	3	0.01277	0.011111	0.02534	0.0033	0.01	0.025	0.025
Full Tidal	PCB 170	mg/kg	1	3	0.006433	0.00598	0.013201	0.0013	0.005	0.013	0.013
Full Tidal	PCB 180	mg/kg	1	3	0.007033	0.005254	0.012979	0.0031	0.005	0.013	0.013
Full Tidal	PCB 187	mg/kg	1	3	0.011993	0.012133	0.025724	0.00098	0.01	0.025	0.025
Full Tidal	Perylene	mg/kg	1	1	0.0001	-	-	0.0001	0.0001	0	0
Full Tidal	Phenanthrene	mg/kg	1	1	0.0016	-	-	0.0016	0.0016	0.002	0.002
Full Tidal	Pyrene	mg/kg	1	1	0.00051	-	-	0.00051	0.00051	0.00051	0.00051
Full Tidal	Total DDT	mg/kg	2	2	0.04	0.02	0.06	0.03	0.04	0.05	0.05
Future Full Tidal	Barium	mg/kg	1	1	7.7	-	-	7.7	7.7	7.7	7.7
Future Full Tidal	Chromium	mg/kg	1	1	2.1	-	-	2.1	2.1	2.1	2.1
Future Full Tidal	Cobalt	mg/kg	1	1	0.11	-	-	0.11	0.11	0.11	0.11
Future Full Tidal	Copper	mg/kg	1	1	7.6	-	-	7.6	7.6	7.6	7.6
Future Full Tidal	Lead	mg/kg	1	1	0.75	-	-	0.75	0.75	0.75	0.75
Future Full Tidal	Nickel	mg/kg	1	1	2.2	-	-	2.2	2.2	2.2	2.2
Future Full Tidal	Selenium	mg/kg	1	1	0.3	-	-	0.3	0.3	0.3	0.3
Future Full Tidal	Vanadium	mg/kg	1	1	0.33	-	-	0.33	0.33	0.33	0.33
Future Full Tidal	Zinc	mg/kg	1	1	120	-	-	120	120	120	120
Future Full Tidal	Percent Lipids	percent	1	1	8.3	-	-	8.3	8.3	8.3	8.3
Future Full Tidal	1,2-Dichloroethene (cis)	mg/kg	2	2	0.13	0.0283	0.169	0.11	0.13	0.15	0.15
Future Full Tidal	4,4'-DDE	mg/kg	1	3	0.0015	0.0015	0.0032	0.0005	0.0009	0.0032	0.0032
Future Full Tidal	Acenaphthene	mg/kg	2	2	0.0001	0	0.0001	0.0001	0.0001	0.0001	0.0001
Future Full Tidal	Acenaphthylene	mg/kg	1	2	0.000025	0.00003536	0.000074	0	0.000025	0.00005	0.00005
Future Full Tidal	Acetone	mg/kg	2	2	1.99	2.4183	5.3416	0.28	1.99	3.7	3.7
Future Full Tidal	Anthracene	mg/kg	2	2	0.125	-	-	0.125	0.125	0.125	0.125
Future Full Tidal	Benzo(a)anthracene	mg/kg	2	2	0.0005	0.0001	0.0006	0.0004	0.0005	0.0005	0.001
Future Full Tidal	Benzo(a)pyrene	mg/kg	2	2	0.0001	0.0001	0.0002	0	0.0001	0.0001	0
Future Full Tidal	Benzo(b)fluoranthene	mg/kg	2	2	0.0003	0.0001	0.0005	0.0002	0.0003	0.0004	0
Future Full Tidal	Benzo(e)pyrene	mg/kg	2	2	0.0002	0.0001	0.0004	0.0001	0.0002	0.0003	0
Future Full Tidal	Benzo(g,h,i)perylene	mg/kg	2	2	0.00126	0.00161	0.00349	0.00012	0.00126	0.0024	0.0024
Future Full Tidal	Benzo(k)fluoranthene	mg/kg	2	2	0.00012	0.00005	0.00018	0.00008	0.00012	0.00015	0.00015
Future Full Tidal	BHC-alpha	mg/kg	2	3	0.00079	0.0003	0.00113	0.0005	0.00077	0.0011	0.0011
Future Full Tidal	BHC-beta	mg/kg	1	3	0.00642	0.01089	0.01875	0.00011	0.00017	0.019	0.019
Future Full Tidal	BHC-delta	mg/kg	3	3	0.00122	0.00102	0.00238	0.00016	0.0013	0.0022	0.0022
Future Full Tidal	BHC-gamma	mg/kg	2	3	0.00029	0.0002	0.00052	0.0001	0.00028	0.0005	0.0005
Future Full Tidal	Biphenyl	mg/kg	2	2	0.00053	0.0001	0.00067	0.00046	0.00053	0.0006	0.0006
Future Full Tidal	Chloroform	mg/kg	2	2	65.5	0.71	66.48	65	65.5	66	66
Future Full Tidal	Chrysene	mg/kg	2	2	0.0003	0	0.0005	0.00022	0.0003	0.0004	0
Future Full Tidal	Dibenz(a,h)anthracene	mg/kg	1	2	0.000035	0.0000495	0.000104	0	0.000035	0.00007	0.00007
Future Full Tidal	Dibenzothiophene	mg/kg	2	2	0.0001	0	0.0002	0.00011	0.0001	0.0002	0
Future Full Tidal	Dieldrin	mg/kg	2	3	0.0006	0.0002	0.0008	0.0005	0.00051	0.0008	0.0008
Future Full Tidal	Fluoranthene	mg/kg	2	2	0.00029	0.00001414	0.00031	0.00028	0.00029	0.0003	0.0003
Future Full Tidal	Fluorene	mg/kg	2	2	0.00016	0	0.00016	0.00016	0.00016	0.00016	0.00016
Future Full Tidal	Indeno(1,2,3-c,d)pyrene	mg/kg	2	2	0.00011	0.00005657	0.000188	0.00007	0.00011	0.00015	0.00015

TABLE 3-7
Summary Statistics for Chemicals Detected in Small Mammals
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Future Full Tidal	Methylene Chloride	mg/kg	2	2	1.6	0.42	2.19	1.3	1.6	1.9	1.9
Future Full Tidal	Naphthalene	mg/kg	2	4	0.000775	0.00090323	0.00166	0	0.0007	0.0017	0.0017
Future Full Tidal	PCB 008	mg/kg	2	3	0.01	0.01	0.02	0.001	0	0.03	0.03
Future Full Tidal	PCB 028	mg/kg	1	3	0.0091	0.013771	0.024683	0.001	0.0013	0.025	0.025
Future Full Tidal	PCB 044	mg/kg	1	3	0.008983	0.013877	0.024687	0.0005	0.0014	0.025	0.025
Future Full Tidal	PCB 052	mg/kg	2	3	0.010513	0.012907	0.025118	0.0002	0.0063	0.025	0.025
Future Full Tidal	PCB 066	mg/kg	2	3	0.01108	0.012604	0.025343	0.0004	0.0078	0.025	0.025
Future Full Tidal	PCB 101	mg/kg	2	3	0.01437	0.01154	0.02742	0.0021	0.016	0.025	0.025
Future Full Tidal	PCB 105	mg/kg	2	3	0.01224	0.01116	0.02487	0.00072	0.013	0.023	0.023
Future Full Tidal	PCB 118	mg/kg	2	3	0.03223	0.04347	0.08142	0.0017	0.013	0.082	0.082
Future Full Tidal	PCB 128	mg/kg	2	3	0.01082	0.00946	0.02153	0.00046	0.013	0.019	0.019
Future Full Tidal	PCB 138	mg/kg	2	3	0.09263	0.145	0.25672	0.0049	0.013	0.26	0.26
Future Full Tidal	PCB 153	mg/kg	2	3	0.1433	0.23186	0.40568	0.0059	0.013	0.411	0.411
Future Full Tidal	PCB 170	mg/kg	2	3	0.029	0.04248	0.07707	0.0025	0.0065	0.078	0.078
Future Full Tidal	PCB 180	mg/kg	2	3	0.07007	0.11253	0.19741	0.0037	0.0065	0.2	0.2
Future Full Tidal	PCB 187	mg/kg	2	3	0.05837	0.08819	0.15816	0.0021	0.013	0.16	0.16
Future Full Tidal	PCB 195	mg/kg	2	3	0.0097	0.011	0.022	0.0007	0.0065	0.022	0.02
Future Full Tidal	PCB 206	mg/kg	2	3	0.006	0.004	0.011	0.0014	0.0065	0.01	0.01
Future Full Tidal	PCB 209	mg/kg	2	3	0.0024	0.004	0.006	0.0003	0.0003	0.0065	0.01
Future Full Tidal	Perylene	mg/kg	2	2	0.000065	0.00002121	0.00009	0.00005	0.000065	0.00008	0.00008
Future Full Tidal	Phenanthrene	mg/kg	2	2	0.001	0	0.001	0.001	0.001	0.0011	0
Future Full Tidal	Pyrene	mg/kg	2	2	0.000415	0.00017678	0.00066	0.00029	0.000415	0.00054	0.00054
Gas Plant	Barium	mg/kg	2	2	12.4	7.9196	23.376	6.8	12.4	18	18
Gas Plant	Cadmium	mg/kg	1	2	0.1	0.07071	0.198	0.05	0.1	0.15	0.15
Gas Plant	Chromium	mg/kg	2	2	1.85	0.9192	3.124	1.2	1.85	2.5	2.5
Gas Plant	Cobalt	mg/kg	2	2	0.175	0.0919	0.3024	0.11	0.175	0.24	0.24
Gas Plant	Copper	mg/kg	2	2	7.9	0.9899	9.272	7.2	7.9	8.6	8.6
Gas Plant	Lead	mg/kg	2	2	1.03	0.52	1.76	0.66	1.03	1.4	1.4
Gas Plant	Mercury	mg/kg	2	2	0.03	0	0.03	0.03	0.03	0.03	0.03
Gas Plant	Nickel	mg/kg	2	2	2.15	0.35	2.64	1.9	2.15	2.4	2.4
Gas Plant	Selenium	mg/kg	2	2	0.17	0	0.17	0.17	0.17	0.17	0.17
Gas Plant	Vanadium	mg/kg	2	2	0.34	0.05	0.4	0.3	0.34	0.37	0.37
Gas Plant	Zinc	mg/kg	2	2	195	106.07	342	120	195	270	270
Gas Plant	Percent Lipids	percent	2	2	12.5	2.12	15.44	11	12.5	14	14
Gas Plant	Aldrin	mg/kg	2	2	0.005	0	0.006	0.005	0.005	0.006	0.006
Gas Plant	BHC-beta	mg/kg	1	2	0.00168	0.00202	0.00447	0.00025	0.00168	0.0031	0.0031
Gas Plant	BHC-delta	mg/kg	1	2	0.00193	0.00237	0.00521	0.00025	0.00193	0.0036	0.0036
Gas Plant	BHC-gamma	mg/kg	1	2	0.00088	0.00088	0.0021	0.00025	0.00088	0.0015	0.0015
Gas Plant	Dieldrin	mg/kg	1	2	0.000675	0.00060104	0.001508	0.00025	0.000675	0.0011	0.0011
Gas Plant	Endosulfan II	mg/kg	2	2	0.001025	0.00109602	0.002544	0.00025	0.001025	0.0018	0.0018
Gas Plant	Endrin ketone	mg/kg	1	2	0.004	0.00339411	0.008704	0.0016	0.004	0.0064	0.0064
Muted Tidal	Barium	mg/kg	11	11	2.973	1.975	4.14	1.3	2.4	5.6	7.7
Muted Tidal	Cadmium	mg/kg	3	11	0.07727	0.05293	0.10855	0.05	0.05	0.14	0.21
Muted Tidal	Chromium	mg/kg	11	11	1.03	0.47	1.31	0.4	1	1.7	1.8
Muted Tidal	Cobalt	mg/kg	4	11	0.09	0.06	0.13	0.05	0.05	0.19	0.21
Muted Tidal	Copper	mg/kg	11	11	5.89	1.1	6.54	4.3	5.8	7.4	7.7
Muted Tidal	Lead	mg/kg	11	11	1.5445	2.087	2.778	0.48	0.82	2.5	7.6
Muted Tidal	Mercury	mg/kg	6	11	0.02	0.01	0.02	0.01	0.02	0.03	0.03
Muted Tidal	Nickel	mg/kg	11	11	1.54	0.32	1.73	0.96	1.6	1.9	2
Muted Tidal	Selenium	mg/kg	11	11	0.18	0.05	0.21	0.13	0.16	0.27	0.27
Muted Tidal	Vanadium	mg/kg	11	11	0.214	0.076	0.26	0.11	0.21	0.3	0.37
Muted Tidal	Zinc	mg/kg	11	11	95.727	25.919	111.04	58	99	110	150
Muted Tidal	Percent Lipids	percent	11	11	11.6091	4.308	14.155	4.2	12	17	17
Muted Tidal	4,4'-DDE	mg/kg	3	12	0.00202	0.0031	0.00377	0.00025	0.0005	0.0064	0.01
Muted Tidal	4,4'-DDT	mg/kg	4	12	0.00299	0.00336	0.00489	0.00025	0.00105	0.0075	0.0098
Muted Tidal	Acenaphthene	mg/kg	2	5	0.006	0.005	0.011	0.00026	0.01	0.01	0.01
Muted Tidal	Aldrin	mg/kg	9	12	0.026	0.04	0.048	0.001	0.0088	0.054	0.14
Muted Tidal	Anthracene	mg/kg	2	5	0.006	0.005	0.011	0.00017	0.01	0.01	0.01
Muted Tidal	Benzo(a)anthracene	mg/kg	2	5	0.006	0.005	0.011	0.0011	0.01	0.01	0.01
Muted Tidal	Benzo(a)pyrene	mg/kg	2	5	0.006	0.005	0.011	0.00013	0.01	0.01	0.01
Muted Tidal	Benzo(b)fluoranthene	mg/kg	2	5	0.006	0.005	0.011	0.00024	0.01	0.01	0.01

TABLE 3-7
Summary Statistics for Chemicals Detected in Small Mammals
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Muted Tidal	Benzo(e)pyrene	mg/kg	2	5	0.00613	0.0053	0.01078	0.00027	0.01	0.01	0.01
Muted Tidal	Benzo(g,h,i)perylene	mg/kg	2	5	0.00612	0.00531	0.01078	0.00027	0.01	0.01	0.01
Muted Tidal	Benzo(k)fluoranthene	mg/kg	2	5	0.00606	0.0054	0.01079	0.00013	0.01	0.01	0.01
Muted Tidal	BHC-alpha	mg/kg	5	12	0.00163	0.0027	0.00315	0.00025	0.001	0.002	0.01
Muted Tidal	BHC-beta	mg/kg	7	12	0.01273	0.02367	0.02612	0.00025	0.00435	0.031	0.082
Muted Tidal	BHC-delta	mg/kg	8	12	0.00359	0.00393	0.00582	0.00025	0.003	0.0061	0.014
Muted Tidal	Biphenyl	mg/kg	2	2	0.00105	0.00007	0.00115	0.001	0.00105	0.0011	0.0011
Muted Tidal	Chlordane-alpha	mg/kg	1	10	0.01	0.01	0.01	0	0.01	0.02	0.03
Muted Tidal	Chrysene	mg/kg	2	5	0.01	0.01	0.01	0	0.01	0.01	0.01
Muted Tidal	Dibenz(a,h)anthracene	mg/kg	1	5	0.01	0.01	0.01	0	0.01	0.01	0.01
Muted Tidal	Dibenzothiophene	mg/kg	2	2	0.000245	0.00002121	0.000274	0.00023	0.000245	0.00026	0.00026
Muted Tidal	Dieldrin	mg/kg	2	12	0.00152	0.00285	0.00313	0.00025	0.0005	0.0038	0.01
Muted Tidal	Endosulfan II	mg/kg	4	10	0.002985	0.00325474	0.005002	0.00025	0.001	0.00805	0.0085
Muted Tidal	Endrin	mg/kg	3	12	0.00169	0.00201	0.00283	0.00025	0.001	0.0051	0.0066
Muted Tidal	Endrin aldehyde	mg/kg	1	10	0.00073	0.00068	0.00115	0.00025	0.0005	0.00175	0.0025
Muted Tidal	Endrin ketone	mg/kg	4	12	0.00195	0.0017	0.00291	0.00025	0.00135	0.00335	0.0057
Muted Tidal	Fluoranthene	mg/kg	2	5	0.01	0	0.01	0.0007	0.01	0.01	0.01
Muted Tidal	Fluorene	mg/kg	2	5	0.01	0.01	0.01	0.0007	0.01	0.01	0.01
Muted Tidal	Indeno(1,2,3-c,d)pyrene	mg/kg	1	5	0.01	0.01	0.01	0	0.01	0.01	0.01
Muted Tidal	Naphthalene	mg/kg	3	5	0.01	0.01	0.02	0.003	0.01	0.02	0.02
Muted Tidal	PCB 008	mg/kg	1	11	0.02	0.01	0.02	0	0.01	0.03	0.03
Muted Tidal	PCB 105	mg/kg	1	11	0.00788	0.00563	0.01121	0.001	0.005	0.017	0.017
Muted Tidal	PCB 118	mg/kg	2	11	0.00778	0.00575	0.01118	0.00072	0.005	0.017	0.017
Muted Tidal	PCB 138	mg/kg	2	11	0.00852	0.00495	0.01144	0.0047	0.005	0.017	0.017
Muted Tidal	PCB 153	mg/kg	3	11	0.01006	0.00571	0.01344	0.005	0.007	0.017	0.02
Muted Tidal	PCB 170	mg/kg	3	11	0.0046	0.003	0.006	0.0022	0.0034	0.0085	0.01
Muted Tidal	PCB 180	mg/kg	3	11	0.0061	0.004	0.009	0.0025	0.0053	0.0085	0.02
Muted Tidal	PCB 187	mg/kg	2	11	0.0079	0.006	0.011	0.0014	0.005	0.017	0.02
Muted Tidal	Perylene	mg/kg	2	2	0.000135	0.00010607	0.000282	0.00006	0.000135	0.00021	0.00021
Muted Tidal	Phenanthrene	mg/kg	2	5	0.0069	0.004	0.011	0.002	0.01	0.01	0.01
Muted Tidal	Pyrene	mg/kg	2	5	0.01	0.01	0.02	0	0.01	0.03	0.03
Muted Tidal	Low MW PAHs	mg/kg	1	3	0.01	0.01	0.02	0	0	0.02	0.02
Muted Tidal	Total DDT	mg/kg	4	10	0.00281	0.00615277	0.006624	0	0	0.01195	0.0198
Muted Tidal	Total PAHs	mg/kg	1	3	0.01	0.01	0.02	0	0	0.02	0.02
Seasonal Ponds	Barium	mg/kg	2	2	2.55	0.07	2.648	2.5	2.55	2.6	2.6
Seasonal Ponds	Chromium	mg/kg	2	2	0.82	0.396	1.3688	0.54	0.82	1.1	1.1
Seasonal Ponds	Cobalt	mg/kg	1	2	0.095	0.0636	0.1832	0.05	0.095	0.14	0.14
Seasonal Ponds	Copper	mg/kg	2	2	6.55	0.2121	6.844	6.4	6.55	6.7	6.7
Seasonal Ponds	Lead	mg/kg	2	2	0.545	0.0212	0.5744	0.53	0.545	0.56	0.56
Seasonal Ponds	Mercury	mg/kg	2	2	0.07	0.04	0.13	0.035	0.066	0.1	0.1
Seasonal Ponds	Nickel	mg/kg	2	2	1.5	0.28	1.89	1.3	1.5	1.7	1.7
Seasonal Ponds	Selenium	mg/kg	2	2	0.2	0.01	0.22	0.19	0.2	0.21	0.21
Seasonal Ponds	Vanadium	mg/kg	2	2	0.12	0.01	0.12	0.11	0.115	0.12	0.12
Seasonal Ponds	Zinc	mg/kg	2	2	125	7.07	134.8	120	125	130	130
Seasonal Ponds	Percent Lipids	percent	2	2	14	4.24	19.88	11	14	17	17
Seasonal Ponds	4,4'-DDE	mg/kg	1	2	0.00513	0.00689	0.01468	0.00025	0.00513	0.01	0.01
Seasonal Ponds	Acenaphthene	mg/kg	1	2	0.005	0.01	0.015	0.0002	0.0051	0.01	0.01
Seasonal Ponds	Aldrin	mg/kg	1	2	0.003	0	0.007	0.0007	0.003	0.005	0.01
Seasonal Ponds	Anthracene	mg/kg	1	2	0.005	0.01	0.015	0.0001	0.0051	0.01	0.01
Seasonal Ponds	Benzo(a)anthracene	mg/kg	1	2	0.0053	0.0067	0.0145	0.0006	0.0053	0.01	0.01
Seasonal Ponds	Benzo(a)pyrene	mg/kg	1	2	0.005	0.007	0.0148	0.0001	0.005	0.01	0.01
Seasonal Ponds	Benzo(b)fluoranthene	mg/kg	1	2	0.0051	0.007	0.0147	0.0002	0.0051	0.01	0.01
Seasonal Ponds	Benzo(e)pyrene	mg/kg	1	2	0.0051	0.007	0.0147	0.0002	0.0051	0.01	0.01
Seasonal Ponds	Benzo(g,h,i)perylene	mg/kg	1	2	0.0051	0.007	0.0147	0.0001	0.0051	0.01	0.01
Seasonal Ponds	Benzo(k)fluoranthene	mg/kg	1	2	0.00504	0.00701	0.01476	0.00008	0.00504	0.01	0.01
Seasonal Ponds	BHC-alpha	mg/kg	1	2	0.0003	0	0.0003	0.0003	0.0003	0	0
Seasonal Ponds	BHC-beta	mg/kg	1	2	0.00023	0.00003	0.00027	0.00021	0.00023	0.00025	0.00025
Seasonal Ponds	BHC-gamma	mg/kg	1	2	0.00057	0.00052	0.00128	0.0002	0.00057	0.00093	0.00093
Seasonal Ponds	Biphenyl	mg/kg	1	1	0.00061	-	-	0.00061	0.00061	0.00061	0.00061
Seasonal Ponds	Chrysene	mg/kg	1	2	0.0051	0.007	0.0147	0.00016	0.0051	0.01	0.01
Seasonal Ponds	Dibenzothiophene	mg/kg	1	1	0.0002	-	-	0.0002	0.0002	0.0002	0

TABLE 3-7
Summary Statistics for Chemicals Detected in Small Mammals
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Seasonal Ponds	Dieldrin	mg/kg	2	2	0.039	0.01131	0.05468	0.031	0.039	0.047	0.047
Seasonal Ponds	Endosulfan II	mg/kg	1	1	0.0016	-	-	0.0016	0.0016	0.0016	0.0016
Seasonal Ponds	Fluoranthene	mg/kg	1	2	0.01	0.01	0.01	0.001	0.005	0.01	0.01
Seasonal Ponds	Fluorene	mg/kg	1	2	0.01	0.01	0.01	0.0004	0.005	0.01	0.01
Seasonal Ponds	Naphthalene	mg/kg	1	2	0.01	0.01	0.01	0.003	0.01	0.01	0.01
Seasonal Ponds	PCB 008	mg/kg	1	2	0.01	0.01	0.01	0	0.01	0.01	0.01
Seasonal Ponds	PCB 101	mg/kg	1	2	0.00565	0.006152	0.014176	0.0013	0.0056	0.01	0.01
Seasonal Ponds	PCB 105	mg/kg	1	2	0.002995	0.002835	0.006925	0.00099	0.0029	0.005	0.005
Seasonal Ponds	PCB 118	mg/kg	1	2	0.00315	0.00262	0.00678	0.0013	0.00315	0.005	0.005
Seasonal Ponds	PCB 128	mg/kg	1	2	0.00281	0.0031	0.0071	0.00062	0.00281	0.005	0.005
Seasonal Ponds	PCB 138	mg/kg	1	2	0.0055	0.00071	0.00648	0.005	0.0055	0.006	0.006
Seasonal Ponds	PCB 153	mg/kg	1	2	0.0068	0.00255	0.01033	0.005	0.0068	0.0086	0.0086
Seasonal Ponds	PCB 170	mg/kg	1	2	0.0018	0.00099	0.00317	0.0011	0.0018	0.0025	0.0025
Seasonal Ponds	PCB 180	mg/kg	1	2	0.0034	0.0013	0.0052	0.0025	0.0034	0.0043	0.004
Seasonal Ponds	PCB 187	mg/kg	1	2	0.0035	0.0021	0.0064	0.002	0.0035	0.005	0.005
Seasonal Ponds	PCB 206	mg/kg	1	2	0.0018	0.0011	0.0032	0.001	0.0018	0.0025	0.003
Seasonal Ponds	Perylene	mg/kg	1	1	0.00007	-	-	0.00007	0.00007	0.00007	0.00007
Seasonal Ponds	Phenanthrene	mg/kg	1	2	0.0057	0.0061	0.0141	0.0014	0.0057	0.01	0.01
Seasonal Ponds	Pyrene	mg/kg	1	2	0.01	0.01	0.01	0	0.01	0.01	0.01

Notes:

-- not applicable

Chemicals summarized are those that were detected in samples collected as part of the ERA Sampling and Analysis, the Focused Sampling and Analysis (CH2M HILL, 1998a; 2000) and Tetra Tech Phase II Environmental Assessment (1996)..

Concentrations are presented on a dry weight basis.

TABLE 3-8
Summary Statistics for Chemicals Detected in Aquatic Invertebrate Tissue
Bolsa Chica Lowlands

Area	Analyte	Tissue	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	Arsenic	Aquatic invertebrate-corixid	mg/kg	1	1	0.66	-	-	0.66	0.66	0.66	0.66
Bolsa Bay	Barium	Aquatic invertebrate-corixid	mg/kg	1	1	4.1	-	-	4.1	4.1	4.1	4.1
Bolsa Bay	Chromium	Aquatic invertebrate-corixid	mg/kg	1	1	0.3	-	-	0.3	0.3	0.3	0.3
Bolsa Bay	Cobalt	Aquatic invertebrate-corixid	mg/kg	1	1	0.33	-	-	0.33	0.33	0.33	0.33
Bolsa Bay	Copper	Aquatic invertebrate-corixid	mg/kg	1	1	4.1	-	-	4.1	4.1	4.1	4.1
Bolsa Bay	Lead	Aquatic invertebrate-corixid	mg/kg	1	1	0.93	-	-	0.93	0.93	0.93	0.93
Bolsa Bay	Nickel	Aquatic invertebrate-corixid	mg/kg	1	1	0.48	-	-	0.48	0.48	0.48	0.48
Bolsa Bay	Vanadium	Aquatic invertebrate-corixid	mg/kg	1	1	0.75	-	-	0.75	0.75	0.75	0.75
Bolsa Bay	Zinc	Aquatic invertebrate-corixid	mg/kg	1	1	17	-	-	17	17	17	17
Bolsa Bay	Percent Lipids	Aquatic invertebrate-corixid	percent	1	1	0.6	-	-	0.6	0.6	0.6	0.6
Bolsa Bay	Barium	Aquatic-mussel	mg/kg	5	5	0.27	0.09823	0.3561	0.15	0.27	0.42	0.42
Bolsa Bay	Beryllium	Aquatic-mussel	mg/kg	1	5	0.076	0.05814	0.127	0.05	0.05	0.18	0.18
Bolsa Bay	Cadmium	Aquatic-mussel	mg/kg	1	5	0.062	0.02683	0.08552	0.05	0.05	0.11	0.11
Bolsa Bay	Chromium	Aquatic-mussel	mg/kg	4	5	0.626	0.629	1.1773	0.05	0.35	1.4	1.4
Bolsa Bay	Copper	Aquatic-mussel	mg/kg	5	5	1.66	0.1673	1.8067	1.4	1.7	1.8	1.8
Bolsa Bay	Lead	Aquatic-mussel	mg/kg	5	5	0.31	0.38	0.64	0.12	0.15	0.98	0.98
Bolsa Bay	Nickel	Aquatic-mussel	mg/kg	3	5	0.32	0.29	0.57	0.05	0.26	0.65	0.65
Bolsa Bay	Selenium	Aquatic-mussel	mg/kg	5	5	0.46	0.14	0.59	0.34	0.42	0.65	0.65
Bolsa Bay	Vanadium	Aquatic-mussel	mg/kg	5	5	0.308	0.051	0.352	0.26	0.29	0.38	0.38
Bolsa Bay	Zinc	Aquatic-mussel	mg/kg	5	5	5.46	1.601	6.863	3.2	6.1	6.9	6.9
Bolsa Bay	Percent Lipids	Aquatic-mussel	percent	5	5	0.17	0.08	0.24	0.06	0.16	0.28	0.28
Bolsa Bay	4,4'-DDD	Aquatic-mussel	mg/kg	3	5	0.00098	0.000682	0.00158	0.00025	0.0013	0.0017	0.0017
Bolsa Bay	4,4'-DDE	Aquatic-mussel	mg/kg	4	5	0.00319	0.002291	0.0052	0.00025	0.0032	0.0066	0.0066
Bolsa Bay	Aldrin	Aquatic-mussel	mg/kg	1	5	0.0005	0.001	0.001	0.0003	0.0003	0.002	0
Bolsa Bay	BHC-alpha	Aquatic-mussel	mg/kg	2	5	0.00047	0.000303	0.00073	0.00025	0.00025	0.00087	0.00087
Bolsa Bay	BHC-beta	Aquatic-mussel	mg/kg	1	5	0.0026	0.005255	0.00721	0.00025	0.00025	0.012	0.012
Bolsa Bay	BHC-delta	Aquatic-mussel	mg/kg	2	5	0.00104	0.001454	0.00232	0.00025	0.00025	0.0036	0.0036
Bolsa Bay	Total DDT	Aquatic-mussel	mg/kg	4	5	0.00402	0.00308658	0.006726	0	0.0045	0.0083	0.0083
Bolsa Bay	Barium	Aquatic-shrimp	mg/kg	1	1	4.2	-	-	4.2	4.2	4.2	4.2
Bolsa Bay	Chromium	Aquatic-shrimp	mg/kg	1	1	0.94	-	-	0.94	0.94	0.94	0.94
Bolsa Bay	Cobalt	Aquatic-shrimp	mg/kg	1	1	0.12	-	-	0.12	0.12	0.12	0.12
Bolsa Bay	Copper	Aquatic-shrimp	mg/kg	1	1	24	-	-	24	24	24	24
Bolsa Bay	Lead	Aquatic-shrimp	mg/kg	1	1	0.36	-	-	0.36	0.36	0.36	0.36
Bolsa Bay	Nickel	Aquatic-shrimp	mg/kg	1	1	0.87	-	-	0.87	0.87	0.87	0.87
Bolsa Bay	Selenium	Aquatic-shrimp	mg/kg	1	1	0.63	-	-	0.63	0.63	0.63	0.63
Bolsa Bay	Silver	Aquatic-shrimp	mg/kg	1	1	0.11	-	-	0.11	0.11	0.11	0.11
Bolsa Bay	Vanadium	Aquatic-shrimp	mg/kg	1	1	0.26	-	-	0.26	0.26	0.26	0.26
Bolsa Bay	Zinc	Aquatic-shrimp	mg/kg	1	1	22	-	-	22	22	22	22
Bolsa Bay	Percent Lipids	Aquatic-shrimp	percent	1	1	0.4	-	-	0.4	0.4	0.4	0.4
Bolsa Bay	4,4'-DDE	Aquatic-shrimp	mg/kg	1	1	0.017	-	-	0.017	0.017	0.017	0.017
Bolsa Bay	Aldrin	Aquatic-shrimp	mg/kg	1	1	0.002	-	-	0.002	0.002	0.002	0
Bolsa Bay	BHC-alpha	Aquatic-shrimp	mg/kg	1	1	0.00059	-	-	0.00059	0.00059	0.00059	0.00059
Bolsa Bay	BHC-beta	Aquatic-shrimp	mg/kg	1	1	0.0091	-	-	0.0091	0.0091	0.0091	0.0091
Bolsa Bay	Dieldrin	Aquatic-shrimp	mg/kg	1	1	0.00072	-	-	0.00072	0.00072	0.00072	0.00072
Bolsa Bay	Total DDT	Aquatic-shrimp	mg/kg	1	1	0.02	-	-	0.02	0.02	0.02	0.02
Bolsa Bay	Barium	Aquatic-snail	mg/kg	7	7	3.9714	1.784	5.293	1.9	3.7	7.2	7.2
Bolsa Bay	Beryllium	Aquatic-snail	mg/kg	3	7	0.0814	0.03976	0.1109	0.05	0.05	0.13	0.13
Bolsa Bay	Cadmium	Aquatic-snail	mg/kg	1	7	0.06143	0.03024	0.08383	0.05	0.05	0.13	0.13
Bolsa Bay	Chromium	Aquatic-snail	mg/kg	7	7	3.2471	3.7389	6.017	0.22	2.1	11	11
Bolsa Bay	Cobalt	Aquatic-snail	mg/kg	7	7	0.5514	0.1308	0.6483	0.37	0.57	0.7	0.7
Bolsa Bay	Copper	Aquatic-snail	mg/kg	7	7	8.5714	4.5511	11.9429	2.5	7.9	17	17
Bolsa Bay	Lead	Aquatic-snail	mg/kg	5	7	0.74	0.71	1.27	0.05	0.59	1.8	1.8
Bolsa Bay	Nickel	Aquatic-snail	mg/kg	7	7	8.56	2.43	10.36	5.5	7.3	12	12
Bolsa Bay	Selenium	Aquatic-snail	mg/kg	1	7	0.1	0.14	0.21	0.05	0.05	0.43	0.43
Bolsa Bay	Vanadium	Aquatic-snail	mg/kg	6	7	0.509	0.366	0.78	0.05	0.52	0.98	0.98
Bolsa Bay	Zinc	Aquatic-snail	mg/kg	7	7	29.514	18.9	43.516	2.2	41	46	46
Bolsa Bay	Percent Lipids	Aquatic-snail	percent	7	7	0.16	0.04	0.19	0.13	0.14	0.22	0.22
Bolsa Bay	4,4'-DDD	Aquatic-snail	mg/kg	2	7	0.00336	0.005567	0.00749	0.00025	0.00025	0.014	0.014
Bolsa Bay	4,4'-DDE	Aquatic-snail	mg/kg	6	7	0.01074	0.014973	0.02183	0.00025	0.0023	0.04	0.04
Bolsa Bay	Aldrin	Aquatic-snail	mg/kg	1	7	0.0004	0	0.001	0.0003	0.0003	0.002	0
Bolsa Bay	BHC-alpha	Aquatic-snail	mg/kg	3	7	0.00171	0.001967	0.00317	0.00025	0.00025	0.0048	0.0048
Bolsa Bay	BHC-beta	Aquatic-snail	mg/kg	3	7	0.0027	0.00308	0.00498	0.00025	0.00025	0.0067	0.0067
Bolsa Bay	BHC-delta	Aquatic-snail	mg/kg	1	7	0.00037	0.000321	0.00061	0.00025	0.00025	0.0011	0.0011
Bolsa Bay	PCB 018	Aquatic-snail	mg/kg	1	7	0.005857	0.0022678	0.007537	0.005	0.005	0.011	0.011
Bolsa Bay	Total DDT	Aquatic-snail	mg/kg	6	7	0.01	0.02	0.03	0	0	0.05	0.05
Bolsa Bay	Barium	Aquatic-worm bioaccumulation	mg/kg	5	10	0.264	0.338	0.473	0.05	0.105	0.82	1.1
Bolsa Bay	Cadmium	Aquatic-worm bioaccumulation	mg/kg	3	10	0.073	0.03831	0.09675	0.05	0.05	0.135	0.15
Bolsa Bay	Chromium	Aquatic-worm bioaccumulation	mg/kg	9	10	0.375	0.3737	0.6066	0.05	0.205	0.965	1.3
Bolsa Bay	Cobalt	Aquatic-worm bioaccumulation	mg/kg	5	10	0.085	0.0375	0.1082	0.05	0.08	0.13	0.13
Bolsa Bay	Copper	Aquatic-worm bioaccumulation	mg/kg	10	10	0.805	0.1049	0.87	0.66	0.805	0.94	0.96
Bolsa Bay	Lead	Aquatic-worm bioaccumulation	mg/kg	10	10	0.31	0.07	0.35	0.2	0.3	0.42	0.47
Bolsa Bay	Nickel	Aquatic-worm bioaccumulation	mg/kg	6	10	0.2	0.23	0.34	0.05	0.13	0.55	0.82

TABLE 3-8
Summary Statistics for Chemicals Detected in Aquatic Invertebrate Tissue
Bolsa Chica Lowlands

Area	Analyte	Tissue	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	Vanadium	Aquatic-worm bioaccumulation	mg/kg	10	10	0.323	0.141	0.411	0.2	0.245	0.555	0.58
Bolsa Bay	Zinc	Aquatic-worm bioaccumulation	mg/kg	10	10	15.08	5.972	18.781	9.8	13.5	24	31
Bolsa Bay	Percent Lipids	Aquatic-worm bioaccumulation	percent	10	10	0.67	0.2	0.79	0.47	0.59	1.01	1.1
Bolsa Bay	4,4'-DDD	Aquatic-worm bioaccumulation	mg/kg	1	10	0.00173	0.004664	0.00462	0.00025	0.00025	0.00763	0.015
Bolsa Bay	4,4'-DDE	Aquatic-worm bioaccumulation	mg/kg	10	10	0.00132	0.001125	0.00201	0.00055	0.00083	0.00315	0.0042
Bolsa Bay	Dieldrin	Aquatic-worm bioaccumulation	mg/kg	4	10	0.00103	0.00166	0.00206	0.00025	0.00025	0.00355	0.0056
Bolsa Bay	Total DDT	Aquatic-worm bioaccumulation	mg/kg	10	10	0.002816	0.00577739	0.006397	0.00055	0.00083	0.01065	0.0192
Full Tidal	Arsenic	Aquatic invertebrate-corixid	mg/kg	2	3	0.485	0.3185	0.8454	0.125	0.6	0.73	0.73
Full Tidal	Barium	Aquatic invertebrate-corixid	mg/kg	3	3	11.767	6.35	18.956	5.3	12	18	18
Full Tidal	Beryllium	Aquatic invertebrate-corixid	mg/kg	3	3	0.51	0.3378	0.892	0.12	0.7	0.71	0.71
Full Tidal	Chromium	Aquatic invertebrate-corixid	mg/kg	3	3	2.65	2.2288	5.1721	0.35	2.8	4.8	4.8
Full Tidal	Cobalt	Aquatic invertebrate-corixid	mg/kg	3	3	0.3033	0.1159	0.4345	0.18	0.32	0.41	0.41
Full Tidal	Copper	Aquatic invertebrate-corixid	mg/kg	3	3	3.1	0.8544	4.0668	2.3	3	4	4
Full Tidal	Lead	Aquatic invertebrate-corixid	mg/kg	3	3	1.3	0.781	2.1838	0.4	1.7	1.8	1.8
Full Tidal	Nickel	Aquatic invertebrate-corixid	mg/kg	3	3	1.96	1.31	3.45	0.59	2.1	3.2	3.2
Full Tidal	Vanadium	Aquatic invertebrate-corixid	mg/kg	3	3	1.533	0.6028	2.215	0.9	1.6	2.1	2.1
Full Tidal	Zinc	Aquatic invertebrate-corixid	mg/kg	3	3	22.333	5.7735	28.867	19	19	29	29
Full Tidal	Percent Lipids	Aquatic invertebrate-corixid	percent	3	3	0.38	0.28	0.6968	0.18	0.26	0.7	0.7
Full Tidal	4,4'-DDE	Aquatic invertebrate-corixid	mg/kg	3	3	0.00074	0.00005	0.00079	0.00071	0.00071	0.00079	0.00079
Full Tidal	Aldrin	Aquatic invertebrate-corixid	mg/kg	1	3	0.0012	0.0017	0.0032	0.0003	0.0003	0.0032	0.003
Full Tidal	BHC-alpha	Aquatic invertebrate-corixid	mg/kg	1	3	0.002	0.0031	0.006	0.0003	0	0.006	0.006
Full Tidal	BHC-beta	Aquatic invertebrate-corixid	mg/kg	1	3	0.0008	0.00095	0.00188	0.00025	0.00025	0.0019	0.0019
Full Tidal	BHC-delta	Aquatic invertebrate-corixid	mg/kg	1	3	0.01283	0.02179	0.0375	0.00025	0.00025	0.038	0.038
Full Tidal	BHC-gamma	Aquatic invertebrate-corixid	mg/kg	1	3	0.00133	0.00188	0.00346	0.00025	0.00025	0.0035	0.0035
Full Tidal	Total DDT	Aquatic invertebrate-corixid	mg/kg	3	3	0.000737	0.000046	0.000789	0.00071	0.00071	0.00079	0.00079
Full Tidal	Barium	Aquatic-mussel	mg/kg	2	2	2.4	0.85	3.576	1.8	2.4	3	3
Full Tidal	Chromium	Aquatic-mussel	mg/kg	2	2	0.415	0.2333	0.7384	0.25	0.415	0.58	0.58
Full Tidal	Copper	Aquatic-mussel	mg/kg	2	2	1.8	0.2828	2.192	1.6	1.8	2	2
Full Tidal	Lead	Aquatic-mussel	mg/kg	2	2	0.135	0.0354	0.184	0.11	0.135	0.16	0.16
Full Tidal	Nickel	Aquatic-mussel	mg/kg	2	2	0.23	0.03	0.27	0.21	0.23	0.25	0.25
Full Tidal	Selenium	Aquatic-mussel	mg/kg	1	2	0.22	0.23	0.54	0.05	0.22	0.38	0.38
Full Tidal	Vanadium	Aquatic-mussel	mg/kg	2	2	0.475	0.0071	0.485	0.47	0.475	0.48	0.48
Full Tidal	Zinc	Aquatic-mussel	mg/kg	2	2	7.45	0.9192	8.724	6.8	7.45	8.1	8.1
Full Tidal	Percent Lipids	Aquatic-mussel	percent	2	2	0.305	0.0354	0.354	0.28	0.305	0.33	0.33
Full Tidal	4,4'-DDD	Aquatic-mussel	mg/kg	1	3	0.01472	0.0228	0.04052	0.00025	0.0029	0.041	0.041
Full Tidal	4,4'-DDE	Aquatic-mussel	mg/kg	1	3	0.02318	0.03627	0.06423	0.00025	0.0043	0.065	0.065
Full Tidal	Acenaphthene	Aquatic-mussel	mg/kg	1	3	0.0093	0.00127	0.0107	0.0078	0.01	0.01	0.01
Full Tidal	Anthracene	Aquatic-mussel	mg/kg	1	3	0.017	0.01	0.031	0.01	0.01	0.031	0.03
Full Tidal	Benzo(a)anthracene	Aquatic-mussel	mg/kg	1	3	0.015	0.01	0.026	0.01	0.01	0.026	0.03
Full Tidal	Benzo(a)pyrene	Aquatic-mussel	mg/kg	1	3	0.009	0	0.011	0.0071	0.01	0.01	0.01
Full Tidal	Benzo(b)fluoranthene	Aquatic-mussel	mg/kg	1	3	0.01	0	0.011	0.01	0.01	0.011	0.01
Full Tidal	Benzo(e)pyrene	Aquatic-mussel	mg/kg	1	3	0.009	0.0024	0.011	0.0059	0.01	0.01	0.01
Full Tidal	Benzo(g,h,i)perylene	Aquatic-mussel	mg/kg	1	3	0.008	0.004	0.012	0.003	0.01	0.01	0.01
Full Tidal	Benzo(k)fluoranthene	Aquatic-mussel	mg/kg	1	3	0.00787	0.0037	0.01205	0.0036	0.01	0.01	0.01
Full Tidal	BHC-delta	Aquatic-mussel	mg/kg	1	3	0.00302	0.00392	0.00745	0.00025	0.0013	0.0075	0.0075
Full Tidal	Chrysene	Aquatic-mussel	mg/kg	1	3	0.0137	0.0064	0.0209	0.01	0.01	0.021	0.021
Full Tidal	Dibenzothiophene	Aquatic-mussel	mg/kg	1	1	0.012	-	-	0.012	0.012	0.012	0.012
Full Tidal	Fluoranthene	Aquatic-mussel	mg/kg	1	3	0.05	0.06	0.12	0.01	0.01	0.12	0.12
Full Tidal	Fluorene	Aquatic-mussel	mg/kg	1	3	0.01	0.01	0.02	0.01	0.01	0.02	0.02
Full Tidal	Indeno(1,2,3-c,d)pyrer	Aquatic-mussel	mg/kg	1	3	0.0073	0.0046	0.0126	0.002	0.01	0.01	0.01
Full Tidal	Naphthalene	Aquatic-mussel	mg/kg	1	3	0.01	0	0.01	0.009	0.01	0.01	0.01
Full Tidal	Perylene	Aquatic-mussel	mg/kg	1	1	0.0017	-	-	0.0017	0.0017	0.002	0.002
Full Tidal	Phenanthrene	Aquatic-mussel	mg/kg	1	3	0.06	0.0866	0.158	0.01	0.01	0.16	0.16
Full Tidal	Pyrene	Aquatic-mussel	mg/kg	1	3	0.03	0.04	0.08	0.01	0.01	0.08	0.08
Full Tidal	Total DDT	Aquatic-mussel	mg/kg	1	2	0.0036	0.00509117	0.010656	0	0.0036	0.0072	0.0072
Full Tidal	Barium	Aquatic-snail	mg/kg	1	1	3.2	-	-	3.2	3.2	3.2	3.2
Full Tidal	Beryllium	Aquatic-snail	mg/kg	1	1	0.13	-	-	0.13	0.13	0.13	0.13
Full Tidal	Chromium	Aquatic-snail	mg/kg	1	1	0.23	-	-	0.23	0.23	0.23	0.23
Full Tidal	Cobalt	Aquatic-snail	mg/kg	1	1	0.51	-	-	0.51	0.51	0.51	0.51
Full Tidal	Copper	Aquatic-snail	mg/kg	1	1	3.5	-	-	3.5	3.5	3.5	3.5
Full Tidal	Lead	Aquatic-snail	mg/kg	1	1	0.11	-	-	0.11	0.11	0.11	0.11
Full Tidal	Nickel	Aquatic-snail	mg/kg	1	1	9.3	-	-	9.3	9.3	9.3	9.3
Full Tidal	Vanadium	Aquatic-snail	mg/kg	1	1	0.16	-	-	0.16	0.16	0.16	0.16
Full Tidal	Zinc	Aquatic-snail	mg/kg	1	1	14	-	-	14	14	14	14
Full Tidal	Percent Lipids	Aquatic-snail	percent	1	1	0.16	-	-	0.16	0.16	0.16	0.16
Full Tidal	4,4'-DDE	Aquatic-snail	mg/kg	1	1	0.00086	-	-	0.00086	0.00086	0.00086	0.00086
Full Tidal	Total DDT	Aquatic-snail	mg/kg	1	1	0.00086	.	.	0.00086	0.00086	0.00086	0.00086
Full Tidal	Barium	Aquatic-worm bioaccumulation	mg/kg	10	35	0.242	0.88	0.535	0.05	0.05	0.27	5.3
Full Tidal	Cadmium	Aquatic-worm bioaccumulation	mg/kg	3	35	0.05686	0.02423	0.06488	0.05	0.05	0.05	0.17
Full Tidal	Chromium	Aquatic-worm bioaccumulation	mg/kg	27	35	0.1389	0.0833	0.1664	0.05	0.12	0.26	0.35
Full Tidal	Cobalt	Aquatic-worm bioaccumulation	mg/kg	11	35	0.07	0.04	0.09	0.05	0.05	0.14	0.18
Full Tidal	Copper	Aquatic-worm bioaccumulation	mg/kg	35	35	0.9326	0.2461	1.0141	0.56	0.88	1.3	1.6

TABLE 3-8
Summary Statistics for Chemicals Detected in Aquatic Invertebrate Tissue
Bolsa Chica Lowlands

Area	Analyte	Tissue	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Full Tidal	Lead	Aquatic-worm bioaccumulation	mg/kg	29	35	0.1909	0.0943	0.2221	0.05	0.2	0.31	0.36
Full Tidal	Mercury	Aquatic-worm bioaccumulation	mg/kg	10	35	0.0155	0.0089	0.0185	0.01	0.01	0.031	0.032
Full Tidal	Nickel	Aquatic-worm bioaccumulation	mg/kg	16	35	0.13	0.11	0.17	0.05	0.05	0.3	0.42
Full Tidal	Selenium	Aquatic-worm bioaccumulation	mg/kg	7	35	0.06	0.02	0.07	0.05	0.05	0.11	0.12
Full Tidal	Thallium	Aquatic-worm bioaccumulation	mg/kg	1	35	0.05	0.02	0.06	0.05	0.05	0.05	0.14
Full Tidal	Vanadium	Aquatic-worm bioaccumulation	mg/kg	35	35	0.248	0.1016	0.282	0.14	0.21	0.46	0.5
Full Tidal	Zinc	Aquatic-worm bioaccumulation	mg/kg	35	35	16.971	6.7709	19.215	7.8	15	25	38
Full Tidal	Percent Lipids	Aquatic-worm bioaccumulation	percent	35	35	0.7791	0.143	0.8265	0.48	0.79	1	1.1
Full Tidal	Percent Solids	Aquatic-worm bioaccumulation	percent	15	15	15.6	0.7368	15.9729	14	16	16	17
Full Tidal	4,4'-DDD	Aquatic-worm bioaccumulation	mg/kg	4	35	0.00046	0.00067	0.00068	0.00025	0.00025	0.00062	0.003
Full Tidal	4,4'-DDE	Aquatic-worm bioaccumulation	mg/kg	9	35	0.00039	0.00028	0.00049	0.00025	0.00025	0.00089	0.0013
Full Tidal	Aldrin	Aquatic-worm bioaccumulation	mg/kg	9	35	0.0009	0.0013	0.0013	0.0003	0.0003	0.0032	0.005
Full Tidal	BHC-alpha	Aquatic-worm bioaccumulation	mg/kg	8	35	0.000356	0.00023537	0.000434	0.00025	0.00025	0.00061	0.0013
Full Tidal	BHC-beta	Aquatic-worm bioaccumulation	mg/kg	7	35	0.001	0.0015	0.001	0.0003	0	0.003	0.006
Full Tidal	BHC-delta	Aquatic-worm bioaccumulation	mg/kg	3	35	0.00028	0.00011	0.00032	0.00025	0.00025	0.00025	0.00077
Full Tidal	BHC-gamma	Aquatic-worm bioaccumulation	mg/kg	9	35	0.00043	0.00035	0.00054	0.00025	0.00025	0.00087	0.0017
Full Tidal	Dieldrin	Aquatic-worm bioaccumulation	mg/kg	14	35	0.00059	0.00048	0.00074	0.00025	0.00025	0.0014	0.0019
Full Tidal	Endosulfan I	Aquatic-worm bioaccumulation	mg/kg	1	35	0.00108	0.00046	0.00123	0.001	0.001	0.001	0.0037
Full Tidal	Endrin	Aquatic-worm bioaccumulation	mg/kg	1	35	0.00029	0.00021	0.00036	0.00025	0.00025	0.00025	0.0015
Full Tidal	Endrin aldehyde	Aquatic-worm bioaccumulation	mg/kg	4	35	0.00084	0.00317	0.00189	0.00025	0.00025	0.00062	0.019
Full Tidal	Aroclor 1254	Aquatic-worm bioaccumulation	mg/kg	6	35	0.012371	0.005407	0.01416	0.01	0.01	0.023	0.027
Full Tidal	Total DDT	Aquatic-worm bioaccumulation	mg/kg	11	35	0.00025	0	0.00025	0.00025	0.00025	0.00025	0.00025
Full Tidal	Total PCB	Aquatic-worm bioaccumulation	mg/kg	6	35	0.004086	0.00918237	0.007128	0	0	0.023	0.027
Future Full Tidal	Arsenic	Aquatic invertebrate-corixid	mg/kg	3	3	0.943	0.41	1.406	0.61	0.82	1.4	1.4
Future Full Tidal	Barium	Aquatic invertebrate-corixid	mg/kg	3	3	57.467	80.23	148.251	7.4	15	150	150
Future Full Tidal	Beryllium	Aquatic invertebrate-corixid	mg/kg	3	3	0.4367	0.2001	0.6631	0.24	0.43	0.64	0.64
Future Full Tidal	Chromium	Aquatic invertebrate-corixid	mg/kg	3	3	3.7	1.277	5.1447	2.3	4	4.8	4.8
Future Full Tidal	Cobalt	Aquatic invertebrate-corixid	mg/kg	3	3	0.52	0.37	0.94	0.23	0.38	0.94	0.94
Future Full Tidal	Copper	Aquatic invertebrate-corixid	mg/kg	3	3	4.7333	3.137	8.2836	2.4	3.5	8.3	8.3
Future Full Tidal	Lead	Aquatic invertebrate-corixid	mg/kg	3	3	1.8	1.2	3.158	0.6	1.8	3	3
Future Full Tidal	Nickel	Aquatic invertebrate-corixid	mg/kg	3	3	3.9	2.93	7.22	1.6	2.9	7.2	7.2
Future Full Tidal	Vanadium	Aquatic invertebrate-corixid	mg/kg	3	3	2.9	1.87	5.014	1.2	2.6	4.9	4.9
Future Full Tidal	Zinc	Aquatic invertebrate-corixid	mg/kg	3	3	24	2.65	26.994	21	25	26	26
Future Full Tidal	Percent Lipids	Aquatic invertebrate-corixid	percent	3	3	0.46	0.11	0.58	0.35	0.48	0.56	0.56
Future Full Tidal	4,4'-DDD	Aquatic invertebrate-corixid	mg/kg	3	3	0.0061	0.0043	0.0109	0.0031	0.0042	0.011	0.011
Future Full Tidal	4,4'-DDE	Aquatic invertebrate-corixid	mg/kg	3	3	0.0028	0.0015	0.0045	0.00097	0.0036	0.0037	0.0037
Future Full Tidal	4,4'-DDT	Aquatic invertebrate-corixid	mg/kg	1	3	0.0005	0.0005	0.0011	0.00025	0.00025	0.0011	0.0011
Future Full Tidal	BHC-gamma	Aquatic invertebrate-corixid	mg/kg	1	3	0.00097	0.00124	0.00237	0.00025	0.00025	0.0024	0.0024
Future Full Tidal	Total DDT	Aquatic invertebrate-corixid	mg/kg	3	3	0.01	0.01	0.02	0.01	0.01	0.02	0.02
Future Full Tidal	Arsenic	Aquatic-worm bioaccumulation	mg/kg	1	45	0.162	0.25	0.235	0.125	0.125	0.125	1.8
Future Full Tidal	Barium	Aquatic-worm bioaccumulation	mg/kg	18	45	0.252	0.47	0.391	0.05	0.05	0.53	2.4
Future Full Tidal	Cadmium	Aquatic-worm bioaccumulation	mg/kg	5	45	0.06	0.02	0.07	0.05	0.05	0.11	0.15
Future Full Tidal	Chromium	Aquatic-worm bioaccumulation	mg/kg	24	45	0.112	0.111	0.1444	0.05	0.1	0.17	0.75
Future Full Tidal	Cobalt	Aquatic-worm bioaccumulation	mg/kg	12	45	0.07	0.03	0.07	0.05	0.05	0.11	0.14
Future Full Tidal	Copper	Aquatic-worm bioaccumulation	mg/kg	45	45	1.4178	0.708	1.6246	0.73	1.1	2.4	4.3
Future Full Tidal	Lead	Aquatic-worm bioaccumulation	mg/kg	31	45	0.134	0.076	0.156	0.05	0.12	0.23	0.3
Future Full Tidal	Mercury	Aquatic-worm bioaccumulation	mg/kg	16	45	0.02	0.01	0.02	0.01	0.01	0.04	0.04
Future Full Tidal	Nickel	Aquatic-worm bioaccumulation	mg/kg	5	45	0.08	0.1	0.11	0.05	0.05	0.17	0.56
Future Full Tidal	Selenium	Aquatic-worm bioaccumulation	mg/kg	5	45	0.06	0.02	0.06	0.05	0.05	0.11	0.12
Future Full Tidal	Vanadium	Aquatic-worm bioaccumulation	mg/kg	40	45	0.173	0.12	0.208	0.05	0.14	0.35	0.72
Future Full Tidal	Zinc	Aquatic-worm bioaccumulation	mg/kg	45	45	19.778	10.32	22.793	8.8	17	39	52
Future Full Tidal	Percent Lipids	Aquatic-worm bioaccumulation	percent	45	45	0.9	0.26	0.97	0.5	0.84	1.3	1.5
Future Full Tidal	Percent Solids	Aquatic-worm bioaccumulation	percent	40	40	15.8	0.85	16.06	14	16	17	17
Future Full Tidal	4,4'-DDD	Aquatic-worm bioaccumulation	mg/kg	24	45	0.0038	0.004	0.005	0.00025	0.0023	0.0089	0.02
Future Full Tidal	4,4'-DDE	Aquatic-worm bioaccumulation	mg/kg	10	45	0.0006	0.0009	0.0008	0.00025	0.00025	0.0012	0.0044
Future Full Tidal	4,4'-DDT	Aquatic-worm bioaccumulation	mg/kg	6	45	0.0008	0.0021	0.0014	0.00025	0.00025	0.0014	0.014
Future Full Tidal	Acenaphthene	Aquatic-worm bioaccumulation	mg/kg	4	45	0.0122	0.0076	0.0144	0.01	0.01	0.01	0.046
Future Full Tidal	Aldrin	Aquatic-worm bioaccumulation	mg/kg	3	45	0.000389	0.00055102	0.00055	0.00025	0.00025	0.00025	0.0032
Future Full Tidal	Anthracene	Aquatic-worm bioaccumulation	mg/kg	5	45	0.028	0.06	0.045	0.01	0.01	0.1	0.27
Future Full Tidal	BHC-alpha	Aquatic-worm bioaccumulation	mg/kg	1	45	0.00026	0.00005	0.00027	0.00025	0.00025	0.00025	0.00058
Future Full Tidal	BHC-beta	Aquatic-worm bioaccumulation	mg/kg	23	45	0.0023	0.00248	0.00302	0.00025	0.0012	0.0062	0.0085
Future Full Tidal	BHC-delta	Aquatic-worm bioaccumulation	mg/kg	10	45	0.0004	0.0003	0.00049	0.00025	0.00025	0.00086	0.0014
Future Full Tidal	BHC-gamma	Aquatic-worm bioaccumulation	mg/kg	1	45	0.00026	0.00006	0.00028	0.00025	0.00025	0.00025	0.00068
Future Full Tidal	Chlordane-alpha	Aquatic-worm bioaccumulation	mg/kg	4	45	0.003278	0.00256629	0.004028	0.0025	0.0025	0.0025	0.014
Future Full Tidal	Chlordane-gamma	Aquatic-worm bioaccumulation	mg/kg	3	45	0.002816	0.00122083	0.003172	0.0025	0.0025	0.0025	0.0086
Future Full Tidal	Chlordane-technical	Aquatic-worm bioaccumulation	mg/kg	5	45	0.01	0.02	0.02	0	0	0.06	0.1
Future Full Tidal	Chrysene	Aquatic-worm bioaccumulation	mg/kg	4	45	0.0117	0.006	0.0133	0.01	0.01	0.01	0.04
Future Full Tidal	Dieldrin	Aquatic-worm bioaccumulation	mg/kg	13	45	0.0006	0.0006	0.0008	0.00025	0.00025	0.0017	0.0027
Future Full Tidal	Endosulfan II	Aquatic-worm bioaccumulation	mg/kg	1	45	0.000258	0.00006	0.00027	0.00025	0.00025	0.00025	0.00062
Future Full Tidal	Endrin	Aquatic-worm bioaccumulation	mg/kg	4	45	0.000401	0.00051	0.00055	0.00025	0.00025	0.00025	0.0025
Future Full Tidal	Endrin aldehyde	Aquatic-worm bioaccumulation	mg/kg	3	45	0.000338	0.00038	0.00045	0.00025	0.00025	0.00025	0.0021
Future Full Tidal	Fluorene	Aquatic-worm bioaccumulation	mg/kg	4	45	0.01	0.02	0.02	0.01	0.01	0.01	0.08

TABLE 3-8
Summary Statistics for Chemicals Detected in Aquatic Invertebrate Tissue
Bolsa Chica Lowlands

Area	Analyte	Tissue	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Future Full Tidal	PCB 008	Aquatic-worm bioaccumulation	mg/kg	1	45	0.01	0	0.01	0.005	0.01	0.01	0.01
Future Full Tidal	Aroclor 1254	Aquatic-worm bioaccumulation	mg/kg	1	45	0.01029	0.00194	0.01086	0.01	0.01	0.01	0.023
Future Full Tidal	Aroclor 1260	Aquatic-worm bioaccumulation	mg/kg	1	45	0.01022	0.00149	0.01066	0.01	0.01	0.01	0.02
Future Full Tidal	Pyrene	Aquatic-worm bioaccumulation	mg/kg	6	45	0.01	0.01	0.02	0.01	0.01	0.02	0.05
Future Full Tidal	High MW PAHs	Aquatic-worm bioaccumulation	mg/kg	6	45	0.01	0.02	0.01	0	0	0.03	0.08
Future Full Tidal	Low MW PAHs	Aquatic-worm bioaccumulation	mg/kg	5	45	0.03	0.09	0.05	0	0	0.13	0.4
Future Full Tidal	Total DDT	Aquatic-worm bioaccumulation	mg/kg	28	45	0.004617	0.00491147	0.006052	0	0.0033	0.0119	0.018
Future Full Tidal	Total PAHs	Aquatic-worm bioaccumulation	mg/kg	6	45	0.03	0.11	0.07	0	0	0.18	0.47
Future Full Tidal	Total PCB	Aquatic-worm bioaccumulation	mg/kg	2	45	0.000956	0.00449219	0.002268	0	0	0	0.023
Gas Plant	Arsenic	Aquatic invertebrate-corixid	mg/kg	2	2	3.311	4.652	9.758	0.021	3.311	6.6	6.6
Gas Plant	Barium	Aquatic invertebrate-corixid	mg/kg	2	2	15.35	17.8898	40.144	2.7	15.35	28	28
Gas Plant	Beryllium	Aquatic invertebrate-corixid	mg/kg	2	2	0.525	0.4172	1.103	0.23	0.525	0.82	0.82
Gas Plant	Chromium	Aquatic invertebrate-corixid	mg/kg	2	2	1.965	1.7466	4.3856	0.73	1.965	3.2	3.2
Gas Plant	Cobalt	Aquatic invertebrate-corixid	mg/kg	1	2	0.125	0.1061	0.272	0.05	0.125	0.2	0.2
Gas Plant	Copper	Aquatic invertebrate-corixid	mg/kg	2	2	2.1	0.8485	3.276	1.5	2.1	2.7	2.7
Gas Plant	Lead	Aquatic invertebrate-corixid	mg/kg	1	2	1.48	2.02	4.27	0.05	1.48	2.9	2.9
Gas Plant	Nickel	Aquatic invertebrate-corixid	mg/kg	2	2	0.82	0.96	2.15	0.14	0.82	1.5	1.5
Gas Plant	Vanadium	Aquatic invertebrate-corixid	mg/kg	2	2	1.27	1.46	3.29	0.23	1.27	2.3	2.3
Gas Plant	Zinc	Aquatic invertebrate-corixid	mg/kg	2	2	13.25	12.37	30.4	4.5	13.25	22	22
Gas Plant	Percent Lipids	Aquatic invertebrate-corixid	percent	2	2	0.77	0.75	1.81	0.24	0.77	1.3	1.3
Gas Plant	4,4'-DDD	Aquatic invertebrate-corixid	mg/kg	1	2	0.0013	0.0014	0.0033	0.0003	0.0013	0.0023	0.002
Gas Plant	BHC-alpha	Aquatic invertebrate-corixid	mg/kg	1	2	0.00048	0.00033	0.00093	0.00025	0.00048	0.00071	0.00071
Gas Plant	BHC-gamma	Aquatic invertebrate-corixid	mg/kg	1	2	0.00093	0.00095	0.00225	0.00025	0.00093	0.0016	0.0016
Gas Plant	Aroclor 1254	Aquatic invertebrate-corixid	mg/kg	1	2	0.0155	0.00778	0.02628	0.01	0.0155	0.021	0.021
Gas Plant	Total DDT	Aquatic invertebrate-corixid	mg/kg	1	2	0.00115	0.00162635	0.003404	0	0.00115	0.0023	0.0023
Gas Plant	Total PCB	Aquatic invertebrate-corixid	mg/kg	1	2	0.01	0.01	0.03	0	0.01	0.02	0.02
Muted Tidal	Arsenic	Aquatic-worm bioaccumulation	mg/kg	2	10	0.215	0.2	0.339	0.125	0.125	0.575	0.71
Muted Tidal	Barium	Aquatic-worm bioaccumulation	mg/kg	3	10	0.076	0.047	0.105	0.05	0.05	0.155	0.19
Muted Tidal	Cadmium	Aquatic-worm bioaccumulation	mg/kg	4	10	0.084	0.04742	0.11339	0.05	0.05	0.16	0.17
Muted Tidal	Chromium	Aquatic-worm bioaccumulation	mg/kg	8	10	0.12	0.04	0.15	0.05	0.13	0.17	0.18
Muted Tidal	Cobalt	Aquatic-worm bioaccumulation	mg/kg	6	10	0.11	0.07	0.15	0.05	0.11	0.21	0.28
Muted Tidal	Copper	Aquatic-worm bioaccumulation	mg/kg	10	10	1.43	0.16	1.53	1.2	1.45	1.65	1.7
Muted Tidal	Lead	Aquatic-worm bioaccumulation	mg/kg	7	10	0.115	0.058	0.151	0.05	0.115	0.195	0.24
Muted Tidal	Mercury	Aquatic-worm bioaccumulation	mg/kg	9	10	0.03	0.01	0.03	0.01	0.027	0.03	0.03
Muted Tidal	Nickel	Aquatic-worm bioaccumulation	mg/kg	5	10	0.17	0.13	0.25	0.05	0.13	0.34	0.34
Muted Tidal	Selenium	Aquatic-worm bioaccumulation	mg/kg	1	10	0.06	0.02	0.06	0.05	0.05	0.08	0.1
Muted Tidal	Vanadium	Aquatic-worm bioaccumulation	mg/kg	10	10	0.191	0.048	0.22	0.13	0.19	0.245	0.25
Muted Tidal	Zinc	Aquatic-worm bioaccumulation	mg/kg	10	10	20.9	15.262	30.36	6.7	14.5	43.5	49
Muted Tidal	Percent Lipids	Aquatic-worm bioaccumulation	percent	10	10	0.945	0.283	1.12	0.54	0.93	1.35	1.5
Muted Tidal	Percent Solids	Aquatic-worm bioaccumulation	percent	10	10	16.3	0.48	16.6	16	16	17	17
Muted Tidal	4,4'-DDD	Aquatic-worm bioaccumulation	mg/kg	1	10	0.00067	0.00131	0.00148	0.00025	0.00025	0.00233	0.0044
Muted Tidal	BHC-alpha	Aquatic-worm bioaccumulation	mg/kg	3	10	0.00038	0.00022	0.00051	0.00025	0.00025	0.00076	0.00077
Muted Tidal	BHC-beta	Aquatic-worm bioaccumulation	mg/kg	3	10	0.00071	0.00082	0.00122	0.00025	0.00025	0.0022	0.0024
Muted Tidal	BHC-gamma	Aquatic-worm bioaccumulation	mg/kg	1	10	0.00034	0.00027	0.0005	0.00025	0.00025	0.00068	0.0011
Muted Tidal	Dieldrin	Aquatic-worm bioaccumulation	mg/kg	6	10	0.00104	0.00086	0.00157	0.00025	0.00098	0.00225	0.0028
Muted Tidal	Endrin	Aquatic-worm bioaccumulation	mg/kg	1	10	0.00032	0.00021	0.00044	0.00025	0.00025	0.00058	0.0009
Muted Tidal	Aroclor 1254	Aquatic-worm bioaccumulation	mg/kg	1	10	0.0113	0.00411	0.01385	0.01	0.01	0.0165	0.023
Muted Tidal	Total DDT	Aquatic-worm bioaccumulation	mg/kg	1	10	0.00044	0.0013914	0.001302	0	0	0.0022	0.0044
Muted Tidal	Total PCB	Aquatic-worm bioaccumulation	mg/kg	1	10	0.0023	0.00727324	0.006808	0	0	0.0115	0.023
Seasonal Ponds	Barium	Aquatic-worm bioaccumulation	mg/kg	5	20	0.074	0.05	0.095	0.05	0.05	0.155	0.21
Seasonal Ponds	Cadmium	Aquatic-worm bioaccumulation	mg/kg	2	20	0.0575	0.02359	0.06784	0.05	0.05	0.08	0.14
Seasonal Ponds	Chromium	Aquatic-worm bioaccumulation	mg/kg	18	20	0.137	0.0476	0.1579	0.05	0.135	0.175	0.27
Seasonal Ponds	Cobalt	Aquatic-worm bioaccumulation	mg/kg	9	20	0.082	0.039	0.0991	0.05	0.05	0.13	0.17
Seasonal Ponds	Copper	Aquatic-worm bioaccumulation	mg/kg	20	20	0.9905	0.397	1.1645	0.38	0.93	1.6	1.7
Seasonal Ponds	Lead	Aquatic-worm bioaccumulation	mg/kg	14	20	0.1535	0.0943	0.1948	0.05	0.135	0.3	0.33
Seasonal Ponds	Mercury	Aquatic-worm bioaccumulation	mg/kg	5	20	0.02	0.01	0.02	0.01	0.01	0.03	0.04
Seasonal Ponds	Nickel	Aquatic-worm bioaccumulation	mg/kg	11	20	0.15	0.12	0.21	0.05	0.13	0.34	0.4
Seasonal Ponds	Vanadium	Aquatic-worm bioaccumulation	mg/kg	20	20	0.23	0.1	0.28	0.13	0.2	0.4	0.43
Seasonal Ponds	Zinc	Aquatic-worm bioaccumulation	mg/kg	20	20	18.18	6.62	21.07	9.7	18	27	37
Seasonal Ponds	Percent Lipids	Aquatic-worm bioaccumulation	percent	20	20	0.63	0.15	0.7	0.36	0.65	0.83	0.92
Seasonal Ponds	Percent Solids	Aquatic-worm bioaccumulation	percent	10	10	15.6	1.17	16.33	14	15.5	17	17
Seasonal Ponds	4,4'-DDD	Aquatic-worm bioaccumulation	mg/kg	4	20	0.0012	0.0024	0.0022	0.00025	0.0003	0.0047	0.01
Seasonal Ponds	4,4'-DDE	Aquatic-worm bioaccumulation	mg/kg	9	20	0.00055	0.00043	0.00074	0.00025	0.00025	0.0009	0.002
Seasonal Ponds	4,4'-DDT	Aquatic-worm bioaccumulation	mg/kg	2	20	0.00163	0.00554	0.00406	0.00025	0.00025	0.00168	0.025
Seasonal Ponds	Aldrin	Aquatic-worm bioaccumulation	mg/kg	6	20	0.001	0	0.001	0.0003	0.0003	0.002	0
Seasonal Ponds	BHC-alpha	Aquatic-worm bioaccumulation	mg/kg	3	20	0.0003	0.0001	0.0003	0.0003	0.0003	0.001	0.001
Seasonal Ponds	BHC-beta	Aquatic-worm bioaccumulation	mg/kg	3	20	0.0008	0.0014	0.0014	0.0003	0.0003	0.004	0.005
Seasonal Ponds	BHC-delta	Aquatic-worm bioaccumulation	mg/kg	1	20	0.00027	0.00009	0.00031	0.00025	0.00025	0.00025	0.00065
Seasonal Ponds	BHC-gamma	Aquatic-worm bioaccumulation	mg/kg	7	20	0.00053	0.00043	0.00072	0.00025	0.00025	0.0013	0.0015
Seasonal Ponds	Dieldrin	Aquatic-worm bioaccumulation	mg/kg	12	20	0.00071	0.0005	0.00093	0.00025	0.00069	0.0016	0.0017
Seasonal Ponds	Endosulfan II	Aquatic-worm bioaccumulation	mg/kg	2	20	0.000328	0.00034659	0.000479	0.00025	0.00025	0.00025	0.0018
Seasonal Ponds	Endrin	Aquatic-worm bioaccumulation	mg/kg	1	20	0.00059	0.00133403	0.001175	0.00025	0.00025	0.000675	0.0062

TABLE 3-8
Summary Statistics for Chemicals Detected in Aquatic Invertebrate Tissue
Bolsa Chica Lowlands

Area	Analyte	Tissue	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Seasonal Ponds	Endrin aldehyde	Aquatic-worm bioaccumulation	mg/kg	1	20	0.00049	0.00106	0.00095	0.00025	0.00025	0.00025	0.005
Seasonal Ponds	PCB 008	Aquatic-worm bioaccumulation	mg/kg	2	20	0.01	0	0.01	0.005	0.01	0.01	0.01
Seasonal Ponds	Aroclor 1254	Aquatic-worm bioaccumulation	mg/kg	6	20	0.0154	0.00856	0.01915	0.01	0.01	0.0295	0.03
Seasonal Ponds	Pyrene	Aquatic-worm bioaccumulation	mg/kg	1	20	0.01	0.01	0.02	0.01	0.01	0.01	0.06
Seasonal Ponds	High MW PAHs	Aquatic-worm bioaccumulation	mg/kg	1	20	0.0028	0.01252198	0.008288	0	0	0	0.056
Seasonal Ponds	Total DDT	Aquatic-worm bioaccumulation	mg/kg	10	20	0.002784	0.00818275	0.00637	0	0.000335	0.00657	0.0365
Seasonal Ponds	Total PAHs	Aquatic-worm bioaccumulation	mg/kg	1	20	0.0028	0.01252198	0.008288	0	0	0	0.056
Seasonal Ponds	Total PCB	Aquatic-worm bioaccumulation	mg/kg	6	20	0.01	0.01	0.01	0	0	0.03	0.03

Notes:
-- not applicable
Chemicals summarized are those that were detected in samples collected as part of the ERA Sampling and Analysis, the Focused Sampling and Analysis (CH2M HILL, 1998a; 2000) and Tetra Tech Phase II Environmental Assessment (1996)..
Concentrations are presented on a dry weight basis.

TABLE 3-9
Summary Statistics for Chemicals Detected in Fish Tissue
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	Barium	mg/kg	11	11	3.5536	2.445	4.998	0.99	3.2	6.4	7.5
Bolsa Bay	Beryllium	mg/kg	1	11	0.0573	0.02412	0.0715	0.05	0.05	0.05	0.13
Bolsa Bay	Cadmium	mg/kg	1	11	0.05455	0.01508	0.0635	0.05	0.05	0.05	0.1
Bolsa Bay	Chromium	mg/kg	11	11	1.4445	1.486	2.3227	0.25	1.1	2.2	5.5
Bolsa Bay	Cobalt	mg/kg	7	11	0.16	0.1162	0.2287	0.05	0.12	0.3	0.36
Bolsa Bay	Copper	mg/kg	11	11	4.3818	1.3906	5.2036	2.7	3.9	5.9	7
Bolsa Bay	Lead	mg/kg	10	11	0.96	0.8	1.43	0.05	0.59	1.9	2.4
Bolsa Bay	Nickel	mg/kg	11	11	1.23	0.84	1.72	0.39	1.1	1.7	3.4
Bolsa Bay	Selenium	mg/kg	11	11	0.63	0.24	0.77	0.19	0.72	0.87	1
Bolsa Bay	Vanadium	mg/kg	11	11	0.87	0.789	1.336	0.16	0.58	1.7	2.7
Bolsa Bay	Zinc	mg/kg	11	11	46.909	10.625	53.188	20	48	56	58
Bolsa Bay	Percent Lipids	percent	11	11	2.26	1.24	2.99	0.7	1.7	3.9	4.5
Bolsa Bay	4,4'-DDD	mg/kg	14	14	0.01298	0.00985	0.0181	0.0025	0.01035	0.03	0.034
Bolsa Bay	4,4'-DDE	mg/kg	14	14	0.15821	0.096369	0.2087	0.039	0.13	0.27	0.38
Bolsa Bay	4,4'-DDT	mg/kg	4	14	0.00033	0.000147	0.0004	0.00025	0.00025	0.00055	0.00069
Bolsa Bay	Acenaphthene	mg/kg	4	15	0.0074	0.00452	0.0097	0.0001	0.01	0.01	0.01
Bolsa Bay	Acenaphthylene	mg/kg	4	15	0.0073	0.005	0.01	0	0.01	0.01	0.01
Bolsa Bay	Acetone	mg/kg	1	1	0.59	-	-	0.59	0.59	0.59	0.59
Bolsa Bay	Anthracene	mg/kg	4	15	0.0074	0.005	0.01	0.0001	0.01	0.01	0.01
Bolsa Bay	Benzene	mg/kg	1	1	0.0029	-	-	0.0029	0.0029	0.0029	0.0029
Bolsa Bay	Benzo(a)anthracene	mg/kg	4	15	0.0074	0.00445	0.0097	0.0002	0.01	0.01	0.01
Bolsa Bay	Benzo(a)pyrene	mg/kg	4	15	0.0073	0.00455	0.0097	0	0.01	0.01	0.01
Bolsa Bay	Benzo(b)fluoranthene	mg/kg	4	15	0.0074	0.00453	0.0097	0.0001	0.01	0.01	0.01
Bolsa Bay	Benzo(e)pyrene	mg/kg	4	15	0.00735	0.004543	0.0097	0.00005	0.01	0.01	0.01
Bolsa Bay	Benzo(g,h,i)perylene	mg/kg	4	15	0.00735	0.004548	0.0097	0.00005	0.01	0.01	0.01
Bolsa Bay	Benzo(k)fluoranthene	mg/kg	4	15	0.00734	0.00456	0.0097	0.00002	0.01	0.01	0.01
Bolsa Bay	BHC-alpha	mg/kg	7	14	0.00046	0.000244	0.0006	0.00025	0.00034	0.00081	0.0009
Bolsa Bay	BHC-beta	mg/kg	5	14	0.00097	0.001418	0.0017	0.00008	0.00025	0.004	0.0042
Bolsa Bay	BHC-delta	mg/kg	7	14	0.00197	0.003089	0.0036	0.00008	0.00038	0.0055	0.011
Bolsa Bay	BHC-gamma	mg/kg	3	14	0.0004	0.00046	0.0007	0.00008	0.00025	0.0013	0.0016
Bolsa Bay	Biphenyl	mg/kg	4	4	0.00021	0.00003	0.0002	0.00017	0.00021	0.00023	0.00023
Bolsa Bay	Chlordane-alpha	mg/kg	7	11	0.02191	0.01875	0.033	0.0025	0.019	0.046	0.052
Bolsa Bay	Chlordane-gamma	mg/kg	2	11	0.00369	0.00268	0.0053	0.0025	0.0025	0.0081	0.01
Bolsa Bay	Chlordane-technical	mg/kg	1	11	0.0027	0.0008	0.0032	0.0025	0.0025	0.0025	0.005
Bolsa Bay	Chrysene	mg/kg	4	15	0.0074	0.0045	0.0097	0.0001	0.01	0.01	0.01
Bolsa Bay	Dibenz(a,h)anthracene	mg/kg	4	15	0.00734	0.004564	0.0097	0.00002	0.01	0.01	0.01
Bolsa Bay	Dibenzothiophene	mg/kg	4	4	0.00011	0.00006	0.0002	0.00008	0.00008	0.0002	0.0002
Bolsa Bay	Dieldrin	mg/kg	10	14	0.00369	0.00386	0.0057	0.00025	0.00225	0.0091	0.013
Bolsa Bay	Endosulfan I	mg/kg	1	11	0.00112	0.00039	0.0014	0.001	0.001	0.001	0.0023
Bolsa Bay	Endrin aldehyde	mg/kg	4	11	0.00117	0.00139	0.002	0.00025	0.00025	0.0036	0.0036
Bolsa Bay	Endrin ketone	mg/kg	2	14	0.00078	0.00112	0.0014	0.00025	0.00025	0.0028	0.0039
Bolsa Bay	Fluoranthene	mg/kg	4	15	0.007	0	0.01	0.0002	0.01	0.01	0.01
Bolsa Bay	Fluorene	mg/kg	4	15	0.007	0	0.01	0.0001	0.01	0.01	0.01
Bolsa Bay	Heptachlor	mg/kg	3	3	0.00065	0.0001852	0.0009	0.00044	0.00072	0.00079	0.00079
Bolsa Bay	Indeno(1,2,3-c,d)pyren	mg/kg	4	15	0.01	0	0.01	0	0.01	0.01	0.01
Bolsa Bay	Methylene Chloride	mg/kg	1	1	0.55	-	-	0.55	0.55	0.55	0.55
Bolsa Bay	Naphthalene	mg/kg	4	16	0.01	0	0.01	0	0.01	0.01	0.01
Bolsa Bay	PCB 008	mg/kg	3	14	0.004052	0.0018842	0.005	0.00043	0.005	0.005	0.005
Bolsa Bay	PCB 018	mg/kg	2	14	0.004013	0.0019707	0.005	0.00011	0.005	0.005	0.005
Bolsa Bay	PCB 028	mg/kg	3	14	0.004193	0.001606	0.005	0.001	0.005	0.005	0.005
Bolsa Bay	PCB 044	mg/kg	3	14	0.004014	0.0019588	0.005	0.00035	0.005	0.005	0.005
Bolsa Bay	PCB 052	mg/kg	3	14	0.004153	0.0016842	0.005	0.00094	0.005	0.005	0.005
Bolsa Bay	PCB 066	mg/kg	3	14	0.004757	0.000557	0.0051	0.0031	0.005	0.005	0.005
Bolsa Bay	PCB 101	mg/kg	3	14	0.005079	0.000294	0.0052	0.005	0.005	0.005	0.0061
Bolsa Bay	PCB 105	mg/kg	4	14	0.002936	0.00117	0.0036	0.0025	0.0025	0.0033	0.0069
Bolsa Bay	PCB 118	mg/kg	7	14	0.006407	0.004116	0.0086	0.0025	0.0058	0.011	0.012
Bolsa Bay	Aroclor 1254	mg/kg	8	11	0.099364	0.07975	0.1465	0.01	0.092	0.21	0.22
Bolsa Bay	Aroclor 1260	mg/kg	3	11	0.031273	0.042069	0.0561	0.01	0.01	0.11	0.12

TABLE 3-9
Summary Statistics for Chemicals Detected in Fish Tissue
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Bolsa Bay	PCB 128	mg/kg	3	14	0.00235	0.000301	0.0025	0.0017	0.0025	0.0025	0.0025
Bolsa Bay	PCB 138	mg/kg	9	14	0.006857	0.004053	0.009	0.0025	0.00665	0.012	0.014
Bolsa Bay	PCB 153	mg/kg	14	14	0.010729	0.003347	0.0125	0.0062	0.011	0.015	0.016
Bolsa Bay	PCB 170	mg/kg	3	14	0.001361	0.000221	0.0015	0.00125	0.00125	0.0018	0.0018
Bolsa Bay	PCB 180	mg/kg	7	14	0.003261	0.0025516	0.0046	0.00125	0.001875	0.0078	0.0081
Bolsa Bay	PCB 187	mg/kg	3	14	0.002871	0.0007488	0.0033	0.0025	0.0025	0.0041	0.0046
Bolsa Bay	PCB 195	mg/kg	3	14	0.001016	0.0004656	0.0013	0.00013	0.00125	0.00125	0.00125
Bolsa Bay	PCB 206	mg/kg	3	14	0.001036	0.0004258	0.0013	0.00024	0.00125	0.00125	0.00125
Bolsa Bay	Perylene	mg/kg	4	4	0.00005	0.00003651	9E-05	0.00001	0.00005	0.00009	0.00009
Bolsa Bay	Phenanthrene	mg/kg	4	15	0.01	0	0.01	0	0.01	0.01	0.01
Bolsa Bay	Pyrene	mg/kg	4	15	0.01	0	0.01	0	0.01	0.01	0.01
Bolsa Bay	Toluene	mg/kg	1	1	0	-	-	0	0	0	0
Bolsa Bay	Total DDT	mg/kg	11	11	0.18	0.12	0.25	0.04	0.19	0.3	0.41
Bolsa Bay	Total PCB	mg/kg	11	11	0.121	0.063	0.158	0.034	0.12	0.21	0.22
Full Tidal	Barium	mg/kg	7	7	4.657	5.14	8.463	1.4	3.6	16	16
Full Tidal	Beryllium	mg/kg	4	7	0.094	0.0431	0.126	0.05	0.11	0.15	0.15
Full Tidal	Chromium	mg/kg	7	7	1.0757	1.8385	2.4377	0.14	0.33	5.2	5.2
Full Tidal	Cobalt	mg/kg	2	7	0.0714	0.0376	0.0993	0.05	0.05	0.14	0.14
Full Tidal	Copper	mg/kg	7	7	3.0429	0.77	3.6133	1.7	3.1	4.1	4.1
Full Tidal	Lead	mg/kg	4	7	0.1957	0.1925	0.3383	0.05	0.11	0.56	0.56
Full Tidal	Nickel	mg/kg	7	7	1.24	0.79	1.82	0.83	0.93	3	3
Full Tidal	Selenium	mg/kg	5	7	0.4	0.4	0.69	0.05	0.28	0.97	0.97
Full Tidal	Vanadium	mg/kg	7	7	0.304	0.092	0.372	0.19	0.27	0.46	0.46
Full Tidal	Zinc	mg/kg	7	7	46.143	5.6988	50.365	37	47	54	54
Full Tidal	Percent Lipids	percent	7	7	2.6586	1.1968	3.5452	0.51	2.7	4	4
Full Tidal	2-Butanone	mg/kg	1	1	0.09	-	-	0.09	0.09	0.09	0.09
Full Tidal	2-Hexanone	mg/kg	1	1	0.015	-	-	0.015	0.015	0.015	0.015
Full Tidal	4,4'-DDD	mg/kg	9	10	0.00762	0.0056	0.0111	0.00025	0.00615	0.016	0.017
Full Tidal	4,4'-DDE	mg/kg	9	10	0.02637	0.01501	0.0357	0.00025	0.0315	0.041	0.044
Full Tidal	4,4'-DDT	mg/kg	2	10	0.00075	0.00087	0.0013	0.00025	0.00025	0.00228	0.00285
Full Tidal	Acenaphthene	mg/kg	3	10	0.0071	0.00465	0.01	0.0002	0.01	0.01	0.01
Full Tidal	Acenaphthylene	mg/kg	3	10	0.0071	0.0047	0.01	0.0001	0.01	0.01	0.01
Full Tidal	Acetone	mg/kg	1	1	1	-	-	1	1	1	1
Full Tidal	Anthracene	mg/kg	3	10	0.007	0	0.01	0.0001	0.01	0.01	0.01
Full Tidal	Benzene	mg/kg	1	1	0.003	-	-	0.0034	0.003	0.003	0.003
Full Tidal	Benzo(a)anthracene	mg/kg	3	10	0.007	0	0.01	0.0003	0.01	0.01	0.01
Full Tidal	Benzo(a)pyrene	mg/kg	3	10	0.007	0	0.01	0.0001	0.01	0.01	0.01
Full Tidal	Benzo(b)fluoranthene	mg/kg	3	10	0.007	0	0.01	0.0003	0.01	0.01	0.01
Full Tidal	Benzo(e)pyrene	mg/kg	3	10	0.007	0.0047	0.01	0.0002	0.01	0.01	0.01
Full Tidal	Benzo(g,h,i)perylene	mg/kg	3	10	0.007	0.0046	0.01	0.0003	0.01	0.01	0.01
Full Tidal	Benzo(k)fluoranthene	mg/kg	3	10	0.00703	0.00478	0.01	0.00007	0.01	0.01	0.01
Full Tidal	BHC-alpha	mg/kg	3	10	0.001	0.0012	0.002	0.0003	0	0.003	0.003
Full Tidal	BHC-beta	mg/kg	2	10	0.00103	0.00174	0.0021	0.00009	0.00025	0.0043	0.0047
Full Tidal	BHC-delta	mg/kg	3	10	0.00172	0.00349	0.0039	0.00009	0.00025	0.0076	0.011
Full Tidal	BHC-gamma	mg/kg	2	10	0.00032	0.00028	0.0005	0.00015	0.00025	0.00068	0.0011
Full Tidal	Biphenyl	mg/kg	3	3	0.00028	0.00005	0.0003	0.00022	0.0003	0.00032	0.00032
Full Tidal	Chloroform	mg/kg	1	1	0.02	-	-	0.024	0.02	0.02	0.02
Full Tidal	Chrysene	mg/kg	3	10	0.0072	0.0046	0.01	0.0004	0.01	0.01	0.01
Full Tidal	Dibenz(a,h)anthracene	mg/kg	3	10	0.007	0.0048	0.01	0.0001	0.01	0.01	0.01
Full Tidal	Dibenzothiophene	mg/kg	3	3	0.00029	0.00012	0.0004	0.00015	0.00034	0.00038	0.00038
Full Tidal	Dieldrin	mg/kg	9	10	0.00307	0.00229	0.0045	0.00025	0.0032	0.0064	0.0067
Full Tidal	Endrin aldehyde	mg/kg	1	7	0.00107	0.00217	0.0027	0.00025	0.00025	0.006	0.006
Full Tidal	Fluoranthene	mg/kg	3	10	0.01	0	0.01	0.0005	0.01	0.01	0.01
Full Tidal	Fluorene	mg/kg	3	10	0.01	0	0.01	0.0004	0.01	0.01	0.01
Full Tidal	Heptachlor	mg/kg	3	3	0.0004	0.0001	0.0005	0.00031	0.00041	0.0005	0.001
Full Tidal	Indeno(1,2,3-c,d)pyren	mg/kg	3	10	0.007	0.0048	0.01	0.00009	0.01	0.01	0.01
Full Tidal	Methylene Chloride	mg/kg	1	1	0.32	-	-	0.32	0.32	0.32	0.32
Full Tidal	Naphthalene	mg/kg	3	11	0.01	0	0.01	0	0.01	0.01	0.01

TABLE 3-9
Summary Statistics for Chemicals Detected in Fish Tissue
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Full Tidal	PCB 008	mg/kg	3	10	0.00433	0.0010955	0.005	0.0024	0.005	0.005	0.005
Full Tidal	PCB 018	mg/kg	1	10	0.003939	0.00175046	0.005	0.00054	0.005	0.005	0.005
Full Tidal	PCB 028	mg/kg	3	10	0.003768	0.001991	0.005	0.00048	0.005	0.005	0.005
Full Tidal	PCB 044	mg/kg	3	10	0.00386	0.001838	0.005	0.001	0.005	0.005	0.005
Full Tidal	PCB 052	mg/kg	3	10	0.00428	0.001196	0.005	0.0021	0.005	0.005	0.005
Full Tidal	PCB 066	mg/kg	3	10	0.00395	0.001693	0.005	0.0013	0.005	0.005	0.005
Full Tidal	PCB 101	mg/kg	3	10	0.00592	0.001601	0.0069	0.005	0.005	0.0088	0.009
Full Tidal	PCB 105	mg/kg	3	10	0.00274	0.00042	0.003	0.0025	0.0025	0.0034	0.0037
Full Tidal	PCB 118	mg/kg	3	10	0.00425	0.002826	0.006	0.0025	0.0025	0.00855	0.0088
Full Tidal	Aroclor 1254	mg/kg	3	7	0.040857	0.039032	0.0698	0.01	0.01	0.089	0.089
Full Tidal	Aroclor 1260	mg/kg	1	7	0.01671	0.017764	0.0299	0.01	0.01	0.057	0.057
Full Tidal	PCB 128	mg/kg	3	10	0.00229	0.000348	0.0025	0.0016	0.0025	0.0025	0.0025
Full Tidal	PCB 138	mg/kg	3	10	0.00525	0.004436	0.008	0.0025	0.0025	0.012	0.012
Full Tidal	PCB 153	mg/kg	8	10	0.00747	0.003761	0.0098	0.0025	0.00675	0.0125	0.013
Full Tidal	PCB 170	mg/kg	3	10	0.00144	0.000328	0.0017	0.00125	0.00125	0.002	0.0021
Full Tidal	PCB 180	mg/kg	3	10	0.002165	0.001489	0.0031	0.00125	0.00125	0.0045	0.0048
Full Tidal	PCB 187	mg/kg	3	10	0.00275	0.000417	0.003	0.0025	0.0025	0.0034	0.0036
Full Tidal	PCB 195	mg/kg	3	10	0.000955	0.000477	0.0013	0.00017	0.00125	0.00125	0.00125
Full Tidal	PCB 206	mg/kg	3	10	0.001024	0.000378	0.0013	0.00035	0.00125	0.00125	0.00125
Full Tidal	PCB 209	mg/kg	1	10	0.0015	0.0013	0.0023	0.0001	0.0013	0.003	0.005
Full Tidal	Perylene	mg/kg	3	3	0.0005	0.0003	0.0008	0.0003	0.0003	0.001	0.001
Full Tidal	Phenanthrene	mg/kg	3	10	0.0074	0.0041	0.01	0.0009	0.01	0.01	0.01
Full Tidal	Pyrene	mg/kg	3	10	0.01	0	0.01	0	0.01	0.01	0.01
Full Tidal	Total DDT	mg/kg	6	7	0.03	0.02	0.04	0	0.04	0.05	0.05
Full Tidal	Total PCB	mg/kg	4	7	0.04	0.04	0.07	0	0.06	0.09	0.09
Future Full Tidal	Barium	mg/kg	6	6	2.617	1.07	3.475	1.7	2.35	4.4	4.4
Future Full Tidal	Beryllium	mg/kg	3	6	0.0983	0.0581	0.1448	0.05	0.085	0.19	0.19
Future Full Tidal	Chromium	mg/kg	6	6	0.4067	0.279	0.6302	0.13	0.285	0.88	0.88
Future Full Tidal	Cobalt	mg/kg	4	6	0.1	0.04	0.14	0.05	0.11	0.16	0.16
Future Full Tidal	Copper	mg/kg	6	6	2.6167	0.56	3.0648	2.1	2.45	3.3	3.3
Future Full Tidal	Lead	mg/kg	6	6	0.4583	0.189	0.609	0.29	0.38	0.73	0.73
Future Full Tidal	Nickel	mg/kg	6	6	0.8	0.13	0.9	0.66	0.8	0.97	0.97
Future Full Tidal	Selenium	mg/kg	3	6	0.1	0.06	0.15	0.05	0.1	0.17	0.17
Future Full Tidal	Vanadium	mg/kg	6	6	0.673	0.2	0.83	0.41	0.67	0.95	0.95
Future Full Tidal	Zinc	mg/kg	6	6	42.667	5.54	47.098	37	42	49	49
Future Full Tidal	Percent Lipids	percent	6	6	2.08	0.36	2.37	1.6	2	2.6	2.6
Future Full Tidal	2-Hexanone	mg/kg	4	4	0.0062	0.0018	0.0079	0.0037	0.0067	0.0078	0.0078
Future Full Tidal	4,4'-DDD	mg/kg	12	12	0.0196	0.0114	0.026	0.0064	0.0175	0.034	0.041
Future Full Tidal	4,4'-DDE	mg/kg	12	12	0.0453	0.0288	0.0617	0.01	0.0475	0.087	0.091
Future Full Tidal	4,4'-DDT	mg/kg	4	12	0.0009	0.0013	0.0016	0.00013	0.00025	0.002	0.0045
Future Full Tidal	Acenaphthene	mg/kg	6	12	0.0089	0.0106	0.0149	0.0002	0.0052	0.025	0.025
Future Full Tidal	Acenaphthylene	mg/kg	1	12	0.009	0.01	0.015	0	0.005	0.025	0.03
Future Full Tidal	Acetone	mg/kg	4	4	0.9475	0.5371	1.4739	0.38	0.955	1.5	1.5
Future Full Tidal	Aldrin	mg/kg	2	12	0.000289	0.00019195	0.0004	0.00003	0.00025	0.00036	0.00085
Future Full Tidal	Anthracene	mg/kg	6	12	0.009	0.01	0.015	0.0001	0.005	0.025	0.03
Future Full Tidal	Benzene	mg/kg	4	4	0.0035	0.0014	0.0049	0.0025	0.003	0.0056	0.006
Future Full Tidal	Benzo(a)anthracene	mg/kg	6	12	0.0101	0.0115	0.0167	0.0002	0.0053	0.025	0.025
Future Full Tidal	Benzo(a)pyrene	mg/kg	6	12	0.01	0.0116	0.0166	0	0.0051	0.025	0.025
Future Full Tidal	Benzo(b)fluoranthene	mg/kg	6	12	0.0101	0.0116	0.0166	0.0001	0.0052	0.025	0.025
Future Full Tidal	Benzo(e)pyrene	mg/kg	6	12	0.0101	0.0116	0.0166	0.0001	0.0051	0.025	0.025
Future Full Tidal	Benzo(g,h,i)perylene	mg/kg	6	12	0.0288	0.0435	0.0535	0.0001	0.0051	0.1	0.1
Future Full Tidal	Benzo(k)fluoranthene	mg/kg	6	12	0.01002	0.01165	0.0166	0.00002	0.00506	0.025	0.025
Future Full Tidal	BHC-alpha	mg/kg	7	12	0.00305	0.00331	0.0049	0.00025	0.00175	0.0076	0.0086
Future Full Tidal	BHC-beta	mg/kg	5	12	0.00151	0.00287	0.0031	0.00008	0.00025	0.0049	0.0096
Future Full Tidal	BHC-delta	mg/kg	7	12	0.00099	0.00172	0.002	0.00008	0.00024	0.003	0.0058
Future Full Tidal	BHC-gamma	mg/kg	4	12	0.00101	0.00173	0.002	0.00008	0.00025	0.0019	0.0062
Future Full Tidal	Biphenyl	mg/kg	6	6	0.00055	0.00025	0.0008	0.00034	0.00048	0.001	0.001
Future Full Tidal	Chlordane-alpha	mg/kg	2	6	0.01	0.01	0.02	0	0	0.03	0.03

TABLE 3-9
Summary Statistics for Chemicals Detected in Fish Tissue
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value
Future Full Tidal	Chloroform	mg/kg	2	3	3.36	5.75	9.87	0	0.08	10	10
Future Full Tidal	Chrysene	mg/kg	6	12	0.0101	0.012	0.0167	0.00012	0.0052	0.025	0.03
Future Full Tidal	Dibenz(a,h)anthracene	mg/kg	4	12	0.0288	0.044	0.0534	0	0.005	0.1	0.1
Future Full Tidal	Dibenzothiophene	mg/kg	6	6	0.0004	0	0.0006	0.00021	0.0004	0.0008	0
Future Full Tidal	Dieldrin	mg/kg	10	12	0.0032	0.0018	0.0042	0.00025	0.0031	0.0052	0.0059
Future Full Tidal	Endosulfan Sulfate	mg/kg	1	12	0.003218	0.00253	0.0047	0.00026	0.005	0.005	0.0066
Future Full Tidal	Endrin aldehyde	mg/kg	1	6	0.001525	0.00312	0.004	0.00025	0.00025	0.0079	0.0079
Future Full Tidal	Endrin ketone	mg/kg	1	12	0.000704	0.0006	0.001	0.00025	0.0006	0.0018	0.002
Future Full Tidal	Fluoranthene	mg/kg	6	12	0.01	0.01	0.01	0.0003	0.01	0.03	0.03
Future Full Tidal	Fluorene	mg/kg	6	12	0.01	0.01	0.02	0.0005	0.01	0.03	0.03
Future Full Tidal	Indeno(1,2,3-c,d)pyren	mg/kg	6	12	0.03	0.04	0.05	0.0001	0.01	0.1	0.1
Future Full Tidal	Methylene Chloride	mg/kg	4	4	0.32	0.07	0.39	0.23	0.32	0.41	0.41
Future Full Tidal	Naphthalene	mg/kg	7	16	0.01	0.01	0.01	0	0	0.03	0.03
Future Full Tidal	PCB 008	mg/kg	6	12	0.01	0	0.01	0.002	0.01	0.01	0.01
Future Full Tidal	PCB 018	mg/kg	3	12	0.002964	0.002157	0.0042	0.00037	0.0034	0 0.0050	0.005
Future Full Tidal	PCB 028	mg/kg	6	12	0.003489	0.002011	0.0046	0.00097	0.005	0 0.0050	0.0057
Future Full Tidal	PCB 044	mg/kg	6	12	0.004742	0.001834	0.0058	0.0017	0.005	0 0.0055	0.0089
Future Full Tidal	PCB 052	mg/kg	6	12	0.007192	0.006534	0.0109	0.0012	0.005	0 0.0150	0.022
Future Full Tidal	PCB 066	mg/kg	6	12	0.004718	0.003154	0.0065	0.0002	0.005	0 0.0068	0.012
Future Full Tidal	PCB 101	mg/kg	6	12	0.015483	0.02014	0.0269	0.0032	0.005	0 0.0440	0.058
Future Full Tidal	PCB 105	mg/kg	6	12	0.00723	0.00918	0.0124	0.0018	0.0025	0.019	0.028
Future Full Tidal	PCB 118	mg/kg	6	12	0.01588	0.02401	0.0295	0.0025	0.00295	0.049	0.067
Future Full Tidal	Aroclor 1260	mg/kg	2	6	0.0155	0.0088	0.0225	0.01	0.01	0.03	0.03
Future Full Tidal	PCB 128	mg/kg	6	12	0.00431	0.00432	0.0068	0.00077	0.0025	0.012	0.012
Future Full Tidal	PCB 138	mg/kg	6	12	0.01812	0.02537	0.0325	0.0025	0.00475	0.059	0.063
Future Full Tidal	PCB 153	mg/kg	6	12	0.01694	0.02311	0.03	0.0025	0.0048	0.054	0.059
Future Full Tidal	PCB 170	mg/kg	6	12	0.00246	0.0019	0.0035	0.00125	0.001425	0.0052	0.0064
Future Full Tidal	PCB 180	mg/kg	6	12	0.00518	0.00464	0.0078	0.00125	0.003225	0.012	0.013
Future Full Tidal	PCB 187	mg/kg	6	12	0.00339	0.00178	0.0044	0.0022	0.0025	0.0066	0.0072
Future Full Tidal	PCB 195	mg/kg	4	12	0.0008	0.001	0.001	0.0002	0.0012	0.0013	0
Future Full Tidal	PCB 206	mg/kg	4	12	0.0009	0	0.001	0.0003	0.0011	0.0013	0
Future Full Tidal	PCB 209	mg/kg	3	12	0.0009	0.001	0.001	0.0002	0.0013	0.0013	0
Future Full Tidal	Perylene	mg/kg	6	6	9.17E-05	0.00004956	0.0001	0.00004	0.000075	0.00017	0.00017
Future Full Tidal	Phenanthrene	mg/kg	6	12	0.0094	0.01	0.015	0.001	0.006	0.025	0.03
Future Full Tidal	Pyrene	mg/kg	6	12	0.01	0.01	0.02	0	0.01	0.03	0.03
Future Full Tidal	Total DDT	mg/kg	6	6	0.05	0.03	0.07	0.02	0.04	0.1	0.1
Future Full Tidal	Total PCB	mg/kg	2	6	0.01	0.01	0.02	0	0	0.03	0.03
Gas Plant	Barium	mg/kg	1	1	3.3	-	-	3.3	3.3	3.3	3.3
Gas Plant	Chromium	mg/kg	1	1	0.15	-	-	0.15	0.15	0.15	0.15
Gas Plant	Copper	mg/kg	1	1	1.5	-	-	1.5	1.5	1.5	1.5
Gas Plant	Lead	mg/kg	1	1	0.15	-	-	0.15	0.15	0.15	0.15
Gas Plant	Mercury	mg/kg	1	1	0.03	-	-	0.03	0.03	0.03	0.03
Gas Plant	Nickel	mg/kg	1	1	0.46	-	-	0.46	0.46	0.46	0.46
Gas Plant	Vanadium	mg/kg	1	1	0.28	-	-	0.28	0.28	0.28	0.28
Gas Plant	Zinc	mg/kg	1	1	31	-	-	31	31	31	31
Gas Plant	Percent Lipids	percent	1	1	1.5	-	-	1.5	1.5	1.5	1.5
Gas Plant	4,4'-DDD	mg/kg	1	1	0.015	-	-	0.015	0.015	0.015	0.015
Gas Plant	4,4'-DDE	mg/kg	1	1	0.0036	-	-	0.0036	0.0036	0.0036	0.004
Gas Plant	BHC-delta	mg/kg	1	1	0.00071	-	-	0.00071	0.00071	0.00071	0.00071
Gas Plant	PCB 105	mg/kg	1	1	0.0068	-	-	0.0068	0.0068	0.0068	0.0068
Gas Plant	PCB 118	mg/kg	1	1	0.01	-	-	0.01	0.01	0.01	0.01
Gas Plant	PCB 138	mg/kg	1	1	0.0064	-	-	0.0064	0.0064	0.0064	0.0064
Gas Plant	PCB 153	mg/kg	1	1	0.01	-	-	0.01	0.01	0.01	0.01
Gas Plant	Total DDT	mg/kg	1	1	0.02	-	-	0.019	0.02	0.02	0.02

Notes:

-- not applicable

Chemicals summarized are those that were detected in samples collected as part of the ERA Sampling and Analysis, the Focused Sampling and Analysis

TABLE 3-9
Summary Statistics for Chemicals Detected in Fish Tissue
Bolsa Chica Lowlands

Area	Analyte	Units	Number of Detects	Number of Samples	Mean	Standard Deviation	95th UCL	Minimum Reported Value	Median	90th Percentile	Maximum Reported Value

(CH2M HILL, 1998a; 2000) and Tetra Tech Phase II Environmental Assessment (1996)..
Concentrations are presented on a dry weight basis.

TABLE 3-10
Background Levels[a] for Selected Inorganic Constituents in Surface and Subsurface Sediments (mg/kg dw)
Bolsa Chica Lowlands

	Surface Sediments			Subsurface Sediments			All Sediments[b]		
Analyte	**Concentration[c]**	**Breakpoint Percentile**	**N**	**Concentration**	**Breakpoint Percentile**	**N**	**Concentration**	**Breakpoint Percentile**	**N**
Arsenic	11	88th	316/316	10.6	95th	210/264	11	91st	526/580
Barium	92	81st	317/317	75.9	86th	264/264	110	89th	581/581
Beryllium	0.88	83rd	311/317	0.8	95th	147/264	0.94	91st	458/581
Cadmium	0.66	95th	155/317	0.65	86th	58/264	0.66	91st /**91st**	213/581
Chromium	43	90th	317/317	32	96th	264/264	43	94th	581/581
Cobalt	10	91st	317/317	10.1	94th	264/264	10.1	93rd	581/581
Copper (see Figure 3-4)	30	91st	317/317	20.6	94th	264/264	26.1	91st	581/581
Lead	48	92nd	317/317	17.3	97th	234/264	48	95th	551/581
Mercury	0.23	96th	160/317	0.15	95th	30/264	0.28	98th /**93rd**	190/581
Nickel	30	93rd	317/317	19.1	95th	261/264	30	95th	578/581
Selenium (see Figures 3-5a and b)	0.54	96th	173/316	0.49	57th	38/264	0.54	78th /**94th**	211/580
Silver (see Figures 3-6a and b)	0.19	97th	40/317	**Not Assessed**		2/264	0.22	80th /**86th**	42/581
Thallium	0.52	96th	293/317	0.44	57th	129/264	0.61	81st /**99th**	422/581
Vanadium	72	84th	317/317	60	93rd	264/264	75	91st	581/581
Zinc	92	81st	317/317	89.7	97th	247/264	103	91st	564/581

Notes:
[a]This background analysis includes sediment samples collected from the proposed dredge area footprint. Surface samples from the dredge area extend from the ground surface to a minimum depth of 2 feet.
[b]Boldface percentile values in "All Sediments" columns indicate analytes with a large number of non-detected ("U") values. The reported percentile values for those elements are for the indicated background limit with non-detect values removed from the data set.
[c]All concentrations given represent the estimated upper limit of background for the site.
N = Number of Detects/Total Number of Samples
dw = dry weight

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Table 3-11
Exposure Parameters for Bird and Mammal Receptors
Bolsa Chica Lowlands

	Body Weight			Food Ingestion Rate (dry wt.)			Water Ingestion Rate			Biotic Dietary Items (% Diet)							Abiotic Media Ingestion (% diet)			Foraging Range	
Species	**Mean (kg)**	**Notes**	**Reference**	**Mean (kg/kgbw-d)**	**Notes**	**Reference**	**(L/kgbw-d)**	**Notes**	**Reference**	**Plants**	**Terrestrial Invertebrates**	**Terrestrial Vertebrates**	**Aquatic Invertebrates**	**Fish**	**Major food items**	**Reference**	**Soil/ Sediment**	**Notes**	**Reference**	**Range**	**Reference**
Birds																					
Black-necked stilt	0.203		Coleman, 1981	0.08	allometric estimation for non-passerine birds normalized to kg/kgbw/d	Nagy, 1987 in USEPA, 1993c	0.099	allometric estimation for 'all birds' normalized to L/kgbw/d	Calder & Braun, 1983 in USEPA, 1993c	--	--	--	100[a]	--	Insects, crustaceans, mollusks, and other aquatic invertebrates.	Hothem and Ohlendorf, 1989	17	stilt sandpiper Kansas	Beyer et al., 1994	10-100 ha	J.P. Skorupa/USFWS pers. Comm with H. Ohlendorf, 10/15/97
Black-crowned night-heron	0.883	adult males and females	Dunning, 1984	0.055	allometric estimation for non-passerine birds normalized to kg/kgbw/d	Nagy, 1987 in USEPA, 1993c	0.061	allometric estimation for 'all birds' normalized to L/kgbw/d	Calder & Braun, 1983 in USEPA, 1993c	--	1	9	38[b]	52	Fishes, frogs, tadpoles, snakes, salamanders, mollusks, crustaceans, insects, and young birds and mammals.	Palmer, 1962	5	estimated from diet and soil/sediment intake information	adapted from Beyer et al., 1994	8 km	Zeiner et al., 1990a
Least tern	0.0431	adult males and females	Dunning, 1984	0.118	allometric estimation for non-passerine birds normalized to kg/kgbw/d	Nagy, 1987 in USEPA, 1993c	0.167	allometric estimation for 'all birds' normalized to L/kgbw/d	Calder & Braun, 1983 in USEPA, 1993c	--	--	--	--	100	Prey in California includes anchovies, silversides and shiner surfperch.	Zeiner, 1990a	2	assumed default based on lowest measured values	adapted from Beyer et al., 1994	Forage in waters close to nest site	Zeiner et al., 1990a
American kestrel	0.116	adult males and females California	Dunning, 1984	0.116	allometric estimation for 'all birds' normalized to kg/kgbw/d	Nagy, 1987 in USEPA, 1993c	0.12	allometric estimation for 'all birds' normalized to L/kgbw/d	Calder & Braun, 1983 in USEPA, 1993c	--	30	70	--	--	Invertebrates - worms, spiders, scorpions, beetles, grasshoppers, other large insects. Amphibians, reptiles, birds, and small mammals.	Meyer and Balgooyen, 1987 and Collopy and Koplin, 1983 in USEPA, 1993c	2	assumed default based on lowest measured values	adapted from Beyer et al., 1994	41 - 500 ha	Craighead & Craighead, 1956 in USEPA, 1993c
Belding's savannah sparrow	0.018		Wheelwright & Rising, 1993	0.258	allometric estimation for passerine birds normalized to kg/kgbw/d	Nagy, 1987 in USEPA, 1993c	0.222	allometric estimation for 'all birds' normalized to L/kgbw/d	Calder & Braun, 1983 in USEPA, 1993c	40	60	--	--	--	Primarily terrestrial invertebrates (insects, snails, and spiders) during the breeding season and plants (grass and seeds) in winter.	Wheelwright and Rising, 1993	2	assumed default based on lowest measured values	adapted from Beyer et al., 1994	3.2 ha	Zeiner et al., 1990a
Mammals																					
Western harvest mouse	0.01		Santolo, 1997	0.227	allometric estimation for rodents normalized to kg/kgbw/d	Nagy, 1987 in USEPA, 1993	0.157	allometric estimation for 'all mammals' normalized to L/kgbw/d	Calder & Braun, 1983 in USEPA, 1993c	81	19	--	--	--	Eats seeds, insects, fruits, and shoots (omnivorous).	Santolo, 1997	2	assumed comparable to white-footed mouse	adapted from Beyer et al., 1994	0.14-0.56 ha	Zeiner et al., 1990b
Coyote	23		Ransom, 1981	0.039	allometric estimation for mammals normalized to kg/kgbw/d	Nagy, 1987 in USEPA, 1993	0.072	allometric estimation for 'all mammals' normalized to L/kgbw/d	Calder & Braun, 1983 in USEPA, 1993c	1	--	99	--	--	Primarily mice, rats, ground squirrels, gophers, lagomorphs, and carrion. Also eats some insects, reptiles, birds (and eggs), and fruits.	Ransom, 1981	2	assumed comparable to white-footed mouse	adapted from Beyer et al., 1994	1430-6800 ha	Bekoff, 1982 in Sample et al., 1996

Notes:
[a]Exposure to aquatic invertebrates is estimated at 80% Corixids and 20% shrimp.
[b]Exposure to aquatic invertebrates is estimated at 13% Corixids, 12% snails, and 13% shrimp.

Table 3-12
Summary Statistics for Soil-to-Biota Bioaccumulation Factors
Bolsa Chica Lowlands

Analyte	Number of Samples	Mean	Standard Deviation	Minimum Detected Value	Median	90th Percentile	Maximum Detected Value
Terrestrial Plants							
Arsenic	9	0.0537	0.0815	0.0046	0.0146	0.254	0.254
Barium	7	0.2089	0.1722	0.0064	0.1863	0.464	0.464
Beryllium	4	0.1498	0.0632	0.084	0.14	0.235	0.235
Cadmium	13	0.8529	1.504	0.0852	0.33	1.867	5.6
Chromium	14	0.0551	0.062	0.0063	0.039	0.117	0.245
Cobalt	7	0.0234	0.013	0.0056	0.0218	0.042	0.042
Copper	14	0.21	0.13	0.07	0.17	0.36	0.55
Lead	14	0.06	0.061	0.0052	0.042	0.17	0.18
Mercury	8	0.235	0.235	0.035	0.194	0.755	0.755
Nickel	14	0.077	0.081	0.02	0.053	0.13	0.334
Selenium	9	0.919	1.007	0.2174	0.348	2.86	2.86
Silver	3	0.7333	0.4163	0.4	0.6	1.2	1.2
Vanadium	7	0.026	0.011	0.0086	0.028	0.04	0.04
Zinc	14	0.38004	0.27076	0.08714	0.32572	0.78273	0.81713
BHC-beta	1	0.943	.	0.943	0.943	0.943	0.943
Bird Eggs - Stilt							
Barium	18	0.0087	0.006	0.0021	0.0067	0.018	0.023
Cadmium	1	0.343	.	0.343	0.343	0.343	0.343
Chromium	19	0.0091	0.004	0.0039	0.0092	0.016	0.019
Cobalt	4	0.052	0.032	0.0231	0.0477	0.089	0.089
Copper	19	0.11	0.04	0.039	0.11	0.16	0.19
Lead	12	0.014	0.012	0.0029	0.008	0.03	0.04
Mercury	18	3.623	2.949	0.863	2.732	9.231	11.429
Nickel	7	0.012	0.005	0.005	0.01	0.021	0.021
Selenium	18	0.473	0.287	0.0623	0.45	0.68	1.32
Zinc	19	0.376	0.134	0.1606	0.384	0.57	0.72
4,4'-DDD	5	17.28	22.9	0.893	13.02	56.57	56.57
4,4'-DDE	19	3820.13	4711.28	150.459	1866.67	10750	18846.15
4,4'-DDT	14	537.64	1146.7	28.923	157.49	1070.42	4415.58
Aroclor 1260	3	38.206	47.452	7.474	14.286	92.857	92.857
BHC-alpha	1	2.85	.	2.85	2.85	2.85	2.85
BHC-beta	7	52.4012	40.882	14.2149	28.5714	117.647	117.647
BHC-delta	1	15.2	.	15.2	15.2	15.2	15.2
BHC-gamma	2	3.7683	0.654	3.3058	3.7683	4.231	4.231
Dieldrin	8	165.18	126.58	40.625	129.26	395.06	395.06
Endrin	2	434.683	597.449	12.222	434.683	857.143	857.143
Endrin aldehyde	1	4.79	.	4.786	4.79	4.79	4.79
Endrin ketone	2	1.19	0.16	1.079	1.19	1.3	1.3
PCB 066	1	1.12	.	1.12	1.12	1.12	1.12
PCB 105	1	1.11	.	1.11	1.11	1.11	1.11
PCB 118	1	1.75	.	1.75	1.75	1.75	1.75
PCB 153	2	1.939	0.784	1.385	1.939	2.493	2.493
Total DDT	18	616.953	643.091	51.4107	350.284	1902.69	2365.25
Small Mammals							
Barium	9	0.0763	0.0544	0.0217	0.05	0.172	0.172

Table 3-12
Summary Statistics for Soil-to-Biota Bioaccumulation Factors
Bolsa Chica Lowlands

Analyte	Number of Samples	Mean	Standard Deviation	Minimum Detected Value	Median	90th Percentile	Maximum Detected Value
Cadmium	5	1.3477	1.997	0.1429	0.6271	4.9	4.9
Chromium	9	0.06	0.03	0.03	0.05	0.11	0.11
Cobalt	7	0.0226	0.008	0.0146	0.02	0.038	0.038
Copper	9	0.6	0.33	0.226	0.56	1.37	1.37
Lead	9	0.085	0.046	0.0352	0.077	0.18	0.18
Mercury	6	0.611	0.497	0.083	0.53	1.408	1.408
Nickel	9	0.147	0.056	0.071	0.142	0.26	0.26
Selenium	7	0.935	0.886	0.1053	0.773	2.73	2.73
Vanadium	9	0.006	0.003	0.0023	0.006	0.01	0.01
Zinc	9	2.78971	1.23825	1.09091	2.53769	5.55851	5.55851
4,4'-DDD	1	1.78	.	1.78	1.78	1.78	1.78
4,4'-DDE	7	14.15	28.67	1	2	78.79	78.79
4,4'-DDT	3	2.92	3.07	0.333	2.12	6.31	6.31
Acenaphthalene	2	1.1336	1.5749	0.02	1.1336	2.247	2.247
Acetone	1	23.3	.	23.3	23.3	23.3	23.3
Anthracene	3	0.71	1.2084	0.0011	0.0236	2.105	2.105
Benzo(a)anthracene	5	0.4353	0.6937	0.0054	0.1714	1.667	1.667
Benzo(a)pyrene	5	0.3488	0.7368	0.0005	0.0217	1.667	1.667
Benzo(b)fluoranthene	5	0.1357	0.2195	0.0014	0.0543	0.526	0.526
Benzo(e)pyrene	3	0.0862	0.1071	0.0084	0.0419	0.208	0.208
Benzo(g,h,i)perylene	2	0.181	0.1966	0.0419	0.181	0.32	0.32
Benzo(k)fluoranthene	5	0.3491	0.737	0.0007	0.025	1.667	1.667
BHC-alpha	2	3.9029	1.1	3.125	3.9029	4.681	4.681
BHC-beta	3	72.2136	122.107	0.9333	2.5	213.208	213.208
BHC-gamma	1	3.13	.	3.13	3.13	3.13	3.13
Chrysene	5	0.38	0.72	0.001	0.06	1.67	1.67
Dibenz(a,h)anthracer	1	0.009	.	0.009	0.009	0.009	0.009
Dieldrin	4	31.37	56.5	1.172	4.13	116.05	116.05
Endrin	1	4.062	.	4.062	4.062	4.062	4.062
Endrin ketone	1	1.57	.	1.57	1.57	1.57	1.57
Fluoranthene	4	0.188	0.132	0.05	0.179	0.345	0.345
Fluorene	2	0.847	1.159	0.028	0.847	1.667	1.667
Indeno(1,2,3-cd)pyre	4	0.435	0.821	0.02	0.026	1.667	1.667
Naphthalene	2	0.551	0.599	0.127	0.551	0.975	0.975
PCB 153	1	0.052	.	0.052	0.052	0.052	0.052
PCB 170	1	0.026	.	0.026	0.026	0.026	0.026
PCB 180	1	0.027	.	0.027	0.027	0.027	0.027
Phenanthrene	4	0.56	0.471	0.1833	0.404	1.25	1.25
Pyrene	5	0.406	0.707	0.0022	0.105	1.67	1.67
Total DDT	5	2.212	3.371	0.039	0.98	8.13	8.13
Aquatic Invertebrates - Corixid							
Arsenic	6	0.2175	0.1862	0.0241	0.1766	0.573	0.573
Barium	7	0.2988	0.2779	0.1079	0.2058	0.882	0.882
Beryllium	6	0.7546	0.5162	0.2069	0.6029	1.41	1.41
Chromium	7	0.1314	0.103	0.0136	0.1103	0.292	0.292
Cobalt	7	0.0569	0.042	0.0175	0.0345	0.138	0.138

Table 3-12
Summary Statistics for Soil-to-Biota Bioaccumulation Factors
Bolsa Chica Lowlands

Analyte	Number of Samples	Mean	Standard Deviation	Minimum Detected Value	Median	90th Percentile	Maximum Detected Value
Copper	7	0.26	0.14	0.126	0.18	0.48	0.48
Lead	7	0.122	0.089	0.0238	0.1	0.29	0.29
Nickel	7	0.18	0.184	0.043	0.111	0.554	0.554
Vanadium	7	0.056	0.054	0.0169	0.032	0.17	0.17
Zinc	7	0.401	0.25	0.191	0.279	0.88	0.88
4,4'-DDD	3	0.42	0.48	0.072	0.22	0.98	0.98
4,4'-DDE	4	1.62	1.63	0.133	1.64	3.05	3.05
Aroclor 1254	1	0.59	.	0.59	0.59	0.59	0.59
BHC-alpha	1	1.3813	.	1.3813	1.3813	1.381	1.381
BHC-beta	1	6.1789	.	6.1789	6.1789	6.179	6.179
Total DDT	4	0.16	0.114	0.0495	0.142	0.31	0.31
Total PCB	1	0.174	.	0.1736	0.174	0.17	0.17
Aquatic Invertebrates - Nereis							
Arsenic	2	0.0232	0.0138	0.0134	0.0232	0.033	0.033
Barium	12	0.0021	0.0019	0.0003	0.0011	0.005	0.006
Cadmium	10	0.1864	0.106	0.0769	0.1759	0.346	0.435
Chromium	17	0.0058	0.003	0.0013	0.0058	0.01	0.012
Cobalt	14	0.0117	0.004	0.0065	0.0116	0.017	0.02
Copper	17	0.1	0.06	0.035	0.09	0.16	0.28
Lead	17	0.015	0.014	0.0025	0.008	0.03	0.06
Mercury	8	0.283	0.223	0.08	0.236	0.795	0.795
Nickel	10	0.01	0.008	0.002	0.006	0.021	0.023
Selenium	3	0.24	0.057	0.2051	0.208	0.31	0.31
Thallium	1	0.182	.	0.182	0.182	0.182	0.182
Vanadium	17	0.005	0.002	0.0021	0.005	0.01	0.01
Zinc	17	0.336	0.178	0.1178	0.273	0.59	0.8
4,4'-DDD	11	1.87	4.74	0.058	0.43	1.61	16.1
4,4'-DDE	7	0.56	0.71	0.004	0.23	1.61	1.61
4,4'-DDT	4	0.46	0.24	0.137	0.52	0.66	0.66
Acenaphthalene	1	1.92	.	1.92	1.92	1.92	1.92
Aldrin	1	1.37	.	1.37	1.37	1.37	1.37
Anthracene	1	10	.	10	10	10	10
Aroclor 1254	3	1.106	0.563	0.541	1.111	1.667	1.667
Aroclor 1260	1	0.714	.	0.714	0.714	0.714	0.714
BHC-alpha	2	0.8652	0.2808	0.6667	0.8652	1.064	1.064
BHC-beta	9	12.0848	18.069	0.4273	1.5152	56	56
BHC-delta	2	1.2693	0.636	0.8197	1.2693	1.719	1.719
BHC-gamma	1	0.599	.	0.599	0.599	0.599	0.599
Chlordane (technical)	1	0.0122	.	0.0122	0.0122	0.0122	0.0122
Chrysene	1	0.0830	.	0.0830	0.0830	0.0830	0.0830
Dieldrin	5	1.37	0.52	0.82	1.61	1.92	1.92
Endrin	5	0.94	0.6	0.294	0.82	1.92	1.92
Endrin aldehyde	2	0.77	0.41	0.483	0.77	1.06	1.06
Fluorene	1	0.702	.	0.702	0.702	0.702	0.702
Low MW PAHs	1	7.77	.	7.77	7.77	7.77	7.77
Pyrene	2	1.073	1.444	0.0526	1.073	2.09	2.09

Table 3-12
Summary Statistics for Soil-to-Biota Bioaccumulation Factors
Bolsa Chica Lowlands

Analyte	Number of Samples	Mean	Standard Deviation	Minimum Detected Value	Median	90th Percentile	Maximum Detected Value
Total DDT	12	0.145	0.143	0	0.129	0.35	0.35
Total PAHs	1	10.3	.	10.3	10.3	10.3	10.3
Total PCB	1	0	.	0	0	0	0
Aquatic Invertebrates - Mussel							
Barium	3	0.0194	0.0239	0.0055	0.0056	0.047	0.047
Beryllium	1	0.114	.	0.114	0.114	0.114	0.114
Cadmium	1	0.208	.	0.208	0.208	0.208	0.208
Chromium	3	0.0324	0.036	0.0041	0.0208	0.072	0.072
Copper	3	0.15	0.07	0.072	0.18	0.2	0.2
Lead	3	0.012	0.004	0.0072	0.014	0.01	0.01
Nickel	2	0.044	0.032	0.021	0.044	0.067	0.067
Selenium	3	1.415	0.482	0.86	1.659	1.73	1.73
Vanadium	3	0.01	0.004	0.0071	0.007	0.01	0.01
Zinc	3	0.13661	0.08171	0.0427	0.17571	0.19143	0.19143
4,4'-DDD	3	6.81	10.31	0.68	1.03	18.71	18.71
4,4'-DDE	3	9.72	15.61	0.197	1.23	27.74	27.74
Benzo(a)anthracene	1	1.74	.	1.74	1.74	1.74	1.74
Benzo(a)pyrene	1	1.54	.	1.54	1.54	1.54	1.54
Benzo(e)pyrene	1	0.526	.	0.526	0.526	0.526	0.526
BHC-alpha	2	0.4501	0.443	0.1368	0.4501	0.763	0.763
BHC-beta	1	0.763	.	0.763	0.763	0.763	0.763
Chrysene	1	1.21	.	1.21	1.21	1.21	1.21
Fluoranthene	1	1.6	.	1.6	1.6	1.6	1.6
Fluorene	1	1.74	.	1.74	1.74	1.74	1.74
Phenanthrene	1	0.645	.	0.645	0.645	0.645	0.645
Pyrene	1	0.976	.	0.976	0.976	0.976	0.976
Total DDT	2	0.639	0.605	0.2108	0.639	1.07	1.07
Aquatic Invertebrates - Shrimp							
Barium	1	0.122	.	0.122	0.122	0.122	0.122
Chromium	1	0.0427	.	0.0427	0.0427	0.0427	0.0427
Cobalt	1	0.0216	.	0.0216	0.0216	0.0216	0.0216
Copper	1	1.04	.	1.04	1.04	1.04	1.04
Lead	1	0.0092	.	0.0092	0.0092	0.0092	0.0092
Nickel	1	0.078	.	0.078	0.078	0.078	0.078
Selenium	1	3.07	.	3.07	3.07	3.07	3.07
Silver	1	2.2	.	2.2	2.2	2.2	2.2
Vanadium	1	0.0058	.	0.0058	0.0058	0.0058	0.0058
Zinc	1	0.247	.	0.247	0.247	0.247	0.247
4,4'-DDE	1	1	.	1	1	1	1
BHC-alpha	1	0.144	.	0.144	0.144	0.144	0.144
BHC-beta	1	1.92	.	1.92	1.92	1.92	1.92
Total DDT	1	0.762	.	0.762	0.762	0.762	0.762
Aquatic Invertebrates - Snails							
Barium	3	0.0904	0.0523	0.058	0.0626	0.151	0.151
Beryllium	2	0.2447	0.0396	0.2167	0.2447	0.273	0.273
Cadmium	1	0.185	.	0.185	0.185	0.185	0.185

Table 3-12
Summary Statistics for Soil-to-Biota Bioaccumulation Factors
Bolsa Chica Lowlands

Analyte	Number of Samples	Mean	Standard Deviation	Minimum Detected Value	Median	90th Percentile	Maximum Detected Value
Chromium	3	0.08	0.07	0.012	0.07	0.15	0.15
Cobalt	3	0.1163	0.024	0.102	0.1027	0.144	0.144
Copper	3	0.51	0.18	0.347	0.48	0.7	0.7
Lead	3	0.026	0.014	0.0121	0.026	0.04	0.04
Nickel	3	0.895	0.299	0.61	0.869	1.207	1.207
Selenium	1	0.152	.	0.152	0.152	0.152	0.152
Vanadium	3	0.011	0.007	0.0048	0.01	0.02	0.02
Zinc	3	0.5854	0.31888	0.33019	0.48315	0.94286	0.94286
4,4'-DDD	1	6.36	.	6.36	6.36	6.36	6.36
4,4'-DDE	3	2.54	2.62	0.769	1.29	5.55	5.55
BHC-alpha	2	0.6625	0.143	0.5617	0.6625	0.763	0.763
BHC-beta	2	4.3393	6.062	0.0526	4.3393	8.626	8.626
Total DDT	2	1.013	0.489	0.6667	1.013	1.36	1.36
Fish							
Barium	8	0.0598	0.0482	0.0138	0.0445	0.17	0.17
Beryllium	5	0.1792	0.0589	0.1136	0.1809	0.271	0.271
Cadmium	1	0.130	.	0.130	0.130	0.130	0.130
Cobalt	4	0.0256	0.016	0.01	0.0223	0.048	0.048
Chromium	8	0.0251	0.022	0.0062	0.0186	0.072	0.072
Copper	8	0.21	0.1	0.09	0.19	0.37	0.37
Mercury	1	0.224	.	0.224	0.224	0.224	0.224
Nickel	8	0.074	0.036	0.035	0.069	0.149	0.149
Lead	8	0.031	0.03	0.0055	0.02	0.1	0.1
Vanadium	8	0.014	0.009	0.0059	0.01	0.03	0.03
Zinc	8	0.83672	0.44593	0.37	0.65438	1.57143	1.57143
4,4'-DDD	8	15.82	14.3	0.848	13.05	43.9	43.9
4,4'-DDE	9	82.41	118.75	0.655	37.42	330.77	330.77
4,4'-DDT	3	1.28	0.86	0.748	0.83	2.27	2.27
Acenaphthalene	2	0.0619	0.0366	0.036	0.0619	0.088	0.088
Acetone	2	86.4247	30.9834	64.5161	86.4247	108.333	108.333
Aldrin	1	0.255	.	0.255	0.255	0.255	0.255
Anthracene	2	0.3323	0.4342	0.0253	0.3323	0.639	0.639
Aroclor 1254	3	8.006	3.459	4.583	7.934	11.5	11.5
Aroclor 1260	1	1.67	.	1.67	1.67	1.67	1.67
Benzo(a)anthracene	4	0.7979	0.7852	0.05	0.6185	1.905	1.905
Benzo(a)pyrene	3	0.8372	0.9685	0.015	0.5918	1.905	1.905
Benzo(b)fluoranthene	5	0.6402	0.7708	0.0089	0.5606	1.905	1.905
Benzo(e)pyrene	4	0.5298	0.9181	0.0035	0.1055	1.905	1.905
Benzo(g,h,i)perylene	2	0.9639	1.3306	0.023	0.9639	1.905	1.905
Benzo(k)fluoranthene	4	0.6282	0.894	0.0088	0.2997	1.905	1.905
BHC-alpha	6	9.9653	12.2446	0.0611	7.1682	33.75	33.75
BHC-beta	5	1.1978	0.843	0.0526	1.0909	2.366	2.366
BHC-delta	1	6.17	.	6.17	6.17	6.17	6.17
Chlordane (alpha)	1	0.820	.	0.820	0.820	0.820	0.820
Chlordane (technical)	1	0.820	.	0.820	0.820	0.820	0.820
Chrysene	5	0.39	0.71	0.033	0.09	1.67	1.67

Table 3-12
Summary Statistics for Soil-to-Biota Bioaccumulation Factors
Bolsa Chica Lowlands

Analyte	Number of Samples	Mean	Standard Deviation	Minimum Detected Value	Median	90th Percentile	Maximum Detected Value
Dibenz(a,h)anthracer	2	1.04	1.23	0.17	1.04	1.9	1.9
Dieldrin	5	13.39	12.82	1.765	6.89	29.68	29.68
Endrin aldehyde	1	1.61	.	1.61	1.61	1.61	1.61
Fluoranthene	5	0.517	0.683	0.018	0.145	1.667	1.667
Fluorene	3	0.285	0.33	0.069	0.12	0.665	0.665
Indeno(1,2,3-cd)pyre	2	0.957	1.34	0.01	0.957	1.905	1.905
Methylene chloride	1	719	.	719	719	719	719
Naphthalene	2	0.247	0.111	0.168	0.247	0.325	0.325
PCB 138	1	1.32	.	1.32	1.32	1.32	1.32
PCB 153	1	2.06	.	2.06	2.06	2.06	2.06
Phenanthrene	6	0.602	0.661	0.163	0.331	1.905	1.905
Pyrene	5	0.408	0.704	0.0708	0.106	1.67	1.67
Selenium	6	1.31	1.168	0.2308	1.07	3.05	3.05
Total DDT	6	7.051	10.292	0.2711	1.994	26.23	26.23
Total PCB	2	6.181	8.616	0.0885	6.181	12.27	12.27

Notes:
-- sample size not large enough to calculate value

Table 3-13
Summary Statistics for Water-to-Biota Bioaccumulation Factors
Bolsa Chica Lowlands

Analyte	Number of Samples	Mean	Standard Deviation	Minimum Detected Value	Median	90th Percentile	Maximum Detected Value
Terrestrial Plants							
Arsenic	2	0.0209	0.02453	0.0035	0.0209	0.0382	0.0382
Barium	1	0.0743	--	0.0743	0.0743	0.0743	0.0743
Cadmium	2	0.6087	0.55339	0.2174	0.6087	1	1
Chromium	2	0.1178	0.00372	0.1152	0.1178	0.1204	0.1204
Cobalt	1	0.0809	--	0.0809	0.0809	0.0809	0.0809
Copper	2	0.233	0.01449	0.2227	0.233	0.2432	0.2432
Lead	2	0.09692	0.11749	0.01385	0.09692	0.18	0.18
Nickel	1	0.0342	--	0.0342	0.0342	0.0342	0.0342
Vanadium	1	0.02628	--	0.02628	0.02628	0.02628	0.02628
Zinc	2	0.16054	0.02578	0.14231	0.16054	0.17877	0.17877
Bird Egg - Stilt							
Barium	1	0.0228	--	0.0228	0.0228	0.0228	0.0228
Chromium	1	0.0172	--	0.0172	0.0172	0.0172	0.0172
Copper	1	0.1514	--	0.1514	0.1514	0.1514	0.1514
Zinc	1	0.15642	--	0.15642	0.15642	0.15642	0.15642
BHC-beta	1	1.1	--	1.1	1.1	1.1	1.1
Dieldrin	1	32	--	32	32	32	32
Small Mammal							
Barium	1	0.0276	--	0.0276	0.0276	0.0276	0.0276
Cadmium	1	0.4348	--	0.4348	0.4348	0.4348	0.4348
Chromium	1	0.1888	--	0.1888	0.1888	0.1888	0.1888
Cobalt	1	0.0745	--	0.0745	0.0745	0.0745	0.0745
Copper	1	0.632	--	0.632	0.632	0.632	0.632
Lead	1	0.06338	--	0.06338	0.06338	0.06338	0.06338
Nickel	1	0.1792	--	0.1792	0.1792	0.1792	0.1792
Vanadium	1	0.00554	--	0.00554	0.00554	0.00554	0.00554
Zinc	1	3.75	--	3.75	3.75	3.75	3.75
BHC-beta	1	0.042	--	0.042	0.042	0.042	0.042
Dieldrin	1	9.4	--	9.4	9.4	9.4	9.4
Aquatic Invertebrates - Corixid							
Arsenic	1	0.5957	--	0.5957	0.5957	0.5957	0.5957
Barium	1	3.0801	--	3.0801	3.0801	3.0801	3.0801
Chromium	1	0.9756	--	0.9756	0.9756	0.9756	0.9756
Cobalt	1	2.0435	--	2.0435	2.0435	2.0435	2.0435
Copper	1	0.6803	--	0.6803	0.6803	0.6803	0.6803
Lead	1	0.6	--	0.6	0.6	0.6	0.6
Nickel	1	1.2101	--	1.2101	1.2101	1.2101	1.2101
Vanadium	1	0.46226	--	0.46226	0.46226	0.46226	0.46226
Zinc	1	0.5176	--	0.5176	0.5176	0.5176	0.5176
Aquatic Invertebrates - Nereis							
Arsenic	1	0.0035	--	0.0035	0.0035	0.0035	0.0035
Barium	3	0.0007	0.00051	0.0001	0.001	0.001	0.001
Cadmium	2	0.4763	0.36621	0.2174	0.4763	0.7353	0.7353
Chromium	3	0.0124	0.00121	0.0112	0.0122	0.0136	0.0136
Cobalt	3	0.0775	0.03095	0.0468	0.0769	0.1087	0.1087
Copper	3	0.128	0.02386	0.1005	0.1393	0.144	0.144
Lead	3	0.0342	0.03227	0.0031	0.032	0.0675	0.0675
Mercury	1	0.43	--	0.43	0.43	0.43	0.43
Nickel	1	0.0042	--	0.0042	0.0042	0.0042	0.0042
Vanadium	3	0.01681	0.01294	0.00198	0.02264	0.02581	0.02581
Zinc	3	0.36975	0.14652	0.20112	0.44231	0.46584	0.46584

Table 3-13
Summary Statistics for Water-to-Biota Bioaccumulation Factors
Bolsa Chica Lowlands

Analyte	Number of Samples	Mean	Standard Deviation	Minimum Detected Value	Median	90th Percentile	Maximum Detected Value
BHC-beta	1	0.05	--	0.05	0.05	0.05	0.05
BHC-delta	2	0.0279	0.03129	0.0057	0.0279	0.05	0.05
Dieldrin	3	0.0608	0.06604	0.0192	0.0263	0.137	0.137
Total DDT	1	1.01538	--	1.01538	1.01538	1.01538	1.01538
Fish							
Barium	1	0.0483	--	0.0483	0.0483	0.0483	0.0483
Chromium	1	0.111	--	0.111	0.111	0.111	0.111
Cobalt	1	0.2717	--	0.2717	0.2717	0.2717	0.2717
Copper	1	0.2418	--	0.2418	0.2418	0.2418	0.2418
Lead	1	0.106	--	0.106	0.106	0.106	0.106
Nickel	1	0.1345	--	0.1345	0.1345	0.1345	0.1345
Vanadium	1	0.07264	--	0.07264	0.07264	0.07264	0.07264
Zinc	1	0.92133	--	0.92133	0.92133	0.92133	0.92133
BHC-delta	1	0.0147	--	0.0147	0.0147	0.0147	0.0147
Dieldrin	2	0.4506	0.13684	0.3538	0.4506	0.5474	0.5474

Notes:
-- sample size not large enough to calculate value

Table 3-14
Summary of Toxicity Test Results
Bolsa Chica Lowlands

Area	Cell	Field ID	Sediment Wet/Dry	Salinity[b]		Amphipod and Nereis Results			Significantly Different From Controls		Maximum Test Conc.[c]	Reproduction			Growth/Survival		
				Adjusted	% Original Sample	Reburial (%)	Survival (%)	Mortality (%)	Reburial	Survival		NOEC (%)	LOEC (%)	EC50 (%)	NOEC (%)	LOEC (%)	LC50 (%)
Sediment - Amphipod (*Eohaustorius estuarius*)																	
Bolsa Bay	CELL IB	RIBC1-2	W	no	--	100	94	6	no	no	100	--	--	--	--	--	--
Bolsa Bay	CELL OB	ROBC1-2	W	no	--	100	96	4	no	no	100	--	--	--	--	--	--
Full Tidal	CELL 01	FS01-1-1	W	no	--	0	3	97	yes	yes	100	--	--	--	--	--	--
Full Tidal	CELL 01	R01C1-2FB	W	yes	39.3	100	99	1	no	no	100	--	--	--	--	--	--
Full Tidal	CELL 03	F3R-1-1	W	yes	21.4	100	97	3	no	no	100	--	--	--	--	--	--
Full Tidal	CELL 03	F3R-2-1	W	no	--	99	98	2	no	no	100	--	--	--	--	--	--
Full Tidal	CELL 03	F3R-3-1	W	no	--	100	96	4	no	no	100	--	--	--	--	--	--
Full Tidal	CELL 03	R3C1-1	W	no	--	100	86	14	no	yes	100	--	--	--	--	--	--
Full Tidal	CELL 03_08	FORB42-1	D	yes	33.3	22	13	87	yes	yes	100	--	--	--	--	--	--
Full Tidal	CELL 08	R08C1-2FB	W	yes	68.4	100	98	2	no	no	100	--	--	--	--	--	--
Full Tidal	CELL 51	FOPC0201-1	D	yes	72.7	95.4	92	8	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 14	FOSN01-1	W	no	--	98.8	87	13	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 14	FOTFSB02-1	D	no	--	98.6	77	23	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 14	FOTFSB04-1	D	no	--	97.6	89	11	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 14	FOTFSL02-1	D	no	--	100	94	6	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 21	FOEO30-1	W	yes	48.3	97.4	75	25	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 21	FOSBA01-1	D	yes	43.2	0	0	100	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 21	FOSBA08-1	W	yes	35.1	80	7	93	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 23	FOAOT5D-1	W	yes	42.7	99	89	11	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 23	FWH-1-1	W	yes	12.4	0	0	100	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 23	FWH-2-1	W	yes	19.4	0	0	100	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 23	FWH-3-1	W	yes	16.8	60	6	94	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 28	FOSK01-1	W	yes	50.0	0	0	100	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 30	FOEO18-1	W	yes	75.0	62	46	54	yes	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 30	FOSJ01-1	W	yes	32.0	95.8	74	26	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 32	FOSI01-1	W	yes	83.3	96	94	6	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 32	R32C2-1	W	no	--	98.6	57	43	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 34	FOAOT4D-1	D	yes	87.5	100	39	61	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 34	FOPC0301-1	D	no	--	96	93	7	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 34	FOSA102-1	W	no	--	95	47	53	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 34	FOSA201-1	W	yes	47.3	100	75	25	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 34	FOTFNB01-1	D	no	--	98	96	4	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 34	FOTFNB04-1	D	yes	81.6	0	0	100	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 36	FOWG38-1	W	no	--	98.6	82	18	no	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 37	FOWG34-1	D	no	--	93.8	57	43	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 38	FOSW03-1	W	no	--	96.2	87	13	no	no	100	--	--	--	--	--	--

Table 3-14
Summary of Toxicity Test Results
Bolsa Chica Lowlands

Area	Cell	Field ID	Sediment Wet/Dry	Salinity[b]		Amphipod and Nereis Results			Significantly Different From Controls		Maximum Test Conc.[c]	Reproduction			Growth/Survival		
				Adjusted	% Original Sample	Reburial (%)	Survival (%)	Mortality (%)	Reburial	Survival		NOEC (%)	LOEC (%)	EC50 (%)	NOEC (%)	LOEC (%)	LC50 (%)
Future Full Tidal	CELL 38	R38C1-1	W	no	--	100	89	11	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 40	FOWG11-1	D	yes	86.1	94	44	56	no	yes	100	--	--	--	--	--	--
Future Full Tidal	CELL 63	R63C1-1	W	no	--	100	73	27	no	yes	100	--	--	--	--	--	--
Gas Plant	OFFSITE_CE	FOPC0101-1	W	yes	42.4	100	96	4	no	no	100	--	--	--	--	--	--
Gas Plant	OFFSITE_CE	FOPC0105-1	W	yes	66.0	94.6	80	20	no	yes	100	--	--	--	--	--	--
Gas Plant	OFFSITE_CE	FOSA601-1	W	no	--	76.6	11	89	no	yes	100	--	--	--	--	--	--
Muted Tidal	CELL 42	FOWG07-1	D	yes	64.2	97.8	79	21	no	yes	100	--	--	--	--	--	--
Muted Tidal	CELL 45	FOWG06-1	D	no	--	96.4	84	16	no	no	100	--	--	--	--	--	--
Seasonal Ponds	CELL 02	R2C1-1	W	yes	14.1	100	66	34	no	yes	100	--	--	--	--	--	--
Seasonal Ponds	CELL 11	FOAOT7D-1	W	no	--	96.8	57	43	no	yes	100	--	--	--	--	--	--
Seasonal Ponds	CELL 11	FORB63-1	D	no	--	100	97	3	no	no	100	--	--	--	--	--	--
Seasonal Ponds	CELL 11	FOSW01-1	D	no	--	99	87	13	no	no	100	--	--	--	--	--	--
Seasonal Ponds	CELL 11	R11C1-1	W	yes	30.6	98.8	86	14	no	yes	100	--	--	--	--	--	--
Seasonal Ponds	CELL 11	R11C2-1	W	yes	33.3	86.6	80	20	no	yes	100	--	--	--	--	--	--
Seasonal Ponds	CELL 12	FOSA501-1	W	yes	30.9	65.4	19	81	no	yes	100	--	--	--	--	--	--
Sediment - Polychaete (*Nereis viriens*)																	
Bolsa Bay	CELL IB	RIBC1-2	W	no	--	--	94.8	5.2	--	no	100	--	--	--	--	--	--
Bolsa Bay	CELL OB	ROBC1-2	W	no	--	--	95.2	4.8	--	no	100	--	--	--	--	--	--
Full Tidal	CELL 01	FS01-1-1	W	no	--	--	93.4	6.6	--	no	100	--	--	--	--	--	--
Full Tidal	CELL 03	F3R-1-1	W	yes	32.1	--	88	12	--	no	100	--	--	--	--	--	--
Full Tidal	CELL 03	F3R-3-1	W	no	--	--	98.6	1.4	--	no	100	--	--	--	--	--	--
Full Tidal	CELL 03	R3C1-1	W	no	--	--	95.8	4.2	--	no	100	--	--	--	--	--	--
Full Tidal	CELL 04	R04C2-1	W	yes	31.0	--	94.7	5.3	--	no	100	--	--	--	--	--	--
Full Tidal	CELL 08	R08C1-2FB	W	no	--	--	93.6	6.4	--	no	100	--	--	--	--	--	--
Full Tidal	CELL 17	R17C1-2FB	W	yes	55.5	--	97.3	2.7	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 21	FOEO30-1	W	yes	65.7	--	80.8	19.2	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 21	FOSBA01-1	D	yes	54.6	--	93.3	6.7	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 23	FOAOT5D-1	W	yes	58.0	--	83.7	16.3	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 30	FOEO18-1	W	no	--	--	92	8	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 34	FOAOT4D-1	D	no	--	--	89.3	10.7	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 36	FOWG38-1	W	no	--	--	97.3	2.7	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 38	FOSW03-1	W	no	--	--	97.3	2.7	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 38	R38C1-1	W	no	--	--	98.6	1.4	--	no	100	--	--	--	--	--	--
Future Full Tidal	CELL 40	FOWG11-1	D	no	--	--	82.7	17.3	--	no	100	--	--	--	--	--	--
Muted Tidal	CELL 45	FOWG06-1	D	no	--	--	86.7	13.3	--	no	100	--	--	--	--	--	--
Muted Tidal	CELL 67	R67C1-1	W	yes	47.5	--	82.7	17.3	--	no	100	--	--	--	--	--	--
Seasonal Ponds	CELL 11	FOAOT7D-1	W	no	--	--	89.3	10.7	--	no	100	--	--	--	--	--	--

Table 3-14
Summary of Toxicity Test Results
Bolsa Chica Lowlands

Area	Cell	Field ID	Sediment Wet/Dry	Salinity[b]		Amphipod and Nereis Results			Significantly Different From Controls		Maximum Test Conc.[c]	Reproduction			Growth/Survival		
				Adjusted	% Original Sample	Reburial (%)	Survival (%)	Mortality (%)	Reburial	Survival		NOEC (%)	LOEC (%)	EC50 (%)	NOEC (%)	LOEC (%)	LC50 (%)
Seasonal Ponds	CELL 11	FORB63-1	D	no	--	--	80	20	--	no	100	--	--	--	--	--	--
Seasonal Ponds	CELL 11	R11C1-1	W	yes	39.4	--	91.8	8.2	--	no	100	--	--	--	--	--	--
Seasonal Ponds	CELL 11	R11C2-1	W	yes	42.9	--	92.6	7.4	--	no	100	--	--	--	--	--	--
Pore Water - Bivalve (*Mytilus edulis*)																	
Bolsa Bay	CELL IB	RIBC1-2	W	no	--	--	--	--	--	--	100	6.25	12.5	30.2	25	50	29.4
Bolsa Bay	CELL OB	ROBC1-2	W	no	--	--	--	--	--	--	100	6.25	12.5	32.2	12.5	25	27.6
Full Tidal	CELL 01	FS01-1-1	W	no	--	--	--	--	--	--	72.4	<4.53	4.53	<4.53	<4.53	4.53	<4.53
Full Tidal	CELL 01	R01C1-2FB	W	yes	79.0	--	--	--	--	--	80	40	80	60.7	40	80	60.2
Full Tidal	CELL 03	F3R-1-1	W	yes	24.5	--	--	--	--	--	25	25	>25	>25	25	>25	>25
Full Tidal	CELL 03	F3R-2-1	W	no	--	--	--	--	--	--	100	12.5	25	30.7	25	50	31.6
Full Tidal	CELL 03	F3R-3-1	W	no	--	--	--	--	--	--	100	6.25	12.5	14.8	12.5	25	15.8
Full Tidal	CELL 03	R3C1-1	W	no	--	--	--	--	--	--	100	25	50	39.8	25	50	41.1
Full Tidal	CELL 04	R04C2-1	W	yes	25.7	--	--	--	--	--	26	26	>26	>26	13	>26	>26
Full Tidal	CELL 06	R06C1-1	D	yes	34.0	--	--	--	--	--	34	17	34	>34	8.5	17	>34
Full Tidal	CELL 08	R08C1-2FB	W	yes	75.5	--	--	--	--	--	76	76	>76	>76	76	>76	>76
Full Tidal	CELL 17	R17C1-2FB	W	yes	41.0	--	--	--	--	--	40	40	>40	>40	40	>40	>40
Full Tidal	CELL 44	R44C1-1	D	yes	52.2	--	--	--	--	--	50	12.5	25	17.6	3.12	6.25	11.6
Full Tidal	CELL 59	R59C1-1	W	yes	27.0	--	--	--	--	--	27	13.5	27	>27	<1.69	1.69	>27
Future Full Tidal	CELL 14	FOSN01-1	W	no	--	--	--	--	--	--	100	25	50	36.3	25	50	23.7
Future Full Tidal	CELL 14	R14C1-1	W	yes	32.7	--	--	--	--	--	33	33	>33	>33	16.5	>33	>33
Future Full Tidal	CELL 20	R20C1-1	D	yes	42.5	--	--	--	--	--	40	20	40	35.8	20	40	29.4
Future Full Tidal	CELL 21	FOEO30-1	W	yes	59.0	--	--	--	--	--	58	14.5	29	38.5	29	58	32.5
Future Full Tidal	CELL 21	FOSBA01-1	D	yes	40.9	--	--	--	--	--	0.39	0.098	0.2	0.22	0.098	0.2	0.17
Future Full Tidal	CELL 23	FOAOT5D-1	W	yes	46.9	--	--	--	--	--	6.25	1.6	3.1	2.4	1.6	3.1	2.3
Future Full Tidal	CELL 23	FWH-3-1	W	yes	15.7	--	--	--	--	--	14.9	0.93	1.86	2.43	1.86	3.73	3.01
Future Full Tidal	CELL 28	FOSK01-1	W	yes	55.7	--	--	--	--	--	55	12.5	25	20.3	25	50	21
Future Full Tidal	CELL 30	FOSJ01-1	W	yes	27.0	--	--	--	--	--	27	13.5	27	>27	13.5	27	26.7
Future Full Tidal	CELL 30	R30C1-1	D	yes	38.0	--	--	--	--	--	38	38	>38	>38	4.75	9.5	>38
Future Full Tidal	CELL 32	FOSI01-1	W	yes	85.4	--	--	--	--	--	85	50	100	76.3	50	100	76.7
Future Full Tidal	CELL 32	R32C2-1	W	no	--	--	--	--	--	--	100	50	100	69.9	50	100	70.7
Future Full Tidal	CELL 34	FOSA102-1	W	no	--	--	--	--	--	--	75	37.5	75	>75	75	>75	>75
Future Full Tidal	CELL 34	FOSA201-1	W	yes	49.5	--	--	--	--	--	48	12	24	>48	48	>48	>48
Future Full Tidal	CELL 36	FOWG38-1	W	no	--	--	--	--	--	--	68	34	68	44.2	34	68	32.1
Future Full Tidal	CELL 38	FOSW03-1	W	no	--	--	--	--	--	--	64	100	>100	>100	100	>100	>100
Future Full Tidal	CELL 38	R38C1-1	W	no	--	--	--	--	--	--	82.8	41.4	82.8	58.7	41.4	82.8	56
Future Full Tidal	CELL 40	FOWG11-1	D	yes	95.6	--	--	--	--	--	96	24	48	>96	96	>96	>96
Future Full Tidal	CELL 40	R40C1-1	D	yes	64.0	--	--	--	--	--	63	15.8	31.5	38.1	31.5	63	27.1

Table 3-14

Summary of Toxicity Test Results

Bolsa Chica Lowlands

Area	Cell	Field ID	Sediment Wet/Dry	Salinity[b]		Amphipod and Nereis Results			Significantly Different From Controls		Maximum Test Conc.[c]	Reproduction			Growth/Survival		
				Adjusted	% Original Sample	Reburial (%)	Survival (%)	Mortality (%)	Reburial	Survival		NOEC (%)	LOEC (%)	EC50 (%)	NOEC (%)	LOEC (%)	LC50 (%)
Future Full Tidal	CELL 63	R63C1-1	W	yes	50.2	--	--	--	--	--	47.8	12	23.9	27.4	23.9	47.8	27.3
Garden Grove	CELL 52	R52C1-1	W	no	--	--	--	--	--	--	100	25	50	49.4	50	100	52.9
Gas Plant	OFFSITE_CE	FOPC0101-1	W	yes	45.4	--	--	--	--	--	45	2.8	5.6	10.3	11.25	22.5	8.6
Gas Plant	OFFSITE_CE	FOPC0105-1	W	yes	64.5	--	--	--	--	--	64	25	50	35.2	25	50	35.4
Muted Tidal	CELL 53	R53C1-1	D	yes	51.3	--	--	--	--	--	0.78	0.2	0.39	0.32	0.2	0.39	0.27
Muted Tidal	CELL 67	R67C1-1	D	yes	35.0	--	--	--	--	--	35	35	>35	>35	4.4	8.8	>35
Seasonal Ponds	CELL 02	R2C1-1	W	yes	17.0	--	--	--	--	--	17.5	8.75	17.5	13.4	8.75	17.5	12.8
Seasonal Ponds	CELL 09	R09C1-1	W	yes	29.3	--	--	--	--	--	29	29	>29	>29	29	>29	>29
Seasonal Ponds	CELL 11	FOAOT7D-1	W	no	--	--	--	--	--	--	100	25	50	36	25	50	25.3
Seasonal Ponds	CELL 11	R11C1-1	W	yes	34.4	--	--	--	--	--	31	15.5	31	>31	31	>31	>31
Seasonal Ponds	CELL 11	R11C2-1	W	yes	34.1	--	--	--	--	--	31.3	31.3	>31.3	>31.3	31.3	>31.3	>31.3
Seasonal Ponds	CELL 12	FOSA501-1	W	yes	33.5	--	--	--	--	--	33	4.12	8.25	7.5	4.12	8.25	5.5
Surface Water - Fish (*Atherinops affinis*)																	
Bolsa Bay	CELL IB	FOSWPIB-1	--	yes	90.9	--	--	--	--	--	90.9	90.9	>90.9	--	90.9	>90.9	--
Full Tidal	CELL 03	FOSWP03-1	--	yes	30.3	--	--	--	--	--	30.3	30.3	>30.3	--	30.3	>30.3	--
Full Tidal	CELL 17	FOSWP17-1	--	yes	73.2	--	--	--	--	--	73.2	73.2	>73.2	--	73.2	>73.2	--
Future Full Tidal	CELL 63	FOSWP63-1	--	no	--	--	--	--	--	--	100	100	>100	--	100	>100	--
Seasonal Ponds	CELL 11	FOSWP11-1	--	no	--	--	--	--	--	--	100	100	>100	--	100	>100	--
Surface Water - *Ceriodaphnia dubia*																	
Future Full Tidal	CELL 38	SW_03	--	no	--	--	--	--	--	--	100	50	100	>50	50	100	57.4
Seasonal Ponds	CELL 11	SW_01	--	no	--	--	--	--	--	--	100	50	100	>50	50	100	70.7
Surface Water - *Mysidopsis bahia*																	
Future Full Tidal	CELL 36	SW_02	--	yes	100	--	--	--	--	--	100	100	>100	>100	100	>100	>100
Future Full Tidal	CELL 36	SW_05	--	yes	100	--	--	--	--	--	100	100	>100	>100	100	>100	>100
Garden Grove	CELL 52	SW_04	--	yes	100	--	--	--	--	--	100	100	>100	>100	100	>100	>100

Notes:

Complete toxicity testing results are presented in Appendix F.

[a]Sample identification numbers used by the laboratory sometimes varied from the full sample number used for the ERA database.

[b]Many samples required salinity adjustment to reach the tolerance range for the test organisms. The % column lists the %original sample subjected to toxicity testing.

[c]The maximum %sample tested over the dilution range required by salinity adjustment and toxicity.

TABLE 3-15

Univariate Regression of Amphipod Survival (Number of Individuals) on Untransformed and Natural Log Transformed Concentrations in Sediment

Bolsa Chica Lowlands

	Analyses with untransformed data					Analyses with log transformed data				
	N	Slope	Intercept	p (model)	r-square	N	Slope	Intercept	p (model)	r-square
4,4'-DDD	140	0.04344	12.1419	0.002	0.0671	140	0.94173	10.9413	0.0326	0.0327
4,4'-DDE	170	-0.05449	15.3016	0.0001	0.2698	170	-2.00285	18.142	0.0001	0.2093
4,4'-DDT	75	0.04322	13.1956	0.159	0.027	75	0.23849	13.4644	0.5731	0.0044
4-Methylphenol	5	0	0	n/a	n/a	5	0	0	0	0
4-Nitrophenol	25	-0.00073	9.633	0.0091	0.2606	25	-2.05994	21.3694	0.0431	0.1662
Acenaphthene	20	-0.00095	1.9593	0.1046	0.1396	20	-0.3262	3.2105	0.2726	0.0664
Aldrin	20	-2.87045	16.6349	0.0001	0.6685	20	-6.92907	12.5919	0.0001	0.6661
Arsenic	180	-0.03134	17.1381	0.0087	0.038	180	-1.41704	19.9424	0.0001	0.1527
BHC alpha	30	-0.58947	16.7469	0.0988	0.0943	30	-1.92299	15.5947	0.0296	0.1581
BHC beta	40	-0.10518	14.0446	0.0001	0.3579	40	-1.73935	14.8065	0.0238	0.1274
BHC delta	5	0	17.4	n/a	0	5	0	17.4	0	0
BHC gamma	5	0	17.4	n/a	0	5	0	17.4	0	0
Barium	175	-0.0082	17.2861	0.0001	0.1202	175	-2.3019	26.7417	0.0001	0.1807
Benzo(a)pyrene	20	-0.01834	19.2951	0.1603	0.1064	20	-1.12617	22.6903	0.1834	0.0961
Benzo(b)fluoranthene	30	-0.036	18.6601	0.0087	0.2212	30	-1.4756	21.995	0.006	0.2402
Benzo(e)pyrene	20	0.00957	17.3618	0.5006	0.0256	20	1.04616	14.0847	0.0601	0.1827
Benzo(g,h,i)perylene	5	0	19.2	n/a	0	5	0	19.2	0	0
Benzo(k)fluoranthene	15	-0.07539	18.4177	0.2779	0.0898	15	-1.70151	21.632	0.2588	0.0969
Beryllium	180	-2.92521	18.8329	0.0001	0.2222	180	-3.44505	15.1249	0.0001	0.2554
Butylbenzylphthalate	55	0.00526	14.3987	0.1422	0.0402	55	1.30822	9.934	0.0268	0.0892
Cadmium	110	-0.52034	18.4338	0.0019	0.0855	110	-0.53165	17.561	0.011	0.0949
Chlordane	35	0.00083	15.7303	0.2571	0.0387	35	0.40422	14.6422	0.0878	0.0858
Chromium	140	-0.10422	21.4632	0.0001	0.5859	140	-4.84107	33.7533	0.0001	0.402
Chrysene	55	-0.01184	19.0193	0.0001	0.9394	55	-3.72337	31.9246	0.0001	0.6866
Cobalt	150	-0.52383	21.2516	0.0001	0.3212	150	-3.11872	23.2093	0.0001	0.2232
Copper	155	-0.04355	17.7789	0.0015	0.0641	155	-2.59789	24.6287	0.0001	0.1515
Dieldrin	80	-0.09309	14.7711	0.4679	0.0068	80	-1.59522	15.9006	0.0136	0.0756
Dimethyl phthalate	10	-0.22	22.04	0.0898	0.3176	10	-3.62955	28.4191	0.0898	0.3176
Dinbutyl phthalate	15	0.00667	16	0.9024	0.0012	15	1.09696	11.5035	0.9024	0.0012
Dinoctyl phthalate	115	-0.00609	14.5435	0.0001	0.3108	115	-3.31421	29.0906	0.0001	0.3817
Endrin	30	-0.25885	13.2786	0.1306	0.0797	30	-2.56057	15.007	0.0034	0.2681
Endrin aldehyde	30	-0.72675	17.4616	0.0001	0.5689	30	-2.30757	16.31	0.014	0.1972
Endrin ketone	25	-0.66797	10.8637	0.0001	0.6599	25	-3.17168	8.8621	0.0001	0.7347
Endosulfan I	20	-0.48292	11.3423	0.6724	0.0102	20	-2.84922	13.4646	0.6274	0.0134
Endosulfan II	5	0	18.8	n/a	0	5	0	18.8	0	0

TABLE 3-15

Univariate Regression of Amphipod Survival (Number of Individuals) on Untransformed and Natural Log Transformed Concentrations in Sediment

Bolsa Chica Lowlands

	Analyses with untransformed data					Analyses with log transformed data				
	N	Slope	Intercept	p (model)	r-square	N	Slope	Intercept	p (model)	r-square
Endosulfan sulfate	5	0	3.8	n/a	0	5	0	3.8	0	0
Fluoranthene	30	-0.00248	18.5612	0.6618	0.0069	30	0.0904	18.1085	0.7224	0.0046
Fluorene	45	-0.00108	4.0496	0.0484	0.0876	45	-1.954	14.4634	0.0001	0.4339
High MW PAHs	65	-0.00035	18.531	0.6789	0.0027	65	0.0193	18.3931	0.9008	0.0002
Indeno(1,2,3-cd)pyrene	5	0	19.2	n/a	0	5	0	19.2	0	0
Lead	160	-0.01487	17.0394	0.0142	0.0374	160	-1.7286	21.8906	0.0001	0.1622
Low MW PAHs	85	-0.00104	13.6086	0.0001	0.4163	85	-3.1239	28.1928	0.0001	0.8306
Mercury	130	-0.04531	16.907	0.0042	0.0623	130	-0.6133	15.604	0.0015	0.0763
Naphthalene	40	-0.00124	5.3082	0.0141	0.1484	40	-2.3932	19.2155	0.0004	0.2822
Nickel	195	-0.09113	18.1037	0.0001	0.4327	195	-5.5113	32.3869	0.0001	0.4906
Oil and Grease	235	0	12.6967	0.6863	0.0007	235	-1.8141	26.606	0.0001	0.2153
Aroclor 1254	70	0.01229	10.299	0.0961	0.0402	70	0.8267	8.1489	0.3906	0.0109
Aroclor 1260	40	0.0067	13.9339	0.1589	0.0515	40	0.0024	14.7656	0.9977	0
PCB008	5	0	0	n/a	n/a	5	0	0	0	0
PCB028	10	-0.356	22.784	0.0001	0.9965	10	-11.7119	48.7083	0.0001	0.9965
PCB044	10	0.34286	8.5429	0.0684	0.3564	10	7.9972	-8.5575	0.0684	0.3564
PCB052	10	0.24	7.72	0.0684	0.3564	10	8.8257	-15.1875	0.0684	0.3564
PCB066	10	0.34286	7.5143	0.0684	0.3564	10	9.0326	-12.9218	0.0684	0.3564
PCB101	10	0.3	7	0.0684	0.3564	10	9.5498	-16.4219	0.0684	0.3564
PCB105	10	1.14286	7.8571	0.0684	0.3564	10	8.6877	-0.9943	0.0684	0.3564
PCB138	5	0	19.2	n/a	0	5	0	19.2	0	0
PCB153	15	0.09342	15.0377	0.0109	0.4036	15	2.7292	8.9533	0.0066	0.4454
PCB180	5	0	19.2	n/a	0	5	0	19.2	0	0
Phenanthrene	80	-0.0024	14.6793	0.0001	0.5109	80	-3.4731	29.1244	0.0001	0.8864
Phenol	5	0	18.8	n/a	0	5	0	18.8	0	0
Pyrene	55	0.00194	18.2489	0.7368	0.0021	55	0.234	17.5324	0.3829	0.0144
Selenium	115	-3.83371	17.2859	0.0003	0.1076	115	-3.397	11.6983	0.0001	0.2352
Silver	35	-0.64977	18.279	0.4748	0.0156	35	-0.24	17.7368	0.5156	0.0129
Total DDT	190	-0.02168	14.6268	0.0004	0.0637	190	-0.8229	15.9661	0.0078	0.0371
Total PAHs	90	-0.00121	17.3793	0.0001	0.7239	90	-3.0719	31.5187	0.0001	0.7725
Total PCBs	100	0.00984	11.6128	0.0312	0.0465	100	0.4383	10.9348	0.5508	0.0036
TPH Diesel	110	0	11.7391	0.0001	0.2795	110	-2.4159	41.3048	0.0001	0.4842
TPH Diesel and Waste Oil	100	-1.95E-08	12.69	0.0001	0.33	100	-3.3267	59.9	0.0001	0.67
Total Phenol	10	-0.0127	20.3243	0.0001	0.9946	10	-7.2579	53.5473	0.0001	0.9946
Total Phthalates	135	-0.0034	13.7686	0.0002	0.1027	135	-1.3482	19.142	0.0006	0.084

TABLE 3-15

Univariate Regression of Amphipod Survival (Number of Individuals) on Untransformed and Natural Log Transformed Concentrations in Sediment

Bolsa Chica Lowlands

	Analyses with untransformed data					Analyses with log transformed data				
	N	**Slope**	**Intercept**	**p (model)**	**r-square**	**N**	**Slope**	**Intercept**	**p (model)**	**r-square**
Total Volatile Solids	255	-0.49774	16.3402	0.0001	0.1156	255	-2.7036	17.3344	0.0001	0.1028
Thallium	130	-25.1361	24.5455	0.0001	0.4525	130	-6.11367	9.2174	0.0001	0.3034
Vanadium	180	-0.0863	21.6369	0.0001	0.2185	180	-5.6634	39.0988	0.0001	0.211
Waste oil	245	0	13.9417	0.0001	0.2186	245	-2.52829	47.7264	0.0001	0.3508
Zinc	155	-0.0216	19.0775	0.0001	0.2574	155	-4.0308	34.7057	0.0001	0.2941
bis(2-ethylhexyl)phthalate	10	0.0051	12.1231	0.009	0.5951	10	4.38169	-12.542	0.009	0.5951

TABLE 3-16
Univariate Regression of Amphipod Survival (Number of Individuals) on Untransformed and Natural Log Transformed Concentrations in Sediment
Bolsa Chica Lowlands

			Analyses with untransformed data					Analyses with log transformed data				
Dry?	Salinity adjusted	Analyte	N	Slope	Intercept	r-square	p (model)	N	Slope	Intercept	r-square	p (model)
d	n	4,4'-DDD	35	0.00449	16.7976	0.005	0.9	35	0.0116	16.8345	0	0.9784
d	y	4,4'-DDD	25	0.2607	0.5446	0.7515	0.0001	25	7.4506	-13.139	0.8451	0.0001
w	n	4,4'-DDD	25	0.0021	16.254	0.0015	0.8536	25	-0.424	17.69	0.0408	0.3331
w	y	4,4'-DDD	55	0.0519	10.9831	0.0987	0.0195	55	1.7489	7.58	0.0884	0.0275
d	n	4,4'-DDE	30	-0.06559	18.676	0.283	0.0025	30	-0.675	18.8312	0.3209	0.0011
d	y	4,4'-DDE	25	-0.0627	8.8266	0.0466	0.2999	25	-0.4946	8.498	0.0067	0.6975
w	n	4,4'-DDE	50	-0.1166	17.508	0.1828	0.002	50	-0.978	18.05	0.1126	0.0172
w	y	4,4'-DDE	65	-0.0498	14.9536	0.4324	0.0001	65	-2.7403	19.9346	0.3767	0.0001
d	n	Arsenic	35	-0.01463	18.5752	0.1585	0.0178	35	-0.3716	18.878	0.1105	0.051
d	y	Arsenic	15	-1.2531	26.6878	0.2522	0.0564	15	-14.1846	46.272	0.2808	0.0422
w	n	Arsenic	65	-0.2004	19.982	0.6052	0.0001	65	-3.248	24.7	0.5629	0.0001
w	y	Arsenic	65	-0.0167	17.4724	0.0255	0.2035	65	-0.8876	19.4425	0.1494	0.0015
d	n	Barium	40	-0.00241	17.7897	0.0072	0.6018	40	-0.4392	19.5153	0.0157	0.4412
d	y	Barium	20	-0.0426	18.2443	0.8508	0.0001	20	-6.7453	42.337	0.9074	0.0001
w	n	Barium	60	-0.0043	16.9	0.0755	0.0336	60	-1.418	22.87	0.0903	0.0196
w	y	Barium	55	-0.0153	19.0456	0.1774	0.0014	55	-1.5606	24.1097	0.154	0.003
d	n	Beryllium	35	2.07288	17.3203	0.0485	0.2035	35	0.8409	18.9973	0.0612	0.1519
d	y	Beryllium	25	-7.2465	19.6674	0.1496	0.0561	25	-12.1026	13.046	0.1969	0.0263
w	n	Beryllium	60	-3.5622	19.908	0.6896	0.0001	60	-3.827	15.32	0.6023	0.0001
w	y	Beryllium	60	-1.4212	17.9972	0.0752	0.034	60	-2.5249	16.3625	0.1341	0.004
d	n	Cadmium	35	-0.53496	18.6794	0.1648	0.0155	35	-0.4647	17.7148	0.1165	0.0448
d	y	Cadmium	5	0	18.4	0	0	5	0	18.4	0	0
w	n	Cadmium	45	-0.7651	18.462	0.0374	0.2031	45	-0.416	17.7	0.025	0.2994
w	y	Cadmium	25	-7.9386	20.4698	0.4784	0.0001	25	-2.0987	15.28	0.4118	0.005
d	n	Chromium	35	0.01121	17.9928	0.0048	0.692	35	0.3793	17.0935	0.0213	0.4024
d	y	Chromium	10	-0.1957	25.4468	0.9962	0.0001	10	-14.33	69.752	0.9962	0.0001
w	n	Chromium	45	-0.02	18.721	0.0488	0.1446	45	-0.889	21.07	0.0574	0.1131
w	y	Chromium	50	-0.1043	22.5878	0.5516	0.0001	50	-5.9	38.4884	0.432	0.0001
d	n	Cobalt	35	0.1219	17.5857	0.0266	0.3492	35	0.5396	17.4022	0.0391	0.2551
d	y	Cobalt	10	-1.1522	25.0826	0.8005	0.0005	10	-11.1556	38.01	0.8005	0.0005
w	n	Cobalt	60	-0.3689	19.819	0.1742	0.0009	60	-3.425	23.7	0.1928	0.0004
w	y	Cobalt	45	-0.5707	22.2389	0.4847	0.0001	45	-3.7467	25.1956	0.4355	0.0001
d	n	Copper	40	-0.05594	19.0411	0.0983	0.0488	40	-0.5689	19.5308	0.0372	0.2331
d	y	Copper	15	-0.7035	33.8264	0.9081	0.0001	15	-24.3655	94.684	0.9236	0.0001
w	n	Copper	55	-0.0111	17.625	0.0238	0.2605	55	-0.968	20.45	0.0767	0.0407
w	y	Copper	45	-0.0667	18.7169	0.1227	0.0183	45	-3.4024	27.2031	0.2311	0.0008

TABLE 3-16

Univariate Regression of Amphipod Survival (Number of Individuals) on Untransformed and Natural Log Transformed Concentrations in Sediment

Bolsa Chica Lowlands

			Analyses with untransformed data					Analyses with log transformed data				
Dry?	Salinity adjusted	Analyte	N	Slope	Intercept	r-square	p (model)	N	Slope	Intercept	r-square	p (model)
d	n	Di-n-octyl phthalate	10	-0.00147	17.8143	0.1037	0.3641	10	-0.2345	18.3328	0.1037	0.3641
d	y	Di-n-octyl phthalate	20	-0.0043	12.0827	0.5615	0.0001	20	-4.1269	32.043	0.9469	0.0001
w	n	Di-n-octyl phthalate	55	-0.0179	16.996	0.1791	0.0013	55	-2.214	24.52	0.0737	0.0449
w	y	Di-n-octyl phthalate	30	-0.0154	16.0018	0.5787	0.0001	30	-4.8046	35.5046	0.6595	0.0001
d	n	Lead	35	-0.03015	18.7009	0.024	0.3746	35	-0.0233	18.3411	0.0002	0.9426
d	y	Lead	20	-0.452	41.2577	0.9173	0.0001	20	-29.1547	132.772	0.8847	0.0001
w	n	Lead	55	-0.00128	17.2445	0.0022	0.7352	55	-0.6681	19.5513	0.0521	0.0938
w	y	Lead	50	-0.0757	18.892	0.1428	0.0068	50	-1.7699	21.6292	0.1692	0.003
d	n	Mercury	35	-0.05304	17.8175	0.5648	0.0001	35	-0.6321	16.6821	0.281	0.0011
d	y	Mercury	10	-77.6371	21.7384	0.9962	0.0001	10	-9.8207	-12.501	0.9962	0.0001
w	n	Mercury	55	-0.37093	17.3059	0.0086	0.4998	55	-0.6535	15.7106	0.1248	0.0082
w	y	Mercury	30	4.271	17.5328	0.1045	0.0814	30	0.6867	19.7457	0.0956	0.0964
d	n	Nickel	40	-0.20062	20.3366	0.1707	0.008	40	-1.0934	20.2142	0.0527	0.1541
d	y	Nickel	15	-0.0722	18.7398	0.9771	0.0001	15	-6.969	38.726	0.9876	0.0001
w	n	Nickel	65	-0.09957	19.0995	0.3415	0.0001	65	-4.6476	30.9221	0.3909	0.0001
w	y	Nickel	75	-0.2016	20.0294	0.5352	0.0001	75	-9.0327	42.8007	0.6065	0.0001
d	n	Oil and Grease	45	0.00001	16.9332	0.0636	0.0946	45	0.1173	16.2921	0.009	0.5352
d	y	Oil and Grease	35	-0.0001	9.83	0.2965	0.0007	35	-3.4678	36.926	0.6647	0.0001
w	n	Oil and Grease	70	-0.00039	16.801	0.2984	0.0001	70	-2.6285	34.8734	0.3671	0.0001
w	y	Oil and Grease	85	-0.0003	12.8983	0.2989	0.0001	85	-2.364	28.0738	0.331	0.0001
d	n	Selenium	15	40	12.1333	0.0458	0.4437	15	5.35505	28.2711	0.042	0.4635
d	y	Selenium	5	0	18.4	0	0	5	0	18.4	0	0
w	n	Selenium	50	-1.43254	17.8697	0.1214	0.0132	50	-1.2496	15.7926	0.1857	0.0018
w	y	Selenium	45	-27.523	24.74	0.7879	0.0001	45	-9.3467	3.0672	0.622	0.0001
d	n	Total DDT	40	-0.0179	17.6371	0.0179	0.4099	40	-0.40929	18.2316	0.0397	0.2175
d	y	Total DDT	35	0.0676	4.6125	0.2101	0.0056	35	1.4547	3.1169	0.1049	0.0777
w	n	Total DDT	50	-0.00284	16.2727	0.0022	0.7476	50	-0.3915	17.2134	0.0364	0.1844
w	y	Total DDT	62	-0.0289	14.82	0.179	0.0004	65	-1.3809	17.3229	0.0746	0.0277
d	n	Thallium	30	-12.2396	20.9833	0.2988	0.0018	30	-2.72435	14.0463	0.2887	0.0022
d	y	Thallium	10	-53	36.42	0.8005	0.0005	10	-22.9128	-6.3185	0.8005	0.0005
w	n	Thallium	45	-0.67358	18.2648	0.0017	0.7869	45	0.1234	18.2626	0.0008	0.8518
w	y	Thallium	45	-48.0439	33.024	0.7171	0.0001	45	-16.0016	-1.2827	0.6015	0.0001
d	n	Total PCB	20	-0.0031	17.8805	0.0651	0.2776	20	-0.41597	19.254	0.0447	0.3709
d	y	Total PCB	20	-0.0578	8.4863	0.1036	0.1665	20	-2.9344	16.3829	0.0577	0.3078
w	n	Total PCB	25	-0.02917	16.0827	0.0378	0.352	25	-3.2879	26.5403	0.1542	0.0522
w	y	Total PCB	35	0.0097	11.873	0.1002	0.064	35	0.675	10.3686	0.0115	0.5393

TABLE 3-16

Univariate Regression of Amphipod Survival (Number of Individuals) on Untransformed and Natural Log Transformed Concentrations in Sediment

Bolsa Chica Lowlands

			Analyses with untransformed data					Analyses with log transformed data				
Dry?	Salinity adjusted	Analyte	N	Slope	Intercept	r-square	p (model)	N	Slope	Intercept	r-square	p (model)
d	n	TPH Diesel	15	-0.0001	19.8379	0.3958	0.012	15	-1.36657	31.5479	0.3901	0.0128
d	y	TPH Diesel	15	0	5.9228	0.4965	0.0034	15	-1.7795	30.0151	0.7168	0.0001
w	n	TPH Diesel	30	-0.00001	16.0479	0.287	0.0023	30	-0.4494	18.3098	0.0158	0.5076
w	y	TPH Diesel	50	0	10.989	0.3594	0.0001	50	-2.8884	47.187	0.5036	0.0001
d	n	TPH Diesel and Waste Oil	15	-0.0000082	20.2022	0.0012	0.57	15	-1.7105	38.7327	0.0036	0.49
d	y	TPH Diesel and Waste Oil	15	-6.11E-08	6.1252	0.0033	0.5	15	-2.2523	41.0371	0.0005	0.62
w	n	TPH Diesel and Waste Oil	25	-0.000001055	18.5073	0.0001	0.71	25	-3.0884	58.7877	0.0003	0.44
w	y	TPH Diesel and Waste Oil	45	-0.000000473	13.688	0.0001	0.5553	45	-3.7414	65.6732	0.0001	0.65
d	n	Total Phthalate	15	0.0004	16.5768	0.0032	0.8405	15	0.15103	16.0082	0.014	0.675
d	y	Total Phthalate	20	-0.0043	12.1056	0.5529	0.0002	20	-4.786	36.8192	0.9182	0.00001
w	n	Total Phthalate	55	0.00365	11.7358	0.0712	0.049	55	0.8511	8.7445	0.0209	0.2921
w	y	Total Phthalate	45	-0.0126	13.912	0.3203	0.0001	45	-2.2893	21.0351	0.2116	0.0015
d	n	Total Volatile Solids	45	-0.1298	17.6779	0.0206	0.3469	45	-0.52229	17.6911	0.0286	0.2667
d	y	Total Volatile Solids	35	-0.041	7.9897	0.0012	0.8443	35	0.4349	6.778	0.0017	0.8166
w	n	Total Volatile Solids	75	-0.15811	15.2646	0.0135	0.3211	75	-0.6047	15.2145	0.004	0.5885
w	y	Total Volatile Solids	10	-0.7291	17.435	0.1955	0.0001	0	-3.6934	18.3891	0.1618	0.0001
d	n	Vanadium	40	-0.0454	20.0667	0.0816	0.074	40	-1.15402	22.0332	0.031	0.2768
d	y	Vanadium	25	-0.0422	14.175	0.0225	0.474	25	-3.9212	27.9134	0.0179	0.5238
w	n	Vanadium	60	-0.096	22.3477	0.3725	0.0001	60	-6.7845	43.7239	0.3676	0.0001
w	y	Vanadium	55	-0.0512	19.964	0.0812	0.035	55	-4.2624	34.0948	0.1223	0.0089
d	n	Waste oil	45	0	17.4138	0.013	0.4564	45	-0.43854	23.0088	0.0827	0.0554
d	y	Waste oil	35	0	9.4105	0.2397	0.0028	35	-3.0073	52.2919	0.5015	0.0001
w	n	Waste oil	75	0	16.42	0.3194	0.0001	75	-1.8403	39.3264	0.1788	0.0002
w	y	Waste oil	90	0	14.212	0.447	0.0001	90	-3.2477	56.4676	0.4611	0.0001
d	n	Zinc	40	-0.0314	20.3473	0.6358	0.0001	40	-3.08402	30.7829	0.4471	0.0001
d	y	Zinc	10	-0.0369	20.6908	0.9962	0.0001	10	-8.3606	52.9053	0.9962	0.0001
w	n	Zinc	50	-0.00327	18.2458	0.0652	0.0735	50	-0.9114	22.0495	0.1073	0.0202
w	y	Zinc	55	-0.0389	19.91	0.1911	0.0008	55	-4.6212	36.2397	0.2339	0.0002

Notes:

Regression results based on dry vs wet sediment, with and without salinity adjustment.

TABLE 3-17
Summary of F-tests for Comparisons of Amphipod Mortality Regression Models by Test Media Adjustment Groups by Analyte
Bolsa Chica Lowlands

Analyte	All Four Groups	Wet vs Dry	Salinity Adjustment
4,4'-DDD	**YES**		**YES**
4,4'-DDE	**YES**	**YES**	**YES**
4,4'-DDT	**YES**		**YES**
4-Methylphenol			
4-Nitrophenol	**YES**	**YES**	**YES**
Acenaphthene	**YES**	**YES**	
Aldrin	**YES**		
Aroclor 1254	**YES**	**YES**	**YES**
Aroclor 1260	**YES**		**YES**
Arsenic	**YES**	**YES**	
BHC alpha	**YES**	**YES**	**YES**
BHC beta	**YES**	**YES**	**YES**
BHC delta			
BHC gamma			
Barium	**YES**	**YES**	**YES**
Benzo(a)pyrene			
Benzo(b)fluoranthene			
Benzo(e)pyrene	**YES**	**YES**	
Benzo(g,h,i)perylene			
Benzo(k)fluoranthene	**YES**	**YES**	
Beryllium	**YES**	**YES**	
Butylbenzylphthalate	**YES**	**YES**	**YES**
Cadmium			
Chlordane	**YES**		**YES**
Chromium	**YES**		**YES**
Chrysene	**YES**	**YES**	
Cobalt	**YES**		
Copper	**YES**	**YES**	**YES**
Dieldrin	**YES**		**YES**
Dimethyl phthalate			
Di-n-butyl phthalate			
Di-n-octyl phthalate	**YES**		**YES**
Endrin	**YES**		**YES**
Endrin aldehyde	**YES**	**YES**	**YES**
Endrin ketone	**YES**	**YES**	**YES**
Endosulfan I	**YES**	**YES**	**YES**
Endosulfan II			
Endosulfan sulfate			
Fluoranthene	**YES**	**YES**	
Fluorene	**YES**	**YES**	**YES**
High MW PAHs			
Indeno(1,2,3-cd)pyrene			
Lead	**YES**	**YES**	**YES**
Low MW PAHs	**YES**	**YES**	
Mercury	**YES**		**YES**
Naphthalene	**YES**	**YES**	**YES**

TABLE 3-17

Summary of F-tests for Comparisons of Amphipod Mortality Regression Models by Test Media Adjustment Groups by Analyte

Bolsa Chica Lowlands

Analyte	All Four Groups	Wet vs Dry	Salinity Adjustment
Nickel	**YES**	**YES**	**YES**
Oil and Grease	**YES**	**YES**	**YES**
PCB008			
PCB028			
PCB044			
PCB052			
PCB066			
PCB101			
PCB105			
PCB138			
PCB153			
PCB180			
Phenanthrene	**YES**	**YES**	
Phenol			
Pyrene			
Selenium	**YES**		**YES**
Silver			
Total DDT	**YES**		**YES**
Total PAHs	**YES**	**YES**	**YES**
Total PCBs	**YES**	**YES**	**YES**
TPH Diesel	**YES**		**YES**
Total Phenol			
Total Phthalates	**YES**	**YES**	**YES**
Total Volatile Solids	**YES**		**YES**
Thallium	**YES**		**YES**
Vanadium	**YES**		
Waste oil	**YES**		**YES**
Zinc	**YES**	**YES**	**YES**
bis(2-ethylhexyl)phthalate			

Notes:

Differences were considered significant if $p<0.05$.

YES - indicates that there were significant differences between/among groups being compared.

TABLE 3-18

Univariate Regression of *Mytilus* Development[a] on Untransformed and Natural Log Transformed Concentrations in Pore Water
Bolsa Chica Lowlands

	Analyses with untransformed data					Analyses with log transformed data				
	N	Slope	Intercept	r-square	p (model)	N	Slope	Intercept	r-square	p (model)
4,4'-DDD	309	-4.0352	1.03511	0.0373	0.0006	309	-0.06469	0.6141	0.0378	0.0006
4,4'-DDE	333	-7.0007	0.97562	0.0793	0.0001	333	-0.10494	0.2736	0.0989	0.0001
4-Methylphenol	40	-0.0177	0.79323	0.2909	0.0003	40	-0.20471	0.57271	0.8341	0.0001
4-Nitrophenol	40	-0.0044	0.79323	0.2909	0.0003	40	-0.20471	0.85649	0.8341	0.0001
Acenaphthene	80	-0.0388	0.75436	0.2404	0.0001	80	-0.20082	0.36035	0.8183	0.0001
Aldrin	40	-19.2671	1.54463	0.8436	0.0001	40	-0.26396	-0.01325	0.4506	0.0001
Arsenic	444	-0.0033	1.28392	0.3521	0.0001	444	-0.11414	1.3001	0.3432	0.0001
BHC alpha	40	-6.5193	1.18212	0.519	0.0001	40	-0.25726	-0.32443	0.647	0.0001
BHC beta	209	-0.7541	0.81902	0.0769	0.0001	209	-0.11352	0.07877	0.1716	0.0001
BHC delta	80	-0.7808	0.985	0.2943	0.0001	80	-0.21655	0.03045	0.5834	0.0001
BHC gamma	80	-0.6861	1.16193	0.3764	0.0001	80	-0.17549	0.2895	0.5489	0.0001
Barium	277	-0.0044	1.19482	0.1758	0.0001	277	-0.10714	1.31438	0.0799	0.0001
Beryllium	669	-0.0099	1.19663	0.2555	0.0001	669	-0.14955	1.28637	0.1857	0.0001
Cadmium	393	-0.111	1.28186	0.2298	0.0001	393	-0.12136	0.95853	0.2374	0.0001
Chlordane	60	-0.0768	1.53236	0.0535	0.0755	60	-0.02402	1.45454	0.0858	0.0232
Chromium	569	-0.0345	1.28811	0.2452	0.0001	569	-0.13911	1.19438	0.1274	0.0001
Chrysene	40	-0.0426	0.79323	0.2909	0.0003	40	-0.20471	0.39287	0.8341	0.0001
Cobalt	733	-0.0202	1.07869	0.0916	0.0001	733	-0.08134	0.95365	0.0931	0.0001
Copper	933	-0.0395	1.17227	0.1412	0.0001	933	-0.15555	1.08539	0.182	0.0001
Dieldrin	76	-19.5488	0.96183	0.1084	0.0037	76	-0.15324	-0.07411	0.1404	0.0009
Endrin	76	-6.9503	0.90648	0.1065	0.004	76	-0.11853	0.11444	0.1245	0.0018
Endrin aldehyde	20	-29.9413	1.54146	0.1514	0.09	20	-0.05299	1.12519	0.0886	0.2024
Endrin ketone	56	-10.362	0.75178	0.1222	0.0083	56	-0.21108	-0.54144	0.3197	0.0001
Fluorene	60	-0.0178	0.76576	0.2342	0.0001	60	-0.22078	0.59604	0.7566	0.0001
High MW PAHs	40	-0.0426	0.79323	0.2909	0.0003	40	-0.20471	0.39287	0.8341	0.0001
Lead	469	-0.0755	1.20296	0.2727	0.0001	469	-0.18615	0.84149	0.4006	0.0001
Low MW PAHs	60	-0.0032	0.76572	0.2341	0.0001	60	-0.22078	0.97283	0.7567	0.0001
Mercury	180	-0.0425	1.44026	0.0005	0.7772	180	-0.00669	1.41292	0.0032	0.4511
Naphthalene	60	-0.0104	0.76644	0.2349	0.0001	60	-0.2207	0.71897	0.7557	0.0001
Nickel	733	-0.011	1.15877	0.1895	0.0001	733	-0.1925	1.27372	0.2726	0.0001
Phenanthrene	60	-0.0089	0.77052	0.2395	0.0001	60	-0.21975	0.77267	0.7488	0.0001
Phenol	80	-0.0085	1.16233	0.4117	0.0001	80	-0.45658	2.29869	0.5376	0.0001

TABLE 3-18

Univariate Regression of *Mytilus* Development[a] on Untransformed and Natural Log Transformed Concentrations in Pore Water
Bolsa Chica Lowlands

	Analyses with untransformed data					Analyses with log transformed data				
	N	**Slope**	**Intercept**	**r-square**	**p (model)**	**N**	**Slope**	**Intercept**	**r-square**	**p (model)**
Selenium	160	-0.0604	1.43717	0.0516	0.0039	160	-0.05355	1.33591	0.0921	0.0001
Silver	853	-0.4835	1.07668	0.0291	0.0001	853	-0.11942	0.6485	0.1015	0.0001
Total DDT	393	-3.6003	1.03288	0.0659	0.0001	393	-0.09845	0.44829	0.0811	0.0001
Total PAHs	60	-0.003	0.76469	0.233	0.0001	60	-0.22083	0.98377	0.758	0.0001
Total Phenol	140	-0.0078	0.99713	0.2847	0.0001	140	-0.13235	1.02149	0.2322	0.0001
Vanadium	284	-0.0765	1.16734	0.2567	0.0001	284	-0.14127	0.95065	0.188	0.0001
Zinc	633	-0.0023	1.1918	0.2519	0.0001	633	-0.23724	1.68114	0.4636	0.0001
endosulfan I	40	-55.8637	1.10501	0.0698	0.0995	40	-0.17892	-0.18479	0.1105	0.0361
endosulfan sulfate	80	-0.4661	0.93801	0.2717	0.0001	80	-0.2274	-0.07859	0.7857	0.0001

Notes:

Regression results based on all data combined.

[a]Arcsine Square-root Proportion of Normal Individuals

TABLE 3-19

Summary of LC_{50}s and LC_{20}s[a] for Chemical Concentrations in Sediment

Bolsa Chica Lowlands

Analyte	N	Slope	Intercept	p (model)	r-square	Sediment LC_{50}	Sediment LC_{20}	Units	Independent Variable Type for Best Fit
Chrysene	55	-0.01184	19.0193	0.0001	0.9394	761.77	255.01	ug/kg	Untransformed
Phenanthrene	80	-3.4731	29.1244	0.0001	0.8864	246.27	43.77	ug/kg	natural-log transformed
Low MW PAHs	85	-3.1239	28.1928	0.0001	0.8306	338.24	49.55	ug/kg	natural-log transformed
Total PAHs	90	-3.0719	31.5187	0.0001	0.7725	1102.14	156.31	ug/kg	natural-log transformed
Endrin ketone	25	-3.17168	8.8621	0.0001	0.7347	0.70	0.11	ug/kg	natural-log transformed
TPH Diesel and Waste oil	100	-3.33	59.9	0.0001	0.67	3275.00	539.00	mg/kg	natural-log transformed
Aldrin	20	-2.87045	16.6349	0.0001	0.6685	2.31	0.22	ug/kg	Untransformed
Chromium	140	-0.10422	21.4632	0.0001	0.5859	109.99	52.42	mg/kg	Untransformed
Endrin aldehyde	30	-0.72675	17.4616	0.0001	0.5689	10.27	2.01	ug/kg	Untransformed
Nickel	195	-5.5113	32.3869	0.0001	0.4906	58.09	19.56	mg/kg	natural-log transformed
TPH Diesel	110	-2.4159	41.3048	0.0001	0.4842	424.14	35.39	mg/kg	natural-log transformed
Thallium	130	-25.1361	24.5455	0.0001	0.4525	0.58	0.34	mg/kg	Untransformed
Fluorene	45	-1.954	14.4634	0.0001	0.4339	9.82	0.46	ug/kg	natural-log transformed
Di-n-octyl phthalate	115	-3.31421	29.0906	0.0001	0.3817	317.42	51.93	ug/kg	natural-log transformed
BHC beta	40	-0.10518	14.0446	0.0001	0.3579	38.45	-18.59	ug/kg	Untransformed
Waste oil	245	-2.52829	47.7264	0.0001	0.3508	3022.84	281.69	mg/kg	natural-log transformed
Cobalt	150	-0.52383	21.2516	0.0001	0.3212	21.48	10.03	mg/kg	Untransformed
Zinc	155	-4.0308	34.7057	0.0001	0.2941	459.08	103.62	mg/kg	natural-log transformed
Endrin	30	-2.56057	15.007	0.0034	0.2681	7.07	0.68	ug/kg	natural-log transformed
Beryllium	180	-3.44505	15.1249	0.0001	0.2554	4.43	0.78	mg/kg	natural-log transformed
Benzo(b)fluoranthene	30	-1.4756	21.995	0.006	0.2402	3391.06	58.13	ug/kg	natural-log transformed
Selenium	115	-3.397	11.6983	0.0001	0.2352	1.65	0.28	mg/kg	natural-log transformed
Vanadium	180	-0.0863	21.6369	0.0001	0.2185	134.84	65.32	mg/kg	Untransformed
Oil and Grease	235	-1.8141	26.606	0.0001	0.2153	9450.76	346.00	mg/kg	natural-log transformed

Notes:

Models are based on all four media adjustment groups pooled.

[a]LC_{50}s and LC_{20}s calculated from the best-fit univariate regression of amphipod survival (number of individuals) on chemical concentrations in sediment.

TABLE 3-20

Summary of LC_{50}s and LC_{20}s[a] for Chemical Concentrations in Sediment

Bolsa Chica Lowlands

Dry?	Salinity adjusted	Analyte	N	Slope	Intercept	r-square	p (model)	Sediment LC_{50}	Sediment LC_{20}	Units	Independent Variable Type for Best Fit
d	n	4,4'-DDE	30	-0.675	18.8312	0.3209	0.0011	480825.29	66.31	µg/Kg	natural-log transformed
w	y	4,4'-DDE	65	-0.0498	14.9536	0.4324	0.0001	99.47	-21.01	µg/Kg	Untransformed
d	y	Arsenic	15	-14.1846	46.272	0.2808	0.0422	12.90	8.45	mg/Kg	natural-log transformed
w	n	Arsenic	65	-0.2004	19.982	0.6052	0.0001	49.81	19.87	mg/Kg	Untransformed
d	y	Barium	20	-6.7453	42.337	0.9074	0.0001	120.78	49.63	mg/Kg	natural-log transformed
w	n	Beryllium	60	-3.5622	19.908	0.6896	0.0001	2.78	1.10	mg/Kg	Untransformed
w	y	Cadmium	25	-7.9386	20.4698	0.4784	0.0001	1.32	0.56	mg/Kg	Untransformed
w	y	Chromium	50	-0.1043	22.5878	0.5516	0.0001	120.69	63.16	mg/Kg	Untransformed
w	y	Cobalt	45	-0.5707	22.2389	0.4847	0.0001	21.45	10.93	mg/Kg	Untransformed
d	y	Copper	15	-24.3655	94.684	0.9236	0.0001	32.32	25.26	mg/Kg	natural-log transformed
w	y	Copper	45	-3.4024	27.2031	0.2311	0.0008	156.99	26.92	mg/Kg	natural-log transformed
d	y	Di-n-octyl phthalate	20	-4.1269	32.043	0.9469	0.0001	208.78	48.78	µg/Kg	natural-log transformed
w	y	Di-n-octyl phthalate	30	-4.8046	35.5046	0.6595	0.0001	202.02	57.95	µg/Kg	natural-log transformed
d	y	Lead	20	-0.452	41.2577	0.9173	0.0001	69.15	55.88	mg/Kg	Untransformed
d	n	Mercury	35	-0.05304	17.8175	0.5648	0.0001	147.39	34.27	mg/Kg	Untransformed
d	y	Nickel	15	-6.969	38.726	0.9876	0.0001	61.68	26.08	mg/Kg	natural-log transformed
w	n	Nickel	65	-4.6476	30.9221	0.3909	0.0001	90.17	24.80	mg/Kg	natural-log transformed
w	y	Nickel	75	-9.0327	42.8007	0.6065	0.0001	37.76	19.43	mg/Kg	natural-log transformed
d	y	Oil and Grease	35	-3.4678	36.926	0.6647	0.0001	2355.66	417.54	mg/Kg	natural-log transformed
w	n	Oil and Grease	70	-2.6285	34.8734	0.3671	0.0001	12873.98	1313.29	mg/Kg	natural-log transformed
w	y	Oil and Grease	85	-2.364	28.0738	0.331	0.0001	2091.07	165.23	mg/Kg	natural-log transformed
w	y	Selenium	45	-27.523	24.74	0.7879	0.0001	0.54	0.32	mg/Kg	Untransformed
d	n	Thallium	30	-12.2396	20.9833	0.2988	0.0018	0.90	0.41	mg/Kg	Untransformed
w	y	Thallium	45	-48.0439	33.024	0.7171	0.0001	0.48	0.35	mg/Kg	Untransformed
d	y	Total Phthalate	20	-4.786	36.8192	0.9182	0.00001	271.42	77.48	µg/Kg	natural-log transformed
w	y	Total Phthalate	45	-0.0126	13.912	0.3203	0.0001	310.48	-165.71	µg/Kg	Untransformed
d	n	TPH Diesel	15	-0.0001	19.8379	0.3958	0.012	98379.00	38379.00	µg/Kg	Untransformed
d	y	TPH Diesel	15	-1.7795	30.0151	0.7168	0.0001	76695.45	2632.96	µg/Kg	natural-log transformed
w	n	TPH Diesel	30	-0.00001	16.0479	0.287	0.0023	604790.00	4790.00	µg/Kg	Untransformed
w	y	TPH Diesel	50	-2.8884	47.187	0.5036	0.0001	390273.03	48889.96	µg/Kg	natural-log transformed
w	n	Vanadium	60	-0.096	22.3477	0.3725	0.0001	128.62	66.12	mg/Kg	Untransformed
d	y	Waste oil	35	-3.0073	52.2919	0.5015	0.0001	1280908.10	174195.71	µg/Kg	natural-log transformed
w	n	Waste oil	75	-1.11E-06	16.42	0.3194	0.0001	5794223.83	379061.37	µg/Kg	Untransformed
w	y	Waste oil	90	-3.2477	56.4676	0.4611	0.0001	1636137.16	257915.52	µg/Kg	natural-log transformed
d	n	Zinc	40	-0.0314	20.3473	0.6358	0.0001	329.53	138.45	mg/Kg	Untransformed
w	y	Zinc	55	-4.6212	36.2397	0.2339	0.0002	292.40	79.82	mg/Kg	natural-log transformed

Notes:

Models are based on each media adjustment group.

[a]LC_{50}s and LC_{20}s calculated from the best-fit univariate regression of amphipod survival (number of individuals) on chemical concentrations in sediment.

TABLE 3-21

Summary of EC_{50}s and EC_{20}s[a] for Chemical Concentrations in Pore Water

Bolsa Chica Lowlands

	N	Slope	Intercept	r-square	p (model)	Pore Water EC_{50}	Pore Water EC_{20}	Units	Independent Variable Type for Best Fit
Aldrin	40	-19.2671	1.54463	0.8436	0.0001	0.05	0.04	µg/L	Untransformed
4-Methylphenol	40	-0.20471	0.57271	0.8341	0.0001	1.43	0.33	µg/L	natural-log transformed
4-Nitrophenol	40	-0.20471	0.85649	0.8341	0.0001	5.71	1.32	µg/L	natural-log transformed
Chrysene	40	-0.20471	0.39287	0.8341	0.0001	0.59	0.14	µg/L	natural-log transformed
High MW PAHs	40	-0.20471	0.39287	0.8341	0.0001	0.59	0.14	µg/L	natural-log transformed
Acenaphthene	80	-0.20082	0.36035	0.8183	0.0001	0.50	0.11	µg/L	natural-log transformed
Endosulfan sulfate	80	-0.2274	-0.07859	0.7857	0.0001	0.08	0.02	µg/L	natural-log transformed
Total PAHs	60	-0.22083	0.98377	0.758	0.0001	8.94	2.30	µg/L	natural-log transformed
Low MW PAHs	60	-0.22078	0.97283	0.7567	0.0001	8.51	2.19	µg/L	natural-log transformed
Fluorene	60	-0.22078	0.59604	0.7566	0.0001	1.54	0.40	µg/L	natural-log transformed
Naphthalene	60	-0.2207	0.71897	0.7557	0.0001	2.70	0.69	µg/L	natural-log transformed
Phenanthrene	60	-0.21975	0.77267	0.7488	0.0001	3.46	0.88	µg/L	natural-log transformed
BHC alpha	40	-0.25726	-0.32443	0.647	0.0001	0.04	0.01	µg/L	natural-log transformed
BHC delta	80	-0.21655	0.03045	0.5834	0.0001	0.11	0.03	µg/L	natural-log transformed
BHC gamma	80	-0.17549	0.2895	0.5489	0.0001	0.30	0.05	µg/L	natural-log transformed
Phenol	80	-0.45658	2.29869	0.5376	0.0001	51.39	26.64	µg/L	natural-log transformed
Zinc	633	-0.23724	1.68114	0.4636	0.0001	145.28	41.02	µg/L	natural-log transformed
Lead	469	-0.18615	0.84149	0.4006	0.0001	6.26	1.25	µg/L	natural-log transformed
Arsenic	444	-0.0033	1.28392	0.3521	0.0001	237.55	146.64	µg/L	Untransformed
Endrin ketone	56	-0.21108	-0.54144	0.3197	0.0001	0.01	0.00	µg/L	natural-log transformed
Total Phenol	140	-0.0078	0.99713	0.2847	0.0001	63.73	25.27	µg/L	Untransformed
Nickel	733	-0.1925	1.27372	0.2726	0.0001	55.66	11.72	µg/L	natural-log transformed
Vanadium	284	-0.0765	1.16734	0.2567	0.0001	8.72	4.80	µg/L	Untransformed
Beryllium	669	-0.0099	1.19663	0.2555	0.0001	70.37	40.06	µg/L	Untransformed
Chromium	569	-0.0345	1.28811	0.2452	0.0001	22.84	14.15	µg/L	Untransformed
Cadmium	393	-0.12136	0.95853	0.2374	0.0001	43.74	3.69	µg/L	natural-log transformed

Notes:

Models are based on all four media adjustment groups pooled.

[a]EC_{50}s and EC_{20}s calculated from the best-fit univariate regression of *Mytilus* development (arcsine-transformed proportion of normal individuals) on chemical concentrations in porewater

TABLE 3-22

Correlation Matrix Among Analytes Associated with Amphipod Toxicity That Were Detected in Sediments

Bolsa Chica Lowlands

	DDD	DDE	DDT	Acenaphthene	Aldrin	Anthracene	PCB-1254	Arsenic	Barium	Benzo(a) anthracene	Benzo(a)pyrene	Beryllium	BHC-beta	BHC-gamma	Cadmium	Chlordane total	Chlordane alpha	Chlordane gamma	Chromium	Chrysene	Cobalt	Copper
DDD	1																					
DDE	0.2222	1																				
DDT	0.1198	0.0314	1																			
Acenaphthene	0.0012	0.4007	-0.0421	1																		
Aldrin	0.016	0.2099	-0.0355	0.7224	1																	
Anthracene	0.0399	0.4649	-0.0338	0.683	0.112	1																
PCB-1254	0.0949	0.1334	0.0336	0.1432	0.1711	-0.0021	1															
Arsenic	0.2987	-0.0043	-0.0549	0.0834	0.0664	0.1262	-0.026	1														
Barium	0.3571	-0.044	0.0677	-0.032	-0.0424	0.0183	-0.0522	0.2445	1													
Benzo(a)anthracene	0.071	0.4647	-0.0426	0.7062	0.1713	0.9791	0.0784	0.1292	0.0013	1												
Benzo(a)pyrene	0.0994	0.46	-0.0367	0.6976	0.1685	0.97	0.0946	0.127	0.0188	0.9965	1											
Beryllium	0.2226	0.0521	0.0122	-0.0343	0.1111	-0.1	-0.058	0.3345	0.2535	-0.0833	-0.0778	1										
BHC-beta	-0.0355	0.148	-0.0345	0.6611	0.9426	0.0175	0.1797	-0.0078	-0.076	0.0788	0.078	0.0694	1									
BHC-gamma	0.6966	0.0786	-0.0324	0.055	0.076	0.0467	-0.0226	0.0581	0.2489	0.0592	0.0868	0.074	0.0366	1								
Cadmium	0.2012	0.1848	-0.0551	0.0875	0.0983	0.0742	0.6371	0.1108	0.0249	0.0981	0.1054	0.266	0.0549	0.2354	1							
Chlordane total	0.7172	0.0304	-0.0314	-0.0127	0.0113	-0.0035	-0.0194	0.0506	0.2644	0.0059	0.0378	0.054	-0.0183	0.9583	0.2451	1						
Chlordane alpha	0.7257	0.0364	-0.0256	-0.005	0.0188	0.0028	-0.0153	0.0525	0.2724	0.0121	0.0457	0.0583	-0.0123	0.9549	0.249	0.9982	1					
Chlordane gamma	0.7256	0.0434	-0.0256	0.0032	0.0261	0.0092	-0.0086	0.0541	0.2724	0.0178	0.0511	0.0605	-0.006	0.9561	0.2556	0.9975	0.9997	1				
Chromium	0.3254	0.3138	0.0147	0.516	0.3872	0.4248	0.1598	0.2498	0.0707	0.4747	0.4895	0.2828	0.3312	0.201	0.1518	0.1527	0.1647	0.1703	1			
Chrysene	0.0452	0.2129	-0.0402	0.8801	0.725	0.5992	0.1807	0.1308	0.0223	0.6559	0.6558	0.0081	0.6724	0.0849	0.1223	0.0185	0.0266	0.033	0.5375	1		
Cobalt	0.1664	0.09	-0.0257	-0.005	0.0401	0.0089	-0.0101	0.2691	0.0882	0.0373	0.043	0.6709	0.0016	0.1948	0.5997	0.1834	0.1884	0.1907	0.2101	0.0353	1	
Copper	0.7477	0.1853	-0.0085	0.1272	0.1652	0.0857	0.1145	0.2601	0.228	0.1137	0.1354	0.2882	0.0934	0.7472	0.4096	0.7462	0.7503	0.7536	0.5017	0.1644	0.3781	1
Di-n-octyl phthalate	0.0317	0.2823	-0.0501	0.7868	0.6894	0.3959	0.1463	0.1359	-0.0254	0.4315	0.4307	-0.0114	0.6481	0.0607	0.0895	0.0045	0.0105	0.0157	0.4392	0.8531	0.0033	0.1623
Dieldrin	0.2835	0.0015	0.0081	-0.004	-0.0147	0.011	0.1688	-0.0186	0.0928	0.0082	0.0215	-0.0377	-0.026	0.3686	0.2103	0.3976	0.4022	0.4056	0.008	0.01	0.0322	0.2681
Endrin aldehyde	-0.0057	-0.0049	0.0152	-0.0836	-0.049	-0.0818	-0.0266	0.1481	0.0336	-0.0829	-0.0797	0.0144	-0.0523	-0.0194	-0.0821	-0.0256	-0.0229	-0.0192	-0.0038	-0.0757	0.0606	0.0211
Endrin ketone	-0.016	0.1462	0.0985	0.0314	-0.0117	0.0695	0.0089	-0.0351	-0.0498	0.0625	0.059	-0.0826	-0.0237	0.0029	-0.0063	-0.0194	-0.0101	-0.0002	0.037	-0.025	-0.0064	-0.0251
Fluoranthene	0.106	0.1943	-0.0624	0.5238	0.1828	0.6637	0.1184	0.1512	-0.0455	0.7068	0.7133	-0.0539	0.1312	0.1377	0.1285	0.1103	0.1165	0.1196	0.6218	0.6088	0.033	0.2007
Fluorene	-0.024	0.2953	-0.0379	0.8383	0.7954	0.4603	0.1381	0.051	-0.0643	0.4961	0.4892	-0.0119	0.7547	0.0482	0.1075	-0.0153	-0.0086	-0.0012	0.5853	0.8773	-0.0073	0.1731
Lead	0.0517	0.0164	-0.0114	0.3685	0.0158	0.1533	0.0788	-0.0099	0.0645	0.1472	0.1488	-0.0024	-0.0053	0.0765	0.0198	0.0808	0.084	0.0846	0.0745	0.0931	0.0315	0.1094
Low MW PAHs	-0.0289	0.3217	-0.0377	0.7087	0.7508	0.2979	0.1373	-0.0015	-0.0859	0.3362	0.3315	-0.002	0.7278	0.04	0.1085	-0.0144	-0.0087	-0.0025	0.5886	0.7459	-0.0057	0.1818
Mercury	0.0482	0.5109	-0.0305	0.3824	0.0154	0.2807	0.0584	-0.029	-0.0352	0.2715	0.2673	-0.0348	-0.0202	0.0002	0.0109	-0.0148	-0.0133	-0.0113	0.0993	-0.0086	0.0199	0.0512
Naphthalene	-0.0295	0.342	-0.0404	0.6541	0.5857	0.4057	0.0988	0.0148	-0.0999	0.4296	0.4242	-0.0285	0.5501	0.0372	0.1106	-0.0128	-0.0075	-0.0016	0.6164	0.6782	-0.0063	0.1915
Nickel	0.1029	0.6618	-0.0192	0.5603	0.1493	0.5815	0.0472	0.0203	0.0208	0.5734	0.5674	-0.0084	0.0793	0.0365	0.0643	-0.0068	-0.002	0.0033	0.1649	0.2334	0.0698	0.1016
Oil and Grease	-0.0085	0.1581	-0.0345	0.7079	0.732	0.286	0.1381	0.0728	-0.0511	0.3227	0.3211	0.0023	0.7211	0.039	0.0834	-0.0012	0.0034	0.0079	0.3345	0.7819	-0.0278	0.105
Phenanthrene	-0.0201	-0.0001	-0.0113	0.0461	0.0034	0.0278	-0.0172	-0.0307	0.1533	0.025	0.023	-0.0341	0.0043	-0.0248	-0.0187	-0.0137	-0.0149	-0.0156	-0.0139	0.0136	-0.0402	-0.0297
Phenol	0.0358	0.5147	-0.0579	0.6436	0.1127	0.8628	0.0118	0.1218	-0.0666	0.8431	0.8348	-0.1013	0.0309	0.0475	0.0825	0.007	0.0124	0.0178	0.5341	0.5092	0.0001	0.1174
Pyrene	0.0754	0.4909	-0.0043	0.5299	0.0724	0.7825	0.0116	0.0557	0.0781	0.7733	0.7674	-0.061	-0.0066	0.0361	0.0428	-0.0086	-0.0034	0.002	0.1279	0.4016	0.034	0.0419
Selenium	0.0022	0.0232	0.0146	0.365	0.039	0.5146	-0.0185	0.052	0.1209	0.5039	0.4951	-0.036	-0.0267	0.0037	0.0017	-0.028	-0.0255	-0.0221	-0.0385	0.3396	0.0186	0.0137
Thallium	0.132	0.0751	0.0261	-0.0244	0.1204	0.0327	0.0036	0.278	0.0334	0.0798	0.0722	0.2862	-0.0056	0.0933	0.1245	0.0264	0.0352	0.0367	0.2405	0.0247	0.3536	0.2625
Total DDT	0.6837	0.2944	0.3407	0.1468	0.1746	0.0897	0.2304	0.083	0.2015	0.1224	0.1463	0.1784	0.1348	0.587	0.3045	0.5928	0.6017	0.6025	0.3716	0.2165	0.1604	0.5777
Total PAH	0.0242	0.3226	-0.0417	0.7086	0.762	0.284	0.1943	0.0101	-0.0754	0.3499	0.3517	0.0173	0.7419	0.0721	0.1313	0.0194	0.0262	0.0318	0.61	0.7771	0.0223	0.2148
Total PCB	0.0742	0.5131	0.0357	0.3585	0.0241	0.2528	0.1303	-0.0401	-0.0407	0.2509	0.2474	-0.0348	-0.011	0.0262	0.0507	0	0.0063	0.0134	0.1076	-0.0064	0.0397	0.0813
Total Phthalate	0.3831	0.116	-0.0356	0.2991	0.3553	0.0269	0.0897	0.1118	0.0607	0.0695	0.0809	0.0324	0.3443	0.5114	0.1535	0.469	0.46	0.461	0.2743	0.4373	0.1019	0.478
TPH Diesel	-0.0293	0.2896	-0.0381	0.7605	0.8423	0.2872	0.1541	0.0082	-0.0805	0.3308	0.3269	0.0144	0.8202	0.0477	0.1064	-0.0115	-0.0056	0.0009	0.5612	0.7861	-0.0122	0.1688
Vanadium	0.0833	0.7057	0.0221	0.3432	0.0145	0.37	0.0128	-0.0298	0.019	0.357	0.3563	-0.0377	-0.0286	-0.0067	0.0224	-0.0243	-0.0226	-0.0202	0.0899	-0.002	0.0256	0.0399
Waste Oil	-0.0006	0.234	-0.0307	0.752	0.8744	0.2211	0.1734	0.0838	-0.055	0.2679	0.2665	0.0363	0.86	0.0521	0.1002	-0.002	0.0037	0.0095	0.4796	0.8049	-0.0098	0.1605
Zinc	0.0383	0.4478	0.0356	0.3292	-0.0031	0.2232	0.0314	-0.0279	0.0339	0.2126	0.214	-0.027	-0.0368	-0.0262	0.0006	-0.0289	-0.0289	-0.0279	0.0692	-0.0112	0.0132	0.0373

TABLE 3-22

Correlation Matrix Amon

Bolsa Chica Lowlands

	Di-n-octyl phthalate	Dieldrin	Endrin aldehyde	Endrin ketone	Fluoranthene	Fluorene	Lead	Low MW PAHs	Mercury	Naphthalene	Nickel	Oil and Grease	Phenanthrene	Phenol	Pyrene	Selenium	Thallium	Total DDT	Total PAH	Total PCB
DDD																				
DDE																				
DDT																				
Acenaphthene																				
Aldrin																				
Anthracene																				
PCB-1254																				
Arsenic																				
Barium																				
Benzo(a)anthracene																				
Benzo(a)pyrene																				
Beryllium																				
BHC-beta																				
BHC-gamma																				
Cadmium																				
Chlordane total																				
Chlordane alpha																				
Chlordane gamma																				
Chromium																				
Chrysene																				
Cobalt																				
Copper																				
Di-n-octyl phthalate	1																			
Dieldrin	-0.0094	1																		
Endrin aldehyde	-0.068	-0.0103	1																	
Endrin ketone	-0.0043	0.0698	0.123	1																
Fluoranthene	0.3961	0.0726	-0.0846	-0.0042	1															
Fluorene	0.7907	-0.0111	-0.0641	0.0077	0.549	1														
Lead	0.1537	0.0169	-0.05	-0.0206	-0.0137	0.0448	1													
Low MW PAHs	0.7245	-0.0205	-0.0485	0.0209	0.4752	0.9618	-0.002	1												
Mercury	0.1549	-0.0229	-0.0394	0.1057	-0.0299	-0.0138	0.7499	-0.0205	1											
Naphthalene	0.6281	-0.0136	-0.0556	0.0303	0.6034	0.9211	-0.0051	0.9604	-0.0224	1										
Nickel	0.2943	-0.0287	-0.0635	0.1218	0.0088	0.1646	0.5254	0.0879	0.8427	0.0735	1									
Oil and Grease	0.7879	0.0543	-0.0717	-0.0202	0.4792	0.7898	-0.0117	0.7292	-0.0325	0.6503	0.0598	1								
Phenanthrene	0.0115	-0.0251	0.2771	-0.0072	-0.0177	0.0194	0.0724	0.0134	0.0627	0.0109	0.0568	-0.0042	1							
Phenol	0.396	0.0266	-0.0897	0.0817	0.8276	0.4677	0.1887	0.3751	0.3996	0.5116	0.4718	0.3693	0.013	1						
Pyrene	0.3116	-0.0194	-0.0517	0.0861	0.1134	0.209	0.2272	0.0528	0.412	0.0625	0.8057	0.0495	0.0469	0.4464	1					
Selenium	0.1503	-0.0386	-0.0123	0.0153	-0.0698	0.1423	0.3662	-0.0362	0.1252	-0.0403	0.4457	-0.0605	0.0567	0.0799	0.753	1				
Thallium	0.0155	-0.0987	-0.1218	-0.029	0.047	-0.008	-0.0775	-0.0248	-0.0364	-0.0165	0.0372	-0.0607	-0.1179	0.0158	0.0562	0.047	1			
Total DDT	0.1858	0.2388	-0.1163	-0.0558	0.3089	0.2757	0.0303	0.3141	-0.0594	0.3376	-0.0287	0.1964	-0.0418	0.1509	-0.0377	-0.1103	0.1187	1		
Total PAH	0.756	-0.0086	-0.0535	0.0148	0.4949	0.9509	-0.0015	0.987	-0.0156	0.9341	0.0961	0.7421	0.0098	0.3567	0.0657	-0.0438	0.002	0.3459	1	
Total PCB	0.1451	0.0407	0.0492	0.2675	-0.0336	-0.0132	0.7095	-0.0191	0.9504	-0.0244	0.7973	-0.0317	0.0551	0.3685	0.3827	0.127	-0.0024	-0.0518	-0.0113	1
Total Phthalate	0.6337	0.1547	-0.0633	-0.044	0.1855	0.3851	0.0215	0.3861	-0.0269	0.3082	0.0244	0.4693	-0.0206	0.0603	0.0363	-0.0699	0.0604	0.4267	0.4433	-0.0236
TPH Diesel	0.7363	-0.0066	-0.0534	0.0092	0.4718	0.9637	-0.0021	0.9731	-0.0225	0.9043	0.0894	0.8211	0.0113	0.3636	0.0401	-0.0413	-0.0251	0.2885	0.9629	-0.0205
Vanadium	0.14	-0.0381	0.0133	0.1404	-0.0503	-0.0187	0.437	-0.0321	0.8719	-0.0337	0.8666	-0.0521	0.0806	0.4168	0.5493	0.1448	-0.0402	-0.0954	-0.0264	0.8327
Waste Oil	0.8274	0.0027	-0.0662	-0.0109	0.3988	0.9176	-0.0059	0.9063	-0.0287	0.8021	0.0826	0.8899	0.0042	0.287	0.0323	-0.053	-0.0081	0.2702	0.9108	-0.0267
Zinc	0.1244	-0.0471	0.0454	0.1015	-0.0669	-0.0246	0.7205	-0.038	0.8884	-0.0398	0.7243	-0.0613	0.1038	0.3116	0.3544	0.2039	-0.0983	-0.1126	-0.0378	0.8515

TABLE 3-23
Summary of Proportion of Variance Accounted for by the First Nine Principal Components for Analytes Detected in Sediments
Bolsa Chica Lowlands

	Proportion of variance explained	Cumulative variance explained
Principal Component 1	0.267689	0.26769
Principal Component 2	0.141402	0.40909
Principal Component 3	0.134644	0.54374
Principal Component 4	0.066975	0.61071
Principal Component 5	0.051246	0.66196
Principal Component 6	0.040874	0.70283
Principal Component 7	0.034201	0.73703
Principal Component 8	0.029456	0.76649
Principal Component 9	0.02843	0.79492

TABLE 3-24
Summary of Correlations Between Principal Component Scores for the Nine Primary Components and Analytes Associated with Amphipod Toxicity
Detected in Sediment (Only those analytes with significant correlations (p<0.05) are reported.)
Bolsa Chica Lowlands

Principal Component 1		Acenaphthene	Fluorene	Chrysene	TPH Diesel	Total PAH	Lo MW PAH	Waste oil	Di-n-octyl phthalate	Naphthalene	Oil and grease	Aldrin	Benzo(a)pyrene	Benzo(a)□Anthraceneene	Chromium	beta BHC	Phenol
	Correlation Coefficient	0.92358	0.91923	0.89795	0.86365	0.86338	0.8484	0.83937	0.8301	0.82011	0.76452	0.72601	0.68859	0.68759	0.67532	0.65901	0.65813
	p	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	N	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Principal Component 2		Nickel	Vanadium	Mercury	Zinc	Total PCB	Pyrene	Lead	Anthracene	Benzo(a)□Anthraceneene	Benzo(a)□pyrene	Selenium	Phenol	DDE	Total DDT	Total Phthalate	Chlordane total
	Correlation Coefficient	0.78294	0.78212	0.76022	0.73129	0.72396	0.64836	0.49842	0.49189	0.45421	0.43842	0.42529	0.41327	0.41301	-0.39938	-0.39247	-0.36859
	p	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	N	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Principal Component 3		Chlordane gamma	Chlordane alpha	Chlordane total	gamma BHC	DDD	Copper	Total DDT	Dieldrin	Barium	Cadmium	Cobalt	beta BHC	TPH Diesel	Total Phthalate	Waste oil	Lo MW PAH
	Correlation Coefficient	0.854	0.85367	0.85122	0.82483	0.79137	0.75005	0.54152	0.38009	0.3501	0.33403	0.3331	-0.30639	-0.30261	0.29799	-0.29546	-0.28541
	p	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0004	0.0005	0.0006	0.0009
	N	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Principal Component 4		Anthracene	Benzo(a)Anthraceneene	Benzo(a)pyrene	Fluoranthene	Total PCB	Zinc	Mercury	beta BHC	Lead	Phenol	Aldrin	Vanadium	Pyrene	Selenium	Waste oil	Nickel
	Correlation Coefficient	-0.55897	-0.5444	-0.5418	-0.52085	0.48355	0.47899	0.4713	0.40682	0.40589	-0.38363	0.35051	0.34985	-0.28822	-0.28337	0.23694	0.19545
	p	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0008	0.0009	0.006	0.0242
	N	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Principal Component 5		Beryllium	Cobalt	Thallium	Arsenic	Cadmium	Chromium	Chlordane total	Chlordane alpha	Chlordane gamma	gamma BHC	Dieldrin
	Correlation Coefficient	0.76322	0.73806	0.54644	0.48514	0.4519	0.27637	-0.26767	-0.26013	-0.25676	-0.23468	-0.23035
	p	0.0001	0.0001	0.0001	0.0001	0.0001	0.0013	0.0018	0.0025	0.0029	0.0065	0.0076
	N	133	133	133	133	133	133	133	133	133	133	133

Principal Component 6		Selenium	Fluoranthene	Pyrene	Phenol	DDE	Barium	PCB-1254	Chromium	Chrysene	Naphthalene	Aldrin	Total DDT	beta BHC	Cadmium	Di-n-octyl phthalate	Endrin ketone
	Correlation Coefficient	0.66824	-0.38555	0.37161	-0.3672	-0.33732	0.33434	-0.2702	-0.2473	0.24721	-0.24067	0.23511	-0.22788	0.21482	-0.20935	0.20303	-0.19192
	p	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0017	0.0041	0.0041	0.0053	0.0064	0.0083	0.013	0.0156	0.0191	0.0269
	N	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Principal Component 7		PCB-1254	Cadmium	Endrin aldehyde	Arsenic	Dieldrin	Selenium	Chromium	Barium	Phenanthrene	Pyrene
	Correlation Coefficient	-0.70393	-0.64022	0.31005	0.29923	-0.29093	-0.25747	0.25428	0.24075	0.20163	-0.17402
	p	0.0001	0.0001	0.0003	0.0005	0.0007	0.0028	0.0031	0.0052	0.0199	0.0451
	N	133	133	133	133	133	133	133	133	133	133

Principal Component 8		Endrin aldehyde	Phenanthrene	Thallium	PCB-1254	Barium	Endrin ketone	Cadmium	Dieldrin
	Correlation Coefficient	0.68317	0.65029	-0.34563	0.30733	0.26098	0.23157	0.20951	0.18769
	p	0.0001	0.0001	0.0001	0.0003	0.0024	0.0073	0.0155	0.0305
	N	133	133	133	133	133	133	133	133

Principal Component 9		DDT	DDE	Total DDT	Lead	Endrin ketone	Fluoranthene	Pyrene	DDD
	Correlation Coefficient	0.72125	0.34434	0.34393	-0.32525	0.26925	-0.24771	0.22272	0.19982
	p	0.0001	0.0001	0.0001	0.0001	0.0017	0.004	0.01	0.0211
	N	133	133	133	133	133	133	133	133

Notes:
P = p-Value for Correlation Coefficient; considered significant if p<0.05.
N = sample size

TABLE 3-24
Summary of Correlations Between Principal C
Detected in Sediment (Only those analytes wi
Bolsa Chica Lowlands

Principal Component 1		Anthracene	Fluoranthene	DDE	Total Phthalate	Nickel	Pyrene	Total DDT	Copper	Vanadium	Mercury	Total PCB	gamma BHC	Selenium	Cadmium	PCB-1254	Zinc	Lead
	Correlation Coefficient	0.64306	0.6409	0.49187	0.46168	0.4289	0.41892	0.36882	0.33064	0.24526	0.23826	0.23274	0.20171	0.20101	0.20095	0.19874	0.18797	0.18771
	p	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0044	0.0058	0.007	0.0199	0.0203	0.0204	0.0218	0.0303	0.0305
	N	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Principal Component 2		Chlordane alpha	Chlordane gamma	gamma BHC	Waste oil	beta BHC	Copper	Total PAH	TPH Diesel	Lo MW PAH	Aldrin	Oil and grease	DDD	Acenaphthene	Naphthalene	Fluorene	Dieldrin
	Correlation Coefficient	-0.36729	-0.36527	-0.35216	-0.33677	-0.32408	-0.32132	-0.3034	-0.30329	-0.28679	-0.28459	-0.27391	-0.24397	0.22589	-0.22533	-0.20581	-0.17167
	p	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0004	0.0008	0.0009	0.0014	0.0047	0.0089	0.0091	0.0175	0.0482
	N	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Principal Component 3		Total PCB	Fluorene	Oil and grease	Vanadium	Mercury	Nickel	Lead	Total PAH	Aldrin	Naphthalene	Zinc	Beryllium	DDE	Pyrene	Arsenic
	Correlation Coefficient	0.28239	-0.27278	-0.26896	0.26419	0.26358	0.26153	0.25221	-0.24475	-0.24433	-0.24367	0.23706	0.20729	0.20689	0.18953	0.17719
	p	0.001	0.0015	0.0017	0.0021	0.0022	0.0024	0.0034	0.0045	0.0046	0.0047	0.006	0.0167	0.0169	0.0289	0.0413
	N	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133

Principal Component 4		Arsenic	Total Phthalate	TPH Diesel
	Correlation Coefficient	-0.19166	0.18755	0.17371
	p	0.0271	0.0306	0.0455
	N	133	133	133

Principal Component 5	
	Correlation Coefficient
	p
	N

Principal Component 6		Arsenic	Acenaphthene
	Correlation Coefficient	0.18701	0.17226
	p	0.0311	0.0474
	N	133	133

Principal Component 7	
	Correlation Coefficient
	p
	N

Principal Component 8	
	Correlation Coefficient
	p
	N

Principal Component 9	
	Correlation Coefficient
	p
	N

Notes:
P = p-Value for Correlation Coefficient; considered signific
N = sample size

Table 3-25
Reference Toxicity Values for Terrestrial Plants
Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference
Inorganics					
Ammonia	na	--	--	--	--
Antimony	Plant sp.	5-10	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
Arsenic	**Plant sp.**	**2-50**	**MAC**	**acceptable for food production or land application of sewage sludge**	**Kabata-Pendias and Pendias, 1992**
	Corn	10	LOEC	<10% reduction in fresh weight	Woolson et al., 1971 in Efroymson et al., 1997a
Barium	Barley	500	LOEC	30% reduction in shoot growth	Chaudhry et al., 1977 in Efroymson et al., 1997a
Beryllium	Plant sp.	10	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
Cadmium	Plant sp.	3-15	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
	Plant sp.	**4**	**LOEC**	**20-30% reduction in growth and germination**	**various authors in Efroymson et al., 1997a**
Chloride	na	--	--	--	--
Chromium	Plant sp.	50-600	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
Cobalt	Plant sp.	20-50	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
Copper	**Plant sp.**	**23-140**	**MAC**	**acceptable for food production or land application of sewage sludge**	**Kabata-Pendias and Pendias, 1992**
	Bush beans	100	NOEC	leaf and stem weight	Wallace et al., 1977a in Efroymson et al., 1997
Lead	**Plant sp.**	**20-500**	**MAC**	**acceptable for food production or land application of sewage sludge**	**Kabata-Pendias and Pendias, 1992**
	Red oak, American sycamore	50	LOEC	26% reduction in tree weight (oak), 30% reduction in leaf weight (sycamore)	Dixon, 1988 and Carlson and Bazzaz, 1977 in Efroymson et al., 1997a
Mercury	Plant sp.	0.3-5	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
Molybdenum	Plant sp.	2-10	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
Nickel	Plant sp.	20-100	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
	Red oak	**50**	**LOEC**	**30% reduction in tree weight**	**Dixon, 1988 in Efroymson et al., 1997a**
	Red oak	**20**	**NOEC**	**tree weight**	**Dixon, 1988 in Efroymson et al., 1997a**
Nitrate	na	--	--	--	--
Nitrite	na	--	--	--	--
Phosphorus (total as P)	na	--	--	--	--
Phosphorus (total as PO4)	na	--	--	--	--
Selenium	Plant sp.	1.6-10	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
	Alfalfa	**1.5**	**LOEC**	**33 to 83% reduction in shoot weight depending on pH of test soil**	**Wan et al., 1988 in Efroymson et al., 1997a**
	Alfalfa	0.5	NOEC	shoot weight	Wan et al., 1988 in Efroymson et al., 1997a
Silver	Plant sp.	2	LOEC	unspecified toxic effects	Kabata-Pendias and Pendias, 1984 in Will and Suter, 1995
Sulfate	na	--	--	--	--
Sulfide	na	--	--	--	--
Thallium	Plant sp.	1	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
Vanadium	Plant sp.	50-150	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
Zinc	Plant sp.	70-300	MAC	acceptable for food production or land application of sewage sludge	Kabata-Pendias and Pendias, 1992
	Soybean	**131**	**LOEC**	**leaf and root weight**	**Aery and Sakar, 1991 in Efroymson et al., 1997a**
Organics					
1,1-Dichloroethene	na	--	--	--	--
1,2-Dichlorobenzene	na	--	--	--	--
1,2-Dichloroethane	na	--	--	--	--
1,2-Dichloroethene (cis-)	na	--	--	--	--
1,2-Dichloroethene (total)	na	--	--	--	--
1,3-Dichlorobenzene	na	--	--	--	--
1,4-Dichlorobenzene	Lettuce (*Lactuca sativa*)	248	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
2,4,5-T	na	--	--	--	--
2,4,5-TP	na	--	--	--	--
2,4-D	na	--	--	--	--
2,4-DB	na	--	--	--	--
2-Butanone	na	--	--	--	--
2-Hexanone	na	--	--	--	--
4,4'-DDD	na	--	--	--	--
4,4'-DDE	na	--	--	--	--
4,4'-DDT	Plant sp.	12.5	toxic	unspecified toxic effects	ICF, 1989
4-Methyl-2-pentanone	na	--	--	--	--
4-Methylphenol	na	--	--	--	--
4-Nitrophenol[c]	Radish (*Raphanus sativus*)	0.000396 M (6.9 mg/kg)	MD50	50% reduction in seed germination	Sund and Nomura, 1963
Acenaphthene	Lettuce (*Lactuca sativa*)	25	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Acenaphthylene	na	--	--	--	--
Acetone	*Camellia sasarqua*	4 mg/ml (503 mg/kg)	toxic	unspecified toxic effects	PHYTOTOX, 1993
Aldrin	Maize	50	toxic	unspecified toxic effects	ICF, 1989
Anthracene[c]	Maize	0.0001M (2.3 mg/kg)	toxic	unspecified toxic effects	PHYTOTOX, 1993
Aroclor 1254	Pigweed	50	NOEC	reduction in plant height	Strek and Weber, 1982 in Efroymson et al., 1997a
Aroclor 1260[b]	Pigweed	50	NOEC	reduction in plant height	Strek and Weber, 1982 in Efroymson et al., 1997a
Benzene	na	--	--	--	--
Benzo(a)anthracene[c]	Tobacco (*Nicotiana tabacum*)	0.00001M (0.29 mg/kg)	toxic	unspecified toxic effects	PHYTOTOX, 1993
Benzo(a)pyrene	Merit	0.02	toxic	unspecified toxic effects	PHYTOTOX, 1993
Benzo(b)fluoranthene	na	--	--	--	--
Benzo(e)pyrene	na	--	--	--	--
Benzo(g,h,i)perylene	Oats (*Avena sativa*)	0.0244	LOAEL	bioaccumulation	UTAB, 1994
Benzo(k)fluoranthene	na	--	--	--	--
BHC-alpha	na	--	--	--	--
BHC-beta	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
BHC-delta	Valentine beans	12.5	toxic	unspecified toxic effects	ICF, 1989
BHC-gamma (lindane)	na	--	--	--	--
Biphenyl	na	--	--	--	--
Bis(2-ethylhexyl)phthalate	na	--	--	--	--
Butylbenzylphthalate	na	--	--	--	--
Carbon disulfide	na	--	--	--	--
Chlordane - alpha/gamma/technical	na	--	--	--	--
Chlorobenzene	na	--	--	--	--
Chloroform	Mandarin	2.5 ml/L (105 mg/kg)	toxic	unspecified toxic effects	PHYTOTOX, 1993
Chlorpyrifos	na	--	--	--	--
Chrysene	na	--	--	--	--
Dalapon	na	--	--	--	--
Diazinon	na	--	--	--	--
Dibenz(a,h)anthracene	na	--	--	--	--
Dibenzothiophene	na	--	--	--	--
Dicamba	na	--	--	--	--
Dieldrin	Valentine beans	12.5	toxic	unspecified toxic effects	ICF, 1989
TPH-Diesel	na	--	--	--	--
Diesel fuel #2	na	--	--	--	--
Diethylphthalate	Lettuce (*Lactuca sativa*)	134	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Dimethylphthalate	na	--	--	--	--
Di-n-butyl-phthalate	Plant sp.	200	LOEC	29-34% reduction in freshweight	Overcash et al., 1982 in Efroymson et al., 1997a
Di-n-octyl-phthalate	na	--	--	--	--
Dinoseb[c]	Sudan grass (*Sorghum sudanense)*	0.0000129 M (0.39 mg/kg)	MD50	50% reduction in seed germination	Sund and Nomura, 1963
Disulfoton (disyston)	na	--	--	--	--
Endosulfan I[b]	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Endosulfan II[b]	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Endosulfan sulfate[b]	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Endrin	na	--	--	--	--

Table 3-25
Reference Toxicity Values for Terrestrial Plants
Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference
Endrin aldehyde	na	--	--	--	--
Endrin ketone	na	--	--	--	--
Ethylbenzene	na	--	--	--	--
Fluoranthene	na	--	--	--	--
Fluorene	na	--	--	--	--
Gasoline	na	--	--	--	--
Heptachlor	Carrot	1	toxic	unspecified toxic effects	PHYTOTOX, 1993
Indeno(1,2,3-cd)pyrene	na	--	--	--	--
Malathion	na	--	--	--	--
MCPP	na	--	--	--	--
Methylene chloride	*Acroptilon picris*	6 tons/ha (2,722 mg/kg)	toxic	unspecified toxic effects	PHYTOTOX, 1993
Mevinphos	na	--	--	--	--
Naphthalene	Lettuce (*Lactuca sativa*)	100	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Oil and grease	na	--	--	--	--
n-Propylbenzene	na	--	--	--	--
Parathion (ethyl-)	na	--	--	--	--
PCB 008	na	--	--	--	--
PCB 018	na	--	--	--	--
PCB 028	na	--	--	--	--
PCB 044	na	--	--	--	--
PCB 052	na	--	--	--	--
PCB 066	na	--	--	--	--
PCB 101	na	--	--	--	--
PCB 105	na	--	--	--	--
PCB 118	na	--	--	--	--
PCB 128	na	--	--	--	--
PCB 138	na	--	--	--	--
PCB 153	na	--	--	--	--
PCB 170	na	--	--	--	--
PCB 180	na	--	--	--	--
PCB 187	na	--	--	--	--
PCB 195	na	--	--	--	--
PCB 206	na	--	--	--	--
PCB 209	na	--	--	--	--
Pentachlorophenol	Lettuce (*Lactuca sativa*)	9	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Perylene	na	--	--	--	--
Phenanthrene	na	--	--	--	--
Phenol	Lettuce (*Lactuca sativa*)	168	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Phorate (thimet)	na	--	--	--	--
Pyrene	na	--	--	--	--
Styrene	Lettuce (*Lactuca sativa*)	320	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Tetrachloroethene (PCE)	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Tetrachlorovinophos	na	--	--	--	--
Toluene	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Trichloroethylene (TCE)	na	--	--	--	--
Waste oil	na	--	--	--	--
Xylene (m,p-)[b]	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Xylene (o-)[b]	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Xylene (total)	Lettuce (*Lactuca sativa*)	1,000	EC50	50% reduction in growth at 14 days	Hulzebos et al., 1993
Chemical Group Totals					
High MW PAHs	na	--	--	--	--
Low MW PAHs	na	--	--	--	--
Total DDT	na	--	--	--	--
Total PAHs	na	--	--	--	--
Total PAHs (lab)	na	--	--	--	--
Total PCB	na	--	--	--	--
Total PCB's (lab)	na	--	--	--	--
Total phenol	na	--	--	--	--
Total phthalate esters	na	--	--	--	--
Total phthalate esters (lab)	na	--	--	--	--
Total volatile solids	na	--	--	--	--

Notes:

[a]Concentrations are in mg/Kg unless otherwise noted. Molar concentrations and solutions (mg/L and mg/ml) were converted to soil concentrations (mg/Kg).

[b]Effect level for similar chemical (surrogate) used:

Chemical	*Surrogate*
endosulfan 1	endosulfan
endosulfan 2	endosulfan
endosulfan sulfate	endosulfan
Aroclor 1260	Aroclor 1254
m,p-xylene	total xylene
o-xylene	total xylene

[c]Concentration is a Molar solution (moles/L). Molecular weights used in conversions were:

Chemical	*Molecular weight*
4-Nitrophenol	138
Anthracene	180
Benzo(a)anthracene	228
Dinoseb	240

MAC: Maximum acceptable concentration in soil.
EC50: Effective concentration where 50% of the test plants are impacted
LOAEL: Lowest observed adverse effect concentration
LOEC: Lowest observed effect concentration
MD50: Median dose at which 50% of the test plants were impacted in seed germination tests
NOAEL: No observed adverse effect level
NOEC: No observed effect concentration

If more than one RTV is listed, the value(s) used to calculate hazard quotients is/are shaded. If two values are shaded for a single chemical, one is a NOEC and one is a LOEC. If there is a range of values within the shaded source, the lesser value was used.

Table 3-26

Reference Toxicity Values for Terrestrial Invertebrates
Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference
Inorganics					
Ammonia	na	--	--	--	--
Antimony	na	--	--	--	--
Arsenic	Earthworms and nematodes	163	NOAEL	population counts	Bisessar, 1982
	Earthworm (*Eisenia foetida*)	**68**	**LOEC**	**growth and reproduction**	**Fischer and Koszorus, 1992 in Efromson et al., 1997b**
Barium	Earthworm sp.	270	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Beryllium	Earthworm sp.	3.1	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Cadmium	**forest soil invertebrates**	**10-50**	**NOAEL**	**species abundance and diversity**	**Bengtsson and Tranvik, 1989**
	Earthworm (Eisenia andrei)	**18**	**LOEC**	**22% reduction in number of juveniles per worm**	**van Gestel et al., 1992 in Efroymson et al., 1997b**
Chloride	na	--	--	--	--
Chromium	Earthworm (*Eisenia andrei*)	32	LOEC	30% reduction in growth	van Gestel et al., 1992 in Efroymson et al., 1997b
Cobalt	Earthworm (*Eisenia foetida)*	300-3,000	LOAEL	growth inhibition	Hartenstein et al., 1981
Copper	forest soil invertebrate	100	NOAEL	species abundance and diversity	Bengtsson and Tranvik, 1989
	Earthworm (*Aporrectodea caliginosa*)	**100**	**LOEC**	**39% decrease in cocoon production**	**Khalil et al., 1996 in Efroymson et al., 1997b**
Lead	Earthworm (*Eisenia foetida)*	5,000	LOEC	decrease in cocoon production	Newhauser et al., 1985a
	Earthworm (*Dendrobaena rubida*)	**500**	**LOEC**	**decrease in reproduction**	**Bengtsson et al., 1986 in Efroymson et al., 1997b**
Mercury	Earthworm (*Eisenia foetida)*	480-4,800	LOAEL	growth inhibition	Hartenstein et al., 1981
	Earthworm (*Octochaetus pattoni*))	**0.5**	**LOEC**	**survival and reproduction**	**Abbasi and Soni, 1983**
Molybdenum	Earthworm sp.	52	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Nickel	Earthworm (*Eisenia foetida)*	500	LOEC	reduced growth	Neuhauser et al., 1985a
	Earthworm (*Eisenia foetida)*	**200**	**LOEC**	**surival and cocoon production**	**Malecki et al., 1982 in Efroymson et al., 1997b**
Nitrate	na	--	--	--	--

Table 3-26

Reference Toxicity Values for Terrestrial Invertebrates
Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference
Nitrite	na	--	--	--	--
Phosphorus (total as P)	na	--	--	--	--
Phosphorus (total as PO4)	na	--	--	--	--
Selenium	Earthworm (*Eisenia foetida)*	77	LOEC	reduction in number of cocoons	Fischer and Koszorus, 1992 in Efroymson et al., 1997b
Silver	na	--	--	--	--
Sulfate	na	--	--	--	--
Sulfide	na	--	--	--	--
Thallium	na	--	--	--	--
Vanadium	Earthworm sp.	46	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Zinc	forest soil invertebrates	500	NOAEL	species abundance and diversity	Bengtsson and Tranvik, 1989
	Earthworm (*Eisenia andrei)*	**320**	**NOEC**	**growth and reproduction**	**van Getsel et al.., 1993 in Efroymson et al., 1997b.**
Organics					
1,1-Dichloroethene	na	--	--	--	--
1,2-Dichlorobenzene	na	--	--	--	--
1,2-Dichloroethane	na	--	--	--	--
1,2-Dichloroethene (cis-)	na	--	--	--	--
1,2-Dichloroethene (total)	na	--	--	--	--
1,3-Dichlorobenzene	na	--	--	--	--

Table 3-26

Reference Toxicity Values for Terrestrial Invertebrates
Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference
1,4-Dichlorobenzene	Earthworm sp.	128	LC50	mortality	van Gestel et al., 1992 in Efroymson et al., 1997
2,4,5-T	na	--	--	--	--
2,4,5-TP	na	--	--	--	--
2,4-D	na	--	--	--	--
2,4-DB	na	--	--	--	--
2-Butanone	na	--	--	--	--
2-Hexanone	na	--	--	--	--
4,4'-DDD	na	--	--	--	--
4,4'-DDE	na	--	--	--	--
4,4'-DDT	Earthworm (*Eisenia foetida)*	3	LOAEL	weight loss	Johnson, 1976
4-Methyl-2-pentanone	na	--	--	--	--
4-Methylphenol	na	--	--	--	--
4-Nitrophenol	Earthworm (*Eisenia foetida)*	38	LC50	mortality	Neuhauser et al., 1985b
Acenaphthene	Earthworm sp.	0.41	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Acenaphthylene	Earthworm sp.	1.7	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Acetone	na	--	--	--	--
Aldrin	na	--	--	--	--
Anthracene	Earthworm sp.	6.1	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Aroclor 1254	na	--	--	--	--
Aroclor 1260	na	--	--	--	--
Benzene	na	--	--	--	--
Benzo(a)anthracene	Earthworm sp.	4.7	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Benzo(a)pyrene	Earthworm sp.	5.3	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Benzo(b)fluoranthene	Earthworm sp.	4.6	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Benzo(e)pyrene	na	--	--	--	--
Benzo(g,h,i)perylene	Earthworm sp.	1.2	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Benzo(k)fluoranthene	Earthworm sp.	4.7	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993

Table 3-26

Reference Toxicity Values for Terrestrial Invertebrates
Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference
BHC-alpha	na	--	--	--	--
BHC-beta	na	--	--	--	--
BHC-delta	na	--	--	--	--
BHC-gamma	na	--	--	--	--
Biphenyl	na	--	--	--	--
Bis(2-ethylhexyl)phthalate	na	--	--	--	--
Butylbenzylphthalate	na	--	--	--	--
Carbon disulfide	na	--	--	--	--
Chlordane -	Nightcrawler	>32 lb/A	LD50	mortality	Ruppel and Laughlin, 1977
Chlorobenzene	na	--	--	--	--
Chloroform	na	--	--	--	--
Chlorpyrifos	na	--	--	--	--
Chrysene	Earthworm sp.	5.6	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Dalapon	na	--	--	--	--
Diazinon	na	--	--	--	--
Dibenz(a,h)anthracene	Earthworm sp.	2.5	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Dibenzothiophene	na	--	--	--	--
Dicamba	na	--	--	--	--
Dieldrin	Earthworm (*Eisenia foetida)*	25	LOEC	decrease in cocoon production	Neuhauser and Callahan, 1990
TPH-Diesel	na	--	--	--	--
Diesel fuel #2	na	--	--	--	--
Diethylphthalate	na	--	--	--	--
Dimethylphthalate	Earthworm sp.	1,064	LC50	mortality	Neuhauser et al., 1990 in Efroymson et al., 1997b
Di-n-butyl-phthalate	na	--	--	--	--
Di-n-octyl-phthalate	na	--	--	--	--
Dinoseb	na	--	--	--	--
Disulfoton (disyston)	na	--	--	--	--
Endosulfan I	na	--	--	--	--
Endosulfan II	na	--	--	--	--
Endosulfan sulfate	na	--	--	--	--
Endrin	na	--	--	--	--

Table 3-26

Reference Toxicity Values for Terrestrial Invertebrates
Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference
Endrin aldehyde	na	--	--	--	--
Endrin ketone	na	--	--	--	--
Ethylbenzene	na	--	--	--	--
Fluoranthene	Earthworm sp.	11	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Fluorene	Earthworm (*Eisenia foetida)*	173	LC50	mortality	Neuhauser et al., 1985b
Gasoline	na	--	--	--	--
Heptachlor	na	--	--	--	--
Indeno(1,2,3-cd)pyrene	Earthworm sp.	0.66	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Malathion	na	--	--	--	--
MCPP	na	--	--	--	--
Methylene chloride	na	--	--	--	--
Mevinphos	na	--	--	--	--
Naphthalene	Earthworm sp.	5.6	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Oil and grease	na	--	--	--	--
n-Propylbenzene	na	--	--	--	--
Parathion (ethyl)	na	--	--	--	--
PCB 008	na	--	--	--	--
PCB 018	na	--	--	--	--
PCB 028	na	--	--	--	--
PCB 044	na	--	--	--	--
PCB 052	na	--	--	--	--
PCB 066	na	--	--	--	--
PCB 101	na	--	--	--	--
PCB 105	na	--	--	--	--
PCB 118	na	--	--	--	--
PCB 126	na	--	--	--	--
PCB 128	na	--	--	--	--
PCB 138	na	--	--	--	--
PCB 153	na	--	--	--	--
PCB 170	na	--	--	--	--
PCB 180	na	--	--	--	--
PCB 187	na	--	--	--	--
PCB 195	na	--	--	--	--

Table 3-26

Reference Toxicity Values for Terrestrial Invertebrates
Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference
PCB 206	na	--	--	--	--
PCB 209	na	--	--	--	--
Pentachlorophenol	Earthworm (*Eisenia andrei)*	10	NOEC	cocoon production, number of juveniles per cocoon	van Gestel et al., 1989 in Efroymson et al., 1997b
Perylene	na	--	--	--	--
Phenanthrene	Earthworm sp.	4.7	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Phenol	Earthworm (*Eisenia foetida)*	401	LC50	mortality	Neuhauser et al., 1985b
Phorate (thimet)	na	--	--	--	--
Pyrene	Earthworm sp.	9.9	LOEC	little or no bioaccumulation	Beyer and Stafford, 1993
Styrene	na	--	--	--	--
Tetrachloroethene (PCE)	na	--	--	--	--
Tetrachlorvinophos	na	--	--	--	--
Toluene	na	--	--	--	--
Trichloroethylene (TCE)	na	--	--	--	--
Waste oil	na	--	--	--	--
Xylene (m,p-)	na	--	--	--	--
Xylene (o-)	na	--	--	--	--
Xylene (total)	na	--	--	--	--
Chemical Group Totals					
High MW PAHs	na	--	--	--	--
Low MW PAHs	na	--	--	--	--
Total DDT	na	--	--	--	--
Total PAHs	na	--	--	--	--
Total PAHs (lab)	na	--	--	--	--
Total PCB	na	--	--	--	--
Total PCB's (lab)	na	--	--	--	--
Total phenol	na	--	--	--	--
Total phthalate esters	na	--	--	--	--
Total phthalate esters (lab)	na	--	--	--	--
Total volatile solids	na	--	--	--	--

Notes:

-- not applicable

NOAEL: No observed adverse effect level

Table 3-26

Reference Toxicity Values for Terrestrial Invertebrates

Bolsa Chica Lowlands

Chemical	Test Species	Soil Concentration (mg/kg)	Endpoint	Effect Measured	Reference

NOEC: No observed effect concentration

LC50: Lethal concentration at which 50% of the test organisms die

LD50: Lethal dose at which 50% of the test organisms died

LOAEL: Lowest observed adverse effect concentration

LOEC: Lowest observed effect concentration

When multiple values are presented, the value used in estimating risk is shaded.

Table 3-27
Reference Toxicity Values for Birds
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Inorganics									
Ammonia	na	--	--	--	--	--	--	--	--
Antimony	na	--	--	--	--	--	--	--	--
Arsenic	mallard	1.134	0.052	--	30	1.56	chronic LOAEL	behavioral changes - feeding, resting, alert	Whitworth et al., 1991
	mallard	**1.134**	**0.052**	**5.14**	**--**	**--**	**chronic NOAEL**	**mortality -0%**	**USFWS, 1964 in Sample et al., 1996**
	mallard	**1.134**	**0.052**	**12.8**	**--**	**--**	**chronic LOAEL**	**mortality - 12%**	**USFWS, 1964 in Sample et al., 1996**
Barium	chicken	1.8	0.047	208	--	--	subchronic NOAEL	mortality	Johnson et al., 1960 in Sample et al., 1996
Beryllium	na	--	--	--	--	--	--	--	--
Cadmium	mallard	1.134	0.052	1.45	--	--	chronic NOAEL	tissue residues and egg production	White and Finley, 1978 in Sample et al., 1996
	mallard	1.134	0.052	20	--	--	chronic LOAEL	tissue residues and egg production	White and Finley, 1978 in Sample et al., 1996
Chloride	na	--	--	--	--	--	--	--	--
Chromium	black duck	1.25	0.051	1	--	--	chronic NOAEL	reproduction and duckling survival	Haseltine et al., 1985 in Sample et al., 1996
Cobalt	duck	1.134	0.052	--	2	0.10	LOAEL	reduction in growth of ducklings	Paulov, 1971
	chicken	1.8	0.047	--	10	0.47	chronic NOAEL	maximum tolerable dietary level	NAS, 1980
	chicken	**1.8**	**0.047**	**--**	**5**	**0.24**	**chronic NOAEL**	**decreased weight gain**	**Puls, 1988**
	chicken	**1.8**	**0.047**	**--**	**50**	**2.35**	**chronic LOAEL**	**decreased weight gain**	**Puls, 1988**
Copper	**chicken**	**1.8**	**0.047**	**47**	**--**	**--**	**chronic NOAEL**	**growth and mortality**	**Mehring et al., 1960 in Sample et al., 1996**
	chicken	**1.8**	**0.047**	**61.7**	**--**	**--**	**chronic LOAEL**	**growth and mortality**	**Mehring et al., 1960 in Sample et al., 1996**
	chicken	1.8	0.047	--	250	11.8	subchronic LOAEL	growth and gizzard erosion	Poupoulis and Jensen, 1976 in Eisler, 1998
	turkey	7	0.03	--	240	7.20	chronic LOAEL	growth and body weight	Kashani et al., 1986 in Eisler, 1998
Lead	coturnix quail	0.191	0.081	--	100	8.10	chronic NOAEL	anemia, growth	Morgan et al., 1975
	american kestrel	0.123	0.12	--	50	6.00	chronic NOAEL	none observed in reproduction	Pattee, 1984 in Sample et al., 1996
	mallard	1.134	0.052	--	25	1.30	chronic NOAEL	liver pathology; mortality; accumulation in liver, kidney, and bone; blood chemistry	Finley et al., 1976 in Eisler, 1988
	coturnix quail	**0.191**	**0.081**	**--**	**10**	**0.81**	**chronic NOAEL**	**no reduction in egg hatching success**	**Edens et al.,1976 in Sample et al., 1996**

Table 3-27
Reference Toxicity Values for Birds
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
	coturnix quail	**0.191**	**0.081**	**--**	**100**	**8.10**	**chronic LOAEL**	**reduced egg hatching success**	**Edens et al.,1976 in Sample et al., 1996**
Mercury	coturnix quail	0.191	0.081	--	32	2.59	chronic NOAEL	food consumption, growth, egg fertilization, egg hatchability, eggshell thickness	Hill and Shaffner, 1976
Molybdenum	chicken	1.8	0.047	35.3	--	--	chronic LOAEL	embryo mortality	Lepore and Miller, 1964 in Sample et al., 1996
Nickel	mallard	1.134	0.052	77.4	--	--	chronic NOAEL	mortality, growth, behavior	Cain and Pafford, 1981 in Sample et al., 1996
Nitrate	na	--	--	--	--	--	--	--	--
Nitrite	na	--	--	--	--	--	--	--	--
Phosphorus (total as P)	na	--	--	--	--	--	--	--	--
Phosphorus (total as PO4)	na	--	--	--	--	--	--	--	--
Selenium	mallard	1.134	0.052	0.4	--	--	chronic NOAEL	impaired reproduction	Heinz et al., 1989 in Sample et al., 1996
Silver	chicken	1.8	0.047	--	900	42.30	subchronic LOAEL	depressed growth, increased heart weight to body weight ratio, mortality	Peterson and Jensen, 1975
Sulfate	na	--	--	--	--	--	--	--	--
Sulfide	na	--	--	--	--	--	--	--	--
Thallium	mallard	1.134	0.052	36.7	--	--	LD50	mortality	Hudson et al., 1984
Vanadium	mallard	1.134	0.052	11.4	--	--	chronic NOAEL	mortality, body weight, blood chemistry	White and Dieter, 1978 in Sample et al., 1996
Zinc	chicken	1.8	0.047	14.5	--	--	chronic NOAEL	no reduction in egg hatchability	Stahl et al., 1990 in Sample et al., 1996
	chicken	1.8	0.047	131	--	--	chronic LOAEL	<20% reduction in egg hatchability	Stahl et al., 1990 in Sample et al., 1996
Organics									
1,1-Dichloroethene	na	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	na	--	--	--	--	--	--	--	--
1,2-Dichloroethane	chicken	1.8	0.047	17.2	--	--	chronic NOAEL	egg production	Alumot et al., 1976 in Sample et al., 1996
1,2-Dichloroethene (cis-)	na	--	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	na	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	na	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	na	--	--	--	--	--	--	--	--
2,4,5-T	coturnix quail	0.191	0.081	--	5,000	405	subacute NOAEL	no morality observed	Hill et al., 1975
2,4,5-TP	mallard	1.134	0.052	--	5,000	260	subacute LOAEL	mortality	Hill et al., 1975
2,4-D	coturnix quail	0.191	0.081	--	5,000	405	LC50	no mortality observed	Hill and Camardese, 1986

Table 3-27
Reference Toxicity Values for Birds
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
2,4-DB	mallard	1.134	0.052	--	5,000	260	subacute NOAEL	mortality	Hill et al., 1975
2-Butanone	na	--	--	--	--	--	--	--	--
2-Hexanone	na	--	--	--	--	--	--	--	--
4,4'-DDD	mallard	1.134	0.052	--	10	0.52	chronic NOAEL	eggshell thinning, egg cracking	Heath et al., 1969 in Stickel, 1973
4,4'-DDE	black duck	1.25	0.051	--	10	0.51	chronic LOAEL	eggshell thinning, egg cracking	Longcore et al., 1971
4,4'-DDT	mallard	1.134	0.052	--	2	0.10	chronic NOAEL	eggshell thickness, weight, calcium content	Davison and Sell, 1974
4-Methyl-2-pentanone	na	--	--	--	--	--	--	--	--
4-Methylphenol	na	--	--	--	--	--	--	--	--
4-Nitrophenol	na	--	--	--	--	--	--	--	--
Acenaphthene	na	--	--	--	--	--	--	--	--
Acenaphthylene	na	--	--	--	--	--	--	--	--
Acetone	coturnix quail	0.191	0.081	--	40,000	3,240	subacute NOAEL	no overt signs of toxicity	Hill and Camardese, 1986
Aldrin	mallard	1.134	0.052	5	--	--	chronic LOAEL	mortality	Tucker and Crabtree, 1970
Anthracene	na	--	--	--	--	--	--	--	--
Aroclor 1254	ring necked pheasant	1.0	0.054	1.8	--	--	chronic LOAEL	reduced egg hatchability	Dahlgren et al., 1972 in Sample et a., 1996
Aroclor 1260	coturnix quail	0.191	0.081	--	2,195	178	LC50	mortality	Hill and Camardese, 1986
Benzene	na	--	--	--	--	--	--	--	--
Benzo(a)anthracene	peking duck	2.5	0.043	200	--	--	BAP/0.1	TEF from benzo(a)pyrene	TEF
Benzo(a)pyrene	peking duck	2.5	0.043	20	--	--	acute NOAEL	lung histologic changes	Rigdon and Neal, 1965
Benzo(b)fluoranthene	peking duck	2.5	0.043	200	--	--	BAP/0.1	TEF from benzo(a)pyrene	TEF
Benzo(e)pyrene	na	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	na	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	peking duck	2.5	0.043	200	--	--	BAP/0.1	TEF from benzo(a)pyrene	TEF
BHC-alpha	na	--	--	--	--	--	--	--	--
BHC-beta	na	--	--	--	--	--	--	--	--
BHC-delta	na	--	--	--	--	--	--	--	--
BHC-gamma	mallard	1.134	0.052	20	--	--	chronic LOAEL	eggshell thickness, number of eggs, laying intervals	Chakravarty and Lahiri 1986 in Sample et al., 1996
Biphenyl	na	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	ringed dove	0.119	0.194	1.1	--	--	chronc NOAEL	reproductive effects	Peakall, 1974 in Sample et al., 1996

Table 3-27
Reference Toxicity Values for Birds
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Butylbenzylphthalate	na	--	--	--	--	--	--	--	--
Carbon disulfide	na	--	--	--	--	--	--	--	--
Chlordane - alpha/gamma/technical	**red-winged blackbird**	**0.064**	**0.214**	**2.14**	**--**	**--**	**chronic NOAEL**	**mortality**	**Stickel et al., 1983 in Sample et al., 1996**
	california quail	**0.191**	**0.081**	**14.1**	**--**	**--**	**LD50**	**mortality**	**Hudson et al., 1984**
	coturnix quail	0.191	0.081	--	25	2.03	subchronic NOAEL	survival, weight gain, activity	NRCC, 1975 in Eisler, 1990
	coturnix quail	0.191	0.081	--	203	16.4	subacute NOAEL	survival and food consumption	Hill and Camardese, 1986
	chicken	1.8	0.047	--	0.3	0.01	subchronic NOAEL	growth, egg hatchability, or chick growth	NRCC, 1975 in Eisler, 1990
	ring necked pheasant	1	0.054	24	--	--	LD50	mortality	Hudson et al., 1984
	ring necked pheasant	1	0.054	--	430	23.2	LD50	mortality	Hill et al., 1975
	red-winged blackbird	0.064	0.214	2.14	--	--	chronic NOAEL	mortality	Stickel et al., 1983 in Sample et al., 1996
Chlorobenzene	na	--	--	--	--	--	--	--	--
Chloroform	na	--	--	--	--	--	--	--	--
Chlorpyrifos	coturnix quail	0.191	0.081	15.9	--	--	LD50	mortality	Tucker and Haegele, 1971 in Eisler, 1988
Chrysene	peking duck	2.5	0.043	2,000	--	--	BAP/0.01	TEF from benzo(a)pyrene	TEF
Dalapon	coturnix quail	0.191	0.081	--	5,000	405	acute NOAEL	no overt signs of toxicity	Hill and Camardese, 1986
Diazinon	coturnix quail	0.191	0.081	--	167	14	LC50	mortality	Hill and Camardese, 1986
Dibenz(a,h)anthracene	peking duck	2.5	0.043	20	--	--	BAP/1	TEF from benzo(a)pyrene	TEF
Dibenzothiophene	na	--	--	--	--	--	--	--	--
Dicamba	coturnix quail	0.191	0.081	--	5,000	405	acute NOAEL	no overt signs of toxicity	Hill and Camardese, 1986
Dieldrin	barn owl	0.466	0.134	0.077	--	--	chronic NOAEL	eggshell thickness, number of eggs laid/hatched, %broken, embryo mortality	Mendenhall et al., 1983 in Sample et al., 1996
TPD-Diesel	na	--	--	--	--	--	--	--	--
Diesel Fuel #2	na	--	--	--	--	--	--	--	--
Diethylphthalate	na	--	--	--	--	--	--	--	--

Table 3-27
Reference Toxicity Values for Birds
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Dimethylphthalate	na	--	--	--	--	--	--	--	--
Di-n-butyl-phthalate	ringed dove	0.119	0.194	1.10	--	--	chronic LOAEL	eggshell thickness and water permeability	Peakhall, 1974 in Sample et al., 1996
Di-n-octyl-phthalate	mallard	1.134	0.052	--	5,000	260	LC50	mortality	Hill et al., 1975
Dinoseb	coturnix quail	0.191	0.081	--	250	20	subacute NOAEL	no overt signs of toxicity	Hill and Camardese, 1986
Disulfoton (disyston)	coturnix quail	0.191	0.081	--	200	16.2	acute toxicity	mortality	Hill and Camardese, 1986
Endosulfan I[a]	gray partridge	0.4	0.068	10	--	--	chronic NOAEL	no overt signs of toxicity, reproduction	Abiola, 1992 in Sample et al., 1996
Endosulfan II[a]	gray partridge	0.4	0.068	10	--	--	chronic NOAEL	no overt signs of toxicity, reproduction	Abiola, 1992 in Sample et al., 1996
Endosulfan sulfate[a]	gray partridge	0.4	0.068	10	--	--	chronic NOAEL	no overt signs of toxicity, reproduction	Abiola, 1992 in Sample et al., 1996
Endrin	mallard	1.134	0.052	0.3	--	--	chronic NOAEL	reproductive performance	Spann et al., 1986 in Sample et al., 1996
Endrin aldehyde[a]	mallard	1.134	0.052	0.3	--	--	chronic NOAEL	reproductive performance	Spann et al., 1986 in Sample et al., 1996
Endrin ketone[b]	mallard	1.134	0.052	0.3	--	--	chronic NOAEL	reproductive performance	Spann et al., 1986 in Sample et al., 1996
Ethylbenzene	na	--	--	--	--	--	--	--	--
Fluoranthene	na	--	--	--	--	--	--	--	--
Fluorene	na	--	--	--	--	--	--	--	--
Gasoline	na	--	--	--	--	--	--	--	--
Heptachlor	coturnix quail	0.191	0.081	--	50	4.05	subacute LOAEL	signs of toxicity, mortality	Hill et al., 1975
Indeno(1,2,3-cd)pyrene	peking duck	2.5	0.043	200	--	--	BAP/0.1	TEF from benzo(a)pyrene	TEF
Malathion	pheasant	1.135	0.054	167	--	--	LD50	CNS - ataxia, imbalance, slowness, falling, tremors, dyspnea, convulsions	Hudson et al., 1984
MCPP	na	--	--	--	--	--	--	--	--
Methylene chloride	na	--	--	--	--	--	--	--	--
Mevinphos	coturnix quail	0.191	0.081	--	250	20	acute toxicity	mortality	Hill and Camardese, 1986
Naphthalene	mallard	1.134	0.052	--	4,000	208	chronic LOAEL	increased liver weight and blood flow to liver	Patton and Dieter, 1980 in Eisler, 1987
Oil and grease	na	--	--	--	--	--	--	--	--
n-Propylbenzene	na	--	--	--	--	--	--	--	--
Parathion, ethyl[a]	mallard	1.134	0.052	1.44	--	--	LD50	CNS - tremors, dyspnea, prostrationconvulsions	Hudson et al., 1984
PCB 008	na	--	--	--	--	--	--	--	--
PCB 018	na	--	--	--	--	--	--	--	--
PCB 028	na	--	--	--	--	--	--	--	--
PCB 044	na	--	--	--	--	--	--	--	--

Table 3-27
Reference Toxicity Values for Birds
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
PCB 052	na	--	--	--	--	--	--	--	--
PCB 066	na	--	--	--	--	--	--	--	--
PCB 101	na	--	--	--	--	--	--	--	--
PCB 105	na	--	--	--	--	--	--	--	--
PCB 118	na	--	--	--	--	--	--	--	--
PCB 126	na	--	--	--	--	--	--	--	--
PCB 128	na	--	--	--	--	--	--	--	--
PCB 138	na	--	--	--	--	--	--	--	--
PCB 153	na	--	--	--	--	--	--	--	--
PCB 170	na	--	--	--	--	--	--	--	--
PCB 180	na	--	--	--	--	--	--	--	--
PCB 187	na	--	--	--	--	--	--	--	--
PCB 195	na	--	--	--	--	--	--	--	--
PCB 206	na	--	--	--	--	--	--	--	--
PCB 209	na	--	--	--	--	--	--	--	--
Pentachlorophenol	chicken	1.8	0.047	--	1	0.05	subchronic LOAEL	liver histopathology, diarrhea	Steadman et al., 1980 in Eisler, 1989
Perylene	na	--	--	--	--	--	--	--	--
Phenanthrene	mallard	1.134	0.052	--	4,000	208	chronic LOAEL	increased liver weight and blood flow to liver	Patton and Dieter, 1980 in Eisler, 1987
Phenol	na	--	--	--	--	--	--	--	--
Phorate (thimet)	mallard	1.134	0.052	0.09	--	--	acute toxicity	CNS - ataxia, diarrhea, lacrimation, irregular hear and respiratory rates, tremors,	Hudson et al., 1984
Pyrene	na	--	--	--	--	--	--	--	--
Styrene	na	--	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	na	--	--	--	--	--	--	--	--
Tetrachlorvinophos	pheasant	1.135	0.054	2,000	--	--	acute toxicity	conulsions, tremors, prostration	Hudson et al., 1984
Toluene	na	--	--	--	--	--	--	--	--
Trichloroethylene (TCE)	na	--	--	--	--	--	--	--	--
Waste oil	na	--	--	--	--	--	--	--	--
Xylene (m,p-)[a]	coturnix quail	0.191	0.081	--	5,000	405	subacute NOAEL	no overt signs of toxicity	Hill and Camardese, 1986
Xylene (o-)[a]	coturnix quail	0.191	0.081	--	5,000	405	subacute NOAEL	no overt signs of toxicity	Hill and Camardese, 1986
Xylene (total)	coturnix quail	0.191	0.081	--	5,000	405	subacute NOAEL	no overt signs of toxicity	Hill and Camardese, 1986
Chemical Group Totals									
High MW PAHs	na	--	--	--	--	--	--	--	--
Low MW PAHs	na	--	--	--	--	--	--	--	--
Total DDT	na	--	--	--	--	--	--	--	--
Total PAHs	na	--	--	--	--	--	--	--	--
Total PAHs (lab)	na	--	--	--	--	--	--	--	--
Total PCB	na	--	--	--	--	--	--	--	--

Table 3-27
Reference Toxicity Values for Birds
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Total PCB's (lab)	na	--	--	--	--	--	--	--	--
Total phenol	na	--	--	--	--	--	--	--	--
Total phthalate esters	na	--	--	--	--	--	--	--	--
Total phthalate esters (lab)	na	--	--	--	--	--	--	--	--
Total volatile solids	na	--	--	--	--	--	--	--	--

Notes:

[a]Effect level for similar chemical (surrogate) used:

Chemical	*Surrogate*
endosulfan I	endosulfan
endosulfan II	endosulfan
endosulfan sulfate	endosulfan
endrin aldehyde	endrin
endrin ketone	endrin
parathion, ethyl-	parathion
m,p-xylene	total xylene
o-xylene	total xylene

-- : Not applicable
na: Not available
RTV: Reference toxicity value.
LC50: Lethal concentration at which 50% of the test organisms died
LD50: Lethal dose at which 50% of the test organisms died
LOAEL: Lowest observed adverse effect level
NOAEL: No observed adverse effect level

When multiple values are presented for a given endpoint (e.g. NOAEL), the value used to estimate risk is shaded.

Table 3-28
Reference Toxicity Values for Mammals
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw-d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Inorganics									
Ammonia	human	70	0.04	--	34	1.4	NOAEL	taste threshold in water (34 mg/L)	HEAST, 1995
Antimony	rat	0.35	0.08	--	5	0.4	chronic LOAEL	longevity, blood glucose levels, and serum cholesterol levels	Schroeder et al., 1970
Arsenic	rat	0.35	0.08	--	31	2.5	chronic NOAEL	survival, body weight, and histology - enlargement of bile duct	Byron et al., 1967
	mouse	0.03	0.18	1.26	--	--	chronic LOAEL	declining litter sizes over 3 generations	Schroeder and Mitchner, 1971 in Sample et al., 1996
Barium	rat	0.35	0.08	5.06	--	--	chronic NOAEL	growth and cardiovascular hypertension	Perry et al., 1983 in Sample et al., 1996
	rat	**0.35**	**0.08**	**--**	**5**	**0.4**	**chronic NOAEL**	**median life-span, longevity, incidence of tumors, serum cholesterol, glucose, uric acid**	**Schroeder and Mitchner, 1975**
	rat	**0.35**	**0.08**	**300**	**--**	**--**	**subchronic LOAEL**	**30% mortality of female test species**	**Borzelleca et al., 1988 in Sample et al., 1996**
Beryllium	rat	0.35	0.08	0.66	--	--	chronic NOAEL	longevity, weight loss	Schroeder and Mitchner, 1975 in Sample et al., 1996
	rat	**0.35**	**0.08**	**0.54**	**--**	**--**	**chronic NOAEL**	**none observed**	**HEAST, 1995**
Cadmium	**rat**	**0.35**	**0.08**	**1**	**--**	**--**	**chronic NOAEL**	**fetal implantations, resorptions, and survivorship**	**Sutou et al., 1980 in Sample et al., 1996**
	rat	**0.35**	**0.08**	**10**	**--**	**--**	**chronic LOAEL**	**fetal implantations, resorptions, and survivorship**	**Sutou et al., 1980 in Sample et al., 1996**
	rat	0.35	0.08	6.13	--	--	chronic NOAEL	reproduction, malformation of fetus, fetal weight	Machener and Lorke, 1981 in Sample et al., 1996
	rat	0.35	0.08	18.4	--	--	chronic LOAEL	reproduction, malformation of fetus, fetal weight	Machener and Lorke, 1981 in Sample et al., 1996
Chloride	na	--	--	--	--	--	--	--	--
Chromium	rat	0.35	0.08	2,737	--	--	chronic NOAEL	reproduction and lifespan	Ivankovic and Preussmann, 1975 in Sample et al., 1996
Cobalt	rat	0.35	0.08	0.05	--	--	chronic NOAEL	conditioned reflexes and stimulation of hemopoiesis	Krasovski and Fridlyand, 1971
Copper	rat	0.35	0.08	--	250	20	subchronic NOAEL	impairment of learning ability, hyperactivity, behavioral aberrations	Murthy et al., 1981
	rat	0.35	0.08	5	--	--	chronic NOAEL	liver and kidney histopathology, body and organ weights	HEAST, 1995
	mink	**1**	**0.137**	**11.7**	**--**	**--**	**chronic NOAEL**	**increased mortality of kits**	**Aulerich et al., 1982 in Sample et al., 1996**
	mink	**1**	**0.137**	**15.14**	**--**	**--**	**chronic LOAEL**	**increased mortality of kits**	**Aulerich et al., 1982 in Sample et al., 1996**

Table 3-28
Reference Toxicity Values for Mammals
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	**Species**	**Body Weight (kg)**	**Ingestion Rate (kg/kgbw-d)**	**Reported Dosage (mg/kgbw-d)**	**Reported Dietary Concentration (mg/kg)**	**Calculated Dosage (from dietary concentration) (mg/kgbw-d)**	**Endpoint**	**Effect Measured/Observed**	**Reference**
Lead	**rat**	**0.35**	**0.08**	**--**	**5**	**0.4**	**chronic NOAEL**	**blood pressure**	**Perry et al., 1988**
	rat	0.35	0.08	8	--	--	chronic NOAEL	number of pregnancies, live births, offspring body weight and kidney function	Azar et al., 1973 in Sample et al., 1996
	rat	**0.35**	**0.08**	**80**	**--**	**--**	**chronic LOAEL**	**number of pregnancies, live births, offspring body weight and kidney function**	**Azar et al., 1973 in Sample et al., 1996**
Mercury	mink	1	0.137	1.01	--	--	chronic NOAEL	fertility and kit survival	Aulerich et al., 1974 in Sample et al., 1996
	rat	**0.35**	**0.08**	**0.032**	**--**	**--**	**chronic NOAEL**	**pup viability**	**Verschueren et al., 1976 in Sample et al., 1996**
	rat	**0.35**	**0.08**	**0.16**	**--**	**--**	**chronic LOAEL**	**pup viability**	**Verschueren et al., 1976 in Sample et al., 1996**
Molybdenum	rabbit	3.8	0.034	--	500	17	chronic NOAEL	no adverse effects reported	NAS, 1980
Nickel	rat	0.35	0.08	--	500	40	chronic NOAEL	reproduction, offspring body weight	Ambrose et al., 1976
	rat	**0.35**	**0.08**	**--**	**1,000**	**80**	**chronic LOAEL**	**reproduction, offspring body weight**	**Ambrose et al., 1976**
	rat	**0.35**	**0.08**	**--**	**100**	**8.0**	**chronic NOAEL**	**body and organ weights**	**HEAST, 1995**
Nitrate	guinea pig	0.86	0.06	507	--	--	chronic NOAEL	reproduction, live births	Sleight and Atallah, 1968 in Sample et al., 1996
Nitrite	human	70	0.04	--	10	0.4	NOEL	blood - methemoglobinemia	HEAST, 1995
Phosphorus (total as P)	na	--	--	--	--	--	--	--	--
Phosphorus (total as PO4)	na	--	--	--	--	--	--	--	--
Selenium	wildlife	0.03	0.18	--	2	0.4	NOAEL	bioaccumulation	USDI, 1993
Silver	**mouse**	**0.03**	**0.18**	**--**	**150**	**27**	**chronic LOAEL**	**hypoactivity-lowered activity levels**	**Rungby and Danscher, 1984**
	rat	0.35	0.08	55.7	--	--	chronic NOAEL	decreased body weight, thyroid effects, nerve myelin degeneration	HEAST, 1995
Sulfate	na	--	--	--	--	--	--	--	--
Sulfide	na	--	--	--	--	--	--	--	--
Thallium	rat	0.35	0.08	0.23	--	--	chronic NOAEL	increased liver SGOT and blood serum LDH; hair alopecia	HEAST, 1995
Vanadium	rat	0.35	0.08	--	5	0.4	chronic NOAEL	longevity, blood glucose levels, and serum cholesterol levels	Schroeder et al., 1970
Zinc	rat	0.35	0.08	--	2,000	160	chronic NOAEL	fetal growth rates, rates of fetal reabsorption	Schlicker and Cox, 1968 in Sample et al., 1996
	rat	**0.35**	**0.08**	**--**	**4,000**	**320**	**chronic LOAEL**	**fetal growth rates, rates of fetal reabsorption**	**Schlicker and Cox, 1968 in Sample et al., 1996**
	rat	**0.35**	**0.08**	**24.3**	**--**	**--**	**chronic NOAEL**	**decreased body weight, thyroid effects, nerve myelin degeneration**	**HEAST, 1995**

Table 3-28
Reference Toxicity Values for Mammals
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw-d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Organics									
1,1-Dichloroethene	rat	0.35	0.08	9	--	--	chronic LOAEL	liver lesions	HEAST, 1995
1,2-Dichlorobenzene	na	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mouse	0.03	0.18	50	--	--	chronic NOAEL	none observed after 2 generations	Lane et al., 1982 in Sample et al., 1996
1,2-Dichloroethene (cis-)	rat	0.35	0.08	32	--	--	chronic NOAEL	decreased blood hematocrit and hemoglobin	HEAST, 1995
1,2-Dichloroethene (total)	mouse	0.03	0.18	452	--	--	subchronic NOAEL	blood chemistry alterations, hepatic function, body and organ weight	Palmer et al., 1979 in Sample et al., 1996
1,3-Dichlorobenzene	na	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	na	--	--	--	--	--	--	--	--
2,4,5-T	na	--	--	--	--	--	--	--	--
2,4,5-TP	dog	12.7	0.024	1	--	--	chronic NOAEL	liver histopathology	HEAST, 1995
2,4-D	deer	74	0.027	80	--	--	mild acute toxicity	CNS - imbalance, slowness, tremors, prostration, salivation	Hudson et al., 1984
2,4-DB	dog	12.7	0.024	8	--	--	chronic NOAEL	cardiovascular hemorrage, mortality	HEAST, 1995
2-Butanone	rat	0.35	0.08	173	--	--	subchronic NOAEL	not reported	Lewis, 1992
2-Hexanone	guinea pig	0.86	0.06	141	--	--	chronic effect	optic nerve damage	Abdel-Rahman et al., 1978
4,4'-DDD	rat	0.35	0.08	121	--	--	chronic effect	decreased organ and body weight, suppressed immunity	Hamid et al., 1974
4,4'-DDE	rat	0.35	0.08	21.9	--	--	chronic effect	mortality and tumor growth	NCI, 1978
4,4'-DDT	rat	0.35	0.08	0.80	--	--	chronic NOAEL	number of young produced	Fitzhugh, 1948 in Sample et al., 1996
4-Methyl-2-pentanone	rat	0.35	0.08	250	--	--	chronic NOAEL	lethargy, liver and kidney weight and function	HEAST, 1995
4-Methylphenol	rabbit	3.8	0.034	5	--	--	chronic NOAEL	CNS hypoactivity, respiratory distress, mortality	HEAST, 1995
4-Nitrophenol	mouse	0.03	0.18	380	--	--	LD50	mortality	Lewis, 1992
Acenaphthene	mouse	0.03	0.18	175	--	--	chronic NOAEL	liver hepatotoxicity	HEAST, 1995
Acenaphthylene	na	--	--	--	--	--	--	--	--
Acetone	rat	0.35	0.08	100	--	--	chronic NOEL	increased liver and kidney weight, kidney nepthrotoxicity	HEAST, 1995
Aldrin	rat	0.35	0.08	0.2	--	--	chronic NOAEL	number of litters, offspring mortality	Treon and Cleveland, 1955 in Sample et al., 1996
Anthracene	rat	0.35	0.08	3,300	--	--	chronic effect	carcinogenicity	Sims and Overcash, 1983 in Eisler, 1987
Aroclor 1254	rat	0.35	0.08	0.32	--	--	chronic NOAEL	no reproductive effects	Linder et al., 1974
Aroclor 1260	rat	0.35	0.08	6.9	--	--	chronic NOAEL	no reproductive effects	Linder et al., 1974
Benzene	rat	0.35	0.08	2.35	--	--	acute NOAEL	blood chemistry changes	Deichman et al., 1963
Benzo(a)anthracene	rodent	0.35	0.08	2	--	--	chronic effect	carcingenicity	Sims and Overcash, 1983 in Eisler, 1987

Table 3-28
Reference Toxicity Values for Mammals
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw-d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Benzo(a)pyrene	mouse	0.03	0.18	1	--	--	chronic LOAEL	rate of pregnancy, percentage of viable litters, pup weight	Mackenzie and Angevine, 1981 in Sample et al., 1996
Benzo(b)fluoranthene	rodent	0.35	0.08	40	--	--	chronic effect	carcingenicity	Sims and Overcash, 1983 in Eisler, 1987
Benzo(e)pyrene	na	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	na	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	rodent	0.35	0.08	72	--	--	chronic effect	carcingenicity	Sims and Overcash, 1983 in Eisler, 1987
BHC-alpha	mouse	0.03	0.18	13	--	--	chronic NOAEL	no overt signs of toxicity	Ito et al., 1973
BHC-beta	rat	0.35	0.08	4	--	--	subchronic NOAEL	gonadal atrophy in both males and females	Van Velsen et al., 1986 in Sample et al., 1996
BHC-delta	mouse	0.03	0.18	32.5	--	--	chronic NOAEL	no effects	Ito et al., 1973
BHC-gamma	rat	0.35	0.08	8	--	--	chronic NOAEL	none observed during 3 generations	Palmer et al., 1978 in Sample et al., 1996
Biphenyl	na	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	mouse	0.03	0.18	18	--	--	chronic NOAEL	reproductive effects	Lamb et al., 1987 in Sample et al., 1996
Butylbenzylphthalate	rat	0.35	0.08	159	--	--	chronic NOAEL	altered liver weight	HEAST, 1995
Carbon disulfide	rabbit	3.8	0.034	11	--	--	chronic NOEL	fetal toxicity	HEAST, 1995
Chlordane - alpha/gamma/technical	mouse	0.03	0.18	4.6	--	--	chronic NOAEL	viability and reduction in number of offspring	WHO, 1984 in Sample et al., 1996
	dog	12.7	0.024	0.075	--	--	chronic NOAEL	behavior, appearance, survival, weight gain, blood chemistry	NRCC, 1975 and WHO, 1984 in Eisler, 1990
	dog	12.7	0.024	200.0	--	--	acute NOAEL	survival	WHO, 1984 in Eisler, 1990
	mouse	0.03	0.18	0.1	--	--	chronic LOAEL	increased liver to body weight ratio	EPA, 1988c in Eisler, 1990
	rabbit	3.8	0.034	1.0	--	--	subacute LOAEL	miscarriages, no other effects to behavior, appearance, or body weight	WHO, 1984 in Eisler, 1990
	rat	**0.35**	**0.08**	**0.229**	**--**	**--**	**chronic NOAEL**	**hematology, clinical chemistry, body weight, survival**	**EPA, 1988c in Eisler, 1990**
	rat	**0.35**	**0.08**	**1.175**	**--**	**--**	**chronic LOAEL**	**hepatocellular necrosis and liver adenomas**	**EPA, 1988 in Eisler, 1990**
	rat	0.35	0.08	--	30	2.4	chronic NOAEL	no effect on fertility, number or young, growth, or mortality	NRCC, 1975 and WHO, 1984 in Eisler, 1990
	rat	0.35	0.08	--	5	0.4	chronic NOAEL	no adverse effects reported	Ingle, 1965 in Eisler, 1990
	rat	0.35	0.08	--	20	1.6	chronic LOAEL	liver enlargement and micropathology	Ingle, 1965 in Eisler, 1990
	rat	0.35	0.08	--	15	1.2	chronic NOAEL	no adverse effects on liver	NRCC, 1975 in Eisler, 1990
	rat	0.35	0.08	--	25	2.0	chronic LOAEL	some adverse effects on liver	NRCC, 1975 in Eisler, 1990
	rat	0.35	0.08	0.055	--	--	chronic NOEL	liver hypertrophy	HEAST, 1995
	mouse	0.03	0.18	4.6	--	--	chronic NOAEL	viability and reduction in number of offspring	WHO, 1984 in Sample et al., 1996

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Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw-d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Chlorobenzene	na	--	--	--	--	--	--	--	--
Chloroform	rat	0.35	0.08	150	--	--	subchronic NOAEL	gonadal atrophy in both males and females	Palmer et al., 1979 in Sample et al., 1996
Chlorpyrifos	rat	0.35	0.08	151	--	--	LD50	mortality	Hudson et al., 1984 in Eisler, 1988
Chrysene	rodent	0.35	0.08	99	--	--	chronic effect	carcingenicity	Sims and Overcash, 1983 in Eisler, 1987
Dalapon	rat	0.35	0.08	8.45	--	--	chronic NOEL	increased kidney weight	HEAST, 1995
Diazinon	rat	0.35	0.08	0.09	--	--	subchronic NOAEL	decreased blood cholinesterase activity	HEAST, 1995
Dibenz(a,h)anthracene	rodent	0.35	0.08	0.006	--	--	chronic effect	carcinogenicity	Sims and Overcash, 1983 in Eisler, 1987
Dibenzothiophene	na	--	--	--	--	--	--	--	--
Dicamba	na	--	--	--	--	--	--	--	--
Dieldrin	rat	0.35	0.08	0.005	--	--	chronic NOAEL	liver lesions	HEAST, 1995
TPH-Diesel	rat	0.35	0.08	5,100	--	--	LD50	mortality	BEIA, 1989
Diesel fuel #2	na	--	--	--	--	--	--	--	--
Diethylphthalate	mouse	0.03	0.18	4,583	--	--	chronic NOAEL	reprodution	Lamb et al., 1987 in Sample et al., 1996
Dimethylphthalate	na	--	--	--	--	--	--	--	--
Di-n-butyl-phthalate	mouse	0.03	0.18	550	--	--	chronic NOAEL	litters/pair, live pups/litter	Lamb et al., 1987 in Sample et al., 1996
Di-n-octyl-phthalate	rat	0.35	0.08	175	--	--	chronic LOAEL	increased liver and kidney weight, increased liver SGOT and SGPT activity	HEAST, 1995
Dinoseb	rat	0.35	0.08	9.1	--	--	chronic NOAEL	reproductive failure	Linder et al., 1982
Disulfoton (disyston)	na	--	--	--	--	--	--	--	--
Endosulfan I[a]	rat	0.35	0.08	--	15	1.2	chronic NOAEL	decreased body weight gain, kidney glomerulonephrosis, blood vessel aneurysms	HEAST, 1995
Endosulfan II[a]	rat	0.35	0.08	--	15	1.2	chronic NOAEL	decreased body weight gain, kidney glomerulonephrosis, blood vessel aneurysms	HEAST, 1995
Endosulfan sulfate[a]	rat	0.35	0.08	--	15	1.2	chronic NOAEL	decreased body weight gain, kidney glomerulonephrosis, blood vessel aneurysms	HEAST, 1995
Endrin	mouse	0.03	0.18	0.920	--	--	chronic LOAEL	reduced parental survival, litter size, number of young	Good and Ware et al., 1969 in Sample et al., 1996
Endrin aldehyde[a]	mouse	0.03	0.18	0.920	--	--	chronic LOAEL	reduced parental survival, litter size, number of young	Good and Ware et al., 1969 in Sample et al., 1996
Endrin ketone[a]	mouse	0.03	0.18	0.920	--	--	chronic LOAEL	reduced parental survival, litter size, number of young	Good and Ware et al., 1969 in Sample et al., 1996
Ethylbenzene	rat	0.35	0.08	97.1	--	--	chronic NOAEL	liver and kidney histopathology	Wolf et al., 1956

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Reference Toxicity Values for Mammals
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw-d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Fluoranthene	mouse	0.03	0.18	125	--	--	chronic NOAEL	kidney nephropathy, liver weight changes, hemotological changes	HEAST, 1995
	mouse	0.03	0.18	250	--	--	chronic LOAEL	kidney nephropathy, liver weight changes, hemotological changes	HEAST, 1995
Fluorene	mouse	0.03	0.18	125	--	--	chronic NOAEL	decreased erythrocyte count	HEAST, 1995
Gasoline	rat	0.35	0.08	13,600	--	--	LD50	mortality	BEIA, 1989
Heptachlor	rat	0.35	0.08	0.15	--	--	chronic NOAEL	increased liver weight	HEAST, 1995
Indeno(1,2,3-cd)pyrene	rodent	0.35	0.08	72	--	--	chronic effect	carcingenicity	Sims and Overcash, 1983 in Eisler, 1987
Malathion	na	--	--	--	--	--	--	--	--
MCPP	na	--	--	--	--	--	--	--	--
Methylene chloride	rat	0.35	0.08	5.85	--	--	chronic NOAEL	liver histopathology	NCA, 1982 in Sample et al., 1996
Mevinphos	na	--	--	--	--	--	--	--	--
Naphthalene	rat	0.35	0.08	41	--	--	chronic NOAEL	none observed	Schmahl, 1955
Oil and grease	na	--	--	--	--	--	--	--	--
n-Propylbenzene	na	--	--	--	--	--	--	--	--
Parathion (ethyl)	na	--	--	--	--	--	--	--	--
PCB 008	na	--	--	--	--	--	--	--	--
PCB 018	na	--	--	--	--	--	--	--	--
PCB 028	na	--	--	--	--	--	--	--	--
PCB 044	na	--	--	--	--	--	--	--	--
PCB 052	na	--	--	--	--	--	--	--	--
PCB 066	na	--	--	--	--	--	--	--	--
PCB 101	na	--	--	--	--	--	--	--	--
PCB 105	na	--	--	--	--	--	--	--	--
PCB 118	na	--	--	--	--	--	--	--	--
PCB 126	na	--	--	--	--	--	--	--	--
PCB 128	na	--	--	--	--	--	--	--	--
PCB 138	na	--	--	--	--	--	--	--	--
PCB 153	na	--	--	--	--	--	--	--	--
PCB 170	na	--	--	--	--	--	--	--	--
PCB 180	na	--	--	--	--	--	--	--	--
PCB 187	na	--	--	--	--	--	--	--	--
PCB 195	na	--	--	--	--	--	--	--	--
PCB 206	na	--	--	--	--	--	--	--	--
PCB 209	na	--	--	--	--	--	--	--	--
Pentachlorophenol	mouse	0.3	0.18	3	--	--	chronic NOAEL	no measurable effects in males or females based on clinical chemistry, hematology, routine histopatholgy, and organ weights	EPA, 1980 in Eisler, 1989
Perylene	na	--	--	--	--	--	--	--	--
Phenanthrene	rat	0.35	0.08	700	--	--	LD50	mortality	Sims and Overcash, 1983 in Eisler, 1987
Phenol	mouse	0.03	0.18	947	--	--	chronic No Effect	survival, body weight, pathology	NCI, 1980
Phorate (thimet)	na	--	--	--	--	--	--	--	--

Table 3-28
Reference Toxicity Values for Mammals
Bolsa Chica Lowlands

	Test Species Parameters			Reference Toxicity Values					
Chemical	Species	Body Weight (kg)	Ingestion Rate (kg/kgbw-d)	Reported Dosage (mg/kgbw-d)	Reported Dietary Concentration (mg/kg)	Calculated Dosage (from dietary concentration) (mg/kgbw-d)	Endpoint	Effect Measured/Observed	Reference
Pyrene	mouse	0.03	0.18	125	--	--	chronic NOAEL	kidney function	EPA, 1988b
Styrene	rat	0.35	0.08	1,000	--	--	LD50	mortality	Verschueren, 1983
Tetrachloroethene (PCE)	mouse	0.03	0.18	14	--	--	chronic NOAEL	liver toxicity	HEAST, 1995
Tetrachlorvinophos	na	--	--	--	--	--	--	--	--
Toluene	rat	0.35	0.08	260	--	--	chronic LOAEL	fetal weight, embryo mortality	Nawrot and Staples, 1979 in Sample et al., 1996
Trichloroethylene (TCE)	mouse	0.03	0.18	100	--	--	subchronic LOAEL	hepatoxicity	Buben and O'Flaherty, 1985 in Sample et al., 1996
Waste oil	na	--	--	--	--	--	--	--	--
Xylene (m,p-)	rat	0.35	0.08	250	--	--	chronic NOEL	body weight, hyperactivity	HEAST, 1995
Xylene (o-)	rat	0.35	0.08	250	--	--	chronic NOEL	body weight, hyperactivity	HEAST, 1995
Xylene (total)	rat	0.35	0.08	250	--	--	chronic NOEL	body weight, hyperactivity	HEAST, 1995
Chemical Group Totals									
High MW PAHs	na	--	--	--	--	--	--	--	--
Low MW PAHs	na	--	--	--	--	--	--	--	--
Total DDT	na	--	--	--	--	--	--	--	--
Total PAHs	na	--	--	--	--	--	--	--	--
Total PAHs (lab)	na	--	--	--	--	--	--	--	--
Total PCB	na	--	--	--	--	--	--	--	--
Total PCB's (lab)	na	--	--	--	--	--	--	--	--
Total phenol	na	--	--	--	--	--	--	--	--
Total phthalate esters	na	--	--	--	--	--	--	--	--
Total phthalate esters (lab)	na	--	--	--	--	--	--	--	--
Total volatile solids	na	--	--	--	--	--	--	--	--

Notes:

[a]Effect level for similar chemical (surrogate) used:

Chemical	*Surrogate*
endosulfan 1	endosulfan
endosulfan 2	endosulfan
endosulfan sulfate	endosulfan
endrin aldehyde	endrin
m,p-xylene	total xylene
o-xylene	total xylene

-- : not applicable
na: not available
LD50: Lethal dose at which 50% of the test organisms died.
LOAEL: Lowest observed adverse effect level
NOAEL: No observed adverse effect leve

When multiple values are listed for a given endpoint (e.g. NOAEL), the value used to estimate risk is shaded.

Table 3-29
Reference Toxicity Values for Sediment
Bolsa Chica Lowlands

Analyte	Screening Effect Levels (mg/kg) ER-L	ER-M	Site Specific Effect Levels: Nereis Bioassay Survival (mg/kg) NOEC	Amphipod Regression Analysis Survival (mg/kg) LC20	LC50
Inorganics					
Ammonia	--	--	--	--	--
Antimony	--	--	--	--	--
Arsenic	8.2	70	16	--	--
Barium	--	--	44	--	--
Beryllium	--	--	0.29	0.78	4.43
Cadmium	1.2	9.6	0.054	--	--
Chloride	--	--	--	--	--
Chromium	81	370	11.6	52.4	110
Cobalt	--	--	1.61	10	21.5
Copper	34	270	5.4	--	--
Lead	46.7	218	13.3	--	--
Mercury	0.15	0.71	0.059	--	--
Molybdenum	--	--	--	--	--
Nickel	20.9	51.6	17.4	19.6	58.1
Nitrate	--	--	--	--	--
Nitrite	--	--	--	--	--
Phosphorus (total as P)	--	--	--	--	--
Phosphorus (total as PO4)	--	--	--	--	--
Selenium	--	--	0.092	0.28	1.65
Silver	1	3.7	0.031	--	--
Sulfate	--	--	--	--	--
Sulfide	--	--	--	--	--
Thallium	--	--	0.069	0.34	0.58
Vanadium	--	--	21.2	65.3	135
Zinc	150	410	37.5	104	459
Organics					
1,1-Dichloroethene	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	--
1,2-Dichloroethane	--	--	--	--	--
1,2-Dichloroethene (cis-)	--	--	--	--	--
1,2-Dichloroethene (total)	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	--
1,4-Dichlorobenzene	--	--	--	--	--
2,4,5-T	--	--	--	--	--
2,4,5-TP	--	--	--	--	--
2,4-D	--	--	--	--	--
2,4-DB	--	--	--	--	--
2-Butanone	--	--	--	--	--
2-Hexanone	--	--	--	--	--
4,4'-DDD[a]	0.002	0.02	0.0063	--	--
4,4'-DDE	0.0022	0.027	0.0058	--	--
4,4'-DDT[a]	0.001	0.007	0.0169	--	--
4-Methyl-2-pentanone	--	--	--	--	--
4-Methylphenol	--	--	0--107	--	--
4-Nitrophenol	--	--	--	--	--
Acenaphthene	0.016	0.5	0.114	--	--

Table 3-29
Reference Toxicity Values for Sediment
Bolsa Chica Lowlands

	Screening Effect Levels (mg/kg)		Site Specific Effect Levels		
			Nereis Bioassay Survival (mg/kg)	Amphipod Regression Analysis Survival (mg/kg)	
Analyte	**ER-L**	**ER-M**	**NOEC**	**LC20**	**LC50**
Acenaphthylene	0.044	0.64	--	--	--
Acetone	--	--	--	--	--
Aldrin	--	--	0.00039	0.00022	0.00231
Aroclor 1254	--	--	0.0087	--	--
Aroclor 1260	--	--	0.0035	--	--
Anthracene	0.0853	1.1	0.0035	--	--
Benzene	--	--	.	--	--
Benzo(a)anthracene	0.261	1.6	0.0035	--	--
Benzo(a)pyrene	0.43	1.6	0.0064	--	--
Benzo(b)fluoranthene	--	--	0.0073	0.0581	3.391
Benzo(e)pyrene	--	--	0.00504	--	--
Benzo(g,h,i)perylene	--	--	0.0033	--	--
Benzo(k)fluoranthene	--	--	0.0043	--	--
BHC-alpha	--	--	0.00042	--	--
BHC-beta	--	--	0.0087	--	0.0384
BHC-delta	--	--	0.00019	--	--
BHC-gamma (lindane)	--	--	0.0001	--	--
Biphenyl	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	--	--	0.0672	--	--
Butyl benzyl phthalate	--	--	0.0192	--	--
Carbon disulfide	--	--	--	--	--
Chlordane - alpha[a]	0.0005	0.006	0.01	--	--
Chlordane - gamma[a]	0.0005	0.006	0.0054	--	--
Chlordane - technical[a]	0.0005	0.006	0.0648	--	--
Chlorobenzene	--	--	--	--	--
Chloroform	--	--	--	--	--
Chlorpyrifos	--	--	--	--	--
Chrysene	0.384	2.8	0.107	0.255	0.762
Dalapon	--	--	--	--	--
Diazinon	--	--	--	--	--
Dibenzo(a,h)anthracene	0.0634	0.26	--	--	--
Dibenzothiophene	--	--	--	--	--
Dicamba	--	--	--	--	--
Dieldrin[a]	0.00002	0.008	0.00057	--	--
TPH-Diesel	--	--	2.08	35.4	424
TPH-Diesel and Waste Oil	--	--	--	539	3275
Diesel fuel #2	--	--	--	--	--
Diethylphthalate	--	--	--	--	--
Dimethylphthalate	--	--	0.0014	--	--
Di-n-butyl-phthalate	--	--	0.0076	--	--
Di-n-octyl-phthalate	--	--	0.214	0.0519	0.317
Dinoseb	--	--	--	--	--
Disulfoton (disyston)	--	--	--	--	--
Endosulfan I	--	--	0.00085	--	--
Endosulfan II	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--
Endrin	--	--	0.00078	0.00068	0.00707

Table 3-29
Reference Toxicity Values for Sediment
Bolsa Chica Lowlands

	Screening Effect Levels (mg/kg)		Site Specific Effect Levels		
			Nereis Bioassay Survival (mg/kg)	Amphipod Regression Analysis Survival (mg/kg)	
Analyte	**ER-L**	**ER-M**	**NOEC**	**LC20**	**LC50**
Endrin aldehyde	--	--	0.000065	0.00201	0.0103
Endrin ketone	--	--	0.000044	0.00011	0.0007
Ethylbenzene	--	--	--	--	--
Fluoranthene	0.6	5.1	0.00403	--	--
Fluorene	0.019	0.54	0.255	0.00046	0.00982
Gasoline	--	--	--	--	--
Heptachlor	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	0.0025	--	--
Malathion	--	--	--	--	--
MCPP	--	--	--	--	--
Methylene chloride	--	--	--	--	--
Mevinphos	--	--	--	--	--
Naphthalene	0.16	2.1	0.295	--	--
n-Propylbenzene	--	--	--	--	--
Oil and grease	--	--	0.0061	346	9451
Parathion, ethyl	--	--	--	--	--
PCB 008	--	--	--	--	--
PCB 018	--	--	--	--	--
PCB 028	--	--	--	--	--
PCB 044	--	--	--	--	--
PCB 052	--	--	--	--	--
PCB 066	--	--	--	--	--
PCB 101	--	--	--	--	--
PCB 105	--	--	--	--	--
PCB 118	--	--	--	--	--
PCB 126	--	--	--	--	--
PCB 128	--	--	--	--	--
PCB 138	--	--	--	--	--
PCB 153	--	--	--	--	--
PCB 170	--	--	--	--	--
PCB 180	--	--	--	--	--
PCB 187	--	--	--	--	--
PCB 195	--	--	--	--	--
PCB 206	--	--	--	--	--
PCB 209	--	--	--	--	--
Pentachlorophenol	--	--	--	--	--
Perylene	--	--	--	--	--
Phenanthrene	0.24	1.5	0.603	0.0437	0.246
Phenol	--	--	0.0062	--	--
Phorate (thimet)	--	--	--	--	--
Pyrene	0.665	2.6	0.0203	--	--
Styrene	--	--	--	--	--
Tetrachloroethene (PCE)	--	--	--	--	--
Tetrachlorvinophos	--	--	--	--	--
Toluene	--	--	--	--	--
Trichloroethylene (TCE)	--	--	--	--	--
Waste oil	--	--	4.8	282	3023

Table 3-29
Reference Toxicity Values for Sediment
Bolsa Chica Lowlands

	Screening Effect Levels (mg/kg)		Site Specific Effect Levels		
			Nereis Bioassay Survival (mg/kg)	Amphipod Regression Analysis Survival (mg/kg)	
Analyte	**ER-L**	**ER-M**	**NOEC**	**LC20**	**LC50**
Xylene (m,p-)	--	--	--	--	--
Xylene (o-)	--	--	--	--	--
Xylene (total)	--	--	--	--	--
High MW PAHs	1.7	9.6	0.107	--	--
Low MW PAHs	0.552	3.16	1.266	0.0495	0.338
Total DDT	0.00158	0.0461	0.029	--	--
Total PAHs	4.022	44.792	1.374	0.156	1.102
Total PCBs	0.0227	0.18	0.0087	--	--
Total Phenol	--	--	0.107	--	--
Total Phthalate Esters	--	--	0.214	--	--
Total Volatile Solids	--	--	--	--	--

Notes:

[a]ER-L and ER-M from Long and Morgan, 1990.

No effects on *Nereis* survival were observed at the highest tested exposure concentration; as a result, the NOEC is not considered as significant a screening value as other effect levels.

-- value not available

ER-L - Effects Range Low

ER-M - Effects Range Median

LC20: Lethal concentration at which 20% of the test organisms died.

LD50: Lethal dose at which 50% of the test organisms died.

NOEC - No observed effect level

mg/kg - milligrams per kilogram

Sediment Value	***Source***
ER-Ls and ER-Ms	Long et al., 1995, except for chlordane, dieldrin, 4,4'-DDD, and 4,4'-DDT (Long and Morgan, 1990)
LC20s and LC50s	Site-specific bioassays (Section 3.2.1.3 [Table 3-19] and Appendix F)
NOECs	Site-specific bioassays (Section 3.2.1.3 and Appendix F)

Table 3-30
Reference Toxicity Values for Surface Water
Bolsa Chica Lowlands

				Site-Specific Bioassays					
	Aquatic Plant	California Water Quality Standards (µg/L)		Mytilus Regression Analysis - Larval Development (µg/L)		Topsmelt - Growth/Survival (µg/L)	Ceriodaphnia - Reproduction (µg/L)		Mysidopsis - Survival/ Growth/ Reproduction (µg/L)
Analyte	LCV	Acute	Chronic	EC20	EC50	NOEC	NOEC	LOEC	NOEC
Inorganics									
Arsenic	2,320	69	36	147	237	10	1.4	2.8	43
Arsenic, Dissolved	2,320	69	36	147	237	10	1.5	3	19
Barium	--	--	--	--	--	120	14.5	29	660
Barium, Dissolved	--	--	--	--	--	120	12	24	88
Beryllium	100,000	--	--	40	70	75	--	--	--
Beryllium, Dissolved	100,000	--	--	40	70	75	--	--	--
Cadmium	2	42	9.3	3.7	44	0.24	0.295	0.59	0.027
Cadmium, Dissolved	2	42	9.3	3.7	44	0.24	0.055	0.11	0.14
Chromium	397	--	--	14	23	25	4.95	9.9	13
Chromium, Dissolved	397	--	--	14	23	25	1.65	3.3	6.1
Cobalt	--	--	--	--	--	0.58	0.325	0.65	1.7
Cobalt, Dissolved	--	--	--	--	--	0.58	0.135	0.27	0.63
Copper	1	4.8	3.1	--	--	6.8	8.5	17	17
Copper, Dissolved	1	4.8	3.1	--	--	6.8	6.5	13	4.3
Lead	500	210	8.1	1.3	6.3	0.92	1.5	3	25
Lead, Dissolved	500	210	8.1	1.3	6.3	0.92	0.28	0.56	0.28
Mercury	5	--	--	--	--	0.033	--	--	--
Mercury, Dissolved	5	--	--	--	--	0.033	--	--	--
Nickel	55	74	8.2	12	56	7.3	4.45	8.9	54
Nickel, Dissolved	55	74	8.2	12	56	7.3	.	.	8
Selenium	100	290	71	--	--	--	--	--	--
Selenium, Dissolved	100	290	71	--	--	--	--	--	--
Silver	30	1.9	--	--	--	0.28	0.12	0.24	1
Silver, Dissolved	30	1.9	--	--	--	0.28	0.0445	0.089	0.084
Sulfate	--	--	--	--	--	--	36500	73000	320000
Sulfide	--	--	--	--	--	--	--	--	--
Vanadium	--	--	.	4.8	8.7	--	7.5	15	84
Vanadium, Dissolved	--	--	.	4.8	8.7	--	--	--	--
Zinc	30	90	81	41	145	12	37.5	75	70
Zinc, Dissolved	30	90	81	41	145	12	15.5	31	8.2
Organics									
2,4-D	--	--	--	--	--	--	0.6	1.2	--
2,4-DB	--	--	--	--	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--
4,4'-DDT	0.3	0.13	0.001	.	.	--	--	--	0.013
4-Methylphenol	--	--	--	0.33	1.4	--	--	--	--
4-Nitrophenol	--	--	--	1.3	5.7	--	0.55	1.1	0.68
Acenaphthene	520	--	--	0.11	0.5	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--
Aldrin	--	1.3	--	0.039	0.054	--	--	--	--
BHC-alpha	--	--	--	0.013	0.041	--	--	--	--
BHC-beta	--	--	--	--	--	0.088	--	--	--
BHC-delta	--	--	--	0.029	0.11	--	0.041	0.082	0.035
BHC-gamma	500	0.16	--	0.055	0.3	--	--	--	0.012
Chlordane-alpha	--	0.09	0.004	--	--	--	--	--	--
Chlordane-gamma	--	0.09	0.004	--	--	--	--	--	--
Chlordane (technical)	--	0.09	0.004	--	--	--	--	--	--
Chlorpyrifos	--	--	--	--	--	--	0.05	0.1	--
Chrysene	--	--	--	0.14	0.59	--	--	--	--
Diazinon	--	--	--	--	--	--	0.165	0.33	0.2
Dicamba	--	--	--	--	--	--	0.05	0.1	--
Dieldrin	--	0.71	0.0019	--	--	0.0039	0.006	0.012	--
Endosulfan I	--	0.034	0.0087	--	--	--	--	--	--
Endosulfan II	--	0.034	0.0087	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	0.021	0.079	--	--	--	--
Endrin	--	0.037	0.0023	--	--	0.016	--	--	--
Endrin aldehyde	--	--	--	--	--	--	--	--	--

Table 3-30
Reference Toxicity Values for Surface Water
Bolsa Chica Lowlands

				Site-Specific Bioassays					
	Aquatic Plant	California Water Quality Standards (µg/L)		Mytilus Regression Analysis - Larval Development (µg/L)		Topsmelt - Growth/Survival (µg/L)	Ceriodaphnia - Reproduction (µg/L)		Mysidopsis - Survival/ Growth/ Reproduction (µg/L)
Analyte	**LCV**	**Acute**	**Chronic**	**EC20**	**EC50**	**NOEC**	**NOEC**	**LOEC**	**NOEC**
Endrin ketone	--	--	--	0.0017	0.0072	--	--	--	--
Fluorene	--	--	--	0.4	1.5	--	--	--	--
Malathion	--	--	--	--	--	--	0.1	0.2	--
Naphthalene	--	--	--	0.69	2.7	--	--	--	--
Parathion, ethyl	--	--	--	--	--	--	0.045	0.09	--
Phenanthrene	--	--	--	0.88	3.5	--	--	--	--
Phenol	20,000	--	--	27	51	--	--	--	--
TPH-Diesel	--	--	--	--	--	939	105	210	310
Waste oil	--	--	--	--	--	4242	445	890	1200
High MW PAHs	--	--	--	0.14	0.59	--	--	--	.
Low MW PAHs	--	--	--	2.2	8.5	--	--	--	.
Total DDT	--	--	--	--	--	--	--	--	0.013
Total PAHs	--	--	--	2.3	8.9	--	--	--	.
Total PCBs	0.144	--	0.03	--	--	--	--	--	--
Total Phenol	--	--	--	25	64	--	--	--	--

Notes:

EC_{20} and EC_{50} for pore water are presented for reference only. They were not used to screen for toxicity in surface water samples.

No effects on topsmelt survival were observed at the highest tested exposure concentration; as a result, the NOEC is not considered as significant a screening value as other effect levels.

-- value not available

EC_{20}: Effect concentration at which 20% of the test organisms showed an adverse effect.

ED_{50}: Effect dose at which 50% of the test organisms showed an adverse effect.

LCV - Lowest chronic value

NOEC - No observed effect concentration

LOEC - Lowest observed effect concentration

µg/L - micrograms per liter

Surface Water Values	***Source***
California Water Quality Standards	U.S. EPA, 2000
Bioassay EC20s, EC50s, NOECs, LOECs	Site-specific bioassays (Section 3.2.1.3 and Appendix F)
Aquatic plant LCVs	

Table 4-1

Sediment/Soil Risk Estimates for Terrestrial and Aquatic Plants and Terrestrial Invertebrates Based on Maximum Concentrations[a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients				Risk Category	
			Terrestrial Plants and/or Aquatic Plants[b]		Terrestrial Invertebrates			
Area	Analyte	Maximum[a] (mg/kg)	NOEC	LOEC	NOEC	LOEC	Plants	Invertebrates
Bolsa Bay	Arsenic	11	--	**5.5**	na	na	B	na
Bolsa Bay	Barium	1200	--	**2.4**	na	na	B	na
Bolsa Bay	Chromium	67	--	**1.3**	na	na	B	na
Bolsa Bay	Copper	83	--	**3.6**	na	na	B	na
Bolsa Bay	Lead	110	--	**5.5**	na	na	B	na
Bolsa Bay	Nickel	140	**7.0**	**2.8**	na	na	B	na
Bolsa Bay	Selenium	3.2*	**6.4**	**2.1**	na	na	B	na
Bolsa Bay	Thallium	1	--	**1.0**	na	na	B	na
Bolsa Bay	Vanadium	110	--	**2.2**	na	na	B	na
Bolsa Bay	Zinc	230	--	**1.8**	na	na	B	na
Bolsa Bay	Benzo(a)pyrene	0.059	--	**3.0**	na	na	B	na
Bolsa Bay	Benzo(g,h,i)perylene	0.069	--	**2.8**	na	na	B	na
Full Tidal	Arsenic	37	--	**19**	na	na	B	na
Full Tidal	Barium	11400	--	**23**	na	na	B	na
Full Tidal	Chromium	244	--	**4.9**	na	na	B	na
Full Tidal	Cobalt	42	--	**2.1**	na	na	B	na
Full Tidal	Copper	163	--	**7.1**	na	na	B	na
Full Tidal	Lead	131	--	**6.6**	na	na	B	na
Full Tidal	Mercury	3.4	--	**11**	na	na	B	na
Full Tidal	Molybdenum	11	--	**5.4**	na	na	B	na
Full Tidal	Nickel	160	**8.0**	**3.2**	na	na	B	na
Full Tidal	Selenium	5.7*	**11**	**3.8**	na	na	B	na
Full Tidal	Thallium	3	--	**3.0**	na	na	B	na
Full Tidal	Vanadium	120	--	**2.4**	na	na	B	na
Full Tidal	Zinc	230	--	**1.8**	na	na	B	na
Full Tidal	Benzo(a)anthracene	0.365*	--	**1.3**	na	na	B	na
Full Tidal	Benzo(a)pyrene	0.365*	--	**18**	na	na	B	na
Full Tidal	Benzo(g,h,i)perylene	0.75*	--	**31**	na	na	B	na
Future Full Tidal	Arsenic	700	--	**350**	--	**10**	B	B
Future Full Tidal	Barium	56000	--	**112**	--	**207**	B	B
Future Full Tidal	Beryllium	590	--	**59.0**	--	**190**	B	B
Future Full Tidal	Cadmium	190	--	**47.5**	**19.0**	**11**	B	B
Future Full Tidal	Chromium	10000	--	**200**	--	**313**	B	B
Future Full Tidal	Cobalt	3900	--	**195**	--	**13**	B	B
Future Full Tidal	Copper	6900	--	**300**	--	**69**	B	B
Future Full Tidal	Lead	17000	--	**850**	--	**34**	B	B
Future Full Tidal	Mercury	190	--	**633**	--	**380**	B	B
Future Full Tidal	Molybdenum	18	--	**9.2**	--	0.35	B	none
Future Full Tidal	Nickel	13000	**650**	**260**	--	**65**	B	B
Future Full Tidal	Selenium	5.5*	**11**	**3.7**	--	0.07	B	none
Future Full Tidal	Silver	68	--	**34**	--	--	B	unknown
Future Full Tidal	Thallium	160	--	**160**	--	--	B	unknown
Future Full Tidal	Vanadium	26000	--	**520**	--	**565**	B	B
Future Full Tidal	Zinc	37000	--	**282**	**116**	--	B	U
Future Full Tidal	4-Nitrophenol	13	--	**1.9**	--	0.3	B	none
Future Full Tidal	Acenaphthene	1.7	--	0.1	--	**4.1**	none	B
Future Full Tidal	Acenaphthylene	7.7	--	--	--	**4.5**	unknown	B
Future Full Tidal	Benzo(a)anthracene	0.7*	--	**2.4**	--	0.1	B	none
Future Full Tidal	Benzo(a)pyrene	0.7*	--	**35**	--	0.1	B	none
Future Full Tidal	Benzo(g,h,i)perylene	1.35*	--	**55**	--	**1.1**	B	B
Future Full Tidal	Indeno(1,2,3-c,d)pyrene	1.35*	--	--	--	**2.0**	unknown	B
Future Full Tidal	Chrysene	5.6	--	--	--	**1.0**	unknown	B
Future Full Tidal	Naphthalene	5.7	--	0.1	--	**1.0**	none	B
Future Full Tidal	Phenanthrene	9	--	--	--	**1.9**	unknown	B
Garden Grove	Arsenic	7.6	--	**3.8**	na	na	B	na
Garden Grove	Cobalt	20.1	--	**1.0**	na	na	B	na
Garden Grove	Copper	34.8	--	**1.5**	na	na	B	na

Table 4-1

Sediment/Soil Risk Estimates for Terrestrial and Aquatic Plants and Terrestrial Invertebrates Based on Maximum Concentrations[a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients				Risk Category	
			Terrestrial Plants and/or Aquatic Plants[b]		Terrestrial Invertebrates			
Area	Analyte	Maximum[a] (mg/kg)	NOEC	LOEC	NOEC	LOEC	Plants	Invertebrates
Garden Grove	Lead	96	--	**4.8**	na	na	B	na
Garden Grove	Mercury	0.39	--	**1.3**	na	na	B	na
Garden Grove	Molybdenum	3.6	--	**1.8**	na	na	B	na
Garden Grove	Nickel	25	**1.3**	0.5	na	na	C	na
Garden Grove	Selenium	3.15	**6.3**	**2.1**	na	na	B	na
Garden Grove	Vanadium	79	--	**1.6**	na	na	B	na
Garden Grove	Zinc	140	--	**1.1**	na	na	B	na
Garden Grove	Benzo(a)pyrene	0.25*	--	**12.5**	na	na	B	na
Garden Grove	Benzo(g,h,i)perylene	0.25*	--	**10.2**	na	na	B	na
Gas Plant	Arsenic	81	--	**41**	--	**1.2**	B	B
Gas Plant	Chromium	120	--	**2.4**	--	**3.8**	B	B
Gas Plant	Copper	110	--	**4.8**	--	**1.1**	B	B
Gas Plant	Lead	91	--	**4.6**	--	0.2	B	none
Gas Plant	Mercury	0.41	--	**1.4**	--	0.8	B	none
Gas Plant	Nickel	34	**1.7**	0.7	--	0.2	C	none
Gas Plant	Selenium	5.35*	**11**	**3.6**	--	0.1	B	none
Gas Plant	Thallium	4.4*	--	**4.4**	--	--	B	unknown
Gas Plant	Vanadium	110	--	**2.2**	--	**2.4**	B	B
Gas Plant	Zinc	300	--	**2.3**	0.9	--	B	none
Gas Plant	Acenaphthene	0.7	--	0.028	--	**1.7**	none	B
Gas Plant	Benzo(a)anthracene	0.41*	--	**1.4**	--	0.1	B	none
Gas Plant	Benzo(a)pyrene	0.41*	--	**21**	--	0.1	B	none
Gas Plant	Benzo(g,h,i)perylene	0.55*	--	**23**	--	0.5	B	none
Muted Tidal	Arsenic	130	--	**65**	--	**1.9**	B	B
Muted Tidal	Barium	9270	--	**19**	--	**34.3**	B	B
Muted Tidal	Beryllium	4.2	--	0.4	--	**1.4**	none	B
Muted Tidal	Cadmium	4.1	--	**1.0**	0.4	0.2	B	none
Muted Tidal	Chromium	120	--	**2.4**	--	**3.8**	B	B
Muted Tidal	Cobalt	59	--	**3.0**	--	0.2	B	none
Muted Tidal	Copper	400	--	**17**	--	**4.0**	B	B
Muted Tidal	Lead	9600	--	**480**	--	**19.2**	B	B
Muted Tidal	Mercury	0.66	--	**2.2**	--	**1.3**	B	B
Muted Tidal	Molybdenum	8.1	--	**4.1**	--	0.2	B	none
Muted Tidal	Nickel	100	**5.0**	**2.0**	--	0.5	B	none
Muted Tidal	Selenium	4.2	**8.4**	**2.8**	--	0.1	B	none
Muted Tidal	Thallium	4	--	**4.0**	--	--	B	unknown
Muted Tidal	Vanadium	130	--	**2.6**	--	**2.8**	B	B
Muted Tidal	Zinc	460	--	**3.5**	**1.4**	--	B	U
Muted Tidal	Acenaphthylene	4.8	--	--	--	**2.8**	unknown	B
Muted Tidal	Benzo(a)anthracene	0.315	--	**1.1**	--	0.1	B	none
Muted Tidal	Benzo(a)pyrene	0.315	--	**16**	--	0.1	B	none
Muted Tidal	Benzo(g,h,i)perylene	0.65	--	**27**	--	0.5	B	none
Seasonal Ponds	Arsenic	320	--	**160**	--	**5**	B	B
Seasonal Ponds	Barium	12100	--	**24**	--	**45**	B	B
Seasonal Ponds	Beryllium	3.2	--	0.32	--	**1**	none	B
Seasonal Ponds	Chromium	250	--	**5.0**	--	**7.8**	B	B
Seasonal Ponds	Copper	58	--	**2.5**	--	0.6	B	none
Seasonal Ponds	Lead	220	--	**11.0**	--	0.4	B	none
Seasonal Ponds	Mercury	1.11*	--	**3.7**	--	2.2	B	none
Seasonal Ponds	Molybdenum	4.1	--	**2.1**	--	0.1	B	none
Seasonal Ponds	Nickel	202	**10.1**	**4.0**	--	**1.0**	B	B
Seasonal Ponds	Selenium	5.5*	**11.0**	**3.7**	--	0.1	B	none
Seasonal Ponds	Thallium	3.4	--	**3.4**	--	--	B	unknown
Seasonal Ponds	Vanadium	120	--	**2.4**	--	**2.6**	B	B
Seasonal Ponds	Zinc	351	--	**2.7**	**1.1**	--	B	U
Seasonal Ponds	Benzo(a)anthracene	0.65	--	**2.2**	--	0.1	B	none
Seasonal Ponds	Benzo(a)pyrene	0.65	--	**32.5**	--	0.1	B	none

Table 4-1

Sediment/Soil Risk Estimates for Terrestrial and Aquatic Plants and Terrestrial Invertebrates Based on Maximum Concentrations[a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients				Risk Category	
			Terrestrial Plants and/or Aquatic Plants[b]		Terrestrial Invertebrates			
Area	Analyte	Maximum[a] (mg/kg)	NOEC	LOEC	NOEC	LOEC	Plants	Invertebrates
Seasonal Ponds	Phenanthrene	4.8	--	--	--	**1.0**	unknown	B

Notes:

[a]Summary statistics for detected analytes are presented in Table 3-2.

[b]Terrestrial and aquatic plants were evaluated using the same reference toxicity values for sediment/soil.

*The maximum detected value was lower than 1/2 the highest non-detect value. The value listed in 1/2 the highest non-detect value.

Risk estimates are presented forCOPECs with HQs exceeding 1 for either plants or invertebrates.
The risk estimates for all detected COPECs are presented in Appendix I, Table I-1.

Shaded entries indicate COPECs with HQs greater than one.

COPEC - Chemical of potential ecological concern
HQ - Hazard quotient
na - not applicable - terrestrial receptors were not evaluated in Bolsa Bay, Full Tidal, or Garden Grove areas.
NOEC - No observed effect concentration
LOEC - Lowest observed effect concentration

Risk Categories	***Description***
none	None - exposure does not exceed a chronic low-effect level
unknown	Unknown - effect levels were not avaiable for this receptor and chemical
U	Uncertain - exposure exceeds chronic no-effect level, but a chronic low-effect level is not available
C	Some Possible - exposure exceeds a chronic no-effect level, but not a chronic low-effect level
B	Possible - exposure exceeds a chronic low-effect level

Table 4-2
Food Chain Uptake Risk Estimates for Birds and Mammals - Hazard Quotients Exceeding 1
Bolsa Chica Lowlands

					Pathway-Specific and Total Exposure Estimates (mg/kgbw-d)										Hazard Quotients		
					Terrestrial Food Chain				Aquatic Food Chain								
Area	Exposure Type	Class	Species	Analyte	Soil	Plants	Invertebrates	Vertebrates	Water	Corixids	Snails	Shrimp	Fish	Total Exposure	NOAEL	LOAEL	Risk Category
Future Full Tidal	Aquatic	Bird	Stilt	Chromium	1.2169	--	--	--	0.0013	0.3072	--	0.0612	--	1.6E+00	**2.3**	--	U
Future Full Tidal	Aquatic	Bird	Stilt	Cobalt	0.4222	--	--	--	0.0003	0.06016	--	0.0107	--	4.9E-01	**3.2**	0.32	C
Future Full Tidal	Aquatic	Bird	Stilt	Lead	1.8163	--	--	--	0.002	0.192	--	0.0197	--	2.0E+00	**2.5**	0.25	C
Future Full Tidal	Terrestrial	Bird	Sparrow	Barium	3.1516	4.608	83.42585	--	0.1182	--	--	--	--	9.1E+01	**1.1**	--	U
Future Full Tidal	Terrestrial	Bird	Sparrow	Chromium	0.4617	0.186	4.048939	--	0.0029	--	--	--	--	4.7E+00	**11.0**	--	U
Future Full Tidal	Terrestrial	Bird	Kestrel	Chromium	0.2076	--	0.9102267	0.203	0.0016	--	--	--	--	1.3E+00	**2.1**	--	U
Future Full Tidal	Terrestrial	Bird	Sparrow	Cobalt	0.1602	0.027	0.6642408	--	0.0007	--	--	--	--	8.5E-01	**8.9**	0.91	C
Future Full Tidal	Terrestrial	Bird	Kestrel	Cobalt	0.072	--	0.1493255	0.0193473	0.0004	--	--	--	--	2.4E-01	**1.7**	0.18	C
Future Full Tidal	Terrestrial	Bird	Sparrow	Lead	0.6891	0.154	6.029972	--	0.0045	--	--	--	--	6.9E+00	**13.6**	**1.4**	B
Future Full Tidal	Terrestrial	Bird	Kestrel	Lead	0.3098	--	1.355575	0.1131587	0.0024	--	--	--	--	1.8E+00	**2.4**	0.24	C
Future Full Tidal	Terrestrial	Bird	Sparrow	Vanadium	1.0588	0.227	5.34867	--	0.0155	--	--	--	--	6.6E+00	**1.3**	--	U
Future Full Tidal	Terrestrial	Bird	Sparrow	Zinc	1.6792	6.539	44.27026	--	0.0167	--	--	--	--	5.3E+01	**9.1**	**1.0**	B
Future Full Tidal	Terrestrial	Bird	Kestrel	Zinc	0.755	--	9.952229	21.7616	0.009	--	--	--	--	3.2E+01	**3.9**	0.43	C
Future Full Tidal	Terrestrial	Mammal	Mouse	Barium	2.773	8.211	23.24391	--	0.0836	--	--	--	--	3.4E+01	**69.3**	0.09	C
Future Full Tidal	Terrestrial	Mammal	Coyote	Barium	0.2382	0.035	--	0.6901577	0.0383	--	--	--	--	1.0E+00	**3.2**	0.00	C
Future Full Tidal	Terrestrial	Mammal	Mouse	Cobalt	0.1409	0.049	0.1850692	--	0.0005	--	--	--	--	3.8E-01	**6.1**	--	U
Future Full Tidal	Terrestrial	Mammal	Mouse	Lead	0.6063	0.275	1.680056	--	0.0032	--	--	--	--	2.6E+00	**5.2**	0.03	C
Future Full Tidal	Terrestrial	Mammal	Mouse	Vanadium	0.9316	0.404	1.490233	--	0.0109	--	--	--	--	2.8E+00	**5.7**	--	U
Garden Grove	Aquatic	Bird	Stilt	Chromium	0.3436	--	--	--	0.0008	0.47259	--	0.0173	--	8.3E-01	**1.2**	--	U
Garden Grove	Aquatic	Bird	Stilt	Cobalt	0.1549	--	--	--	0.0001	0.10074	--	0.0039	--	2.6E-01	**1.7**	0.17	C
Garden Grove	Aquatic	Bird	Stilt	Lead	0.8704	--	--	--	0.0006	1.19466	--	0.0095	--	2.1E+00	**2.5**	0.25	C
Garden Grove	Aquatic	Bird	Tern	Lead	0.151	--	--	--	0.001	--	--	--	0.7666	9.2E-01	**1.5**	0.15	C
Garden Grove	Aquatic	Bird	Tern	Selenium	0.0041	--	--	--	0.0002	--	--	--	0.6238	6.3E-01	**3.0**	--	U
Garden Grove	Aquatic	Bird	Tern	Zinc	0.2502	--	--	--	0.0107	--	--	--	19.661	2.0E+01	**2.9**	0.32	C
Gas Plant	Aquatic	Bird	Stilt	Chromium	0.6739	--	--	--	--	0.2048	--	0.0339	--	9.1E-01	**1.3**	--	U
Gas Plant	Aquatic	Bird	Tern	Selenium	0.009	--	--	--	--	--	--	--	1.3794	1.4E+00	**6.7**	--	U
Gas Plant	Aquatic	Bird	Heron	Selenium	0.0105	--	--	0.0517612	--	--	0.0038	0.0842	0.3343	4.8E-01	**1.3**	--	U
Gas Plant	Terrestrial	Bird	Sparrow	Arsenic	0.1345	0.683	2.313566	--	--	--	--	--	--	3.1E+00	**1.4**	0.56	C
Gas Plant	Terrestrial	Bird	Sparrow	Chromium	0.2557	0.597	2.242074	--	--	--	--	--	--	3.1E+00	**7.2**	--	U
Gas Plant	Terrestrial	Bird	Kestrel	Chromium	0.115	--	0.504032	0.4604452	--	--	--	--	--	1.1E+00	**1.7**	--	U
Gas Plant	Terrestrial	Bird	Sparrow	Cobalt	0.0466	0.04	0.1934319	--	--	--	--	--	--	2.8E-01	**2.9**	0.30	C
Gas Plant	Terrestrial	Bird	Sparrow	Lead	0.1597	0.541	1.397806	--	--	--	--	--	--	2.1E+00	**4.2**	0.42	C
Gas Plant	Terrestrial	Bird	Kestrel	Lead	0.0718	--	0.3142355	0.4530516	--	--	--	--	--	8.4E-01	**1.1**	0.11	C
Gas Plant	Terrestrial	Bird	Sparrow	Selenium	0.0198	1.131	--	--	--	--	--	--	--	1.2E+00	**6.6**	--	U
Gas Plant	Terrestrial	Bird	Kestrel	Selenium	0.0089	--	--	0.8490932	--	--	--	--	--	8.6E-01	**3.4**	--	U
Gas Plant	Terrestrial	Bird	Kestrel	Zinc	0.2734	--	3.604438	53.1972	--	--	--	--	--	5.7E+01	**6.8**	0.75	C
Gas Plant	Terrestrial	Bird	Sparrow	Zinc	0.6082	9.521	16.03354	--	--	--	--	--	--	2.6E+01	**4.5**	0.50	C
Gas Plant	Terrestrial	Mammal	Mouse	Arsenic	0.1184	1.216	0.6446002	--	--	--	--	--	--	2.0E+00	--	**1.5**	B
Gas Plant	Terrestrial	Mammal	Mouse	Barium	0.6442	12.1	5.399675	--	--	--	--	--	--	1.8E+01	**36.7**	0.049	C
Gas Plant	Terrestrial	Mammal	Coyote	Barium	0.0553	0.051	--	0.9421761	--	--	--	--	--	1.0E+00	**3.4**	0.004	C
Gas Plant	Terrestrial	Mammal	Mouse	Cobalt	0.041	0.07	0.0538935	--	--	--	--	--	--	1.7E-01	**2.7**	--	U

Table 4-2
Food Chain Uptake Risk Estimates for Birds and Mammals - Hazard Quotients Exceeding 1
Bolsa Chica Lowlands

					Pathway-Specific and Total Exposure Estimates (mg/kgbw-d)												
					Terrestrial Food Chain				Aquatic Food Chain						Hazard Quotients		
Area	Exposure Type	Class	Species	Analyte	Soil	Plants	Invertebrates	Vertebrates	Water	Corixids	Snails	Shrimp	Fish	Total Exposure	NOAEL	LOAEL	Risk Category
Gas Plant	Terrestrial	Mammal	Mouse	Lead	0.1406	0.964	0.3894534	--	--	--	--	--	--	1.5E+00	**3.0**	0.015	C
Gas Plant	Terrestrial	Mammal	Mouse	Selenium	0.0174	2.014	--	--	--	--	--	--	--	2.0E+00	**4.8**	--	U
Gas Plant	Terrestrial	Mammal	Coyote	Selenium	0.0015	0.009	--	0.4037375	--	--	--	--	--	4.1E-01	**1.5**	--	U
Gas Plant	Terrestrial	Mammal	Mouse	Vanadium	0.3376	0.597	0.5400609	--	--	--	--	--	--	1.5E+00	**3.0**	--	U
Gas Plant	Terrestrial	Mammal	Coyote	Zinc	0.046	0.072	--	25.29488	--	--	--	--	--	2.5E+01	**1.3**	0.10	C
Gas Plant	Terrestrial	Mammal	Coyote	Dieldrin	6E-07	--	--	0.0073671	--	--	--	--	--	7.4E-03	**1.9**	--	U
Muted Tidal	Aquatic	Bird	Stilt	Chromium	0.3012	--	--	--	--	0.41434	--	0.0151	--	7.3E-01	**1.1**	--	U
Muted Tidal	Aquatic	Bird	Stilt	Cobalt	0.0951	--	--	--	--	0.0619	--	0.0024	--	1.6E-01	**1.0**	0.10	C
Muted Tidal	Aquatic	Bird	Stilt	Lead	1.8595	--	--	--	--	2.55226	--	0.0202	--	4.4E+00	**5.4**	0.54	C
Muted Tidal	Aquatic	Bird	Tern	Lead	0.3227	--	--	--	--	--	--	--	1.6378	2.0E+00	**3.3**	0.33	C
Muted Tidal	Aquatic	Bird	Heron	Lead	0.376	--	0.0219335	0.0137498	--	0.28514	0.037	0.009	0.397	1.1E+00	**1.0**	0.10	C
Muted Tidal	Aquatic	Bird	Tern	Selenium	0.0033	--	--	--	--	--	--	--	0.5061	5.1E-01	**2.4**	--	U
Muted Tidal	Aquatic	Bird	Tern	Zinc	0.1423	--	--	--	--	--	--	--	11.183	1.1E+01	**1.6**	0.18	C
Muted Tidal	Terrestrial	Bird	Sparrow	Chromium	0.1143	0.134	1.002191	--	--	--	--	--	--	1.3E+00	**2.9**	--	U
Muted Tidal	Terrestrial	Bird	Sparrow	Cobalt	0.0361	0.017	0.149712	--	--	--	--	--	--	2.0E-01	**2.1**	0.22	C
Muted Tidal	Terrestrial	Bird	Sparrow	Lead	0.7055	0.109	6.173286	--	--	--	--	--	--	7.0E+00	**13.8**	**1.4**	B
Muted Tidal	Terrestrial	Bird	Kestrel	Lead	0.3172	--	1.387793	0.2255522	--	--	--	--	--	1.9E+00	**2.6**	0.26	C
Muted Tidal	Terrestrial	Bird	Sparrow	Zinc	0.3112	2.634	8.20418	--	--	--	--	--	--	1.1E+01	**1.9**	0.21	C
Muted Tidal	Terrestrial	Bird	Kestrel	Zinc	0.1399	--	1.84435	9.016829	--	--	--	--	--	1.1E+01	**1.3**	0.15	C
Muted Tidal	Terrestrial	Mammal	Mouse	Barium	0.9095	1.207	7.623908	--	--	--	--	--	--	9.7E+00	**19.7**	0.026	C
Muted Tidal	Terrestrial	Mammal	Mouse	Cobalt	0.0318	0.031	0.0417124	--	--	--	--	--	--	1.0E-01	**1.7**	--	U
Muted Tidal	Terrestrial	Mammal	Mouse	Lead	0.6207	0.194	1.719986	--	--	--	--	--	--	2.5E+00	**5.1**	0.026	C
Muted Tidal	Terrestrial	Mammal	Mouse	Vanadium	0.2091	0.214	0.3344891	--	--	--	--	--	--	7.6E-01	**1.5**	--	U
Seasonal Ponds	Aquatic	Bird	Stilt	Chromium	0.5202	--	--	--	--	0.71552	--	0.0261	--	1.3E+00	**1.8**	--	U
Seasonal Ponds	Aquatic	Bird	Stilt	Cobalt	0.1021	--	--	--	--	0.06642	--	0.0026	--	1.7E-01	**1.1**	0.11	C
Seasonal Ponds	Aquatic	Bird	Stilt	Lead	0.3562	--	--	--	--	0.4889	--	0.0039	--	8.5E-01	**1.0**	0.10	C
Seasonal Ponds	Aquatic	Bird	Tern	Selenium	0.0045	--	--	--	--	--	--	--	0.6853	6.9E-01	**3.3**	--	U
Seasonal Ponds	Aquatic	Bird	Tern	Zinc	0.1922	--	--	--	0.0227	--	--	--	15.104	1.5E+01	**2.2**	0.25	C
Seasonal Ponds	Terrestrial	Bird	Sparrow	Arsenic	0.1606	0.013	2.762408	--	--	--	--	--	--	2.9E+00	**1.3**	0.53	C
Seasonal Ponds	Terrestrial	Bird	Sparrow	Chromium	0.1974	0.115	1.730671	--	--	--	--	--	--	2.0E+00	**4.8**	--	U
Seasonal Ponds	Terrestrial	Bird	Sparrow	Cobalt	0.0387	0.013	0.1606467	--	--	--	--	--	--	2.1E-01	**2.2**	0.23	C
Seasonal Ponds	Terrestrial	Bird	Sparrow	Lead	0.1351	0.08	1.182526	--	--	--	--	--	--	1.4E+00	**2.8**	0.28	C
Seasonal Ponds	Terrestrial	Bird	Sparrow	Zinc	0.4203	2.48	11.08078	--	0.0302	--	--	--	--	1.4E+01	**2.4**	0.27	C
Seasonal Ponds	Terrestrial	Bird	Kestrel	Zinc	0.189	--	2.491027	10.556	0.0163	--	--	--	--	1.3E+01	**1.6**	0.18	C
Seasonal Ponds	Terrestrial	Mammal	Mouse	Barium	2.3414	2.942	19.6268	--	0.0123	--	--	--	--	2.5E+01	**50.3**	0.067	C
Seasonal Ponds	Terrestrial	Mammal	Coyote	Barium	0.2011	0.012	--	0.100386	0.0056	--	--	--	--	3.2E-01	**1.0**	0.001	C
Seasonal Ponds	Terrestrial	Mammal	Mouse	Cobalt	0.0341	0.024	0.044759	--	--	--	--	--	--	1.0E-01	**1.7**	--	U
Seasonal Ponds	Terrestrial	Mammal	Mouse	Lead	0.1189	0.142	0.3294726	--	--	--	--	--	--	5.9E-01	**1.2**	0.006	C
Seasonal Ponds	Terrestrial	Mammal	Mouse	Vanadium	0.2617	0.221	0.4186364	--	--	--	--	--	--	9.0E-01	**1.8**	--	U

Table 4-2
Food Chain Uptake Risk Estimates for Birds and Mammals - Hazard Quotients Exceeding 1
Bolsa Chica Lowlands

					Pathway-Specific and Total Exposure Estimates (mg/kgbw-d)												
					Terrestrial Food Chain				Aquatic Food Chain						Hazard Quotients		
Area	Exposure Type	Class	Species	Analyte	Soil	Plants	Invertebrates	Vertebrates	Water	Corixids	Snails	Shrimp	Fish	Total Exposure	NOAEL	LOAEL	Risk Category

Notes:

Summary statistics for detected analytes are presented in Table 3-2 (sediment/soil), Table 3-3 (surface water), and Tables 3-4 through 3-9 (biota tissue).
The risk estimates for all detected COPECs are presented in Appendix I, Table I-2.

-- Estimate not available because there was no exposure to this food source or no effect level.

COPEC - Chemical of potential ecological concern
HQ - Hazard quotient
NOEC - No observed effect concentration
LOEC - Lowest observed effect concentration

Risk Categories	*Description*
none	None - exposure does not exceed a chronic low-effect level
unknown	Unknown - effect levels were not avaiable for this receptor and chemical
U	Uncertain - exposure exceeds chronic no-effect level, but a chronic low-effect level is not available
C	Some Possible - exposure exceeds a chronic no-effect level, but not a chronic low-effect level
B	Possible - exposure exceeds a chronic low-effect level

Table 4-3

Sediment/Soil Risk Estimates for Aquatic Invertebrates based on Maximum Concentrations [a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients					
						Amphipod		
Area	Analyte	Maximum (mg/kg)	ER-L	ER-M	*Nereis* NOEC	LC20	LC50	Risk Category
Bolsa Bay	Arsenic	11	**1.3**	0.16	0.69	--	--	B
Bolsa Bay	Barium	1200	--	--	**27**	--	--	U
Bolsa Bay	Beryllium	1.2	--	--	**4.1**	**1.5**	0.27	B
Bolsa Bay	Cadmium	1.3	**1.1**	0.14	**24**	--	--	B
Bolsa Bay	Chromium	67	0.83	0.18	**5.8**	**1.3**	0.61	B
Bolsa Bay	Cobalt	15	--	--	**9.3**	**1.5**	0.70	B
Bolsa Bay	Copper	83	**2.4**	0.31	**15**	--	--	B
Bolsa Bay	Lead	110	**2.4**	0.50	**8.3**	--	--	B
Bolsa Bay	Mercury	0.14*	0.93	0.20	**2.4**	--	--	B
Bolsa Bay	Nickel	140	**6.7**	**2.7**	**8.1**	**7.1**	**2.4**	A
Bolsa Bay	Selenium	3.2*	--	--	**35**	**11**	**1.9**	A
Bolsa Bay	Silver	0.7*	0.70	0.19	**23**	--	--	C
Bolsa Bay	Thallium	1	--	--	**14**	**2.9**	**1.7**	A
Bolsa Bay	Vanadium	110	--	--	**5.2**	**1.7**	0.82	B
Bolsa Bay	Zinc	230	**1.5**	0.56	**6.1**	**2.2**	0.50	B
Bolsa Bay	4,4'-DDD	0.035	**18**	**1.8**	**5.6**	--	--	A
Bolsa Bay	4,4'-DDE	0.055	**25**	**2.0**	**9.5**	--	--	A
Bolsa Bay	4,4'-DDT	0.0059	**5.9**	0.84	0.35	--	--	B
Bolsa Bay	Anthracene	0.024	0.28	0.02	**6.9**	--	--	C
Bolsa Bay	Aroclor 1254	0.0405*	--	--	**4.7**	--	--	U
Bolsa Bay	Benzo(a)anthracene	0.051	0.20	0.03	**15**	--	--	C
Bolsa Bay	Benzo(a)pyrene	0.059	0.14	0.04	**9.2**	--	--	C
Bolsa Bay	Benzo(b)fluoranthene	0.072	--	--	**9.9**	**1.2**	0.02	B
Bolsa Bay	Benzo(e)pyrene	0.053	--	--	**11**	--	--	U
Bolsa Bay	Benzo(g,h,i)perylene	0.069	--	--	**21**	--	--	U
Bolsa Bay	Benzo(k)fluoranthene	0.07	--	--	**16**	--	--	U
Bolsa Bay	BHC-alpha	0.008	--	--	**19**	--	--	U
Bolsa Bay	BHC-beta	0.025	--	--	**2.9**	--	0.65	U
Bolsa Bay	BHC-gamma	0.001	--	--	**10**	--	--	U
Bolsa Bay	Bis(2-ethylhexyl)phthalate	1.4	--	--	**21**	--	--	U
Bolsa Bay	Butylbenzylphthalate	0.17	--	--	**8.9**	--	--	U
Bolsa Bay	Chlordane (technical)	0.26	**520**	**43**	**4.0**	--	--	A
Bolsa Bay	Chlordane-alpha	0.054	**108**	**9.0**	**5.4**	--	--	A
Bolsa Bay	Chlordane-gamma	0.034	**68**	**5.7**	**6.3**	--	--	A
Bolsa Bay	Chrysene	0.12	0.31	0.04	**1.1**	0.47	0.16	C
Bolsa Bay	Dieldrin	0.0015	**75**	0.19	**2.6**	--	--	B
Bolsa Bay	Dimethylphthalate	0.017	--	--	**12**	--	--	U
Bolsa Bay	Di-n-butylphthalate	0.14	--	--	**18**	--	--	U
Bolsa Bay	Di-n-octylphthalate	0.72	--	--	**3.4**	**14**	**2.3**	A
Bolsa Bay	Fluoranthene	0.21	0.35	0.04	**52**	--	--	C
Bolsa Bay	Indeno(1,2,3-c,d)pyrene	0.065	--	--	**26**	--	--	U
Bolsa Bay	Oil and Grease	8600	--	--	**1,409,836**	**25**	0.91	B
Bolsa Bay	Phenanthrene	0.051	0.21	0.03	0.08	**1.2**	0.21	B
Bolsa Bay	Phenol	0.12	--	--	**19**	--	--	U
Bolsa Bay	Pyrene	0.21	0.32	0.08	**10**	--	--	C
Bolsa Bay	TPH-Diesel	1800	--	--	**865**	**51**	**4.2**	A
Bolsa Bay	TPH-Diesel and Waste oil	11400	--	--	--	**21**	**3.5**	A
Bolsa Bay	Waste oil	9600	--	--	**2,000**	**34**	**3.2**	A
Bolsa Bay	High MW PAHs	0.919	0.54	0.10	**8.6**	--	--	C
Bolsa Bay	Low MW PAHs	0.051	0.09	0.02	0.04	**1.0**	0.15	B
Bolsa Bay	Total DDT	0.09	**57**	**2.0**	**3.1**	--	--	A
Bolsa Bay	Total PAHs	0.97	0.24	0.02	0.71	**6.2**	0.88	B
Bolsa Bay	Total PCB	0.023	**1.0**	0.13	**2.6**	--	--	B
Bolsa Bay	Total phenol	0.12	--	--	**1.1**	--	--	U
Bolsa Bay	Total phthalate esters	1.68	--	--	**7.9**	--	--	U
Full Tidal	Arsenic	37	**4.5**	0.5	**2.3**	--	--	B
Full Tidal	Barium	11400	--	--	**259**	--	--	U
Full Tidal	Beryllium	2.0	--	--	**6.9**	**2.5**	0.45	B
Full Tidal	Cadmium	1.3	**1.1**	0.14	**24**	--	--	B
Full Tidal	Chromium	244	**3.0**	0.66	**21**	**4.7**	**2.2**	A

Table 4-3

Sediment/Soil Risk Estimates for Aquatic Invertebrates based on Maximum Concentrations [a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients					
						Amphipod		
Area	Analyte	Maximum (mg/kg)	ER-L	ER-M	*Nereis* NOEC	LC20	LC50	Risk Category
Full Tidal	Cobalt	41.7	--	--	**26**	**4.2**	**1.9**	A
Full Tidal	Copper	163	**4.8**	0.60	**30**	--	--	B
Full Tidal	Lead	131	**2.8**	0.60	**9.9**	--	--	B
Full Tidal	Mercury	3.4	**23**	**4.8**	**58**	--	--	A
Full Tidal	Nickel	160	**7.7**	**3.1**	**9.2**	**8.2**	**2.8**	A
Full Tidal	Selenium	5.6*	--	--	**61**	**20**	**3.4**	A
Full Tidal	Silver	1.2*	**1.2**	0.3	**37**	--	--	B
Full Tidal	Thallium	3*	--	--	**44**	**8.8**	**5**	A
Full Tidal	Vanadium	120	--	--	**5.7**	**1.8**	0.89	B
Full Tidal	Zinc	230	**1.5**	0.56	**6.1**	**2.2**	0.50	B
Full Tidal	4,4'-DDD	0.077	**39**	**3.9**	**12**	--	--	A
Full Tidal	4,4'-DDE	0.045	**20**	**1.7**	**7.8**	--	--	A
Full Tidal	4,4'-DDT	0.059	**59**	**8.4**	**3.5**	--	--	A
Full Tidal	Acenaphthene	0.96	**60**	**1.9**	**8**	--	--	A
Full Tidal	Anthracene	0.365*	**4.3**	0.33	**104**	--	--	B
Full Tidal	Aroclor 1254	0.14	--	--	**16**	--	--	U
Full Tidal	Aroclor 1260	0.075	--	--	**21**	--	--	U
Full Tidal	Benzo(a)anthracene	0.365*	**1.4**	0.23	**104**	--	--	B
Full Tidal	Benzo(a)pyrene	0.365*	0.85	0.23	**57**	--	--	B
Full Tidal	Benzo(b)fluoranthene	0.365*	--	--	**50**	**6.3**	0.11	B
Full Tidal	Benzo(e)pyrene	0.365*	--	--	**72**	--	--	U
Full Tidal	Benzo(g,h,i)perylene	0.75*	--	--	**227**	--	--	U
Full Tidal	Benzo(k)fluoranthene	0.365*	--	--	**85**	--	--	U
Full Tidal	BHC-alpha	0.017	--	--	**40**	--	--	U
Full Tidal	BHC-beta	0.0096	--	--	**1.1**	--	0.25	U
Full Tidal	BHC-delta	0.0019*	--	--	**10**	--	--	U
Full Tidal	BHC-gamma	0.035	--	--	**350**	--	--	U
Full Tidal	Bis(2-ethylhexyl)phthalate	0.88	--	--	**13**	--	--	U
Full Tidal	Butylbenzylphthalate	0.365*	--	--	**19**	--	--	U
Full Tidal	Chlordane (technical)	0.023	**46**	**3.8**	0.35	--	--	A
Full Tidal	Chlordane-alpha	0.019*	**38**	**3.2**	**1.9**	--	--	B
Full Tidal	Chrysene	0.96	**2.5**	0.34	**9.0**	**3.8**	**1.3**	A
Full Tidal	Dibenz(a,h)anthracene	0.75*	**12**	**2.9**	--	--	--	A
Full Tidal	Dieldrin	0.0076	**380**	0.95	**13**	--	--	B
Full Tidal	Dimethylphthalate	0.365*	--	--	**261**	--	--	U
Full Tidal	Di-n-butylphthalate	0.4	--	--	**53**	--	--	U
Full Tidal	Di-n-octylphthalate	0.81	--	--	**3.8**	16	2.6	A
Full Tidal	Endosulfan I	0.012*	--	--	**14**	--	--	U
Full Tidal	Endrin	0.016	--	--	**20**	**24**	**2.3**	A
Full Tidal	Endrin aldehyde	0.00305*	--	--	**47**	**1.5**	0.30	B
Full Tidal	Endrin ketone	0.038	--	--	**864**	**345**	**54**	A
Full Tidal	Fluoranthene	0.37	0.62	0.07	**92**	--	--	C
Full Tidal	Fluorene	1.4	**74**	**2.6**	**5.5**	**3,043**	**143**	A
Full Tidal	Indeno(1,2,3-c,d)pyrene	1*	--	--	**400**	--	--	U
Full Tidal	Naphthalene	1.8	**11**	**0.9**	**6.1**	--	--	A
Full Tidal	Oil and Grease	47000	--	--	**7,704,918**	**136**	**5**	A
Full Tidal	Phenanthrene	2.4	**10**	**1.6**	**4.0**	**55**	**9.8**	A
Full Tidal	Pyrene	0.84	**1.3**	0.3	**41**	--	--	B
Full Tidal	TPH-Diesel	12000	--	--	**5,769**	**339**	**28**	A
Full Tidal	TPH-Diesel and Waste oil	53000	--	--	--	**98**	**16**	A
Full Tidal	Waste oil	41000	--	--	**8,542**	**145**	**14**	A
Full Tidal	High MW PAHs	2.42	**1.4**	0.25	**23**	--	--	B
Full Tidal	Low MW PAHs	4.76	**8.6**	**1.5**	**3.8**	**96**	**14**	A
Full Tidal	Total DDT	0.146	**92**	**3.2**	**5.0**	--	--	A
Full Tidal	Total PAHs	6.56	**1.6**	0.15	**4.8**	**42**	**6.0**	A
Full Tidal	Total PCB	0.14	**6.2**	0.78	**16**	--	--	B
Full Tidal	Total phenol	0.48	--	--	**4.5**	--	--	U
Full Tidal	Total phthalate esters	1.901	--	--	**8.9**	--	--	U
Future Full Tidal	Arsenic	700	**85**	**10**	**44**	--	--	A
Future Full Tidal	Barium	56000	--	--	**1,273**	--	--	U

Table 4-3

Sediment/Soil Risk Estimates for Aquatic Invertebrates based on Maximum Concentrations [a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients					
						Amphipod		
Area	Analyte	Maximum (mg/kg)	ER-L	ER-M	*Nereis* NOEC	LC20	LC50	Risk Category
Future Full Tidal	Beryllium	590	--	--	**2,034**	**756**	**133**	A
Future Full Tidal	Cadmium	190	**158**	**20**	**3,519**	--	--	A
Future Full Tidal	Chromium	10000	**123**	**27**	**862**	**191**	**91**	A
Future Full Tidal	Cobalt	3900	--	--	**2,422**	**390**	**181**	A
Future Full Tidal	Copper	6900	**203**	**26**	**1,278**	--	--	A
Future Full Tidal	Lead	17000	**364**	**78**	**1,278**	--	--	A
Future Full Tidal	Mercury	190	**1,267**	**268**	**3,220**	--	--	A
Future Full Tidal	Nickel	13000	**622**	**252**	**747**	**663**	**224**	A
Future Full Tidal	Selenium	5.5*	--	--	**60**	**20**	**3**	A
Future Full Tidal	Silver	68	**68**	**18**	**2,194**	--	--	A
Future Full Tidal	Thallium	160	--	--	**2,319**	**471**	**276**	A
Future Full Tidal	Vanadium	26000	--	--	**1,226**	**398**	**193**	A
Future Full Tidal	Zinc	37000	**247**	**90**	**987**	**356**	**81**	A
Future Full Tidal	4,4'-DDD	0.26	**130**	**13**	**41**	--	--	A
Future Full Tidal	4,4'-DDE	0.34	**155**	**13**	**59**	--	--	A
Future Full Tidal	4,4'-DDT	0.088	**88**	**13**	**5.2**	--	--	A
Future Full Tidal	4-Methylphenol	4.7*	--	--	**44**	--	--	U
Future Full Tidal	Acenaphthene	1.7	**106**	**3.4**	**15**	--	--	A
Future Full Tidal	Acenaphthylene	7.7	**175**	**12**	--	--	--	A
Future Full Tidal	Aldrin	0.0065*	--	--	**17**	**30**	**3**	A
Future Full Tidal	Anthracene	0.7*	**8.2**	0.64	**200**	--	--	B
Future Full Tidal	Aroclor 1254	0.39	--	--	**45**	--	--	U
Future Full Tidal	Aroclor 1260	0.16	--	--	**46**	--	--	U
Future Full Tidal	Benzo(a)anthracene	0.7*	**2.7**	0.44	**200**	--	--	B
Future Full Tidal	Benzo(a)pyrene	0.7*	**1.6**	0.44	**109**	--	--	B
Future Full Tidal	Benzo(b)fluoranthene	1.5	--	--	**205**	**26**	0.44	B
Future Full Tidal	Benzo(e)pyrene	0.7*	--	--	**139**	--	--	U
Future Full Tidal	Benzo(g,h,i)perylene	1.35*	--	--	**409**	--	--	U
Future Full Tidal	Benzo(k)fluoranthene	0.7*	--	--	**163**	--	--	U
Future Full Tidal	BHC-alpha	0.028	--	--	**67**	--	--	U
Future Full Tidal	BHC-beta	0.13	--	--	**15**	--	**3.4**	A
Future Full Tidal	BHC-delta	0.042	--	--	**221**	--	--	U
Future Full Tidal	BHC-gamma	0.023	--	--	**230**	--	--	U
Future Full Tidal	Bis(2-ethylhexyl)phthalate	3.7	--	--	**55**	--	--	U
Future Full Tidal	Butylbenzylphthalate	5.3	--	--	**276**	--	--	U
Future Full Tidal	Chlordane (technical)	3.8	**7,600**	**633**	**59**	--	--	A
Future Full Tidal	Chlordane-alpha	0.52	**1,040**	**87**	**52**	--	--	A
Future Full Tidal	Chlordane-gamma	0.28	**560**	**47**	**52**	--	--	A
Future Full Tidal	Chrysene	5.6	**15**	**2.0**	**52**	**22**	**7.3**	A
Future Full Tidal	Dibenz(a,h)anthracene	1.35*	**21**	**5.2**	--	--	--	A
Future Full Tidal	Dieldrin	0.041	**2,050**	**5.1**	**72**	--	--	A
Future Full Tidal	Dimethylphthalate	0.7*	--	--	**500**	--	--	U
Future Full Tidal	Di-n-butylphthalate	6.7	--	--	**882**	--	--	U
Future Full Tidal	Di-n-octylphthalate	3.2	--	--	**15**	**62**	**10**	A
Future Full Tidal	Endosulfan I	0.055*	--	--	**65**	--	--	U
Future Full Tidal	Endrin	0.035	--	--	**45**	**52**	**5.0**	A
Future Full Tidal	Endrin aldehyde	0.05	--	--	**769**	**25**	**4.9**	A
Future Full Tidal	Endrin ketone	0.054	--	--	**1,227**	**491**	**77**	A
Future Full Tidal	Fluoranthene	0.6*	**1.0**	0.12	**149**	--	--	B
Future Full Tidal	Fluorene	3.8	**200**	**7.0**	**15**	**8,261**	**387**	A
Future Full Tidal	Indeno(1,2,3-c,d)pyrene	1.35*	--	--	**540**	--	--	U
Future Full Tidal	Naphthalene	5.7	**36**	**2.7**	**19**	--	--	A
Future Full Tidal	Oil and Grease	370000	--	--	**60,655,738**	1,069	39	A
Future Full Tidal	Phenanthrene	9	**38**	**6.0**	**15**	206	37	A
Future Full Tidal	Pyrene	1.5	**2.2**	--	**74**	--	--	B
Future Full Tidal	TPH-Diesel	31000	--	--	**14,904**	**876**	**73**	A
Future Full Tidal	TPH-Diesel and Waste oil	102000	--	--	--	**189**	**31**	A
Future Full Tidal	Waste oil	71000	--	--	**14,792**	**252**	**23**	A
Future Full Tidal	High MW PAHs	3.639	**2.1**	0.38	**34**	--	--	B
Future Full Tidal	Low MW PAHs	18.9	**34**	**6.0**	**15**	**382**	**56**	A

Table 4-3

Sediment/Soil Risk Estimates for Aquatic Invertebrates based on Maximum Concentrations [a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients					
						Amphipod		
Area	Analyte	Maximum (mg/kg)	ER-L	ER-M	*Nereis* NOEC	LC20	LC50	Risk Category
Future Full Tidal	Total DDT	0.385	**244**	**8.4**	**13**	--	--	A
Future Full Tidal	Total PAHs	20.5	**5.1**	0.46	**15**	131	19	A
Future Full Tidal	Total PCB	0.39	**17**	**2.2**	**45**	--	--	A
Future Full Tidal	Total phenol	1.6	--	--	**15**	--	--	U
Future Full Tidal	Total phthalate esters	6.875	--	--	**32**	--	--	U
Garden Grove	Barium	152	--	--	**3.5**	--	--	U
Garden Grove	Beryllium	1.1	--	--	**3.8**	**1.4**	0.25	B
Garden Grove	Cadmium	0.65	0.54	0.07	**12**	--	--	C
Garden Grove	Chromium	35.5	0.44	0.10	**3.1**	0.68	0.32	C
Garden Grove	Cobalt	20.1	--	--	**12**	**2.0**	0.94	B
Garden Grove	Copper	34.8	**1.0**	0.13	**6.4**	--	--	B
Garden Grove	Lead	96	**2.1**	0.44	**7.2**	--	--	B
Garden Grove	Mercury	0.39	**2.6**	0.55	**6.6**	--	--	B
Garden Grove	Nickel	25	**1.2**	0.48	**1.4**	**1.3**	0.43	B
Garden Grove	Selenium	3.15	--	--	**34**	**11**	**1.9**	A
Garden Grove	Silver	0.65*	0.65	0.18	**21**	--	--	C
Garden Grove	Thallium	0.65*	--	--	**9.4**	**1.9**	**1.1**	A
Garden Grove	Vanadium	79	--	--	**3.7**	**1.2**	0.59	B
Garden Grove	Zinc	140	0.93	0.34	**3.7**	**1.3**	0.31	B
Garden Grove	4,4'-DDD	0.037	**19**	**1.9**	**5.9**	--	--	A
Garden Grove	4,4'-DDE	0.098	**45**	**3.6**	**17**	--	--	A
Garden Grove	Aroclor 1254	0.074	--	--	**8.5**	--	--	U
Garden Grove	Benzo(a)anthracene	0.25*	0.96	0.16	**71**	--	--	C
Garden Grove	Benzo(a)pyrene	0.25*	0.58	0.16	**39**	--	--	C
Garden Grove	Benzo(b)fluoranthene	0.25*	--	--	**34**	**4.3**	0.07	B
Garden Grove	Benzo(e)pyrene	0.25*	--	--	**50**	--	--	U
Garden Grove	Benzo(g,h,i)perylene	0.25*	--	--	**76**	--	--	U
Garden Grove	Benzo(k)fluoranthene	0.25*	--	--	**58**	--	--	U
Garden Grove	BHC-delta	0.0016	--	--	**8.4**	--	--	U
Garden Grove	Bis(2-ethylhexyl)phthalate	0.76	--	--	**11**	--	--	U
Garden Grove	Butylbenzylphthalate	0.25	--	--	**13**	--	--	U
Garden Grove	Chlordane (technical)	0.018	**36**	**3.0**	0.28	--	--	A
Garden Grove	Chlordane-alpha	0.0071	**14**	**1.2**	0.71	--	--	A
Garden Grove	Chlordane-gamma	0.0059	**12**	0.98	**1.1**	--	--	B
Garden Grove	Chrysene	0.25*	0.65	0.09	**2.3**	0.98	0.33	C
Garden Grove	Dieldrin	0.0012	**60**	0.15	**2.1**	--	--	B
Garden Grove	Di-n-butylphthalate	0.25*	--	--	**33**	--	--	U
Garden Grove	Di-n-octylphthalate	0.25*	--	--	**1.2**	**4.8**	0.79	B
Garden Grove	Endrin aldehyde	0.003	--	--	**46**	**1.5**	0.29	B
Garden Grove	Fluoranthene	0.25*	0.42	0.05	**62**	--	--	B
Garden Grove	Indeno(1,2,3-c,d)pyrene	0.25*	--	--	**100**	--	--	U
Garden Grove	Oil and Grease	750	--	--	**122,951**	**2**	0.079	B
Garden Grove	Phenanthrene	0.25*	**1.0**	0.17	0.41	**5.7**	**1.0**	A
Garden Grove	Pyrene	0.12	0.18	0.05	**5.9**	--	--	C
Garden Grove	TPH-Diesel and Waste oil	730	--	--	--	**1.4**	0.22	B
Garden Grove	Waste oil	650	--	--	**135**	**2.3**	0.22	B
Garden Grove	High MW PAHs	0.475	0.28	0.05	**4.4**	--	--	C
Garden Grove	Total DDT	0.135	**85**	**2.9**	**4.7**	--	--	A
Garden Grove	Total PAHs	0.514	0.13	0.01	0.37	**3.3**	0.47	B
Garden Grove	Total PCB	0.074	**3.3**	0.41	**8.5**	--	--	B
Garden Grove	Total phthalate esters	0.878	--	--	**4.1**	--	--	U
Gas Plant	Arsenic	81	**9.9**	**1.2**	**5.1**	--	--	A
Gas Plant	Barium	249	--	--	**5.7**	--	--	U
Gas Plant	Beryllium	2	--	--	**6.9**	**2.6**	0.45	B
Gas Plant	Cadmium	1.05*	0.88	0.11	**19**	--	--	C
Gas Plant	Chromium	120	**1.5**	0.32	**10**	**2.3**	**1.1**	A
Gas Plant	Cobalt	14	--	--	**8.7**	**1.4**	0.65	B
Gas Plant	Copper	110	**3.2**	0.41	**20**	--	--	B
Gas Plant	Lead	91	**1.9**	0.42	**6.8**	--	--	B
Gas Plant	Mercury	0.41	**2.7**	0.58	**7.0**	--	--	B

Table 4-3

Sediment/Soil Risk Estimates for Aquatic Invertebrates based on Maximum Concentrations [a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients					
						Amphipod		
Area	Analyte	Maximum (mg/kg)	ER-L	ER-M	*Nereis* NOEC	LC20	LC50	Risk Category
Gas Plant	Nickel	34	**1.6**	0.66	**2.0**	**1.7**	0.59	B
Gas Plant	Selenium	5.35*	--	--	**58**	**19**	**3.2**	A
Gas Plant	Silver	1.05*	**1.1**	0.28	**34**	--	--	B
Gas Plant	Thallium	4.4*	--	--	**64**	**13**	**7.6**	A
Gas Plant	Vanadium	110	--	--	**5.2**	**1.7**	0.82	B
Gas Plant	Zinc	300	**2.0**	0.73	**8.0**	**2.9**	0.65	B
Gas Plant	4,4'-DDD	0.16	**80**	**8.0**	**25**	--	--	A
Gas Plant	4,4'-DDE	0.013	**5.9**	0.48	**2.2**	--	--	B
Gas Plant	Acenaphthene	0.7	**44**	**1.4**	**6.1**	--	--	A
Gas Plant	Aroclor 1254	0.067	--	--	**7.7**	--	--	U
Gas Plant	Aroclor 1260	0.65	--	--	**186**	--	--	U
Gas Plant	Benzo(a)anthracene	0.41*	**1.6**	0.26	**117**	--	--	B
Gas Plant	Benzo(a)pyrene	0.41*	0.95	0.26	**64**	--	--	C
Gas Plant	Benzo(b)fluoranthene	0.41*	--	--	**56**	**7.1**	0.12	B
Gas Plant	Benzo(g,h,i)perylene	0.55*	--	--	**167**	--	--	U
Gas Plant	Benzo(k)fluoranthene	0.41*	--	--	**95**	--	--	U
Gas Plant	BHC-alpha	0.00052	--	--	**1.2**	--	--	U
Gas Plant	Chrysene	0.41*	**1.1**	0.15	**3.8**	**1.6**	0.54	B
Gas Plant	Dieldrin	0.0021	**105**	0.26	**3.7**	--	--	B
Gas Plant	Dimethylphthalate	0.15	--	--	**107**	--	--	U
Gas Plant	Di-n-butylphthalate	0.15*	--	--	**20**	--	--	U
Gas Plant	Di-n-octylphthalate	0.59	--	--	**2.8**	**11**	**1.9**	A
Gas Plant	Fluoranthene	0.41*	0.68	0.08	**102**	--	--	C
Gas Plant	Fluorene	3.6	**189**	**6.7**	**14**	**7,826**	**367**	A
Gas Plant	Naphthalene	2.5	**16**	**1.2**	**8.5**	--	--	A
Gas Plant	Oil and Grease	29000	--	--	**4,754,098**	**84**	**3.1**	A
Gas Plant	Phenanthrene	1.5	**6.3**	**1.0**	**2.5**	**34**	**6.1**	A
Gas Plant	Pyrene	0.41*	0.62	0.16	**20**	--	--	C
Gas Plant	TPH-Diesel	1700	--	--	**817**	**48**	**4.0**	A
Gas Plant	TPH-Diesel and Waste oil	14700	--	--	--	**27**	**4.5**	A
Gas Plant	Waste oil	13000	--	--	**2,708**	**46**	**4.3**	A
Gas Plant	High MW PAHs	0.249	0.15	0.03	**2.3**	--	--	C
Gas Plant	Low MW PAHs	6.75	**12**	**2.1**	**5.3**	**136**	**20**	A
Gas Plant	Total DDT	0.173	**109**	**3.8**	**6.0**	--	--	A
Gas Plant	Total PAHs	6.91	**1.7**	0.15	**5.0**	**44**	**6.3**	A
Gas Plant	Total PCB	0.65	**29**	**3.6**	**75**	--	--	A
Gas Plant	Total phthalate esters	0.59	--	--	**2.8**	--	--	U
Muted Tidal	Arsenic	130	**16**	**1.9**	**8.1**	--	--	A
Muted Tidal	Barium	9270	--	--	**211**	--	--	U
Muted Tidal	Beryllium	4.2	--	--	**14**	**5.4**	0.95	B
Muted Tidal	Cadmium	4.1	**3.4**	0.43	**76**	--	--	B
Muted Tidal	Chromium	120	**1.5**	0.32	**10**	**2.3**	**1.1**	A
Muted Tidal	Cobalt	59	--	--	**37**	**5.9**	**2.7**	A
Muted Tidal	Copper	400	**12**	**1.5**	**74**	--	--	A
Muted Tidal	Lead	9600	**206**	**44**	**722**	--	--	A
Muted Tidal	Mercury	0.66	**4.4**	0.93	**11**	--	--	B
Muted Tidal	Nickel	100	**4.8**	**1.9**	**5.8**	5.1	1.7	A
Muted Tidal	Selenium	4.2	--	--	**46**	15	2.5	A
Muted Tidal	Silver	0.8*	0.80	0.22	**26**	--	--	C
Muted Tidal	Thallium	4*	--	--	**58**	**12**	**6.9**	A
Muted Tidal	Vanadium	130	--	--	**6.1**	**2.0**	0.96	B
Muted Tidal	Zinc	460	**3.1**	**1.1**	**12**	**4.4**	**1.0**	A
Muted Tidal	4,4'-DDD	0.13	**65**	**6.5**	**21**	--	--	A
Muted Tidal	4,4'-DDE	0.045	**20**	**1.7**	**7.8**	--	--	A
Muted Tidal	4,4'-DDT	0.067	**67**	**9.6**	**4.0**	--	--	A
Muted Tidal	Acenaphthylene	4.8	**109**	**7.5**	**41**	--	--	A
Muted Tidal	Anthracene	0.315*	**3.7**	0.29	**90**	--	--	B
Muted Tidal	Aroclor 1254	0.12	--	--	**14**	--	--	U
Muted Tidal	Aroclor 1260	2.8	--	--	**800**	--	--	U
Muted Tidal	Benzo(a)anthracene	0.315*	**1.2**	0.20	**90**	--	--	B

Table 4-3

Sediment/Soil Risk Estimates for Aquatic Invertebrates based on Maximum Concentrations [a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients					
						Amphipod		
Area	Analyte	Maximum (mg/kg)	ER-L	ER-M	*Nereis* NOEC	LC20	LC50	Risk Category
Muted Tidal	Benzo(a)pyrene	0.315*	0.73	0.20	**49**	--	--	C
Muted Tidal	Benzo(b)fluoranthene	0.73	--	--	**100**	**13**	0.22	B
Muted Tidal	Benzo(e)pyrene	0.315*	--	--	**63**	--	--	U
Muted Tidal	Benzo(g,h,i)perylene	0.65*	--	--	**197**	--	--	U
Muted Tidal	Benzo(k)fluoranthene	0.315*	--	--	**73**	--	--	U
Muted Tidal	BHC-alpha	0.0025	--	--	**6.0**	--	--	U
Muted Tidal	BHC-delta	0.0054	--	--	**28**	--	--	U
Muted Tidal	BHC-gamma	0.0018	--	--	**18**	--	--	U
Muted Tidal	Bis(2-ethylhexyl)phthalate	2.6	--	--	**39**	--	--	U
Muted Tidal	Butylbenzylphthalate	0.56	--	--	**29**	--	--	U
Muted Tidal	Chlordane (technical)	0.11	**220**	**18**	**1.7**	--	--	A
Muted Tidal	Chlordane-alpha	0.027	**54**	**4.5**	**2.7**	--	--	A
Muted Tidal	Chlordane-gamma	0.015	**30**	**2.5**	**2.8**	--	--	A
Muted Tidal	Chrysene	0.62	**1.6**	0.22	**5.8**	**2.4**	0.81	B
Muted Tidal	Dieldrin	0.026*	**1,300**	**3.3**	**46**	--	--	A
Muted Tidal	Dimethylphthalate	0.315*	--	--	**225**	--	--	U
Muted Tidal	Di-n-butylphthalate	0.65*	--	--	**86**	--	--	U
Muted Tidal	Di-n-octylphthalate	0.69	--	--	**3.2**	**13**	**2.2**	A
Muted Tidal	Endosulfan I	0.105*	--	--	**124**	--	--	U
Muted Tidal	Endrin	0.029	--	--	**37**	**43**	**4.1**	A
Muted Tidal	Endrin aldehyde	0.14*	--	--	**2,154**	**70**	**14**	A
Muted Tidal	Endrin ketone	0.14*	--	--	**3,182**	**1,273**	**200**	A
Muted Tidal	Fluoranthene	0.315*	0.53	0.06	**78**	--	--	C
Muted Tidal	Fluorene	0.315*	**17**	0.58	**1.2**	**685**	**32**	A
Muted Tidal	Indeno(1,2,3-c,d)pyrene	0.65*	--	--	**260**	--	--	U
Muted Tidal	Naphthalene	0.315*	**2.0**	0.15	**1.1**	--	--	B
Muted Tidal	Oil and Grease	77000	--	--	**12,622,951**	**223**	**8.1**	A
Muted Tidal	Phenanthrene	0.63	**2.6**	0.42	**1.0**	**14**	**2.6**	A
Muted Tidal	Phenol	1.6*	--	--	**258**	--	--	U
Muted Tidal	Pyrene	0.315*	0.47	0.12	**16**	--	--	C
Muted Tidal	TPH-Diesel	7000*	--	--	**3,365**	**198**	**17**	A
Muted Tidal	TPH-Diesel and Waste oil	47000	--	--	--	**87**	**14**	A
Muted Tidal	Waste oil	40000	--	--	**8,333**	**142**	**13**	A
Muted Tidal	High MW PAHs	0.62	0.36	0.07	**5.8**	--	--	C
Muted Tidal	Low MW PAHs	0.63	**1.1**	0.20	0.50	**13**	**1.9**	A
Muted Tidal	Total DDT	0.168	**106**	**3.6**	**5.8**	--	--	A
Muted Tidal	Total PAHs	0.63	0.16	0.01	0.46	**4.0**	0.57	B
Muted Tidal	Total PCB	2.8	**123**	**16**	**322**	--	--	A
Muted Tidal	Total phenol	0.3	--	--	**2.8**	--	--	U
Muted Tidal	Total phthalate esters	3.11	--	--	**15**	--	--	U
Seasonal Ponds	Arsenic	320	**39**	**4.6**	**20**	--	--	A
Seasonal Ponds	Barium	12100	--	--	**275**	--	--	U
Seasonal Ponds	Beryllium	3.2	--	--	**11**	**4.1**	0.72	B
Seasonal Ponds	Cadmium	1.165*	0.97	0.12	**22**	--	--	C
Seasonal Ponds	Chromium	250	**3.1**	0.68	**22**	**4.8**	**2.3**	A
Seasonal Ponds	Cobalt	18	--	--	**11**	**1.8**	0.84	B
Seasonal Ponds	Copper	58	**1.7**	0.21	**11**	--	--	B
Seasonal Ponds	Lead	220	**4.7**	**1.0**	**17**	--	--	A
Seasonal Ponds	Mercury	1.11*	**7.4**	**1.6**	**19**	--	--	A
Seasonal Ponds	Nickel	202	**9.7**	**3.9**	**12**	**10**	**3.5**	A
Seasonal Ponds	Selenium	5.5*	--	--	**60**	**20**	**3.3**	A
Seasonal Ponds	Silver	1.165*	**1.2**	0.31	**38**	--	--	B
Seasonal Ponds	Thallium	3.4*	--	--	**49**	**10**	**5.9**	A
Seasonal Ponds	Vanadium	120	--	--	**5.7**	**1.8**	0.89	B
Seasonal Ponds	Zinc	351	**2.3**	0.86	**9.4**	**3.4**	0.77	B
Seasonal Ponds	4,4'-DDD	0.053	**27**	**2.7**	**8.4**	--	--	A
Seasonal Ponds	4,4'-DDE	0.074	**34**	**2.7**	**13**	--	--	A
Seasonal Ponds	4,4'-DDT	0.0068	**6.8**	0.97	0.4	--	--	B
Seasonal Ponds	Anthracene	0.65*	**7.6**	0.59	**186**	--	--	B
Seasonal Ponds	Aroclor 1254	0.083	--	--	**9.5**	--	--	U

Table 4-3

Sediment/Soil Risk Estimates for Aquatic Invertebrates based on Maximum Concentrations [a] - Hazard Quotients Exceeding 1

Bolsa Chica Lowlands

			Hazard Quotients					
						Amphipod		
Area	Analyte	Maximum (mg/kg)	ER-L	ER-M	*Nereis* NOEC	LC20	LC50	Risk Category
Seasonal Ponds	Benzo(a)anthracene	0.65*	**2.5**	0.41	**186**	--	--	B
Seasonal Ponds	Benzo(a)pyrene	0.65*	**1.5**	0.41	**102**	--	--	B
Seasonal Ponds	Benzo(b)fluoranthene	0.65*	--	--	**89**	**11**	0.19	B
Seasonal Ponds	Benzo(e)pyrene	0.65*	--	--	**129**	--	--	U
Seasonal Ponds	Benzo(k)fluoranthene	0.65*	--	--	**151**	--	--	U
Seasonal Ponds	BHC-alpha	0.0027	--	--	**6.4**	--	--	U
Seasonal Ponds	BHC-beta	0.012	--	--	**1.4**	--	0.31	U
Seasonal Ponds	BHC-gamma	0.0008	--	--	**8**	--	--	U
Seasonal Ponds	Bis(2-ethylhexyl)phthalate	0.65*	--	--	**9.7**	--	--	U
Seasonal Ponds	Butylbenzylphthalate	0.65*	--	--	**34**	--	--	U
Seasonal Ponds	Chrysene	0.65*	**1.7**	0.23	**6.1**	**2.5**	0.85	B
Seasonal Ponds	Dibenz(a,h)anthracene	0.9*	**14**	**3.5**	--	--	--	A
Seasonal Ponds	Dieldrin	0.0032*	**160**	0.4	**5.6**	--	--	B
Seasonal Ponds	Di-n-butylphthalate	0.65*	--	--	**86**	--	--	U
Seasonal Ponds	Di-n-octylphthalate	0.65*	--	--	**3.0**	**13**	**2.1**	A
Seasonal Ponds	Endosulfan I	0.013*	--	--	**15**	--	--	U
Seasonal Ponds	Endrin	0.019	--	--	**24**	**28**	**2.7**	A
Seasonal Ponds	Endrin aldehyde	0.017	--	--	**262**	**8.5**	**1.7**	A
Seasonal Ponds	Fluoranthene	0.65*	**1.1**	0.13	**161**	--	--	B
Seasonal Ponds	Oil and Grease	15000	--	--	**2,459,016**	**43**	**1.6**	A
Seasonal Ponds	Phenanthrene	4.8	**20**	**3.2**	**8.0**	**110**	**20**	A
Seasonal Ponds	Phenol	4.4	--	--	**710**	--	--	U
Seasonal Ponds	Pyrene	0.65*	0.98	0.25	**32**	--	--	C
Seasonal Ponds	TPH-Diesel	1650*	--	--	**793**	**47**	**3.9**	A
Seasonal Ponds	TPH-Diesel and Waste oil	10150	--	--	--	**19**	**3.1**	A
Seasonal Ponds	Waste oil	8500	--	--	**1,771**	**30**	**2.8**	A
Seasonal Ponds	High MW PAHs	0.463	0.27	0.05	**4.3**	--	--	C
Seasonal Ponds	Total DDT	0.0812	**51**	**1.8**	**2.8**	--	--	A
Seasonal Ponds	Total PAHs	0.496	0.12	0.01	0.36	**3.2**	0.45	B
Seasonal Ponds	Total PCB	0.083	**3.7**	0.46	**9.5**	--	--	B
Seasonal Ponds	Total phthalate esters	0.234	--	--	**1.1**	--	--	U

Notes:

[a]Summary statistics for detected analytes are presented in Table 3-2.

*Maximum detected value was lower than 1/2 the highest non-detect value. The value listed is 1/2 the highest non-detect value.

Risk estimates are presented for those COPECs with HQs exceeding 1 for an effect level.

Shaded entries indicate COPECs with HQs greater than one.

No effects on *Nereis* survival were observed at the highest tested exposure concentration; as a result, the NOEC is not considered as significant a screening value as other effect levels.

The risk estimates for all detected COPECs are presented in Appendix I, Table I-3.

COPEC - Chemical of potential ecological concern
ER-L - Effects range low
ER-M - Effects range median
HQ - Hazard quotient
NOEC - No observed effect concentration
LC_{20} - Lethal concentration resulting in mortality to 20% of the test organisms
LC_{50} - Lethal concentration resulting in mortality to 50% of the test organisms

Risk Categories	***Description***
U	Uncertain - exposure exceeds chronic no-effect level, but a chronic low-effect level is not available
C	Some Possible - exposure exceeds a chronic no-effect level, but not a chronic low-effect level
B	Possible - exposure exceeds a chronic low-effect level
A	Probable - exposure represent the highest level risk that culd be quantified

Table 4-4
Surface Water Risk Estimates for Aquatic Plants, Invertebrates, and Fish Based on Maximum Concentrations[a] - Hazard Quotients Exceeding 1
Bolsa Chica Lowlands

				Hazard Quotients							Risk Category		
				California Water Quality Standards[b]		Aquatic Plant Lowest Chronic Value	Aquatic Invertebrates			Fish NOEC			
							Ceriodaphnia		*Mysidopsis*				
Area	Analyte	Maximum	Units	Acute	Chronic		NOEC	LOEC	NOEC		Plants	Invertebrates	Fish
Bolsa Bay	Arsenic, Dissolved	1.6	ug/L	0.02	0.04	0.0007	**1.1**	0.53	0.08	0.16	none	C	none
Bolsa Bay	Beryllium, Dissolved	82	ug/L	--	--	0.0008	--	--	--	**1.1**	none	unknown	U
Bolsa Bay	Cadmium, Dissolved	0.15	ug/L	0.004	0.02	0.08	**2.7**	**1.4**	**1.1**	0.63	none	B	none
Bolsa Bay	Chromium, Dissolved	27	ug/L	--	--	0.07	**16**	**8.2**	**4.4**	**1.1**	none	B	U
Bolsa Bay	Copper, Dissolved	7.2	ug/L	**1.5**	**2.3**	**7.2**	**1.1**	0.55	**1.7**	**1.1**	A	A	A
Bolsa Bay	Lead, Dissolved	0.46	ug/L	0.002	0.06	0.0009	**1.6**	0.82	**1.6**	0.50	none	C	none
Bolsa Bay	Silver, Dissolved	0.29	ug/L	0.15	--	0.01	**6.5**	**3.3**	**3.5**	**1.0**	none	B	C
Bolsa Bay	Sulfate	2300000	ug/L	--	--	--	**63**	**32**	**7.2**	--	unknown	B	none
Bolsa Bay	Zinc, Dissolved	14	ug/L	0.16	0.17	0.47	0.90	0.45	**1.7**	**1.2**	none	C	C
Full Tidal	Arsenic, Dissolved	33	ug/L	0.48	0.92	0.01	**22**	**11**	**1.7**	**3.3**	none	B	C
Full Tidal	Barium, Dissolved	130	ug/L	--	--	--	**11**	**5.4**	**1.5**	**1.1**	unknown	B	U
Full Tidal	Beryllium, Dissolved	190	ug/L	--	--	0.002	--	--	--	**2.5**	none	unknown	U
Full Tidal	Cadmium, Dissolved	0.8	ug/L	0.02	0.09	0.40	**15**	**7.3**	**5.7**	**3.3**	none	B	C
Full Tidal	Chromium, Dissolved	37	ug/L	--	--	0.09	**22**	**11**	**6.1**	**1.5**	none	B	U
Full Tidal	Cobalt, Dissolved	0.79	ug/L	--	--	--	**5.9**	**2.9**	**1.3**	**1.4**	unknown	B	U
Full Tidal	Copper, Dissolved	7.8	ug/L	**1.6**	**2.5**	**7.8**	**1.2**	0.60	**1.8**	**1.1**	A	A	A
Full Tidal	Lead, Dissolved	1.8	ug/L	0.01	0.22	0.004	**6.4**	**3.2**	**6.4**	**2.0**	none	B	C
Full Tidal	Mercury	0.11	ug/L	--	--	0.02	--	--	--	**3.3**	none	unknown	U
Full Tidal	Nickel, Dissolved	24	ug/L	0.32	**2.9**	**4.8**	--	--	**3.0**	**3.3**	B	B	B
Full Tidal	Silver, Dissolved	0.25	ug/L	0.13	--	0.01	**5.6**	**2.8**	**3.0**	0.89	none	B	none
Full Tidal	Sulfate	6300000	ug/L	--	--	--	**173**	**86**	**20**	--	unknown	B	unknown
Full Tidal	Zinc, Dissolved	12	ug/L	0.13	0.15	0.40	0.77	0.39	**1.5**	**1.0**	none	C	C
Full Tidal	Dieldrin	0.013	ug/L	0.02	**6.8**	--	**2.2**	**1.1**	--	**3.3**	B	B	B
Full Tidal	Endrin	0.054	ug/L	**1.5**	**23**	--	--	--	--	**3.4**	A	A	A
Full Tidal	TPH-Diesel	3100	ug/L	--	--	--	**30**	**15**	**10**	**3.3**	unknown	B	U
Full Tidal	Waste oil	14000	ug/L	--	--	--	**31**	**16**	**12**	**3.3**	unknown	B	U
Future Full Tidal	Arsenic	43	ug/L	0.62	**1.2**	0.02	**31**	**15**	**1.0**	**4.3**	B	B	B
Future Full Tidal	Arsenic, Dissolved	19	ug/L	0.28	0.53	0.01	**13**	**6.3**	**1.0**	**1.9**	none	B	C
Future Full Tidal	Barium	660	ug/L	--	--	--	**46**	**23**	**1.0**	**5.5**	unknown	B	U
Future Full Tidal	Barium, Dissolved	88	ug/L	--	--	--	**7.3**	**3.7**	**1.0**	0.73	unknown	B	none
Future Full Tidal	Cadmium	0.59	ug/L	0.01	0.06	0.30	**2.0**	**1.0**	**22**	**2.5**	none	B	C
Future Full Tidal	Cadmium, Dissolved	0.47	ug/L	0.01	0.05	0.24	**8.5**	**4.3**	**3.4**	**2.0**	none	B	C
Future Full Tidal	Chromium	13	ug/L	--	--	0.03	**2.6**	**1.3**	**1.0**	0.52	none	B	none
Future Full Tidal	Chromium, Dissolved	12.5*	ug/L	--	--	0.03	**7.6**	**3.8**	**2.0**	0.50	none	B	none
Future Full Tidal	Cobalt	3	ug/L	--	--	--	**9.2**	**4.6**	**1.8**	**5.2**	unknown	B	U
Future Full Tidal	Cobalt, Dissolved	0.63	ug/L	--	--	--	**4.7**	**2.3**	**1.0**	**1.1**	unknown	B	U
Future Full Tidal	Copper	15	ug/L	**3.1**	**4.8**	**15**	**1.8**	0.88	0.88	**2.2**	A	A	A
Future Full Tidal	Copper, Dissolved	13	ug/L	**2.7**	**4.2**	**13**	**2.0**	**1.0**	**3.0**	**1.9**	A	A	A
Future Full Tidal	Lead	25	ug/L	0.12	**3.1**	0.05	**17**	**8.3**	**1.0**	**27**	B	B	B
Future Full Tidal	Lead, Dissolved	0.92	ug/L	0.004	0.11	0.002	**3.3**	**1.6**	**3.3**	**1**	none	B	C

Table 4-4
Surface Water Risk Estimates for Aquatic Plants, Invertebrates, and Fish Based on Maximum Concentrations[a] - Hazard Quotients Exceeding 1
Bolsa Chica Lowlands

				Hazard Quotients							Risk Category		
				California Water Quality Standards[b]		Aquatic Plant Lowest Chronic Value	Aquatic Invertebrates			Fish NOEC			
							Ceriodaphnia		*Mysidopsis*				
Area	Analyte	Maximum	Units	Acute	Chronic		NOEC	LOEC	NOEC		Plants	Invertebrates	Fish
Future Full Tidal	Mercury	0.13	ug/L	--	--	0.03	--	--	--	**3.9**	none	unknown	U
Future Full Tidal	Nickel	13	ug/L	0.18	**1.6**	0.24	**2.9**	**1.5**	0.24	**1.8**	B	B	B
Future Full Tidal	Nickel, Dissolved	8	ug/L	0.11	0.98	**1.6**	--	--	**1.0**	**1.1**	B	C	C
Future Full Tidal	Silver	1	ug/L	0.53	--	0.03	**8.3**	**4.2**	**1.0**	**3.6**	none	B	U
Future Full Tidal	Silver, Dissolved	0.19	ug/L	0.10	--	0.01	**4.3**	**2.1**	**2.3**	0.68	none	B	none
Future Full Tidal	Sulfate	1800000	ug/L	--	--	--	**49**	**25**	**5.6**	--	unknown	B	unknown
Future Full Tidal	Vanadium	84	ug/L	--	--	--	**11**	**5.6**	**1.0**	--	unknown	B	unknown
Future Full Tidal	Zinc	75	ug/L	0.83	0.93	**2.5**	**2.0**	**1.0**	**1.1**	**6.3**	B	B	C
Future Full Tidal	Zinc, Dissolved	31	ug/L	0.34	0.38	**1.0**	**2.0**	**1.0**	**3.8**	**2.6**	B	B	C
Future Full Tidal	2,4-D	1.2	ug/L	--	--	--	**2.0**	**1.0**	--	--	unknown	B	unknown
Future Full Tidal	4,4'-DDT	0.013	ug/L	0.10	**13**	0.04	--	--	**1.0**	--	B	B	B
Future Full Tidal	4-Nitrophenol	25*	ug/L	--	--	--	**45**	**23**	**37**	--	unknown	B	unknown
Future Full Tidal	BHC-delta	0.082	ug/L	--	--	--	**2.0**	**1.0**	**2.3**	--	unknown	B	unknown
Future Full Tidal	Chlorpyrifos	0.1	ug/L	--	--	--	**2.0**	**1.0**	--	--	unknown	B	unknown
Future Full Tidal	Diazinon	0.5*	ug/L	--	--	--	**3.0**	**1.5**	**2.5**	--	unknown	B	unknown
Future Full Tidal	Dicamba	0.1	ug/L	--	--	--	**2.0**	**1.0**	--	--	unknown	B	unknown
Future Full Tidal	Dieldrin	0.014	ug/L	0.02	**7.4**	--	**2.3**	**1.2**	--	**3.6**	B	B	B
Future Full Tidal	Malathion	0.2	ug/L	--	--	--	**2.0**	**1.0**	--	--	unknown	B	unknown
Future Full Tidal	TPH-Diesel	370	ug/L	--	--	--	**3.5**	**1.8**	**1.2**	0.39	unknown	B	none
Future Full Tidal	Waste oil	1200	ug/L	--	--	--	**2.7**	**1.3**	**1**	0.28	unknown	B	none
Garden Grove	Arsenic	2.2	ug/L	0.03	0.06	0.0009	**1.6**	0.79	0.05	0.22	none	C	none
Garden Grove	Arsenic, Dissolved	2.1	ug/L	0.03	0.06	0.0009	**1.4**	0.70	0.11	0.21	none	C	none
Garden Grove	Barium	41	ug/L	--	--	--	**2.8**	**1.41**	0.06	0.34	unknown	B	none
Garden Grove	Barium, Dissolved	39	ug/L	--	--	--	**3.3**	**1.6**	0.44	0.33	unknown	B	none
Garden Grove	Cadmium	0.7	ug/L	0.02	0.08	0.35	**2.4**	**1.2**	**26**	**2.9**	none	B	C
Garden Grove	Cadmium, Dissolved	0.11	ug/L	0.003	0.01	0.06	**2.0**	**1.0**	0.79	0.46	none	B	none
Garden Grove	Chromium	8	ug/L	--	--	0.02	**1.6**	0.81	0.62	0.32	none	C	none
Garden Grove	Chromium, Dissolved	6.1	ug/L	--	--	0.02	**3.7**	**1.8**	**1.0**	0.24	none	B	none
Garden Grove	Cobalt	1.3	ug/L	--	--	--	**4.0**	**2.0**	0.76	**2.2**	unknown	B	U
Garden Grove	Cobalt, Dissolved	0.25	ug/L	--	--	--	**1.9**	0.93	0.40	0.43	unknown	C	none
Garden Grove	Copper	17	ug/L	**3.5**	**5.5**	**17**	**2.0**	**1.0**	**1.0**	**2.5**	A	A	A
Garden Grove	Lead	6.2	ug/L	0.03	0.77	0.01	**4.1**	**2.1**	0.25	**6.7**	none	B	C
Garden Grove	Lead, Dissolved	0.8	ug/L	0.004	0.10	0.002	**2.9**	**1.4**	**2.9**	0.87	none	B	none
Garden Grove	Mercury	0.1	ug/L	--	--	0.02	--	--	--	**3.0**	none	unknown	U
Garden Grove	Nickel	54	ug/L	0.73	**6.6**	0.98	**12**	**6.1**	**1.0**	**7.4**	B	B	B
Garden Grove	Sulfate	320000	ug/L	--	--	--	**8.8**	**4.4**	**1.0**	--	unknown	B	unknown
Garden Grove	Vanadium	81	ug/L	--	--	--	**11**	**5.4**	0.96	--	unknown	B	unknown
Garden Grove	Zinc	64	ug/L	0.71	0.79	**2.1**	**1.7**	0.85	0.91	**5.3**	B	C	C
Garden Grove	4-Nitrophenol	25*	ug/L	--	--	--	**45**	**23**	**37**	--	unknown	B	unknown
Garden Grove	Diazinon	0.5*	ug/L	--	--	--	**3.0**	**1.5**	**2.5**	--	unknown	B	unknown

Table 4-4
Surface Water Risk Estimates for Aquatic Plants, Invertebrates, and Fish Based on Maximum Concentrations[a] - Hazard Quotients Exceeding 1
Bolsa Chica Lowlands

				Hazard Quotients							Risk Category		
				California Water Quality Standards[b]		Aquatic Plant Lowest Chronic Value	Aquatic Invertebrates			Fish NOEC			
							Ceriodaphnia		*Mysidopsis*				
Area	Analyte	Maximum	Units	Acute	Chronic		NOEC	LOEC	NOEC		Plants	Invertebrates	Fish
Garden Grove	Dieldrin	0.098	ug/L	0.14	**52**	--	**16**	**8.2**	--	**25**	B	B	B
Garden Grove	TPH-Diesel	330	ug/L	--	--	--	**3.1**	**1.6**	**1.1**	0.35	unknown	B	none
Garden Grove	Waste oil	1900	ug/L	--	--	--	**4.3**	**2.1**	**1.6**	0.4	unknown	B	none
Seasonal Ponds	Arsenic, Dissolved	10	ug/L	0.14	0.28	0.004	**6.7**	**3.3**	0.53	**1.0**	none	B	C
Seasonal Ponds	Barium	78.2	ug/L	--	--	--	**5.4**	**2.70**	0.12	0.65	unknown	B	none
Seasonal Ponds	Barium, Dissolved	120	ug/L	--	--	--	**10**	**5.0**	**1.4**	**1.0**	unknown	B	U
Seasonal Ponds	Cadmium, Dissolved	0.15	ug/L	0.004	0.02	0.08	**2.7**	**1.4**	**1.1**	0.63	none	B	none
Seasonal Ponds	Chromium, Dissolved	12.5*	ug/L	--	--	0.03	**7.6**	**3.8**	**2.0**	0.50	none	B	none
Seasonal Ponds	Cobalt, Dissolved	0.42	ug/L	--	--	--	**3.1**	**1.6**	0.67	0.72	unknown	B	none
Seasonal Ponds	Copper	1.5	ug/L	0.30	0.48	**1.5**	0.18	0.09	0.09	0.22	B	none	none
Seasonal Ponds	Copper, Dissolved	6.7	ug/L	**1.4**	**2.2**	**6.7**	**1.0**	0.52	**1.6**	0.98	A	A	A
Seasonal Ponds	Lead, Dissolved	1.6	ug/L	0.01	0.20	0.003	**5.7**	**2.9**	**5.7**	**1.7**	none	B	C
Seasonal Ponds	Silver, Dissolved	0.64	ug/L	0.34	--	0.02	**14**	**7.2**	**7.6**	**2.3**	none	B	U
Seasonal Ponds	Sulfate	1500000	ug/L	--	--	--	**41**	**21**	**4.7**	--	unknown	B	unknown
Seasonal Ponds	Zinc	136	ug/L	**1.5**	**1.7**	**4.5**	**3.6**	**1.8**	**1.9**	**11**	A	A	A
Seasonal Ponds	Zinc, Dissolved	85	ug/L	0.94	**1.0**	**2.8**	**5.5**	**2.7**	**10**	**7.1**	B	B	B
Seasonal Ponds	Diazinon	1.8	ug/L	--	--	--	**11**	**5.5**	**9.0**	--	unknown	B	unknown
Seasonal Ponds	TPH-Diesel	600	ug/L	--	--	--	**5.7**	**2.9**	**1.9**	0.64	unknown	B	none
Seasonal Ponds	Waste oil	1700	ug/L	--	--	--	**3.8**	**1.9**	**1.4**	0.4	unknown	B	none

Notes:

[a]Summary statistics for detected analytes are presented in Table 3-3.

[b]California Water Quality Standards are applicable to all aquatic receptors - plants, invertebrates, and fish.

*The maximum detected value was lower than 1/2 the highest non-detect value. The value listed is 1/2 the highest non-detect value.

Risk estimates are presented only for those COPECs with hazard quotients exceeding 1 for an effect level.

No effects on topsmelt survival were observed at the highest tested exposure concentration; as a result, the NOEC is not considered as significant a screening value as other effect levels.

The risk estimates for all detected COPECs are presented in Appendix I, Table I-4.

Bolded entries indicate COPECs with HQs greater than one.

COPEC - Chemical of potential ecological concern
HQ - Hazard quotient
NOEC - No observed effect concentration
LOEC - Lowest observed effect concentration

Risk Categories	***Description***
none	None - exposure does not exceed available effect levels
unknown	Unknown - effect levels were not available for this receptor and chemical
U	Uncertain - exposure exceeds chronic no-effect level, but a chronic low-effect level is not available

Table 4-4
Surface Water Risk Estimates for Aquatic Plants, Invertebrates, and Fish Based on Maximum Concentrations[a] - Hazard Quotients Exceeding 1
Bolsa Chica Lowlands

				Hazard Quotients							Risk Category		
				California Water Quality Standards[b]		Aquatic Plant Lowest Chronic Value	Aquatic Invertebrates			Fish NOEC			
							Ceriodaphnia		*Mysidopsis*				
Area	Analyte	Maximum	Units	Acute	Chronic		NOEC	LOEC	NOEC		Plants	Invertebrates	Fish
C	Some Possible - exposure exceeds a chronic no-effect level, but not a chronic low-effect level												
B	Possible - exposure exceeds a chronic low-effect level												
A	Probable - exposure represent the highest level risk that could be quantified - exceeds an acute effect level												

Table 4-5

Chemicals of Ecological Concern in Sediment/Soil - Terrestrial Receptors

Bolsa Chica Lowlands

Chemical of Ecological Concern (COEC)	Future Full Tidal	Gas Plant Pond Area[a]	Muted Tidal	Seasonal Ponds
Inorganics				
Arsenic	B	B	B	B
Barium	B	C	B	B
Beryllium	B		B	B
Cadmium	B		B	
Chromium	B	B	B	B
Cobalt	B	C	B	C
Copper	B	B	B	B
Lead	B	B	B	B
Mercury	B	B	B	B
Molybdenum	B		B	B
Nickel	B	C	B	B
Selenium	B	B	B	B
Silver	B			
Thallium	B	B	B	B
Vanadium	B	B	B	B
Zinc	B	B	B	B
Organics				
4-Nitrophenol	B			
Acenaphthene	B	B		
Acenaphthylene	B		B	
Benzo(a)anthracene	B	B	B	B
Benzo(a)pyrene	B	B	B	B
Benzo(g,h,i)perylene	B	B	B	
Chrysene	B			
Dieldrin		U		
Indeno(1,2,3-c,d)pyrene	B			
Naphthalene	B			
Phenanthrene	B			B

Notes:

[a]This area includes samples collected in the vicinity of the ponds downgradient of the former Gas Plant (outside the numbered Cells, south of Cells 11 and 12).

Risk Categories	*Description*
U	Uncertain - exposure exceeds chronic no-effect level, but a chronic low-effect level was not availat
C	Some Possible - exposure exceeds a chronic no-effect level, but not a chronic low-effect level
B	Possible - exposure exceeds a chronic low-effect level

Table 4-6
Chemicals of Ecological Concern in Sediment/Soil - Aquatic Plants and Organisms, and Semi-Aquatic Birds
Bolsa Chica Lowlands

Chemical of Ecological Concern (COEC)	Bolsa Bay	Full Tidal	Future Full Tidal	Garden Grove	Gas Plant Pond Area[a]	Muted Tidal	Seasonal Ponds
Inorganics							
Arsenic	B	B	A	B	A	A	A
Barium	B	B	B*	U	U	B	B
Beryllium	B	B	A	B	B	B	B
Cadmium	B	B	A	C	C	B	C
Chromium	B	A	A	C	A	A	A
Cobalt	B	A*	A	B	B	A	B
Copper	B	B	A*	B	B	A	B
Lead	B	B*	A*	B	B	A*	A
Mercury	B	A	A*	B	B	B	A
Molybdenum		B	B	B		B	B
Nickel	A*	A*	A	B	B	A*	A*
Selenium	A	A	A*	A	A	A	A
Silver	C	B	A	C	B	C	B
Thallium	A	A	A	A	A	A	A
Vanadium	B	B*	A*	B	B	B	B
Zinc	B	B	A*	B	B	A*	B
Organics							
4,4'-DDD	A	A	A*	A	A	A	A
4,4'-DDE	A*	A	A*	A	B	A	A*
4,4'-DDT	B	A	A			A	B
4-Methylphenol			U				
4-Nitrophenol			B				
Acenaphthene		A	A*		A		
Acenaphthylene			A			A	
Aldrin			A				
Anthracene	C	B	B			B	B
Aroclor 1254	U	U	U	U	U	U	U
Aroclor 1260		U	U		U	U	
Benzo(a)anthracene	C	B	B	C	B	B	B
Benzo(a)pyrene	B	B	B	B	B	B	B
Benzo(b)fluoranthene	B	B	B	B	B	B	B
Benzo(e)pyrene	U	U	U	U		U	U
Benzo(g,h,i)perylene	B	B	B	B	B	B	
Benzo(k)fluoranthene	U	U	U	U	U	U	U
BHC-alpha	U	U	U		U	U	U
BHC-beta	U	U	A*				U
BHC-delta		U	U	U		U	
BHC-gamma	U	U	U			U	U
Bis(2-ethylhexyl)phthalate	U	U	U	U		U	U
Butylbenzylphthalate	U	U	U	U		U	U
Chlordane (technical)	A	A	A*	A		A	
Chlordane-alpha	A	B	A*	A		A	
Chlordane-gamma	A		A*	B		A	
Chrysene	C	A	A*	C	B	B	B
Dibenz(a,h)anthracene		A	A				A
Dieldrin	B	B	A	B	B	A	B

Table 4-6
Chemicals of Ecological Concern in Sediment/Soil - Aquatic Plants and Organisms, and Semi-Aquatic Birds
Bolsa Chica Lowlands

Chemical of Ecological Concern (COEC)	Bolsa Bay	Full Tidal	Future Full Tidal	Garden Grove	Gas Plant Pond Area[a]	Muted Tidal	Seasonal Ponds
Dimethylphthalate	U	U	U		U	U	
Di-n-butylphthalate	U	U	U	U	U	U	U
Di-n-octylphthalate	A	A	A	B	A	A	A
Endosulfan I		U	U			U	U
Endrin		A	A			A	A
Endrin aldehyde		B	A	B		A	A
Endrin ketone		A	A			A	
Fluoranthene	C	C	B	B	C	C	B
Fluorene		A	A*		A	A	
Indeno(1,2,3-c,d)pyrene	U	U	U	U		U	
Naphthalene		A	A		A	B	
Oil and Grease	B	A	A	B	A	A	A
Phenanthrene	B	A	A	A	A	A	A
Phenol	U					U	U
Pyrene	C	B	B	C	C	C	C
TPH-Diesel	A	A	A		A	A	A
TPH-Diesel and Waste Oil	A	A	A	B	A	A	A
Waste oil	A	A	A	B	A	A	A
High MW PAHs	C	B	B	C	C	C	C
Low MW PAHs	B	A	A		A	A	
Total DDT	A	A	A	A	A	A	A
Total PAHs	B	A	A	B	A	B	B
Total PCB	B	B	A	B	A	A	B
Total phenol	U	U	U			U	
Total phthalate esters	U	U	U	U	U	U	U

Notes:
[a]This area includes samples collected in the vicinity of the ponds downgradient of the former Gas Plant (outside the numbered Cells, south of Cells 11 and 12).
*Chemical showed significant bioaccumulation in *Nereis* clam worms

Risk Categories	***Description***
U	Uncertain - exposure exceeds chronic no-effect level, but a chronic low-effect level is not available
C	Some Possible - exposure exceeds a chronic no-effect level, but not a chronic low-effect level
B	Possible - exposure exceeds a chronic low-effect level
A	Probable - exposure represents the highest-level risk that could be quantified

Table 4-7
Chemicals of Ecological Concern in Surface Water - Aquatic Receptors
Bolsa Chica Lowlands

Chemical of Ecological Concern (COEC)	Bolsa Bay	Full Tidal	Future Full Tidal	Garden Grove	Gas Plant Pond Area[a]	Muted Tidal	Seasonal Ponds
Inorganics							
Arsenic			B	C			
Arsenic, Dissolved	C	B	B	C			B
Barium			B	B			B
Barium, Dissolved	U	B	B	B			B
Beryllium, Dissolved		U					
Cadmium			B	B			
Cadmium, Dissolved	B	B	B	B			B
Chromium			B	C			
Chromium, Dissolved	B	B	B	B			B
Cobalt			B	B			
Cobalt, Dissolved		B	B	C			B
Copper			A	A			B
Copper, Dissolved	A	A	A	B			A
Lead			B	B			
Lead, Dissolved	C	B	B	B			B
Mercury		U	U	U			
Nickel			B	B			
Nickel, Dissolved		B	B				
Silver			B				
Silver, Dissolved	B	B	B				B
Sulfate	B	B	B	B			B
Vanadium			B	B			
Zinc			B	B			A
Zinc, Dissolved	C	C	B				B
Organics							
2,4-D			B				
4,4'-DDT			B				
4-Nitrophenol			B	B			
BHC-delta			B				
Chlorpyrifos			B				
Diazinon			B	B			B
Dicamba			B				
Dieldrin		B	B	B			
Endrin		A					
Malathion			B				
TPH-Diesel		B	B	B			B
Waste oil		B	B	B			B

Notes:

[a]This area includes samples collected in the vicinity of the ponds downgradient of the former Gas Plant (outside the numbered Cells, south of Cells 11 and 12).

Risk Categories	*Description*
U	Uncertain - exposure exceeds chronic no-effect level, but a chronic low-effect level is not available
C	Some Possible - exposure exceeds a chronic no-effect level, but not a chronic low-effect level
B	Possible - exposure exceeds a chronic low-effect level
A	Probable - exposure represents the highest-level risk that could be quantified